



UNIVERSAL REGISTRATION DOCUMENT 2021

INCLUDING THE ANNUAL FINANCIAL REPORT



THE “RAISON D’ÊTRE” OF EDF

To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development —

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THE GROUP, ITS STRATEGY AND ACTIVITIES

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* This information is part of the annual financial report, as required by Article L. 451-1-2 of the French Monetary and Financial Code.



Universal Registration Document 2021

INCLUDING THE ANNUAL FINANCIAL REPORT

BE THE ENERGY **FOR CHANGE.**



This Universal Registration Document (URD) was filed on 17 March 2022 with the French Financial Markets Authority (AMF), the competent authority under Regulation (EU) 2017/1129, without prior approval in accordance with Article 9 of that Regulation.

This Universal Registration Document may be used for the purposes of an offer of securities to the public or the admission of securities to trading on a regulated market if it is supplemented by a securities note and, if applicable, a summary and any amendments made to the Universal Registration Document. The set of documents formed thereof is approved by the AMF in accordance with EU Regulation 2017/1129. The URD has been prepared by the issuer and its signatories are liable for its content. However, the version of the URD issued in French as mentioned above is the only binding version. The English language version is provided solely for the convenience of English speaking readers. All possible care has been taken to ensure that the translation is an accurate presentation of the original. However, in all matters of interpretation, views or opinion expressed in the original language version of the document in French take precedence over the translation.

Copies of this 2021 Universal Registration Document are available free of charge from EDF (22-30, avenue de Wagram, 75382 Paris cedex 08) and on its website (<http://www.edf.fr>), as well as on the AMF's website (<http://www.amf-france.org>).

This document should be read with the reading caveats on the last page of this document [available by clicking here].

523.7^{TWh}

ELECTRICITY PRODUCED
WORLDWIDE

38.5

MILLION CUSTOMERS
WORLDWIDE ⁽¹⁾

91%

DECARBONISED
GENERATION ⁽²⁾

167,157

EMPLOYEES ⁽³⁾

(1) Customers are counted per site. A customer can have two delivery points: one for electricity and another one for gas.

(2) Direct output-related CO₂ emissions, excluding life-cycle analysis (LCA) of fuel and production means.

(3) Group scope.





1

THE GROUP, ITS STRATEGY AND ACTIVITIES

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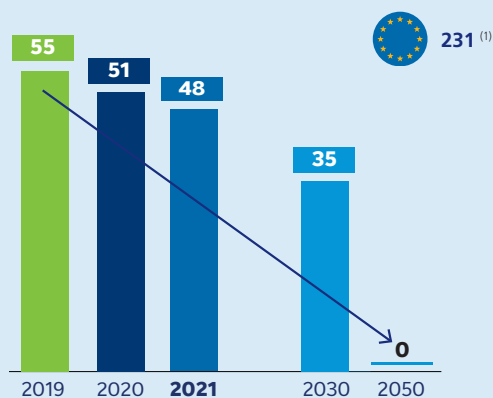
1.1 Key figures and business model

EDF Carbon trajectory

Carbon intensity trajectory

(In gCO₂/kWh)

Steadily declining and around
5x lower than the European average

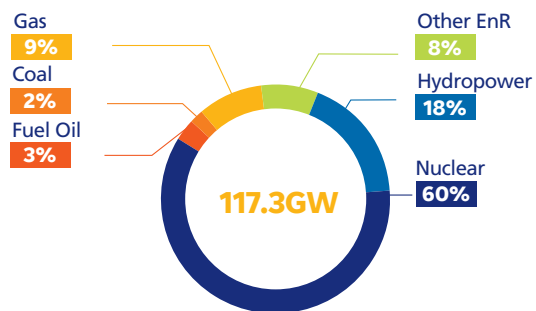


(1) 2020 carbon intensity average of power producers in Europe according to the European Environment Agency (EEA).

Key figures 2021*

Installed capacity⁽¹⁾

In GW



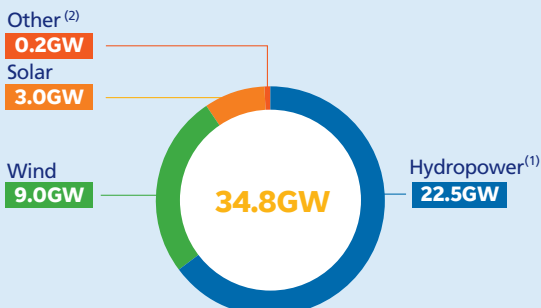
(1) Consolidated data.

EDF, the renewable energy leader in Europe

Net installed renewable capacity by sector - 2021

In GW

**60GW NET
TARGET 2030**

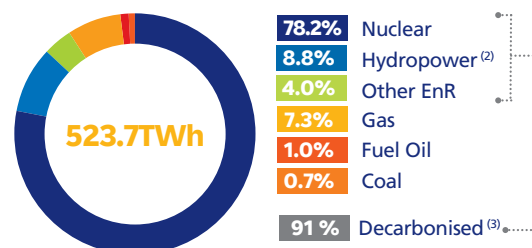


(1) Including sea energy: 0.24 GW.

(2) Biomass, geothermy.

Electricity generation⁽¹⁾

In TWh



(1) Consolidated data.

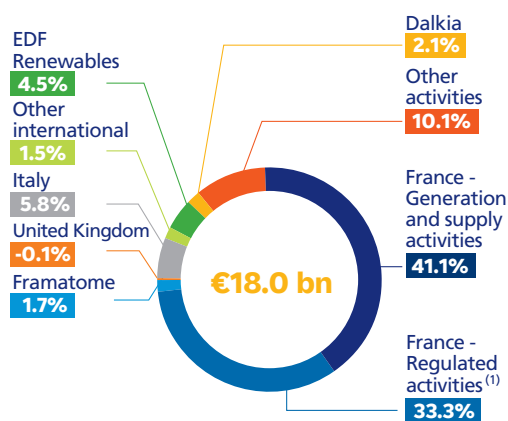
(2) Hydro output including pumped storage consumption.

(3) Direct output-related CO₂ emissions, excluding life-cycle analysis (LCA) of fuel and production means.

* The Group's financial outlook is presented in Section 5.5.



Breakdown of EBITDA

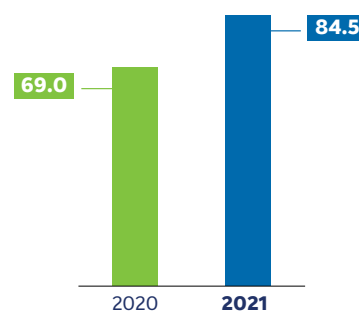


2020 EBITDA: €16.2 bn

(1) Regulated activities: Enedis, ÉS and island activities; Enedis, an independent EDF subsidiary as defined in the French energy code.

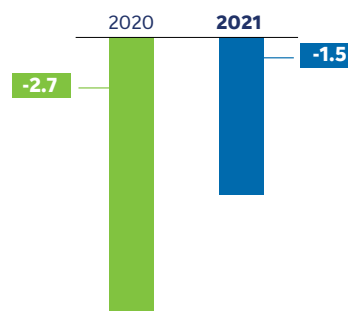
Sales

In billion of euros

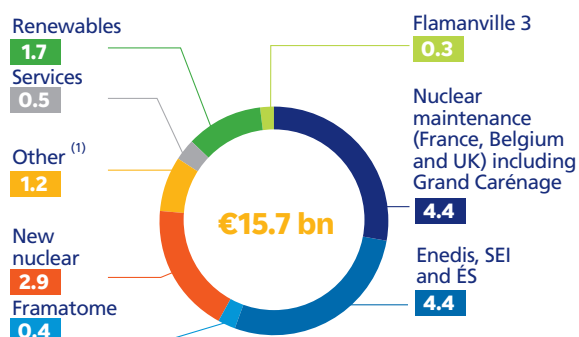


Cash-flow

In billion of euros

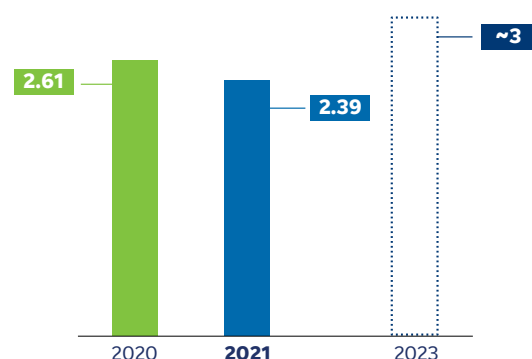


Net investments excluding disposal plan



(1) Mainly thermal maintenance, gas, property, central functions.
NB : Values are rounded.

Net financial debt / EBITDA



Net financial debt amounts to €43.0 bn at the end of 2021 (€42.3 bn at the end of 2020).

ASSETS AND RESOURCES

Customer proximity

- **32.5** million customers in electricity
- **6.0** million customers in gas⁽¹⁾
- **Leading brands:** EDF, Edison, Luminus, Dalkia
- **74.3** million visits on digital consumption monitoring platforms⁽²⁾

A human ambition

- **167,157** employees⁽³⁾
- **79%** of employees took part in a skills development initiative during the year⁽³⁾

An ambitious innovative ecosystem

- An new Innovation and Pulse Programmes department created in 2021
- Nearly **2,263** R&D employees⁽⁴⁾
- R&D consolidated budget of **€661 M** in 2021
- **756** patented innovations at the end of 2021 by the R&D (EDF & Enedis)

Major industrial assets

- **117.3GW** of electricity generation capacity⁽⁵⁾
- An integrated nuclear industry
- EPR technology
- A portfolio of wind and solar projects of almost **76GW** gross⁽⁶⁾
- **1.4** million km of distribution network⁽⁷⁾
- **34** million smart meters installed⁽³⁾
- **Over 330** heating and cooling networks operated by Dalkia

A strong CSR commitment

- **No. 1** investor in energy transition in Europe
- **A rating**  Climate Change
- **No. 4** 
- **€19 bn** of green & sustainable funding

(1) Consolidated scope. Counted per site.

(2) EDF SA scope excluding French overseas departments and Corsica.

(3) Group scope.

(4) FTEs (full-time equivalent) at Group level.

(5) Consolidated data at Group scope.

(6) Group scope. Pipeline excluding capacity under construction. All the projects in prospect phase included in the pipeline, starting 2020.

(7) Enedis distribution network under concession.

BUSINESS MODEL

The *Raison d'être* of EDF

To build a net zero energy future with electricity

and innovative solutions and services, to help save the planet and drive wellbeing and economic development.

CAP 2030

Three strategic axes

to decarbonise our societies in France, in Europe and in the world:

A creator of services and solutions to support customers and territories in the shift towards carbon neutrality

>15MtCO₂
avoided emissions⁽¹⁾

€10 bn revenue
in services⁽³⁾

>1.5
contracts/customer⁽²⁾

A global leader in the generation of CO₂-neutral electricity

>50%
emissions
CO₂ eq vs 2017

60GW net,
>x2 renewable capacities
(incl. hydro)
vs 2015

Initiating new
EPRs & 1 SMR

An international key player in the energy transition

Exit coal

1.5-2GW net
hydro installed capacity⁽⁴⁾

1 million
off grid kits

Supported by an impulse of transformation, innovation, human ambition and Corporate Social Responsibility commitments and by **the implementation of 4 plans:**



LE PLAN
stockage
électrique

LE PLAN
MOBILITÉ
ÉLECTRIQUE



Scope: (1) Customers, Services & Territories sector's activities. (2) EDF estimate : France, UK, Italy and Belgium (Residential). (3) Group. (4) Excluding priority countries in Europe (France, Italy, UK and Belgium).

The breakdown of CSR issues into 16 commitments

Ambitious carbon trajectory
Carbon offset solutions
Adapting to climate change
Developing electricity use and energy services

Biodiversity
Responsible land management
Integrated and sustainable water management
Waste and circular economy

Health and safety for all
Ethics, compliance and human rights
Equality, diversity and inclusion
Energy poverty and social innovation

Dialogue and consultation with stakeholders
Responsible regional development
Development of industrial sectors
Sustainable and inclusive digitalization

VALUE CREATION - 2021



For the climate and environment

- An ambition to contribute to **carbon neutrality** by 2050
- Electricity output of **523.7 TWh**, 91% decarbonised⁽¹⁾ with emissions of **48g of CO₂/kWh**⁽²⁾
- EDF, a water sharing player: water intensity of **0.82l/kWh**⁽³⁾
- A commitment to biodiversity



Sales
€84.5 bn

EBITDA
€18.0 bn

Net income excl.
Non-recurring items
€4.7 bn

Sharing added value with our stakeholders



For customers

- High customer satisfaction level
- More than **642,000** energy advice actions for customers⁽⁴⁾



For partners and territories

- SMEs account for between **22** and **26%** of EDF and Enedis procurements
- **1** direct job at EDF SA generates **4.4** on the national territory⁽⁵⁾
- **100%** of projects are subject to consultation⁽⁶⁾



For employees

- An employee engagement index of **69%**⁽⁷⁾
- Women represent **29.8%** in Management Committees⁽⁸⁾
- An average salary equity ratio of **6.6%**⁽⁹⁾



Suppliers
Purchases⁽¹⁰⁾
€52.9 bn

EDF Group Global CSR agreement



States and Territories
Taxes⁽¹¹⁾
€4.7 bn



Employees
Remuneration⁽¹²⁾
€14.5 bn



Shareholder
Dividends
Target distribution rate⁽¹³⁾
45% - 50%

(1) Direct output-related CO₂ emissions, excluding life-cycle analysis (LCA) of fuel and production means.

(2) CO₂ emissions due to heat and electricity generation. Group scope.

(3) Water consumed / electrical production of fleet. Group scope.

(4) EDF SA scope.

(5) Goodwill study based on the 2020 consolidated figures.

(6) Projects over €50m in accordance with the Equator Principles - Group Scope.

(7) MyEDF Group internal survey.

(8) Group Scope.

(9) EDF SA scope - ratio established in accordance with the guidelines published by AFEP.

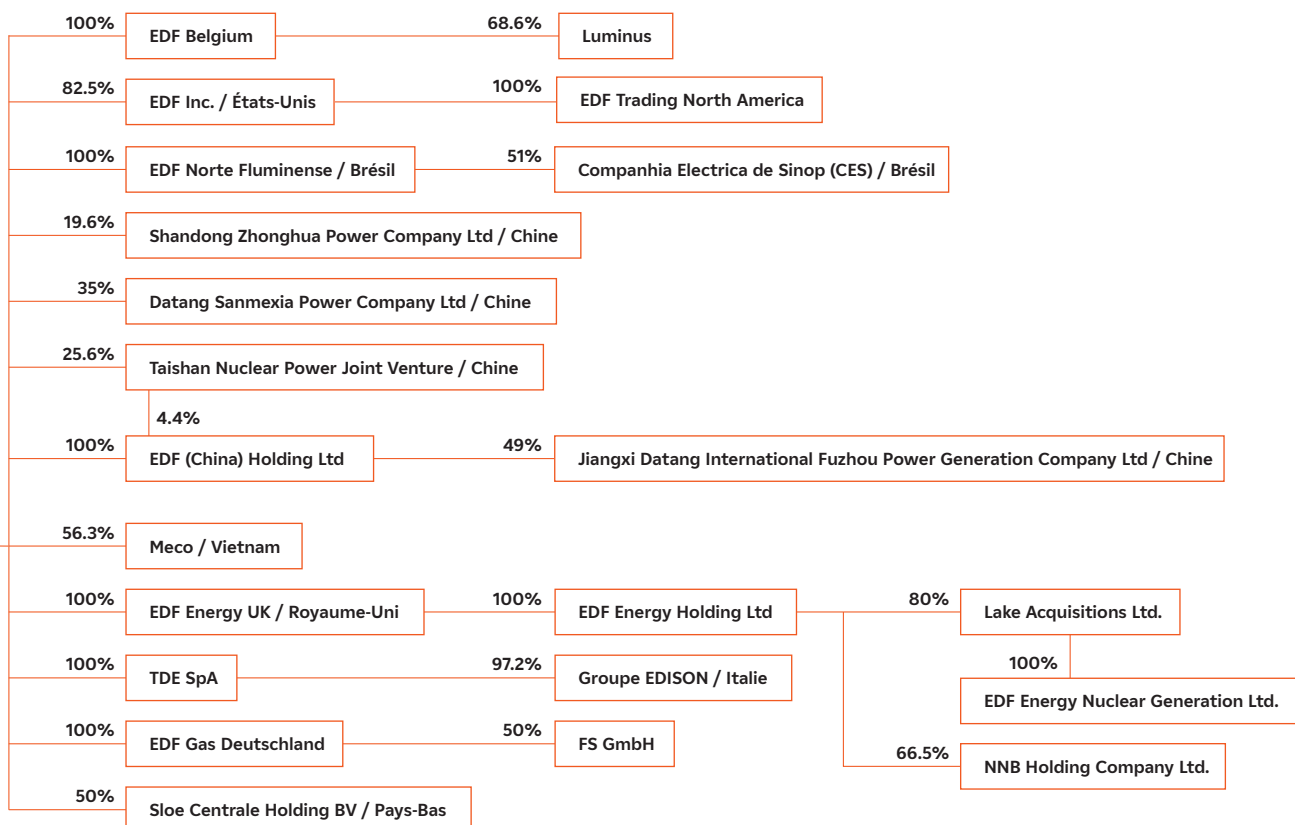
(10) Consolidated purchases and other external expenses.

(11) Consolidated taxes, including income taxes.

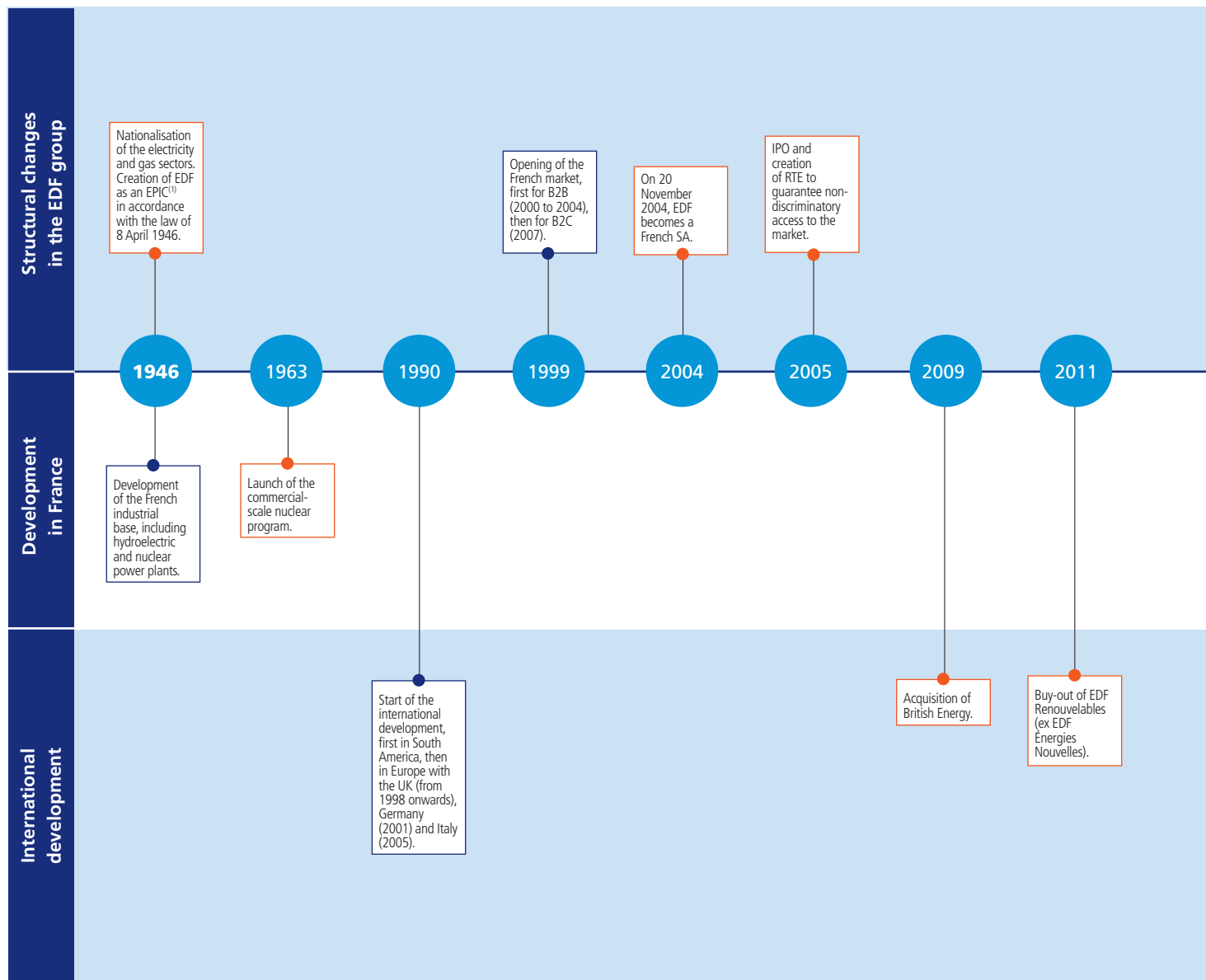
(12) Consolidated personnel expenses.

(13) Rate applied to 2021 net income from ordinary activities adjusted for the interest on hybrid loans recognised in equity.

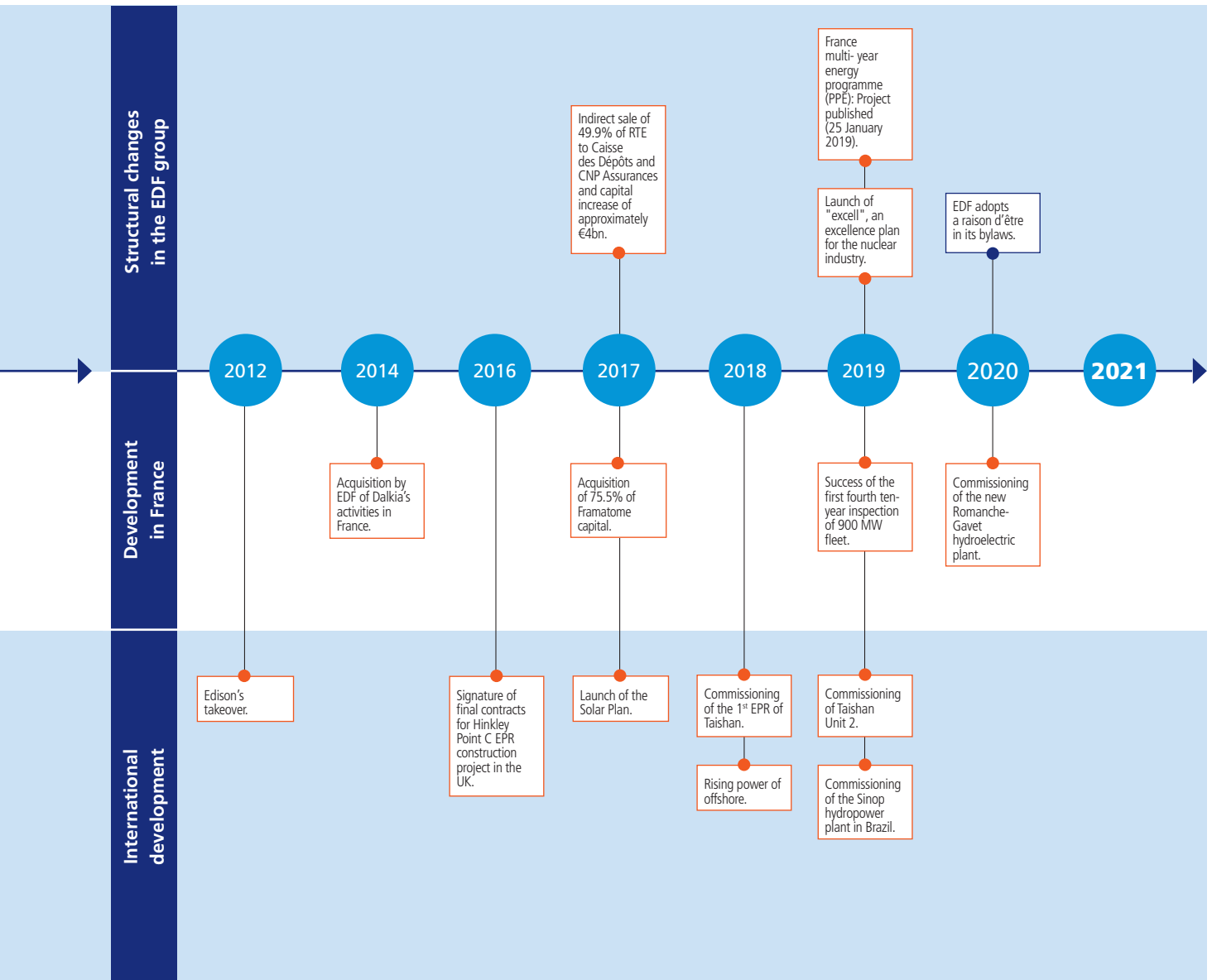
EDF International



1.2.2 History of the Group



*EPIC: Public Industrial and Commercial Establishment.



1.2.3 Significant events of the year



Financial targets achieved ⁽¹⁾



Strong increase in EBITDA and Net Income compared to 2020 and 2019



Successful disposal and cost savings plans *



Decrease in carbon intensity

(1) Targets revised on 15/12/2021 for EBITDA and on 29/07/2021 for the net financial debt/EBITDA ratio



NUCLEAR

- **Nuclear power included in European taxonomy ⁽¹⁾**
- **France:**
 - Existing nuclear and *Grand carénage* programme: 5 fourth 10-year inspections completed, 2 in progress, and extension of 1,300MW French nuclear fleet depreciation period to 50 years**
 - EDF is a major actor of the "France 2030" plan, bringing €1 billion of support for the nuclear industry, particularly for SMRs ⁽²⁾ and of the "France Relance" national recovery plan through the creation with the French State of the *Fonds France Nucléaire* for SME growth in the nuclear sector
 - Flamanville 3:
 - Update of fuel loading target from end-2022 to Q2 2023 and construction costs from €12.4 billion to €12.7 billion ⁽³⁾
 - Finalisation of repair work on the 8 welds on the main secondary circuit
 - New nuclear: Submission to the public authorities by EDF and the nuclear industry of their contribution to the programme to build 3 pairs of new EPR 2 reactors in France
- **China:** Anomaly in the fuel assemblies of Taishan reactor 1
- **United Kingdom:**
 - Sizewell C:
 - Draft law introduced by the UK government on a funding scheme (Regulated Asset Base) of new nuclear projects
 - Announcements by the UK government of future investment of up to €1.7 billion in development of large-scale nuclear projects
- **India:** Binding technical and commercial offer submitted for the construction of six EPRs ⁽⁴⁾ at the Jaitapur site
- **Poland:** Submission of a non-binding preliminary offer for engineering, procurement and construction services for 4 to 6 EPR reactors in Poland (6.6 to 9.9GW)



RENEWABLES

- Increased production: 20.9TWh, +8.3% vs end-2020
- Acceleration in commissioning: 3.1GW gross (vs 2.5GW in 2020)
- Growth in installed capacities: 12GW net at end-2021 (+13% vs 2020)
- Substantial capacity under construction: 7.9GW gross at end-2021, notably including the Courseulles-sur-Mer wind farm (448MW), France's first offshore wind farm at Saint-Nazaire ⁽⁵⁾ and a 300MW solar power plant at Jeddah
- Project pipeline: 76GW gross (+27% vs end-2020) including the 1.5GW Atlantic Shores project in the United States



CUSTOMERS AND SERVICES

- 1.4 million residential electricity customers with market offers in France, up 40% vs end-2020 and consistent with the target of 3 million in 2023
- Strong growth in electric mobility: close to 200,000 charging points installed and managed at end-2021, mainly Pod Point, the leader in home charging in the United Kingdom with over 150,000 charging points
- Signature of renewable power purchase agreements (PPAs) with Bouygues Telecom, SNCF and RATP
- Dalkia Electrotechnics/Citelum winner of a 10-year public street lighting contract for the city of Paris
- Dalkia: creation of an innovative monitoring system for operation and maintenance of 122 SNCF railway stations, and signature of an agreement with Futuroscope for a green heating and air-conditioning network ⁽⁶⁾ using renewable energies ⁽⁷⁾

enedis

ENEDIS

- Successful roll-out of the Linky smart meters, final programme target achieved in terms of time, cost and performance

(1) According to the complementary delegated act adopted on 2 February 2022 subject to definitive adoption in 2022.

(2) Small Modular Reactors.

(3) See the press release of 12 January 2022. Costs in 2015 euros and excluding interest during the period of construction.

(4) EDF is neither an investor nor in charge of construction.

(5) See the press release of 28 August 2021.

(6) Technology similar to that of heat pumps, circular economy, environment protection.

(7) 40% reduction in greenhouse gas emissions for Futuroscope and 70% energy self-consumption by 2025.



ITALY

- Strategic repositioning of Edison: reorganisation of renewable assets ⁽¹⁾ and refocus on core businesses



INNOVATIONS

- Commissioning of 50MW of batteries in the United Kingdom as part of the ESO ⁽²⁾ project
- Inauguration of the first hydrogen production and distribution plant by Hynamics at Auxerre, France



INTERNATIONAL

- Signature of a development agreement for a 240MW hybrid floating solar project on the Nam Theun 2 reservoir in Laos
- Finalisation of financing for an innovative project combining solar power and gas, with development of Chile's largest solar power plant so far (480MW)
- Construction of the Nachtigal hydro powerplant (420MW) in Cameroon: progress on civil engineering and electro-mechanical work (more than half completed). Industrial commissioning planned for 2024

* €3 billion disposal plan and €500 million cost savings plan achieved

To offset the impacts of the health crisis on the Group's financial situation, cost savings and disposal plans were launched mid-2020 with a view to reducing operating expenses by €500 million between 2019 and 2022 ⁽⁴⁾, and generating approximately €3 billion in disposals between 2020 and 2022 ⁽⁵⁾. At end-2021, an estimated €543 million in cost savings had been achieved compared to 2019. Asset disposals signed or completed at 31 December 2021 had a favourable effect of around €3.0 billion on net debt and around €3.7 billion on the Group's economic debt ⁽⁶⁾. These disposals are consistent with Group strategy and have helped to refocus on core businesses and to withdraw from carbonised activities (mainly the sales of the E&P business and of the IDG gas distribution network). Both plans have exceeded their targets one year ahead of schedule.



PHASE-OUT OF COAL-FIRED PLANTS IN EUROPE

- France: closure of Le Havre coal-fired power plant on 31 March 2021 ⁽³⁾
- United Kingdom: closure of the West Burton A plant planned for September 2022, two years before the deadline set by the UK government



ACHIEVEMENTS AND ENVIRONMENTAL AND SOCIAL TARGETS

- Carbon intensity: 48gCO₂/kWh in 2021 vs 51gCO₂/kWh in 2020, level around 5 times lower than the European average for utilities
- Gender equality: women accounted for 29.8% of Management Committee members at Group's entities in 2021 vs 28.7% in 2020, in line with Group targets
- EDF listed on "CAC 40 ESG", the Euronext index of 40 socially responsible companies

** Extension to 50 years of the depreciation period of 1,300MW reactors in France

The Group changed the depreciation period of its 1,300MW PWR plants in France on 1 January 2021, as the technical, economic and governance conditions had been met. Since then, the provisions related to nuclear production decrease by €1,016 million. This decrease is largely taxed and generated a tax disbursement of €184 million. The impact of the 50-year depreciation period extension on net income - Group share for this year is +€405 million (see note 1.4.1 to the 2021 consolidated financial statements).

(1) Purchase of remaining shares in the E2i holding company and investment by a new financial partner. Edison retains control of the new platform.

(2) Energy Superhub Oxford, with 100% renewable energies.

(3) The coal-fired plant in Le Havre has been shut down and mothballed (multi-year guaranteed shutdown) since end-March 2021.

(4) Sum of personnel expenses and other external expenses. At constant scope, accounting standards, exchange and pensions discount rates, and excluding inflation. Excluding sales costs of energy service activities and nuclear engineering services of Framatome and in particular projects such as Jaitapur.

(5) Signed or completed disposals: impact on Group's economic debt (Standard and Poor's definition).

(6) Net economic debt according to Standard and Poor's definition.

1.3 Group strategy and objectives

1.3.1 Environment and strategic challenges

Energy efficiency and low-carbon electricity are at the heart of energy transition.

The fight against climate change is a major challenge for the planet. The agreement reached in Paris at the 21st session of the Conference of Parties (COP 21) in 2015 has confirmed the effort being made to combat climate change and the ramping up of energy transitions beyond Europe.

In Europe, the Clean Energy Package finalised in 2019, the Green Deal developed in 2020 and the "Fit for 55" climate package proposed by the European Commission in 2021 provide the framework of measures that can enable the European Union to become carbon-neutral by 2050. Recovery programmes in the wake of the Covid-19 health crisis have made climate issues an even higher priority.

The EU's Green Deal and the related national programmes are set to focus on **cutting CO₂ emissions as a priority, and as competitively as possible**, drawing on a locally-rooted industrial vision.

The UK, which must undertake a major renewal of its electricity generation facilities, adopted the Climate Change Act in 2008 and established a market model that is consistent with that policy (comprising a Carbon Price Floor, Contracts for Difference, capacity market, and consideration of a regulated asset base model for new nuclear generation facilities).

Electricity in France accounts for some 25% of final energy consumption, but only just over 12% of CO₂ emissions⁽¹⁾ (the international figures are 20%⁽²⁾ and 41%⁽³⁾ respectively). France's "Climate and Energy" Act (*loi relative à l'énergie et au climat*) of 8 November 2019 places cutting greenhouse gas emissions at the heart of French energy policy. The goal is now *"becoming carbon-neutral by 2050 by cutting greenhouse gas emissions more than sixfold"*. France's Multi-Year Energy Programme (*Programmation Pluriannuelle de l'Énergie*, PPE), which lists the broad outlines of French energy policy, sets out a ten-year vision, which is vital for major industrial players. EDF agrees with the PPE's analysis, in particular in terms of identifying leverage to eliminate fossil energy.

To reach these objectives, the two major levers of actions are:

- lowering energy consumption by developing **energy efficiency** solutions (downstream); and
- switching from fossil fuel to carbon-free energy sources, with **carbon-free electricity** first and renewable heat (upstream).

Transition to a carbon-free economy is needed, but this should be achieved whilst preserving households' purchasing power and companies' competitiveness.

Innovation, both upstream and downstream, will be an essential factor in these goals being successfully achieved.

1.3.2 Priorities of the CAP 2030 strategy

EDF's *raison d'être* is "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development". Drawing on the contribution of employees during the "Let's Talk Energy" (*Parlons Énergies*) dialogue, the *raison d'être* was added to the Company's bylaws at the Shareholders' General Meeting held on 7 May 2020. **The CAP 2030 strategy reflects EDF's *raison d'être*.**

The EDF group produces some of the least carbon-intensive electricity in the world. In 2020 EDF made new greenhouse gas reduction commitments by 2030; these have been validated by the Science Based Targets Initiatives organisation as being ahead of the COP21 2°C ambition.

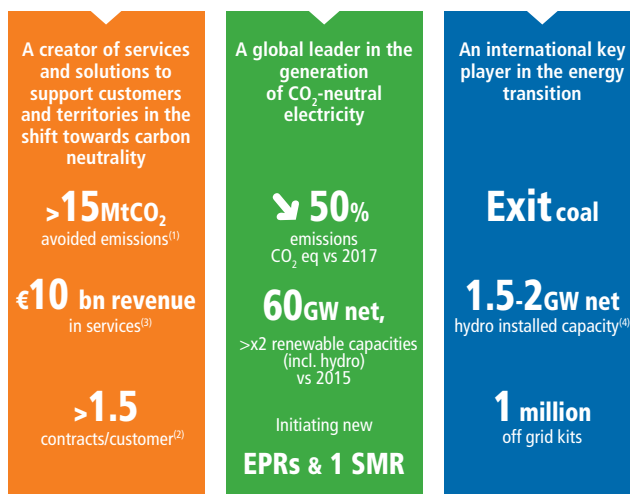
For the first time, the EDF group has set itself targets that cover not only its direct emissions but also its indirect emissions. The aim is to adopt a trajectory whereby the Group contributes to achieving carbon neutrality for its entire carbon footprint by 2050. By 2030, EDF aims to reduce its direct and indirect emissions by 50% compared to the 2017 level of emissions and to reduce its scope 3 emissions by 28% compared to the 2019 level (see also section 3.1 "Carbon neutrality and the climate").

For EDF, the fight against climate change is based on energy decarbonisation, as a means of reducing the carbon intensity of consumption, and energy efficiency.

The Group's strategy is structured around three strategic axes, which are expounded in the CAP 2030 strategy:

CAP 2030

Three strategic axes to decarbonise our societies in France, in Europe and in the world:



Perimeter:

(1) Customers, Services & Territories sector's activities.

(2) EDF estimate : France, UK, Italy and Belgium (Residential).

(3) Group.

(4) Excluding priority countries in Europe (France, Italy, UK et Belgium).

(1) Source: French Ministry for Ecological Transition, *Chiffres clés du climat* (Climate: Key Figures), 2022 edition, page 38.

(2) International Energy Agency, World Energy Outlook 2021, Table A.2a page 295.

(3) Source: French Ministry for Ecological Transition, *Chiffres clés du climat* (Climate: Key Figures), 2022 edition, page 38.

A creator of services and solutions to support customers and territories in the shift towards carbon neutrality

Individuals, businesses and cities increasingly want to change their methods of lighting, heating, production, consumption and travel, etc. Everyone wishes to be a stakeholder in energy transition. This momentum, which is an aggregate of individual initiatives and public decisions, is gradually increasing everywhere. EDF's goal is to assist customers and local areas to achieve CO₂ neutrality with accessible and innovative carbon-free and energy-efficient solutions.

In doing so, EDF is enhancing the value of its customer portfolio in priority European countries (France, the United Kingdom, Belgium and Italy) on account of its benchmark-quality customer relations and an expanded range of service and supply offers.

In 2030, EDF group is aiming to achieve sales of €10 billion in services ⁽¹⁾.

EDF is strengthening its positions in the electric mobility sector (in France, the United Kingdom, Italy, and Belgium), in renewable heating and cooling networks in France, and also in leveraging electrical flexibility and aggregation (in Europe).

By building on customer confidence and developing a broad range of offers, in particular in sustainable energy performance on residential and business markets, EDF is growing value per customer and is seeking to achieve more than 1.5 contracts per residential customer in 2030 ⁽²⁾. Offerings for green energy, self-consumption, energy efficiency services, local services, contracts covering performance and electrical/climate engineering, waste heat recovery, and biomass all address its customers' emerging needs.

EDF's customers are increasingly aware of their environmental footprint. In response, EDF is providing affordable, innovative solutions that grant them access to smarter, lower energy use:

- **by contributing to the decarbonisation of consumption through a shift to electricity use in the sectors that produce the most CO₂:**

- **Transport** ⁽³⁾

To support the massive rollout of mobility electrification, EDF is making practical commitments: investing in support for customers (consumers, companies, and local authorities); leveraging electric vehicle storage capacity; and producing and marketing electrolytic hydrogen,

- **Buildings**

The Group is highly committed alongside industry professionals, landlords, and local authorities to help them improve energy efficiency and transition towards decarbonisation of heating and cooling solutions. EDF offers a range of services that cover everything from monitoring and management of energy use through to decarbonisation and energy efficiency operations ⁽⁴⁾, in particular during renovation works. EDF also provides direct support for households ⁽⁵⁾ through IZI by EDF. Through its subsidiary Dalkia, the Group is actively engaged in developing heating networks and their decarbonisation (with the use of renewable energy sources or energy recovery) and the development of Energy Performance Contracts (*Contrats de Performance Énergétique*, CPE) for public buildings, companies, and residential complexes,

- **Industry**

EDF develops electrification solutions for processes, waste heat recovery, and low-carbon electrolytic hydrogen production. It leverages its R&D expertise for the benefit of its industrial customers to assist them in upgrading their production facilities (electric boilers and furnaces, etc.) but also by proposing (via its subsidiary Agregio) flexible solutions or green supply offers.

- **by building on the development of infrastructure, data, and the creation of low-carbon solutions;**
- **by helping its residential customers, businesses, and local authorities to play a more substantial role in their energy consumption** (through self-consumption, digital consumption management solutions and heat pumps).

The aim of these solutions is for EDF to avoid the emission of over 15 million tonnes of CO₂ by 2030 ⁽⁶⁾.

In addition, EDF continues to innovate by developing new business models to assist its customers with energy transition and put into practice the Group's commitments regarding carbon neutrality. Innovation, both downstream and upstream, will be an essential factor in covering the required ground, given the speed at which renewables technology is progressing from storage to electric vehicles via hydrogen power and digital developments.

Building on its own R&D efforts and its innovation ecosystem developed with its partners, the EDF group selects those innovations that have the potential to accelerate energy transition, while supporting the French industrial fabric as much as possible.

Lastly, energy transition will only be achieved if it is just and equitable. The EDF group supports its customers by helping them to use energy more wisely. EDF pays particular attention to the most vulnerable customers and implements actions to reduce energy poverty (see section 3.3.4 "Energy poverty and social innovation").

A global leader in the generation of CO₂-neutral electricity

Nearly 98% of electricity produced by EDF in France is decarbonised as a result of nuclear and renewable energies, therefore EDF is playing a leading role in achieving carbon neutrality by 2050. Its action aims to accelerate the development of renewable energies in addition to its nuclear fleet, for which it guarantees safety, performance and competitiveness.

There is no single solution for ensuring low-carbon electricity, but rather an array of technologies: nuclear power, hydropower, solar power, onshore and offshore wind power, renewable heat, grids, storage and low-carbon thermal generation means, tools for managing flexibility in uses and production, etc.

EDF's strategy is consistent with the announcements made by the French President of the Republic on 10 February 2022 in Belfort. He confirmed the growing role of low-carbon electricity in France's ambition to reduce French greenhouse gas emissions by 55% by 2030 compared to 1990 and to achieve carbon neutrality by 2050. The President of the Republic has therefore announced:

- A strong strategy to boost nuclear energy in France, including:
 - the launch of a construction programme of 6 new EPR2 reactors and studies for potentially 8 more, which will notably mobilise massive public funding of several tens of billions of euros, even if the precise terms of this funding remain to be defined;
 - the continued operation of all existing French reactors, except for safety reasons (this extension of the operating period is therefore done without giving up any of the obligations in terms of nuclear safety), and in particular the need for EDF to study the conditions for an extension beyond 50 years, in conjunction with the Nuclear Safety Authority;
 - The development of small modular reactors (SMR), as well as innovative reactors allowing to close the fuel cycle and to produce less waste, with an additional intervention of the State up to €500 million for the NUWARD™ project currently carried out by EDF.
- Acceleration in renewable energy development (solar, offshore and onshore wind and hydro).

(1) Group scope.

(2) scope comprising France, United Kingdom, Italy and Belgium (residential).

(3) Responsible for 24% of emissions relating to energy use worldwide – Source: French Ministry for Ecological Transition, *Chiffres clés du climat*, 2022 edition, page 38.

(4) Particularly through Energy Performance Contracts (*Contrats de Performance Énergétique*, CPE) and Energy Savings Certificates (*Certificats d'Économie d'Énergie*, CEE) in France.

(5) They may choose a heat pump to replace a fuel oil or gas-powered boiler that emits large quantities of CO₂.

(6) Customers, Services & Territories activities.

- **EDF group's aim of achieving very low carbon production is embodied first and foremost in the accelerated development of renewable energy in France and abroad.** The EDF group is developing renewable electrical power using all types of technology (hydropower, solar power, onshore and offshore wind power, etc.). Renewable energies already account for over one-quarter of the Group's overall capacity ⁽¹⁾.

The EDF group is now the leader in renewable energy in Europe and, in particular, the leading supplier of hydropower in the European Union, with 22.5GW of net installed capacity ⁽²⁾. With regards to the other renewable energies, mainly wind power and solar power, EDF is also one of the world leaders, with a net installed capacity of 12GW. EDF's goal is to increase its installed capacities in those sectors rapidly.

The target is to achieve installed capacity for renewable energy (including hydropower) of 60GW net for 2030, the equivalent of more than twice the 2015 installed capacity. EDF group is seeking a balance between the different technologies (onshore and offshore wind power, solar power, and hydropower), as well as in geographical distribution. Lastly, EDF regularly invests in hydropower facilities in order to combine economic, energy and environmental performance, and offers solutions to strengthen hydropower generation.

EDF is establishing a position as a European leader in the aggregation of renewable capacity and flexibility, and has set itself the target of tripling the Group's storage resources by 2035 as part of its Storage Plan.

- **This aim of very low carbon production is also based on the performance of the nuclear industry,** by guaranteeing industrial expertise, safety, competitiveness, care for the environment, optimised operation of nuclear fleets in France and the United Kingdom, completion of works in progress (Flamanville 3, HPC), and implementation of an innovative fuel cycle strategy.

EDF's nuclear generation fleet is the only one of its kind in the world. The *Grand Carénage* of the existing fleet in France has already begun and is a major industrial challenge. The related investment is designed to enable the plants in question to remain in operation beyond 40 years, guaranteeing nuclear safety, performance, and the protection of the environment.

Nuclear power operation does not emit CO₂ ⁽³⁾; it provides baseline production whilst offering strong leverage in terms of management and flexibility to adjust to electricity consumption. As such it is an essential asset for a decarbonised electricity mix by 2050.

With this in mind, EDF is building the Hinkley Point C reactor in the United Kingdom and the Flamanville reactor in France. Two EPR in Taishan, China, are being operated. In Finland, the Olkiluoto 3 EPR built by Orano diverged on 21 December 2021. Since 4 January, it entered a second phase, during which the power is limited to 30%. Several other stages need to be completed before its scheduled commissioning in July 2022.

EDF is also developing other projects which may be built in countries that are seeking to equip themselves with new reactors. In addition, EDF is finalising the design of a new-generation of EPR.

By 2030, the Group is seeking to be engaged in new EPR programmes in France, the United Kingdom, and elsewhere in the world, as well as in the development of a first Small Modular Reactor (SMR) demonstrator in France.

EDF is also preparing for redeployments following final shutdowns. It aims to become the European leader in generation asset decommissioning, and is developing the circular economy.

- **Supporting energy transition by reducing the carbon footprint requires targeted development of electricity production projects using gas** to meet flexibility and energy transition requirements.

An international key player in the energy transition

To deal with the challenges of demographics, urbanisation and air pollution, many countries are looking for solutions that can improve the situation.

- **EDF, which operates on four continents, supports this energy transition trend by exporting its expertise in the fields of nuclear power, renewable energies and energy services.**

Internationally, there is considerable scope for innovation. EDF is seeking to triple the value creation of its activities (compared to 2015) through targeted development of its renewable energy, nuclear, and services production assets, thus contributing to other countries' energy transition.

By 2030, the EDF group's goal is that of no longer having any coal-fired assets anywhere in the world, whilst also making a significant contribution to the development of renewable installed capacity (including 1.5 to 2GW of net installed capacity in hydropower ⁽⁴⁾).

In terms of new business lines, EDF is aiming to have a portfolio of 1 million off-grid kits by 2030 and is pursuing the development of new markets such as microgrids, smart grids, storage, hydrogen, mobility, smart cities, etc., as well as further strengthening its positions in energy efficiency services, grids, and engineering services.

From a geographical point of view, EDF is seeking to strengthen its position in Europe, particularly in core countries (France, the United Kingdom, Italy, and Belgium), as well as to consolidate its position in China and North America. EDF is aiming to become a benchmark player in a limited number of priority countries in South America, Asia, Africa, and the Middle East, by means of a significant multi-business presence, thus providing coordinated support for energy transition in these target countries.

- **EDF has committed itself to ending the Group's coal-fired electricity generation by 2030.** In France, pursuant to the SNBC national low carbon strategy ⁽⁵⁾, the government has committed to halting coal-based electricity production by the end of 2022 ⁽⁶⁾. EDF is also conducting a sustained innovation policy by investing in bioenergy and innovative carbon capture technologies, and has made a commitment to decarbonised heat energy.
- **EDF is investing massively in energy transition.** In 2021, nearly 94% of Group investments were made in accordance with the Group's low-carbon goals (94% in 2020) (see also note 20.4 in the notes to the consolidated financial statements as presented in chapter 6.1 and section 3.8.3 "Details on the taxonomy").

In all the countries in which it operates, the EDF group is implementing a strategy to adapt all its activities to the impacts of climate change. It aims to make its existing facilities more resilient to increasingly frequent extreme weather events, such as heat waves, droughts, storms and floods. Moreover, the EDF group incorporates long-term climate change (such as average temperatures and sea levels) into the design of its new facilities, particularly those with a lifespan of over 40 years, such as hydroelectric and nuclear plants (see section 3.1.2 "Adapting to climate change").

(1) 30.8GW at end 2021 out of a total of 117.3GW in consolidated data.

(2) Including marine energies.

(3) No direct emission; LCA (life-cycle assessment) emissions can be estimated at 6gCO₂/kWh (source: Ademe).

(4) Excluding priority countries in Europe: France, Italy, the United Kingdom and Belgium.

(5) Introduced by the French Energy Transition Act promoting green growth (*Loi de Transition Énergétique pour la Croissance Verte*, LTECV), the National Low Carbon Strategy (*Stratégie Nationale Bas-Carbone*, SNBC) constitutes France's road map for combating climate change. It provides guidelines for implementing the transition to a low-carbon, circular, sustainable economy in all areas of business. It also defines a trajectory for cutting greenhouse gas emissions through to 2050 and establishes short to medium-term goals: carbon budgets. Its aim is twofold: to achieve carbon neutrality by 2050, and to cut the carbon footprint of the French population's consumption. National and local public-sector decision-makers must take the SNBC into account.

(6) However, RTE's most recent provisional review reveals the need to maintain production at the Cordemais power plant until 2024, or perhaps even 2026, so as to maintain the balance between supply and demand.





Conditions for the execution of the Group's strategy

The implementation of the Group's strategy requires the continuation of a very significant investment programme over the coming period. It is therefore subject to the recovery and stabilization of the Group's financial structure. The action plan communicated by the Group on 18 February 2022, which aims at strengthening its balance sheet structure, will contribute to this objective (see section 5.2 "Post balance sheet events").

However, the scale and variety of the risks the Group is facing, particularly in an extremely volatile market context, with regulatory measures that have a significantly negative impact on the company, marked by the Ukrainian conflict and the associated geopolitical tensions, the consequences of which cannot yet be fully identified or quantified, and by the analyses and works the Group has to perform out on the French nuclear fleet in relation to the stress corrosion phenomena recently identified, could have consequences of all kinds, including the emergence of new risks or the aggravation of existing risks, likely to impact significantly on the Group's capability to achieve the 2022 and 2023 financial objectives described in section 5.5 "Outlook", and its short and long-term strategic objectives described in section 1.3, or at least could make additional actions necessary to achieve them.

1.3.2.4 Strategic priorities backed up by four plans plus a transformation programme, in line with the Group's raison d'être and business model

These goals are pursued through the **four following plans** and a strategic work programme ⁽¹⁾:

	<p>Through the electric mobility plan, launched in October 2018, the EDF group aims to secure a 30% market share by 2023 in the supply of electricity for electric vehicle on the Group's four major European markets (France, the United Kingdom, Italy and Belgium). The EDF group aims at rolling out 400,000 charging points and at operating 20,000 smart charging points by 2023. At the end of 2021, almost 200,000 charging points had been rolled out. For its own fleet of light commercial vehicles, EDF is also rolling out the EV100 ⁽²⁾ programme and gradually converting its ICE vehicles into electric vehicles; the target is to be 100% complete by 2030.</p>
	<p>With the storage plan, which was launched in 2018, the EDF group plans to develop 10GW of new storage facilities in the world by 2035, in order to increase the Group's storage capacity to 15GW by that time. The EDF group is aiming to develop a portfolio of 1 million off-grid kits by 2030. Storage is a key factor in stabilising network frequency, encouraging the inclusion of renewable energy, and managing microgrids in non-interconnected areas. It will be developed by using hydro pumped energy transfer stations and batteries.</p>
	<p>Through its solar plan, which was launched in 2017, the EDF group aspires to become the leader in solar photovoltaic energy in France with a 30% market ⁽³⁾ share of the sector by 2035.</p>
	<p>With the excell plan, which was announced in December 2019 and launched in the spring of 2020, EDF is laying the required groundwork for the French nuclear industry to return to the highest standards of diligence, quality, and excellence, which are necessary for the successful completion of nuclear projects. This is a key challenge: as a low-carbon source of energy, nuclear power has a significant role to play in the fight against climate change. In 2021, 22 of the 25 commitments of the excell plan met or even exceeded the target set, due to the commitment of EDF's teams and of all the companies in the French nuclear sector ⁽⁴⁾ (see also section 1.4.1.1.1 "The excell plan").</p>

1.3.2.5 Group transformation

Health and safety, digital technology and new work practices, responsibility and simplification, skills and the recognition model are the five major levers of the Group's transformation.

In order to be able to face new challenges and meet the new expectations of the customers, employees and all the stakeholders, the Group has adapted its managerial practices by making teams more accountable, and by streamlining its organisations and its *modus operandi*. Since 2016, this approach can be illustrated by numerous concrete examples (introduction of fixed numbers of working days for managers, boosting career paths and promoting internal mobility and career advancement training, development of electronic signatures, streamlining of reporting processes, etc.).

In 2018, the Group signed new global agreement on Corporate Social Responsibility ("CSR agreement"), which includes improvements in favour of diversity and for the benefit of Group employees.

In 2019, a new management-labour dialogue approach was adopted, simplified and set up, in accordance with new legal requirements (see section 3.5.3 "Social dialogue").

In 2020, the Group reviewed its support system for internal mobility and declared new aspirations for leadership in support of managerial transformation (see section 3.3.3.6 "Skills development").

In 2021, the Group used the experience of the health crisis to give new impetus to transformation. By continuing to rethink processes, by making them more digital and by giving teams the power to act in order to implement streamlining and improvement initiatives, the Group is continuing to build a framework for effective work for which employees are accountable, thereby fostering commitment. The experience during the crisis thus resulted at the end of the year in the signature of a collective agreement entitled *Travailler autrement, Manager autrement* ("Work Differently, Manage Differently") (see section 3.3.1.3.5 "Well-being, organisation of work and working hours").

The transformation process is based in particular on mechanisms for coordinating networks of stakeholders as a continuation of "Let's Talk Energy". This a collective intelligence initiative that was created in 2018 to involve employees in building the Group's medium- and long-term scenarios (see section 3.4.1 "Dialogue and consultation with stakeholders").

For several years, the Group has also placed the focus of digital transformation and innovation at the strategic level. It has carried out an in-depth review of its internal organisation and training. Digital transformation involves employees and internal *modus operandi*, as well as customer relations and the management and design of industrial assets, and the services provided.

⁽¹⁾ The strategic work programme is composed of some twenty strategic projects managed at the Executive Committee level, which concretely implement each of the three strategic priorities.

⁽²⁾ EV100 is a global initiative that was launched in New York at Climate Week NYC in September 2017. It aims to bring together multinationals that are committed to the development of electric mobility and to ensuring its widespread adoption by 2030.

⁽³⁾ Market share expressed in terms of gross installed capacity.

⁽⁴⁾ See the EDF press release dated 8 November 2021 "Midway through the excell plan, EDF and the nuclear industry announce tangible results and new commitments for 2022".

Amongst other initiatives, 2019 saw the creation of an in-house academy devoted to training and supporting employees in transitioning to new digital jobs. In 2020, the usage centre accelerated the rollout of digital resources and practices. It is continuing its action to enhance collaboration across the Company and facilitate current remote working arrangements.

The Group continues to digitise its processes, for example by the widespread rollout of the electronic signature and by automating certain tasks (RPA ⁽¹⁾). The Group engages with technological innovations through multi-business-line teams tasked with cross-functional subjects such as Artificial Intelligence, blockchain, the Internet of Things (IoT), edge computing, quantum computing and 5G.

In 2018 the Group adopted a data management policy and set up a "data analytics" plant for nuclear, thermal and renewable electricity generation, with the pooling of expertise. A second plant has been set up for tertiary data (real estate, purchasing, etc.). In 2020, the Group adopted an AI Ambition to speed up its progress in this field and structure a policy for responsible use of Artificial Intelligence. On the occasion of its innovation showcase event "Electric Days", EDF also unveiled an open data platform.

EDF's commitment was embodied by the signature of a Responsible Digital charter created by Institut du Responsable digitalization (the French Institute for Responsible Digital Technology) and, in 2021, EDF obtained the *Responsible digitalization* (Responsible Digital) label that is backed by the Ministry for Ecological Transition.

EDF group is also a founder member of Gaia-X ⁽²⁾, an initiative to promote the emergence of a European trusted cloud. It maintained its position on the Board of Directors of this association, and is an active example of the concept of *Label de Confiance*, as well as "DataSpace Energy", a trusted ecosystem for promoting stronger availability and sharing of energy sector data.

Performance improvement has always been a priority for the Group. The current economic and financial context further increases the urge for such improvement. The Group is strengthening control of its costs to bring them into line with its environment. The approach is adjusted depending on the scopes involved (Support Divisions, operating entities, etc.) and has already produced results in terms of reduction of operating expenses, optimisation of the working capital requirement and improved management (cash-based management, project management team, cyber-security management, etc.), with the aim of enhancing the competitiveness of support activities and providing the business lines with performance levers.

In the nuclear sector, 2020 and 2021 were marked by the rollout and progress of the "excell plan", which seeks to enhance the industrial quality, expertise and governance of major nuclear projects (see section 1.4.1.1.1 "The excell plan").

1.4 Description of the Group's activities

1.4.1 Electricity generation activity

Against a backdrop in which there will be more electricity usages, the Group has one of the largest power generation fleets in the world, with some of the lowest CO₂ emissions, thanks to the share of nuclear and renewable energy in its energy mix. The Group intends to greatly accelerate the development of renewable energy in France and worldwide, with the goal of achieving 60GW net in 2030. The Group is also preparing for the nuclear energy of the future with EPRs and through the development of Small Modular Reactors (SMR).

523.7^{TWh}

ELECTRICITY GENERATION

117.3^{GW}

CONSOLIDATED INSTALLED CAPACITY

34.8^{GW}

NET RENEWABLE CAPACITY

91%

SHARE OF DECARBONISED GENERATION *

* Direct output-related CO₂ emissions, excluding life-cycle analysis (LCA) of fuel and production means.

Strengths of the generation fleet

The Group's generation fleet has significant strengths:

- a variety of means of generation, which enable adequate coverage of EDF's downstream portfolio needs (end users, sales to alternative suppliers, sales on the wholesale markets, etc.). The use of the different components of the assets is managed by placing the priority at any time on the resources offering the lowest variable costs;
- a standardised nuclear fleet of 56 reactors in France ⁽³⁾ and 15 reactors in the United Kingdom;
- the construction of EPR-type reactors worldwide and the operation of 2 EPRs in China ⁽⁴⁾;
- the control of the entire life cycle of nuclear generation resources: design, operation, and decommissioning;
- the implementation of actions aimed at improving the technical performance of power stations and extending operating lifespan;
- a fleet generating at 91% without CO₂ emissions ⁽⁵⁾ (93% at the EU level) due to the predominance of nuclear and hydro-power generation facilities;
- a geographical position at the junction of electricity exchanges between the continental platform and the electric peninsulas (Italy, Spain and the UK).

(1) Robotic process automation.

(2) GAIA-X – European Association for Data and Cloud.

(3) After the permanent shutdown of the two Fessenheim units.

(4) Two EPR reactors are operated in China by TNPJVC.

(5) Direct output-related CO₂ emissions, excluding life-cycle analysis (LCA) of fuel and production means.

Composition and specifications of EDF fleet in mainland France

With a total installed generation capacity of 86.4GW in mainland France ⁽¹⁾ at 31 December 2021, EDF fleet produced 413.1TWh ⁽²⁾ in mainland France in 2021.

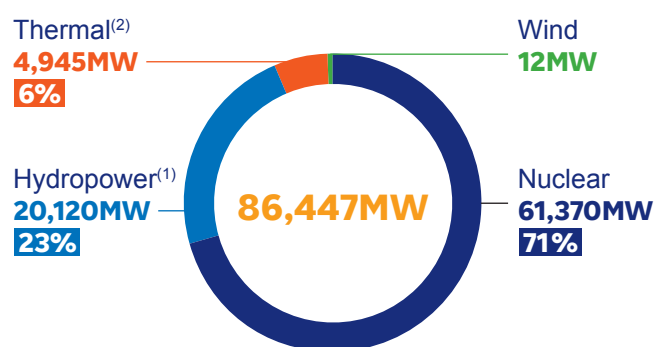
At 31 December 2021, the capacity of EDF's generation fleet was mainly composed of:

- 56 nuclear units based on pressurised water reactors (PWR), with electrical power capacities ranging from 900MW to 1,500MW and an average age of 36 years (see section 1.4.1.1.2 "Nuclear power generation in France");

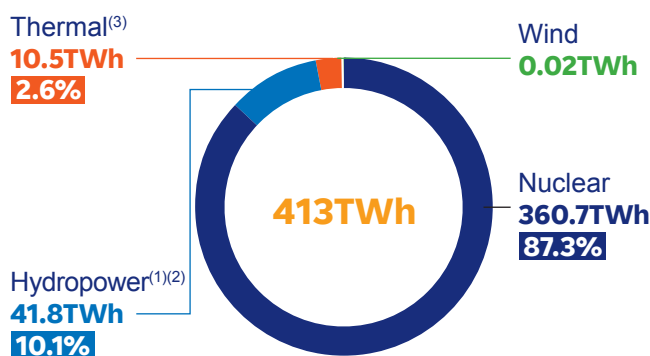
- 19 functioning thermal units (see section 1.4.1.2 "Thermal generation in mainland France");
- 427 hydropower plants, with an average age of 76 years ⁽³⁾ (see section 1.4.1.3.1 "Hydropower generation in France");
- other hydropower plants owned by the Group's subsidiaries: ÉS, SHEMA Group, CERGA and RKI (on the Rhine, owned 50%-50% with German energy company EnBW) and the Franco-Swiss entities of Chatelôt and Emosson, accounting for a total of approximately 142MW of installed capacity in 2020.

EDF installed capacity and output in mainland France – 2021

Installed capacity



Electricity output



Expressed in megawatts of maximum capacity linked to the network.

(1) Excluding Corsica and overseas départements, i.e. 439MW in 2021; including sea energy: 240MW.

(2) Excluding Corsica and overseas départements, i.e. 1,567MW in 2021.

(1) Excluding Corsica and overseas départements, i.e. 1.3TWh in 2021.

(2) Generation including pumped storage consumption.

(3) Excluding Corsica and overseas départements, i.e. 4.8TWh in 2021.

NB: figures are rounded.

1.4.1.1 Nuclear power generation

1.4.1.1.1 The excell plan

The "excell" plan, announced in December 2019 and finally launched in the spring of 2020, aims at enabling the French nuclear industry to return to a high standard of quality and excellence so as to take on existing and future major projects in France, the United Kingdom, and elsewhere in the world. The excell plan also benefits existing the nuclear fleet programmes, in particular *Grand Carénage* and related maintenance operations.

In October 2020, EDF group and the nuclear industry made 25 public commitments, spread across 5 priority areas of work. Most of the commitments of the excell plan have met or exceeded the targets set ⁽⁴⁾. These accomplishments concern all the areas of the plan:

- the governance of new nuclear projects has been strengthened by establishing a Major Projects Inspection;
- in the area of skills, the Nuclear Industry University (UMN) was created in April 2021 to offer a stimulating range of training offers;
- under the excell plan, 12 standards have been defined in conjunction with the sector to ensure manufacture is "right the first time" compliant. They will be

deployed in 2022 with more straightforward contracts that will balance the relationship between EDF and its suppliers. 44 of them have launched their own "Excell in quality" plan and, therefore, it is the entire nuclear sector, led by Gifem, that is committed to the pursuit of excellence;

- standardisation and replication are systematically favoured as factors ensuring quality and safety. For this purpose, required-use catalogues have been prepared in order to streamline the equipment used and favour proven solutions. For example, the number of valves in the catalogue has been divided by 10, dropping from 13,000 to 1,200 references;
- the welding plan strives to ensure quality of workmanship from start to finish. The Cotentin Welding Training Academy (*Haute École de Formation Soudage du Cotentin*) (Hefais) was created in partnership with Orano, Naval Group and CMN, and will welcome its first class in September 2022.

EDF and the entire nuclear industry are now entering the third phase of the excell plan: consolidating the results achieved and perpetuating the actions undertaken in order to attain the highest industrial standards. This objective to capitalise on achievements is reflected in 30 commitments to be met by mid-2022, two-thirds of which are a direct extension of the commitments made in 2021.

All of these full commitments are available at the following address: <https://www.edf.fr/plan-excell>. See also section 3.4.3.2.1 "Adaptation of skills (excell plan)".

(1) Excluding Corsica and French overseas départements.

(2) including pumped storage hydropower.

(3) Arithmetic mean.

(4) See the press release of 8 November 2021 "Halfway through the excell plan, EDF and the nuclear industry have presented concrete results and new commitments for 2022".

1.4.1.1.2 Nuclear power generation in France

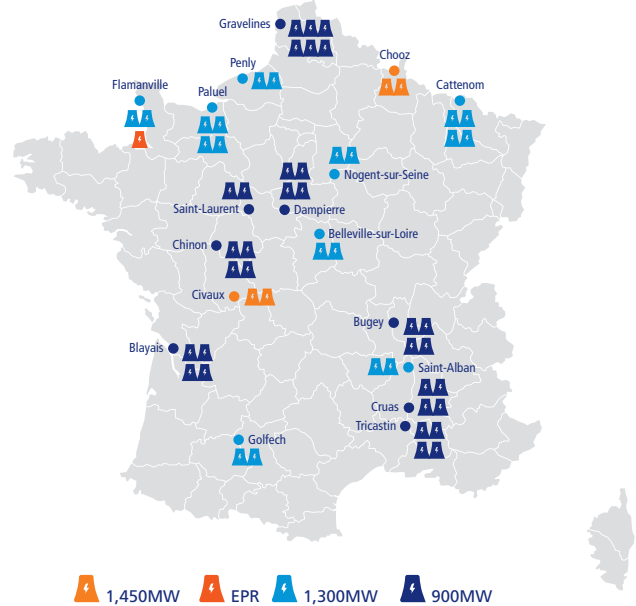
The electricity generated by EDF in France from its fleet of nuclear power plants represented 88.6% of its total electricity generation in 2021 (excluding pumped storage hydropower), and 87.3% including pumped storage hydropower.

1.4.1.1.2.1 EDF's nuclear fleet in France and its operation

EDF's PWR model is divided into three series of available electrical power:

- a 900MW series consisting of 32 operating units of (for a total power capacity of 29,010MW) with an average age of 39 years;
- a 1,300MW series consisting of 20 operating units of (for a total power capacity of 26,370MW) with an average age of 33 years;
- the N4 series, which is the most recent with an average age of 21 years, consisting of 4 operating units (for a total power capacity of 5,990MW);

for a total of 56 functioning units spread over 18 sites ⁽¹⁾ owned by EDF, and constituting a total authorised capacity of 61,370MW as at 31 December 2021. With an average age of approximately 36 years, EDF's nuclear fleet is about average compared to the fleets installed worldwide.



The commissioning and most recent ten-year inspection (VD) dates for these units **as of end-2021** are as follows ⁽²⁾:

Units	Year of industrial commissioning	Most recent ten-year inspection	Next ten-year inspection	Units	Year of industrial commissioning	Most recent ten-year inspection	Next ten-year inspection
Bugey 2	1979	2021	VD5	Cruas 3	1984	2014	VD4
Bugey 3	1979	2013	VD4	Cruas 4	1985	2016	VD4
Bugey 4	1979	2021	VD5	Chinon B3	1987	2020	VD4
Bugey 5	1980	2011	VD4 in progress	Chinon B4	1988	2020	VD4
Dampierre 1	1980	2011	VD4 in progress	Paluel 1	1985	2016	VD4
Gravelines 1	1980	2011	VD4 in progress	Paluel 2	1985	2018	VD4
Gravelines 2	1980	2013	VD4	Paluel 3	1986	2017	VD4
Tricastin 1	1980	2019	VD5	Paluel 4	1986	2019	VD4
Tricastin 2	1980	2021	VD5	Saint-Alban 1	1986	2017	VD4
Dampierre 2	1981	2012	VD4	Flamanville 1	1986	2018	VD4
Dampierre 3	1981	2013	VD4	Saint-Alban 2	1987	2018	VD4
Dampierre 4	1981	2014	VD4	Flamanville 2	1987	2020	VD4
Tricastin 3	1981	2012	VD4	Cattenom 1	1987	2016	VD4
Tricastin 4	1981	2014	VD4	Cattenom 2	1988	2018	VD4
Gravelines 3	1981	2012	VD4	Nogent 1	1988	2019	VD4
Gravelines 4	1981	2014	VD4	Belleville 1	1988	2021	VD4
Blayais 1	1981	2012	VD4	Belleville 2	1989	2019	VD4
Blayais 2	1983	2013	VD4	Nogent 2	1989	2020	VD4
Blayais 3	1983	2015	VD4	Penly 1	1990	2011	VD3 in progress
Blayais 4	1983	2015	VD4	Cattenom 3	1991	2021	VD4
Saint-Laurent 1	1983	2015	VD4	Golfech 1	1991	2012	VD3
Saint-Laurent 2	1983	2013	VD4	Cattenom 4	1992	2013	VD3
Chinon B1	1984	2013	VD4	Penly 2	1992	2014	VD3
Cruas 1	1984	2015	VD4	Golfech 2	1994	2014	VD3
Chinon B2	1984	2016	VD4	Chooz B1	2000	2020	VD3
Cruas 2	1984	2018	VD4	Chooz B2	2000	2019	VD3
Gravelines 5	1985	2017	VD4	Civaux 1	2002	2011	VD2 in progress
Gravelines 6	1985	2018	VD4	Civaux 2	2002	2012	VD2

(1) After the permanent shutdown in 2020 of the two 900MW Fessenheim units.

(2) EDF first-generation design plants have been gradually shut down and are currently being decommissioned. The Fessenheim plant has also been shut down in 2020 (see section 1.4.1.1.2.3 - C "Issues related to decommissioning of nuclear power plants").

- At end-2021, all of the units of 900MW in operation had undergone their third ten-year inspections. In 2019, the first fourth ten-year inspection was successfully conducted on Tricastin 1. The second occurred in 2020 at Bugey 2 and was completed in early 2021. In 2021, the VD4 900s continued at Tricastin 2, Bugey 4 and Dampierre 1 (completed in February 2022). The VD4s at Bugey 5 and Gravelines 1, which began in 2021, will be completed in early 2022.
- For the 1,300MW fleet, fifteen third ten-year inspections were conducted (including Belleville 1 and Cattenom 3 in 2021). One third ten-year inspection (VD3) was underway at the end of 2021 (Penly 1), and four are still to be carried out.
- For the N4 series, two second ten-year inspections were carried out, at Chooz 1 and Chooz 2. The VD2 inspection at Civaux 1 is underway and Civaux 2 is still pending.

Regulatory notice

Regulations applicable to basic nuclear facilities (BNFs)

After completion of a procedure set out in the French Environmental Code (*Code de l'environnement*), the construction of a BNF is authorised by a decree issued by the French Prime Minister after consulting the French Nuclear Safety Authority (Autorité de sûreté nucléaire, ASN) and on the basis of a report produced by the Minister for Nuclear Safety. The authorisation to commission a BNF is issued by the ASN, also on completion of a procedure set out in the French Environmental Code. The general regulations applicable to basic nuclear facilities, among other issues, make the protection of public safety, health and sanitation, nature and the environment (the "protected interests") a priority.

Generation allocation contracts

In the 1970-80's, EDF developed, industrial cooperation with European operators in the nuclear industry, in the form of generation allocation contracts backed by units of the EDF French nuclear fleet.

As at 31 December 2021 EDF has within its fleet ten generating units participating in the contracts (up to 1GW) with the following European energy companies:

- Cattenom 1-2: EnBW (5%);
- Bugey 2-3: Électricité de Laufenbourg ⁽¹⁾ (17,5%);
- Tricastin 1 to 4: Electrabel ⁽²⁾ (12,5%);
- Chooz B1-B2: Luminus, EDF subsidiary in Belgium (3.3%).

The purpose of these generation allocation contracts is to make available to each partner the proportion of energy generated actually due to it, based on the share of the capacity allocated to it – in return for payment of their share of the construction costs, annual operating costs (including upstream and downstream fuel costs), local taxes and taxes specific to nuclear energy, and the costs relating to decommissioning. In these transactions, the partners have shared with EDF the industrial risks in the development of the fleet and assume the risks linked to the current operation of the power plants. On the other hand, they have no operational role.

Furthermore, EDF signed a second type of generation allocation contract relating to a pool of power plants (totalling approximately 2GW) under which EDF makes available to its partners a share of the electricity determined by the level of availability of all or part of a standard fleet, applied to the capacity share reserved to the partners for the units concerned. These contracts mainly concern the following power plants:

- Chooz B1-B2 (initial series unit N4): Electrabel (21,7%);
- Cattenom 3-4: Électricité de Laufenbourg (7.8%) and the Swiss electricity group CNP (21.8%).

Operation of the nuclear fleet

Nuclear power is a means of generation whose variable cost, mainly fuel-related costs, is low since it represents less than 30% of operating costs ⁽³⁾. The main competitive levers of the nuclear fleet in its operating phase are thus the amount of generated energy and the optimisation of fixed operating and maintenance costs. The levers relating to the fuel cycle are described in section 1.4.1.1.2.3 "The issues relating to the nuclear activity" – "The nuclear fuel cycle and related issues".

Generation cycle and planned outages

EDF must reconcile the challenges linked to the strong variations in seasonal consumption in France, due to its strong temperature sensitivity, and the availability of maintenance resources together with an efficient use of reactor fuel. To this end, EDF has adopted 12- and 18-month generation cycles for its fleet, which break down as follows at end-2021:

- 28 units of the 900MW series have an operating cycle of approximately 12 months;
- 4 units of the 900MW series, 20 units of the 1,300MW series and 4 units of the N4 (1,450MW) series have an operating cycle of approximately 18 months.

At the end of these operating cycles, shutdown periods are programmed in order to replace a fraction of the fuel loaded in the core and perform maintenance work. Two types of planned outages are alternated at the end of each generation cycle:

- an ordinary shutdown for refuelling for a standard period of approximately 40 days: unloading spent fuel and reloading new fuel is the main operation performed. Some maintenance or periodic testing may also take place during this type of outage;
- a partial inspection for a standard period ⁽⁴⁾ of approximately 85 days: this inspection is dedicated to refuelling and maintenance.

Every ten years, the power plant is shut down for an average period of 180 days ⁽⁵⁾ in average to carry out a ten-year inspection ⁽⁶⁾. This length of time varies according to the works and maintenance programme, as well as the series concerned.

The programme for a ten-year inspection includes the following:

- unloading of spent fuel and reloading of fresh fuel, as at each outage;
- hydro-power test of the primary coolant system, a leak test of the containment, and inspection work of the reactor's pressure vessel;
- modification work, associated with ten-year safety re-evaluations;
- other specific maintenance operations, in particular renovation or replacement of major components.

At the end of each ten-year inspection, the ASN has to agree to the restarting of the reactor and make any relevant technical recommendations.

Regulatory notice

Nuclear safety authority (ASN)

The Autorité de sûreté nucléaire (ASN) is an independent administrative authority which contributes to the control of nuclear safety, radiation protection in France, and informing the public about these matters.

Its activity is organised around the following missions:

- contributing to drawing up legislation, giving its opinion to the Government on draft decrees and ministerial orders, and making regulatory rulings of a technical nature;
- examining all individual authorisation applications for basic nuclear facilities (BNFs). It grants authorisations except in the case of major BNF authorisations, such as for construction and decommissioning;
- inspection of installations, which it carries out through regulatory scheduled and unannounced on-site inspections, in particular on the occasion of regular compliance checks and safety reviews; these are mandatory for a power plant to continue operating;
- informing the public about the status of nuclear safety and radiation protection in France;
- lastly, in the event of an emergency, the ASN controls the operations to secure the installation carried out by the operator. It informs the public of the situation and assists the Government. In particular, it provides the competent authorities with recommendations on the measures to be taken in respect of civil security.

(1) Axpo Group.

(2) Engie Group.

(3) Operating costs are defined as follows: fuel costs (including downstream expenses in the fuel cycle), operating expenses (purchases and external services, employee expenses) and maintenance costs (expenses and investments). They do not include investments related to construction or decommissioning expenses.

(4) Standard durations represent optimised and realistic reference durations by outage types.

(5) "Normal" duration excluding particular and/or extreme cases.

(6) Pursuant to Article L. 593-18 of the Environmental Code.

Operation of EDF's nuclear fleet

Nuclear generation resources, owing to their low variable cost are first used for base-load generation, immediately after run-of-river hydro-power and other unavoidable renewable energies, as well as the energy purchased under buying obligations from decentralised energy producers. Variations in energy consumption over one year (summer-winter, day-night) and the currently restricted fluidity of wholesale markets due to limited interconnections on the borders lead nuclear energy to be used also for mid-merit generation. High variations in seasonal consumption in France and its major variation during winter months require that planned nuclear fleet outages be concentrated between April and October.

Generation and technical performance

The nuclear fleet produced 360.7TWh in 2021, up 25.3TWh compared to that of 2020. The increase in generation in 2021 compared with 2020 was due in particular to:

- greater availability of the nuclear fleet;
- decreased "environmental" losses, due to more favourable weather conditions;
- reduced fleet modulation due to high market prices.

In addition, the Covid health crisis resulted in a greater number of planned outages in 2021 following the postponements decided in 2020.

The main developments that impacted generation in 2021 were:

- the discovery of a fuel assembly desquamation phenomenon on the Chooz 2 reactor. This phenomenon, due to accelerated oxidation of the sheathing of the assemblies (called M5), caused an estimated generation loss of 5.4TWh on this unit. It affected other reactors and required specific inspections (without impacting generation);
- the continuing unavailability of Flamanville 1, which resulted in a loss of 3.9TWh;
- the unplanned shutdown of Chooz 1 to work on the reactor vessel head continued in 2021 with a generation loss of 2.2TWh;
- the shutdown of the Civaux 2 (November 2021), Chooz 1 (December 2021) and Chooz 2 (December 2021) reactors following the discovery of evidence of stress corrosion in the SIS ⁽¹⁾ circuits of Civaux 1 during its ten-year inspection. These unplanned outages had a total impact of 2.5TWh in 2021.

With respect to unit shutdowns, performance remains below target. Several reactors experienced overruns exceeding 60 days including Cruas 1 (VP), Civaux 2 (VP), Gravelines 4 (VP), St Laurent B1 (VP), Golfech 2 (VP) and Cattenom 2 (ASR). However, the performance of Tricastin, which carried out the partial inspection of reactor 1 25 days ahead of the initial schedule, is noteworthy.

The Start 2025 transformation programme is a multi-year plan that aims to improve the industrial control of unit outages and their long-term performance.

Nuclear generation expressed in annual energy corresponds to a load factor rate referred to as "Kp" for the French nuclear fleet (defined as the ratio of energy generated to the maximum theoretical energy, or the energy generated if the installed capacity were operated year-round). This rate is obtained by multiplying two coefficients ($Kp = Kd \times Ku$):

- the availability factor ("Kd") (the available energy ⁽²⁾ as a percentage of the theoretical maximum energy, or the energy generated if the installed capacity were operated year-round). The Kd depends on outage durations, and is therefore impacted by standard durations and the work programme to be performed;
- a utilisation factor, "Ku" (energy generated compared to energy available). The Ku factor reflects environmental, regulatory and social constraints, supply of system services and optimisation implemented by EDF (fuel and modulation).

In 2021, the Kp factor reached 67%, an increase compared with that of 2020 (61.6%). This results from a Kd of 72.9%, higher than in 2020 (71.9%) and a Ku of 92.2%, also higher than in 2020 (85.7%).

Evidence of stress corrosion detected in several nuclear reactors

Following the discovery of evidence of stress corrosion in the SIS circuits of Civaux 1 during its ten-year inspection, it was decided to shut down the Civaux 2 (November 2021), Chooz 1 (December 2021) and Chooz 2 (December 2021) reactors ⁽³⁾. The inspections carried out on these reactors revealed similar evidence. During the ten-year inspection of Penly reactor 1 (1,300 series), preventive maintenance checks revealed similar evidence in the SIS circuit ⁽⁴⁾.

After analysing the results of the non-destructive examinations carried out during the last ten-yearly outage programmes for the 56 reactors in the nuclear fleet and the results of the latest laboratory assessments, EDF has drawn up a prioritised list of reactors on which inspections will be carried out:

- during their scheduled outages: Bugey 3, Flamanville 1 and Flamanville 2;
- during a specific shutdown: Chinon 3, Cattenom 3 and Bugey 4.

In addition, EDF is continuing to define a plan for inspections across the nuclear fleet, with the aim of carrying them out by the end of 2022, during scheduled maintenance and fuel renewal outages of several 1,300MW and 900MW reactors. EDF is continuing its studies to complete its knowledge of the phenomenon and has initiated the development of new ultrasonic inspection means capable of measuring the cracks depth. EDF plans to inspect its reactors with these new methods from September 2022 until the end of 2023.

Technical exchanges continue with the Nuclear Safety Authority, which is regularly informed of the results of inspections and expert reports.

At the date of filing of this document, the Group is awaiting the position from the investigation carried out by the French Nuclear Safety Authority on the evidence of stress corrosion and the corrective measures considered.

The programme for inspecting and repairing the pipes that are potentially concerned by the phenomenon of stress corrosion constitutes a major risk in terms of nuclear generation. In response, the Group has reviewed its estimate of nuclear generation for 2022 and 2023 ⁽⁵⁾. To date, the Group is not in a position to analyse the impacts beyond 2023.

This risk that the Group is facing is described in section 2.2.5 "Specific risks relating to nuclear activities" – Risk 5A "Failure to meet operating and/or continued operating targets for nuclear fleets (France and United Kingdom)".

1.4.1.1.2.2 Environment, nuclear safety, radiation protection

The risks related to the environment, nuclear safety and radiation protection are described in Chapter 2 under risk 5C "Nuclear safety violations during operations resulting in nuclear civil liability".

Environmental protection

EDF's environmental procedure was introduced in 2002 on a few sites, then extended to all nuclear generation units. It is based on an ISO 14001-certified SME environmental management system (see section 3.5.4.2 "The environmental management system (EMS)").

For a description of radioactive waste processing downstream of the fuel cycle as well as decommissioning, see sections 1.4.1.1.2.3 "The issues relating to the nuclear activity", "The nuclear fuel cycle and related issues" and "Decommissioning of nuclear power plants".

(1) The safety injection system (SIS) is a backup system that cools the reactor in the event of an accident.

(2) Available energy is equal to the maximum theoretical energy less generation losses due to technical reasons inherent to power plants, such as planned outages, unplanned outages due to failure or safety requirements, and performance of regulatory tests.

(3) See the EDF press release of 15 December 2021 "Reactors of the Civaux and Chooz nuclear power plants: replacements and preventive checks on parts of the piping of a safety system".

(4) See the EDF press release of 13 January 2022 "EDF updates its nuclear output estimate in France for 2022".

(5) See EDF press release of 7 and 11 February 2022.

A constant nuclear safety procedure

EDF, in its capacity as a nuclear operator, takes responsibility for nuclear safety and, in a rapidly-changing context (market competition, environmental issues, European connection, etc.), reaffirms as its absolute priority the protection of the human and environmental health, among other things, through the prevention of accidents and the limiting of their consequences as regards nuclear safety. The implementation of the French nuclear power programme led EDF to establish a safety procedure that:

- takes into account, from the design stage, the risks that might arise during the operation of the power plants, whether relating to the actual operation of the facilities or to internal or external attacks;
- is based both on the application of strict rules of operation, and on the cautious and inquiring attitude of the technical teams thanks to the establishment of a true safety culture;
- is based on the cumulative experience of a standardised fleet;
- incorporates and fosters a continuous improvement approach that is notably embodied by the ongoing efforts to decrease the number of automatic reactor trips;
- benefits from integrated nuclear engineering and Research & Development within the Group in order to anticipate the occurrence of failures, maintain the facilities in good working order, develop equipment on an ongoing basis, reassess safety margins and monitor technology advances, as well as the implementation of more effective new technologies and the management of sites being decommissioned;
- relies strongly on the development of skills. With this objective in mind, each nuclear generation site is equipped with a simulator used for training to cope with any type of situation.

Regulatory notice

Nuclear transparency

Articles L. 125-10 *et seq.* of the French Environmental Code includes specific provisions on the right to information regarding the nuclear industry aimed at guaranteeing the public's right to reliable, accessible information. In particular, the operator of a BNF is required to declare any accidents and incidents occurring as a result of the operation of the facility that could potentially be detrimental to the interests referred to in Article L. 593-1 of the French Environmental Code, namely public health and safety and/or the protection of nature and the environment, and to do so speedily to the ASN and the competent administrative authority.

Other authorities also contribute to transparency for the nuclear industry. They include the Haut Comité pour la transparence et l'information sur la sécurité nucléaire (High Committee for Transparency and Information on Nuclear Safety, HCTISN) as well as local information Committees formed for any site housing one or more BNFs.

The control system

Nuclear safety is subject to numerous controls, both internal and external.

- For example, every four years, EDF performs overall safety assessments for each nuclear unit ⁽¹⁾, which take place over a three-week period and involve approximately 30 inspectors. In addition, the General Inspector for Nuclear Safety and Radiation Protection, reporting directly to and appointed by EDF's Chairman and CEO, holds discussions with employees in the nuclear industry, enabling an opinion to be issued each year on the overall safety of the nuclear fleet and improvement actions to be suggested to the Company's management. Efforts by EDF have made it possible to decrease the annual average number of automatic reactor trips in recent years (by a factor of four over a period of twenty years). In 2021, there were 27 for the entire fleet.

- Nationally in France, safety is controlled by the ASN by means of:

- › scheduled or unannounced inspections conducted by the ASN. 515 inspections, including 26 national inspections, were conducted in 2021 at all EDF nuclear facilities (463 in 2020, including 6 national inspections);
- › a periodic (ten-year) review process designed to improve the compliance of nuclear plants with applicable rules and to update assessments of the risks and drawbacks that such facilities pose to the "protected interests" (protection of public safety, health and sanitation, as well as preservation of nature and the environment). To achieve this, the state of the facilities, the experience gained during their operation, new developments in nuclear science, and rules applying to similar facilities (safety standards) are taken into account. At the close of the ten-year inspection, the operator sends the ASN a report containing the findings of the periodic review. In this report, the operator states its position regarding the regulatory compliance of its facility, as well as the modifications made in order to correct the discrepancies identified or improve the safety of the facility. The ASN provides the Minister in charge of nuclear safety with its analysis of the report and may define additional obligations for the operator. See in section 1.4.1.1.2.1 "EDF's nuclear fleet in France" the regulatory notice on ASN. The periodic review is an important step in continuing the operation of power plants (see section 1.4.1.1.2.3 "The issues relating to the nuclear activity" – "Preparing for the future of the nuclear fleet in France").

- At the international level, regular inspections are held making it possible to share the experience gained worldwide:

- › the OSART (Operational Safety Review Team) of the IAEA (International Atomic Energy Agency) performs reviews at the request of the French government with the objective of formulating recommendations and promoting best practices. In 2021, 2 OSARTs were carried out (Paluel, Belleville);
- › the international "peer review" inspections carried out by the WANO (World Association of Nuclear Operators) are organised at the request of EDF to assess safety performance compared to best international working practices. In 2021, there were two follow-up ⁽²⁾ missions (Bugey, Dampierre) and five peer reviews (Chinon, Flamanville, Cattenom, Saint-Alban, Blayais).

Whistleblowing system

In the event of an accident, a crisis plan is in place to limit impacts on the environment and people, and to ensure the safety of the facility. This crisis system is based on two closely coordinated plans, designed for both local and national use. These are:

- the Internal Emergency Plan for each nuclear site, developed by EDF;
- the Special Intervention Plan, prepared by French prefectures in collaboration with the French government and EDF.

In order to provide greater effectiveness, these plans in particular take into account external risks (flooding, etc.) and internal risks (fire, etc.). The relevance of the system for warning, informing and protecting people is regularly assessed through accident simulation exercises. Each year, approximately 100 exercises are organised for the entire French nuclear fleet, *i.e.*, approximately one every three days. Approximately ten exercises are on a national level, under the management of the ASN and involve EDF and the public authorities, in particular the prefectures. In 2021, fourteen nationwide drills were organised including one to support CGN operators (China) and one with ESKOM (South Africa).

After its initial analyses following the Fukushima accident in March 2011, EDF supplemented its crisis management organisation with a national team capable of quickly delivering material and human assistance to a site in great difficulty. This system, called the Nuclear Rapid Action Force (FARN), has had many simulation exercises from regional bases located at Civaux, Paluel, Dampierre and Bugey and can be sent to a unit at any site in difficulty. The FARN is capable of a simultaneous response at six units on a single site.

(1) *i.e.* nuclear power plants.

(2) Follow-up missions related to the recommendations issued during peer-review audits (and detailed in an audit report).

Significant events regarding safety

The operational safety of nuclear facilities is taken into consideration from the initial design stage, and is regularly monitored, together with the implementation of an employee motivation policy and large-scale investment programmes.

Discrepancies that are particularly important according to the criteria defined by the ASN are referred to as "specific events". The detection of significant events by nuclear operators plays a key role in the prevention of incidents and accidents. The regulations require all nuclear operators to declare significant events to the ASN for the protection of the interests mentioned in Article L. 593-1 of the French Environment Code. Each event is analysed by the plant's teams to determine whether it is significant, and the independent safety reviewer also provides an independent assessment.

Those events that concern safety are known as "SSEs". This declaration process is part of the ongoing drive to improve nuclear safety and radiation protection and transparency. Its aim is, in particular, to enable the analysis of these events, so as to facilitate subsequent assessment of an incident or the risk of an incident, and to improve the practices of an establishment and/or of a sector of activity in the field of prevention.

Nuclear operators and transporters of nuclear material must declare all significant events to the ASN, at the latest within 48 business hours, along with the proposed classification using the INES ⁽¹⁾ scale (a scale of one to seven, with seven being the most serious; incidents without nuclear safety significance are declared as "Level 0"). The ASN is ultimately responsible for the final classification decision. The use of the INES scale enables the ASN to select among all the significant events that occur, those of sufficient importance to be communicated by it.

Since the establishment of a scale of this kind in France in 1987, no INES scale level 3 event (serious incident – very low external emission, and exposure of the public representing a fraction of regulatory limits) or above has occurred in the French nuclear fleet. In 2021, EDF declared 752 significant safety events (SSEs) in France, an improvement on the 745 SSEs declared in 2020. No INES scale level 2 SSE (compared to 1 in 2020) and 79 INES scale level 1 SSEs (compared to 91 in 2020) were declared.

Moreover, the Group's nuclear safety policy is an integral part of the training courses that the employees of EDF and of its service providers are required to take. After initial training that lasts for several months, and even up to 24 months for key positions (Safety Engineers, Operators, etc.), each employee has to take mandatory annual, biannual and triannual refresher courses depending on the business line and field.

The 2021 detailed results on nuclear safety are published in the annual report created by the General Inspector for Nuclear Safety and are available on the Internet ⁽²⁾.

Radiation protection

The mobilisation of various players has permitted a continuous improvement in dose levels (cleanliness of facilities, compliance with time/distance guidelines, improved materials, optimised installation of lead screens, etc.). Thus, the average annual collective dose of all workers, both employees of EDF and outside companies intervening in power plants, has been halved in less than ten years. In 2021, the average collective dose was 0.71 man-sievert per reactor. The average individual dose (EDF and contractors) remained below 1mSv (0.96mSv). The hourly dose remained stable throughout the year and was the second lowest achieved for the fleet, with 5.8µSv per hour worked in controlled areas.

EDF is proactively implementing an ALARA (As Low as Reasonably Achievable) policy to limit the collective dose in parallel with an increasing workload involved in the industrial project on the fleet in operation. EDF is furthermore committed to continuing to lower exposure to radiation below the regulatory limit of 20mSv over 12 rolling months for the whole body. Accordingly, throughout 2021 and over 12 rolling months, no participant (among the EDF employees and contractors) was exposed to an individual dose of higher than 14mSv.

In the coming years, given the levels already achieved, efforts will focus on cleaning power plants circuits.

Regulatory notice

Regulations on radiation protection

In France, nuclear activities that present a risk of exposing persons to ionising radiation are regulated by two separate sets of rules, depending on the category of persons to be protected.

Regulations on the basic protection of the population against such radiation, which are governed by the French Public Health Code, are primarily based on all nuclear activities being subject to a declaration, registration or authorisation. Authorisations granted to establish a Basic Nuclear Facility serve as the authorisation required under the French Public Health Code. Article R. 1333-11 of the French Public Health Code sets the maximum exposure level of the general public at 1mSv per year.

French regulations on the protection of workers against the dangers of ionising radiation, which are governed by the French Labour Code, lay down various obligations for employers of workers who are likely to be exposed.

1.4.1.1.2.3 The issues relating to the nuclear activity

A – Nuclear fuel cycle and related issues

The risks related to nuclear fuel cycle are described in chapter 2 risk 5D "Control of the fuel cycle".

The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it.

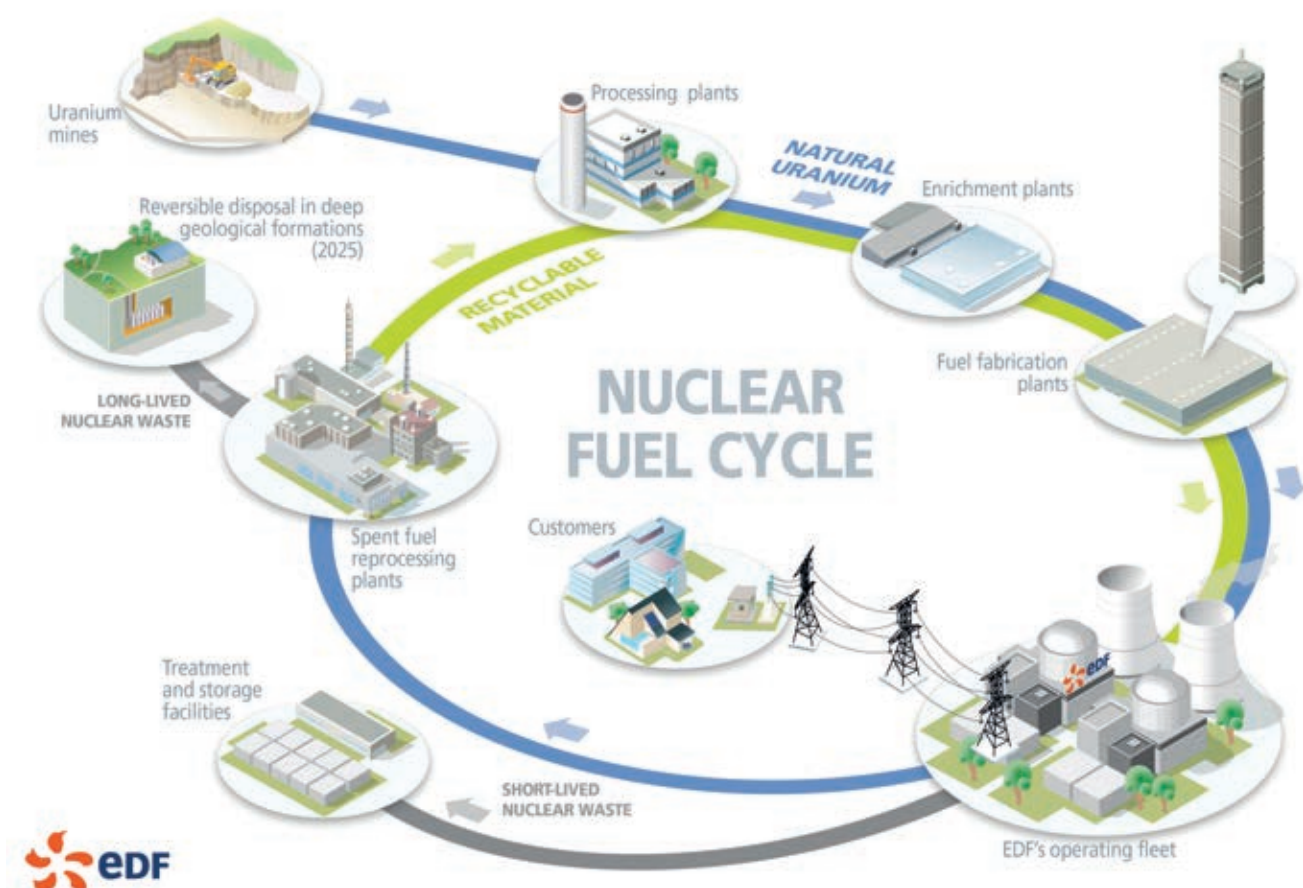
The cycle can be broken down into three stages:

- front-end (upstream), corresponding to the purchase of concentrates from uranium ore, fluorination (or conversion), enrichment and production of fuel;
- the core cycle, corresponding to the use of fuel in the reactor: receipt, loading, operation and unloading. the fuel stays four to five years in the reactor;
- back-end (downstream), for the reactor fleet in France: interim pool storage, reprocessing of spent fuel, conditioning of radioactive waste and recycling of reusable materials, the intermediate storage of treated waste prior to storage.

EDF coordinates all the operations in the fuel cycle. Generally speaking, upstream and downstream operations are carried out by subcontractors or suppliers, generally on the basis of multi-year contracts. EDF acquires most of the raw materials as uranium concentrates (U₃O₈), with transformation into more processed products carried out by industrial operators through service contracts (fluorination, enrichment and production). EDF provides core cycle operations. EDF is the owner in most cases and is responsible for the fuel and materials it uses throughout all different stages of the cycle.

(1) International Nuclear Event Scale.

(2) For example for the 2020 report: <https://www.edf.fr/sites/default/files/contrib/groupe-edf/producteur-industriel/nucleaire/Notes%20d%27information/rapport-2020-fr-v08b-web.pdf>



Upstream

To ensure the continuity and security of the supply of its reactors in France and the UK, EDF retains overall control of all operations at each stage of the cycle, through a portfolio of contacts and by stockpiling at different stages of the front-end stage of the fuel cycle (natural uranium, fluorinated enriched or unenriched uranium, and warehousing of new assemblies). Orano is an important supplier of this stage of the cycle.

Natural uranium supply

EDF's uranium supplies are guaranteed by long-term contracts for periods of up to 20 years with a policy of diversification in terms of sources and suppliers. Indexation formulas for portfolio contracts of natural uranium supply include fixed prices (base prices whether inflated or not) and variable prices (indexed according to market price indexes) and are sometimes limited by floor and ceiling prices. Consequently, the effects of fluctuations in market prices of natural uranium on supply costs are limited. Where necessary, the Group implements a strategy of currency hedging for its uranium supplies.

EDF is making sure to implement best practices in mineral extraction so as to contribute to making overall progress in this sector. Since 2011, EDF has conducted mine audits (2-3 a year) based on a method drawn up in collaboration with the World Nuclear Association (WNA) (see section 3.4.2.3.4 "Responsibility in the fuel supply chain").

Fluorination (or conversion)

EDF's needs are covered by Orano in France, as well as other international producers such as Cameco in Canada, Converdyn in the United States and Tenex in Russia.

Enriching natural uranium into uranium 235

EDF meets its enrichment needs through global enrichers Orano (France), Urenco (UK, Germany, Netherlands, United States) and Tenex (Russia), primarily through fixed-price contracts.

Enriched reprocessed uranium

Since the 1990s, reprocessing has made it possible to recycle within the reactors uranium from processing spent fuel, which represents approximately 95% of the spent fuel mass. Reprocessing was suspended in 2013, pending the availability of a new industrial scheme. In 2018, the Board of Directors approved the restart of a robust, competitive and efficient sector. The first assemblies are planned to be loaded in 2023, subject to technical changes made and the necessary authorisations obtained from the safety authority. The corresponding contracts were signed with the respective suppliers in 2018. Pending the effective restart of the sector, the reprocessed uranium is stored in a stable form.

The 50-year operation of the 1,300MWe ⁽¹⁾ series, which will include industrial changes permitting the loading of enriched recycled uranium fuel into the 1,300MWe reactors, and the achievement of industrial milestones significant for the recovery of the sector (in particular the commissioning of the TENEX residue vitrification plant in the second half of 2021) confirm that all industrial, regulatory and economic conditions for the recovery of the industry have now been met.

Fuel assembly manufacturing

EDF has two sources of fuel assemblies: one is internal, via its Framatome subsidiary, while the other is external, the main external supplier being Westinghouse.

Fuel supply of the two EDF reactors at Hinkley Point (United Kingdom)

In September 2016, EDF, Orano and Framatome entered into an agreement providing for the supply of uranium, conversion and enrichment services, and assembly manufacturing for the fuel supply of the Hinkley Point C reactors.

(1) Reflected in the financial statements at 30 June 2021.

Downstream

Risks related to downstream fuel cycle are described in chapter 2 risk 5B "Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments" and 5D "Control of the fuel cycle".

Regulatory notice

As the producer of the waste, EDF is responsible for what happens to its spent fuel and how it is processed and for the related waste, without any possibility of transfer of responsibility or limitation in time. Orano is responsible for processing spent fuel and ANDRA for the management of the long-term storage of final waste, in accordance with the Article L. 542-12 of the French Environmental Code.

Management of radioactive and non-radioactive waste is governed by Articles L. 541-1 *et seq.* of the French Environmental Code.

Processing of spent fuel from EDF's nuclear power stations

EDF's current strategy for the nuclear fuel cycle, in agreement with the French government, is to process spent fuel and wherever possible recycle substances such as plutonium separated in this process in the form of MO_x fuel. The quantities handled are determined by the amount of recycled plutonium in reactors allowed to load MO_x fuel ("equal flows" principle). The recycling capacity of nuclear units in the French fleet has allowed the processing of around 1,100 tonnes of spent fuel per year.

Spent fuel awaiting processing is temporarily stored underwater in cooling pools, first in pools at the plants and subsequently in those of Orano's reprocessing plant in La Hague. The storage conditions are recognised as being safe over a century-scale period of time. Approximately ten years after the spent enriched natural uranium fuel has been unloaded from the reactor, it is processed to separate the recyclable products from waste. The waste is subsequently conditioned and stored at the La Hague site in specific premises.

The relationship between EDF and Orano concerning the transport, processing and recycling of spent fuel was formalised for the 2008-2040 period by a framework agreement signed on 19 December 2008. In February 2016, EDF and Orano signed an implementation agreement covering the 2016-2023 period as well as the associated supply contracts for the MO_x assemblies.

In addition, and in anticipation of the storage needs of the nuclear generation fleet, EDF is working on the design of a large spent fuel storage pool. This will make possible the long-term storage (for around 100 years) of spent MO_x and ERU fuel from PWRs and from fuel assemblies of the Superphénix fast-neutron reactors, stored in the APEC⁽¹⁾ storage pool pending multi-recycling in third-generation pressurised water reactors, or recycling in fourth-generation reactors (Gen IV).

The need for additional storage capacity and the relevance of an underwater storage solution were confirmed at the conclusion of the public debate organised by the CNDP⁽²⁾ (from 17 April to 25 September 2019). The Ministry for the Ecological Transition and the ASN published their conclusions on 21 February 2020 and noted, in particular, "the continuing work to set up additional centralised underwater storage capacities".

Following this public debate and the favourable opinion on the safety option file (DOS) issued by the ASN on 23 July 2019, EDF now has the fundamentals required to pursue its project.

EDF has initiated the public consultation process for a facility at La Hague (Manche), within the perimeter of the Orano site. On 3 March 2021, the CNDP, which EDF consulted in early 2021, decided that the project would be the subject of a preliminary consultation, which began on 22 November 2021. Following a proposal from EDF, the CNDP suspended the preliminary consultation on 3 February 2022 on its website (debatpublic.fr), in order to develop more in-depth consultation procedures to better cover the Manche area and the issues raised during the consultation, and to give itself the time necessary to set them up. This decision is consistent with EDF's approach, which aims to promote open dialogue about the

project with citizens, elected officials and associations. The preliminary consultation will resume on 20 June 2022 and continue until 8 July 2022, after the elections, following procedures that will be specified in spring 2022. This consultation is a prerequisite for EDF to submit a request for authorisation to create the facility with a view to commissioning it in 2034.

The construction cost of the facility, estimated at €₂₀₂₀1.25 billion, is included in the financial trajectory of the *Grand Carénage* programme.

In order to maintain flexibility in the storage of spent fuel, Orano, at EDF's request, is developing a technique that will enable it to densify its existing pools at La Hague and, for the first time in France, it is studying the possibility of dry storage of spent fuel. The safety options file on the densification project for the La Hague pools was assessed by IRSN⁽³⁾, which issued an opinion on 28 May 2021 stating that the safety options selected for this project are appropriate. Provisions have been set aside for the dry storage and densification scenarios.

Storing conditioned final radioactive waste

Radioactive waste, depending on its nature, level of radioactivity and the lifespan of its radionuclide components, has been classified into different categories: from High-Level Waste (HLW), to Very Low-Level Waste (VLLW) on to Low-Level Waste (LLW) and Intermediate-Level Waste (ILW). It is called Long-Lived (LL) when it remains active for more than 31 years.

High-Level and Intermediate-Level Waste (ILW-LL)

The processing of spent fuel enables the vitrification of HLW, which provides very high-quality conditioning with a reduced volume. For example, all of the HLW produced in this way, corresponding to the operation of the early plants and to 50 years of operation of the current PWR facilities, would represent a volume of approximately 9,300 cubic metres (the electricity consumption of one million people for one year generates approximately 3 cubic metres of HLW).

The structures of the assemblies (shells and nozzles, clad pieces, etc.) separated during the processing of spent fuel, constitute ILW-LL. They are currently compacted and conditioned in stainless steel containers. ILW-LL waste also results from certain operating, maintenance and dismantling activities. For example, the total volume of ILW-LL waste, including in particular the waste from the operation and decommissioning of shut down facilities, including Uranium Natural Graphite Gas reactors and the waste from the current PWR facilities, taking into account the 50-year operating life of the power plants and the decommissioning operations, represents about 37,000 cubic metres. It generates less heat compared to HLW and thus is suitable for faster storage.

• Cigéo project

HLW and ILW-LL from the reprocessing of spent fuel is temporarily stored in dedicated Orano facilities in La Hague, pending the storage in deep geological layers, as is currently envisaged as part of ANDRA's Centre industriel de stockage géologique (Cigéo) project. The Cigéo project is also the French deep geological storage facility project for ILW and HLW radioactive waste. It is designed to store highly radioactive and long-lived waste produced by all French nuclear facilities until their decommissioning, and by the processing of spent fuel used in nuclear power plants. After 15 years of research, evaluation and public debate, the principle of deep geological storage was adopted by the French Law no. 2006-739 of 28 June 2006 on the sustainable management of radioactive materials and waste as a safe long-term solution to manage this type of waste without shifting the burden onto future generations.

The centre is to be located in the east of France at the border of the Meuse and Haute-Marne départements. Cigéo will consist of surface facilities that will be used to receive and prepare waste packages as well as to excavate and build the necessary underground structures. The waste will be stored in underground facilities some 500 metres below ground in an impermeable argillaceous rock formation able to contain radioactivity over very long periods (several hundreds of thousands of years). Cigéo is designed to operate for at least 100 years and provides flexibility in order to give future generations a maximum number of possibilities to adapt it as needed.

(1) Spent fuel storage pool at the Creys-Malville power plant.

(2) "Commission nationale du débat public", i.e. French national public debate Committee.

(3) IRSN: Institut de radioprotection et de sûreté nucléaire (French Radiation protection and Nuclear Safety Institute).

ANDRA's baseline schedule calls for a pilot industrial phase by 2030, followed by the start of delivery of the first waste (at this stage, the baseline for producers is still for intake of the first waste packages in 2031). It should be noted that if this date were to be delayed by a few years, this would not have a significant impact on EDF's capacity for storing the waste in question beforehand, or on the financial amounts to be provisioned at present value.

On 11 January 2018, ASN gave its opinion on the DOS (safety options file) submitted by Cigéo in which it considered the project had on the whole reached a satisfactory technological maturity at that stage. It shall be noted that the ASN requires the examination of alternatives to the proposals for storage of bituminous waste at Cigéo. In September 2019, the expert panel instructed by DGEC in September 2018 to review the management of bituminous waste concluded that in principle, various handling options were feasible (storage or neutralisation), whilst emphasising the importance of further research to identify the most appropriate option. A four-party research programme between producers and ANDRA is already in progress on this issue.

The detailed design review, organised at the request of the DGEC (French General Directorate for Energy & Climate) by a group of independent experts, reported its findings in late 2020 and issued a generally favourable opinion on ANDRA's submission. It made a certain number of recommendations for finalisation of the application for authorisation to create the centre. In particular, it called for closer involvement of EDF and Orano in the preparation of the application to be submitted.

The dossier for the public interest declaration application was filed by ANDRA with the public authorities in August 2020. The Environmental Authority's opinion of 13 January 2021 emphasises the instructive nature of the environmental assessment. It makes a series of recommendations, which ANDRA has taken into account in the public enquiry file. The counter-assessment of the socioeconomic assessment of the Cigéo project carried out by the General Secretariat for Investment (SGPI) concluded with a favourable opinion *"both with respect to the project as a whole and its transport component"*, and pointed out that *"the Cigéo project has a strong prudential and reassurance value in the face of environmental and health risks"*. The public enquiry in connection with the declaration of public utility was held from 15 September to 23 October 2021, and also concluded with a favourable opinion (with five recommendations directed to the project owner) of the investigating commissioners, which was made public on 20 December 2021. Earlier in 2021, the Citizens' Conference issued a "Citizens' Opinion" on the pilot phase organised by ANDRA between May and July. Two online public consultations were held on governance issues and the pilot phase from May to September.

As regards the tax status of Cigéo, Article 127 of France's 2021 Finance Act has made a change to the taxation regime for BNFs under Article 43 of the 2000 Finance Act. In particular, it provides for a change in the method of calculation of the tax on the storage of long-lived medium- and high-level waste by removing the minimum and maximum brackets (5-50) of the multiplication factor. These legislative provisions have yet to be specified by a decree of the French Council of State.

● ICEDA

ILW-LL waste from the operation (excluding fuel management) and decommissioning of plants is conditioned and stored at ICEDA. The facility, which is located at the Bugey site, was commissioned in 2020 and received its first waste shipments. The ASN decision approving and supervising the conditioning of long-lived intermediate-level waste (ILW-LL) in C1PG^{SP} packages at ICEDA was received on 19 July 2021. The first C1PG^{SP} package containing activated waste from Chooz-A was sealed on 21 September 2021. The first waste conditioning campaign (from Chooz-A and Fessenheim) was held in December 2021.

Long-Lived Low-Level Waste (LLW-LL)

LLW-LL comes from the decommissioning of the old NUGG reactors (graphite, processing waste – see section "Decommissioning of nuclear power plants"). In July 2015, ANDRA transmitted a report on the feasibility of a storage centre on a site located in the Soulaïnes region (Aube) in France for an opinion from the ASN. Work is currently ongoing, as part of the PNGMDR plan⁽¹⁾ to identify the waste that could be taken on. Furthermore, studies conducted by EDF to characterise more precisely the radiological inventory of this waste have led to significant gains. As a result the possibility of storing part of the graphite (particularly that of the Chinon A2 reactor) in existing surface facilities can be reconsidered.

ASN opinion 2020-AV-0357 dated 6 August 2020 on the studies relating to the management of LLW-LL, issued following the work conducted between 2016 and 2018, as well as the orientations suggested by the contracting authorities for the PNGMDR in the current phase of development of the fifth edition of the plan, suggest a precise schedule for the next stages to enable the consolidation of the management strategy for this particular waste.

These specify the following by 2023:

- definition by ANDRA of several baseline management scenarios; these will be presented to the PNGMDR working group⁽²⁾ in order to highlight the management options that may be envisaged, including using existing options such as the storage centre in Aube, decentralised storage, Cires (VLLW storage centre) and the requirements for additional concepts;
- production of a dossier (with a level of maturity corresponding to a summary preliminary draft) presenting the technical and safety options chosen for LLW-LL storage for an inventory of waste to be proposed by ANDRA, on the Vendeuvre-Soulaïnes site. To draw up this dossier, ANDRA will take into account the possibility of staggering the construction of this storage by constructing independent units to suit each type of waste, with implementation in a range of campaigns suitable for different families of waste;
- they also show that should new storage sites be envisaged, in application of this management scheme, ANDRA will initiate a procedure for identifying sites and carrying out feasibility studies, followed by design studies, for these sites. If this management option is confirmed for the Vendeuvre-Soulaïnes local authorities' storage site, ANDRA will submit a safety options file for the deployment of an LLW-LL repository, with a level of maturity corresponding to a detailed preliminary draft, on a date to be set by the next edition of the PNGMDR.

Although this procedure does not yet provide any clear visibility as to the date of availability of waste removal sites, it will enable information from ANDRA to be available in 2022-2023 with regard to the management solutions that can be envisaged, and for these to be implemented within a timeframe compatible with the extraction of the graphite bricks from the reactors, maintaining two main options for graphite from the Chinon A2 lead reactor (LLW-LL or the Aube repository (CSA)). The scenario currently modelled in the provisioning for the first graphite piles from Chinon A2 extracted in around 2040 is for them to be stored at CSA. The risk of construction of temporary storage at Chinon was also taken into account. All the provisions also cover the scenario of direct storage in a modular subsurface LLW-LL repository.

Short-Lived Low- and Intermediate-Level Waste (LILW-SL) and Very-Low-Level Waste (VLLW)

Very Low-, Low- and Intermediate-Level Waste comes from the operation of nuclear facilities (gloves, filters, resins, etc.) and their decommissioning (concrete, scrap, lagging, piping, etc.). They are stored above ground in the Soulaïnes and Morvilliers storage facilities run by ANDRA in the Aube département.

In order to minimise volumes, some waste is treated beforehand by melting or incineration at the Centraco plant owned by Cyclife France (part of Cyclife SAS, a subsidiary of EDF). In 2016, following the acquisition of the English and Swedish assets of Studsvik, the holding company "Cyclife" was created. The goal is to group together all recently acquired assets and establish the development of the Group's internal and external activities in terms of waste treatment and decommissioning. To this end, in 2019, the subsidiaries Cyclife Engineering and Graphitech⁽³⁾ were created to develop solutions for decommissioning light water reactors and designing waste treatment facilities (Cyclife Engineering), and for decommissioning graphite reactors (Graphitech). In 2020, Cyclife SAS holds an 84.6% stake in Cyclife Digital Solutions, which specialises in tools and digital simulation used for decommissioning, and waste management. On 22 December 2021, Cyclife SAS signed a contract to acquire the Aquila engineering company in the United Kingdom. This new acquisition aims at strengthening Cyclife's position in the UK in the nuclear engineering sector.

On 30 November 2021, EDF also announced the forthcoming creation of a new subsidiary in the field of waste management, in which Cyclife SAS and Astaralis will each hold a 50% interest. The objective of this subsidiary, Waste2Glass, is to develop new waste management processes by vitrification based on the Geomelt and MVS processes owned by Veolia.

(1) Plan national de gestion des matières et des déchets radioactifs (National plan for the management of radioactive materials and radioactive waste).

(2) The PNGMDR working group includes environmental protection associations, representatives of elected officials and assessment and supervisory authorities, as well as waste producers (mainly Orano, EDF and CEA) and ANDRA.

(3) Owned jointly by EDF and Veolia.

In addition, following the PNGMDR public debate and in line with the joint decision of the Ministry for the Ecological Transition and the ASN, the PNGMDR project owners, several draft regulations allowing the recovery of VLLW metals were put out for public consultation, which was held from 4 January to 4 February 2021, and which concluded with favourable opinions of the Technological Risks Prevention Council (CSPRT) and the ASN. On 15 February 2022, the decree that defines the categories of substances that are eligible for recovery and the government order that determines the rules on the exemption application needed to recover these substances were published. In this context, EDF is continuing the studies undertaken with a view to building a cutting and fusion facility to process and recover VLLW metal waste from decommissioning operations in France and abroad. This project, called Technocentre, is being carried out by EDF in collaboration with Orano. The objective is to commission the facility, which is proposed to be located at the Fessenheim site, by 2031.

EDF also conducts both its own R&D activities and R&D with a network of partners (nuclear operators, manufacturers, VSBs and SMEs, institutional and academic players), on the twin themes of the management of radioactive waste and decommissioning. EDF is a recognised leader in these fields and is taking part in seven EU projects to improve the performance of waste management and decommissioning projects, develop its expertise, and contribute to the development and implementation of the best international practices.

Consideration of future charges relating to the management of spent fuel and long-term management of radioactive waste

Each year, EDF makes provisions for the downstream side of the nuclear fuel cycle in France (see note 15 in the notes to the consolidated financial statements for the year ended 31 December 2021 in section 6.1).

B – The issues at stake in preparing for the future of the nuclear fleet in France

EDF's industrial goal for the preparation for the future of the nuclear fleet rests primarily on the following strategic areas:

- the implementation of technical conditions allowing the extension of the operational life of nuclear power plants beyond 40 years;
- continued safety improvements, primarily by integrating lessons learned from the Fukushima accident in Japan;
- implementation of a preventive policy with respect to ageing or obsolete equipment.

On 10 February 2022 ⁽¹⁾, EDF and GE announced the signature of an exclusive agreement for EDF to acquire part of GE Steam Power's nuclear power activities. The proposed transaction would cover GE Steam Power's conventional island equipment for new nuclear power plants, including Arabelle turbines, as well as maintenance and upgrades for existing nuclear power plants (outside the Americas). Given the context of the Ukrainian conflict, see also section 2.2 "Risks to which the Group is exposed".

Continued operation of the operating units after 40 years

Additional Safety Assessments (ASA) following the Fukushima accident

On 15 September 2011 and in light of the accident at the Fukushima nuclear plant in Japan, EDF submitted 19 additional safety assessment reports to the ASN, at its request, one for each of its nuclear sites, encompassing all its existing reactors and all those under construction.

The safety of EDF's nuclear fleet is based on the principle of continuous improvement: Existing and new facilities continuously benefit from feedback from all power plants. Lessons are learnt from incidents and accidents that may occur in the world.

These assessments consisted of re-examining the defences of existing power plants and those under construction, in light of the events in Japan, taking into account issues set out in the specifications drafted by the safety authorities.

Thus, the safety margins were reassessed against the risks of earthquakes and flooding, when dealing with situations of simultaneous loss of the cooling source and power supplies and the consequences of severe accidents.

These assessments also led to inquire whether certain changes to the scenarios planned beyond situations used for the sizing of the protection systems, would lead to a worsening of the consequences in terms of safety ("cliff effects").

They finally led to deterministically consider the extreme situations that substantially exceed those used in the design of nuclear installations and subsequent safety reviews.

Finally, the ASAs also re-examined the rules applied in outsourcing.

These analyses confirmed first and foremost the adequate level of security throughout the EDF nuclear power fleet, particularly because of the periodic reviews carried out in France since the end of the 1980s. EDF also proposed additional measures to the ASN that exceed those considered for sizing safety systems, to contribute to further improving the safety level of power plants.

In its opinion to the government published on 3 January 2012, the ASN states, on the basis of the analyses of its technical support, that *"after the additional safety assessments on priority nuclear facilities, the ASN considers that the facilities examined show an adequate level of safety, and that it will not thus request the immediate shutdown of any of them"*. At the same time, the ASN considers that *"continuing to operate these facilities requires increasing their robustness, as soon as possible, to an extent beyond existing safety margins, to handle extreme situations"*.

The ASN also recommended the "hard core" concept and the FARN system (see section 1.4.1.1.2.2 "Environment, nuclear safety, radiation protection"). The "hard core" is made up of the plant's structures, systems and components that can withstand situations studied in connection with ASAs. On 26 June 2012, the ASN made 19 decisions requiring EDF to follow over 600 technical requirements, which set regulatory requirements according to the post-Fukushima action plan. These technical rules require that all nuclear sites must have an organisation and local crisis centres resistant to the occurrence of a large-scale event affecting several facilities. For EDF power plants, the prescribed "hard core" must in particular have "bunkerised" electrical resources in each unit.

Operating life of EDF's PWR fleet

The provisions of the French Environmental Code do not set a limit on operating life but require a review of facilities every ten years in light of applicable rules and updates of assessments of the risks facilities pose to protected interests, taking into account the state of the facilities, the experience gained during their operation, new developments in nuclear science, and rules applying to similar facilities (safety standards).

EDF's industrial strategy is to operate the fleet beyond 40 years in the best conditions of safety and performance, considering the significant investment linked to the third ten-year inspections and the post-Fukushima improvements on the one hand, and the energy needs of France on the other. This target is consistent with trends observed around the world for reactors using similar technologies. To this end, EDF has implemented industrial and R&D action plans. Actions have been launched to renew the major components that can be renewed and solutions are being studied to demonstrate the capacity of non-replaceable equipment such as the confinement containment building and reactor vessels, to ensure their operation up to 60 years.

An extension to the life of the current nuclear fleet must enable, whilst respecting the absolute priority of nuclear safety, better use of the industrial base it represents.

In the first half of 2016, all the technical, economic and governance conditions necessary to match the amortization period of the 900MW power plants in the French nuclear fleet with the Group's industrial strategy were met. On 28 July 2016, the Board of Directors of EDF approved the extension of the accounting amortisation periods of PWR 900MW series power plants in France (excluding Fessenheim) from 40 to 50 years from 1 January 2016 onwards, without prejudice to the ASN's position on the measures suggested by EDF for each of the nuclear units in question.

This approval on the extension is based on the technical capacity of the PWR 900MW fleet facilities to operate for at least 50 years, supported by international benchmarks, as well as by the investments made progressively under the *Grand Carénage* programme. These investments will enable the PWR 900MW series to reach a level of safety as close as possible to that of the EPR, and one of the highest internationally, after its fourth ten-year inspection (VD4).

(1) See EDF's press release of 10 February 2022 "EDF Signs an Exclusive Agreement to Acquire Part of GE Steam Power's Nuclear Activities".

On 23 February 2021, the ASN ruled on the terms for continuing to operate 900MW reactors beyond their fourth scheduled inspection. The ASN *"deems that the measures put forward by EDF, coupled with its own recommendations, open up the way for the continued operation of 900MW reactors for ten years after their fourth regular re-examination"*.

Tricastin 1 was the first 900MW reactor unit to successfully undergo its fourth ten-year inspection (VD4). The lessons learned from the Tricastin 1 VD4 have been applied to the Bugey, Gravelines and Dampierre VD4s. The results of these VD4s are satisfactory. They show a strong capacity for industrialising operations, as well as for involving the industrial fabric necessary for the success of this project.

During his speech on 10 February 2022 at General Electric's Steam Power site in Belfort, the President of the French Republic announced that he wanted to *"extend the lifespan of all reactors that can be extended"* and that *"no nuclear reactor in operation will be closed in the future (...), except for safety reasons"*.

On this occasion, the President also stated that he had asked EDF to *"study the conditions necessary for extending the life of nuclear power plants beyond fifty years"*, thus paving the way for the continued operation of nuclear reactors beyond their 50-year lifespan.

In 2021, the process for examining the generic phase of the fourth periodic review of the 1,300MW series was initiated with the ASN. The initial series unit (TTS) is planned for Paluel in 2026. In addition, the 30-year review of the 1,450MW series has been initiated with a TTS planned for 2029. The lessons learned from these two reviews were shared by ASN, IRSN and EDF in order to benefit from the review carried out on the 900MW series.

The standardisation and industrialisation of issues reviewed for the various series improves the capacity to deploy identical and proven technical solutions and makes it easier for the operator to absorb these substantial upgrades to the facilities. The analysis of social, organisational and human impacts is an integral part of the periodic review process.

On 28 July 2021, the Board of Directors approved the extension in the consolidated financial statements of the depreciation period for the 1,300MW PWR plants from 40 years to 50 years (see note 1.4.1 to the consolidated financial statements at year-end 2021). This accounting estimate does not assume that continued operation will be authorised: such authorisation will be granted unit by unit by the Safety Authority after each ten-yearly inspection, as required by law.

The depreciation period for the 1,450MW series currently remains at 40 years, because the conditions for an extension have not been met. Nevertheless, the subsequent extension of the depreciation period of these series remains an industrial objective for the Group.

Investment programme for the existing nuclear fleet in France: the Grand Carénage programme

On 22 January 2015, EDF's Board of Directors approved in principle a major overhaul programme (the *Grand Carénage*) aimed at refurbishing the French nuclear fleet, enhancing reactor safety and, if conditions allow, continuing their operation. This programme incorporates additional safety improvements identified following the Fukushima accident.

This industrial programme is being gradually implemented in compliance with the objectives of the Energy transition for green growth Law, multi-year energy programmes and the opinions and orders of the ASN as well as specific procedures for reactors to run for more than 40 years.

Cost of the programme

The initial cost of the programme was €₂₀₁₃55 billion (or €60 billion in current euros) over the period 2014-2025 for the 58 reactors of the fleet in operation ⁽¹⁾, covering, on the existing nuclear fleet, both investments in routine maintenance and investments necessary to extend their operating life (replacement of steam generators, VD4 900, VD3 1300).

The optimisation work undertaken since (reductions and postponements) led to a downward revision of the overall cost of the programme to €₂₀₁₃45 billion (or €48 billion in current euros) over the 2014-2025 period. This revision is largely a result of continued optimisation efforts regarding the adopted technical solutions and component replacement strategies and greater precision in their application by integrating the capacities of the industrial base. Bringing forward the shutdown date for the Fessenheim plant in 2020 has also been taken into account.

In 2020, EDF readjusted the cost of the *Grand Carénage* refurbishment programme for 2014-2025 to €49.4 billion in current euros ⁽²⁾. For the most part, this new estimate incorporates the initial lessons learned from the additional works to be conducted, drawn from the examination process in connection with the fourth periodic review of the 900MW reactors, which was completed with the decision the ASN rendered on 23 February 2021. It includes studies, alterations and additional equipment not originally planned for, aimed at improving safety levels. It also includes the review of the planned duration for scheduled maintenance shutdowns (ten-year inspections and partial inspections), drawing on the experience of previous years, as well as the impact of the health crisis, as estimated in 2020, applying to 2020-2022 ⁽³⁾.

The estimated cost of the programme is regularly updated and to date stands at €50.2 billion (+€0.8 billion compared to the adjusted figure of €49.4 billion for 2020) ⁽⁴⁾, which takes into account additional studies and work.

The new roadmap of the *Grand Carénage* project for the period after 2025, which includes, in particular, the costs in connection with the VD5 of the 900 series, is underway.

Milestone report at end 2021

- The programme for preventive replacement of the poles in the main transformers is ongoing. 150 main transformer poles out of 174 had been replaced *i.e.* approximately 86% of the programme.
- The steam generators of 27 out of the 32 units of the 900MW series were replaced. In early 2022, that of the Gravelines 6 plant was underway.
- All 56 "ultimate backup" diesel generators have been put into operation; the last one (Paluel 1) was commissioned in February 2021.

Industrial work will continue beyond 2025. Capital expenditure will therefore remain high beyond this date.

C - Issues related to decommissioning of nuclear power plants

EDF takes full regulatory, financial, and technical responsibility for the decommissioning of its plants and the other nuclear installations it operates ⁽⁵⁾. EDF has taken steps to ensure that throughout decommissioning, it controls the entire life cycle of nuclear power generation resources.

Regulatory notice

Regulations applicable to the decommissioning of nuclear facilities

The decommissioning of a BNF is ordered by a decree, issued after an opinion by the ASN and completion of a public enquiry. This decree determines the characteristics of the decommissioning, the timeframe for its completion, and where applicable, the operations incumbent upon the operator after decommissioning.

The reference scenario adopted by EDF since 2001 is for decommissioning without a waiting period, consistent with French regulations, which provide for decommissioning "in as short a time as possible" after final shutdown on acceptable economic terms and in line with the principles set out in Article L. 1333-2 of the French Public Health Code and Article L. 110-1 II of the Environmental Code (see Article L. 593-25 of the French Environmental Code).

(1) The figures presented by the French Cour des Comptes in its report of 10 February 2016 cover a longer time horizon, up to 2030, and included operating and maintenance expenses, in addition to investment expenses. Both assessments are consistent, as stated by the Cour des Comptes in its report. Indeed, among the overall estimates calculated by the Cour des Comptes and amounting to close to €100 billion for the 2014-2030 period, the investment -expenditures estimated at €74.73 billion should be distinguished from the operating expenditures estimated at €₂₀₁₃25.16 billion. Within the €₂₀₁₃74.73 billion of investment expenses between 2014 and 2030, €₂₀₁₃55 billion are dedicated to the 2014-2025 period, which allows the two estimates established by the EDF group and the Cour des Comptes to be connected.

(2) See the press release dated 29 October 2020 "EDF readjusts the costs of its *Grand Carénage* programme".

(3) This does not include any subsequent lockdown or other restrictive measures affecting activity.

(4) Excluding repairs that may be required for stress corrosion evidence discovered at the Chooz, Civaux and Penly reactors. See EDF's press releases of 15 December 2021 "Reactors of the Civaux and Chooz nuclear power plants: replacements and preventive checks on parts of the piping of a safety system" and of 13 January 2022 "EDF updates its nuclear output estimate in France for 2022".

(5) BCOT (Base chaude opérationnelle du Tricastin), Saint-Laurent Silos, ICEDA...

The regulatory process for decommissioning involves the following:

- a final shutdown declaration at least two years before the planned shutdown date, which describes the preparatory decommissioning operations planned;
- a decommissioning request filed within two years from the final shutdown declaration, which after investigation by the authorities and a public inquiry, will result in a decree ordering the decommissioning of the facility;
- key progress reviews with the ASN, included in a safety reference system relative to decommissioning;
- finally, once the work and final shutdown have been completed, the declassification of the facility to remove it from the legal regime governing basic nuclear facilities.

The power plants in question that have been permanently shut down are a heavy water reactor (HWR) at Brennilis; a fast-neutron reactor (FNR), Superphenix; the industry's six natural uranium graphite gas reactors (NUGG) in Bugey, Saint-Laurent, and Chinon, and three pressurised water reactors (PWR): one in Chooz A and those at the Fessenheim site.

The sites remain the property of EDF, and they will remain under its responsibility and monitoring. Given its role as responsible operator, EDF will act as the contracting authority for the decommissioning.

EDF plans a period of 15 years for the decommissioning of Pressurised Water Reactors.

The decommissioning of EDF's historic nine first-generation power plants in final shutdown will produce approximately one million tonnes of primary waste materials, of which 80% is standard waste material and none is High-Level Waste. The remaining 20% comprises Very-Low to Intermediate-Level Waste including about 2% Long-Lived Waste requiring the availability of a storage facility for ILW-LL and LLW-LL. Decommissioning of the two Fessenheim reactors shut down in 2020 will produce 380,000 tonnes of waste, 95% of which will be non-radioactive waste.

The existing means of removal of short-lived VLLW and LILW have been supplemented by the *Installation de conditionnement et d'entreposage des déchets activés* (Conditioning and Storage Facility for Activated Waste, ICEDA) for the conditioning and storage of activated waste from operations and decommissioning (ILW-LL).

The scheme for handling waste from decommissioning still needs to include the construction of the LLW-LL repository (see the paragraph on LLW-LL in section 1.4.1.1.2.3 "Nuclear fuel cycle and related issues"). Moreover, the new dismantling schedule of the NUGG plants provides for the construction of a storage facility for the LLW-LL liners⁽¹⁾ of the silos at Saint-Laurent, pending the availability of a definitive disposal route (first removal of graphite in 2044).

Chooz A: Chooz A is a pressurised water reactor using a technology similar to the 58 units in operation. It was commissioned in 1967 and operated until 1991. The reactor location, in a rocky cave in a hillside, means that access conditions and entry and exit of materials and effluent management are more difficult than those of the rest of the existing PWR fleet.

In 2019, the underwater cutting of the internal components of the vessel⁽²⁾ was carried out according to schedule. During the health crisis of 2020, the shutdown of the construction site, coupled with operating difficulties due to the lockdowns, resulted in a major turbidity incident in the water⁽³⁾ of the pool, which strongly impacted the end of the project. The cutting of the vessel's internal components was completed in late February 2021. The cutting of the vessel will begin in 2023 after the pool has been emptied and cleaned, as well as the cutting of the first components of the primary circuit piping.

Following the letter of interest sent by the CNRS in September 2021, a Memorandum of Understanding (MoU) should be signed with the management of the CNRS in early 2022. It concerns the proposed reuse of caverns for neutrino research in connection with the "SuperChooz" project.

Creys Malville: following the filling of the Creys-Malville reactor vessel at the end of 2017, the decommissioning process continued. In 2020 and 2021, the first two caps were cut (teleoperated procedures) and the cutting of the last cap is in progress. It will then be extracted, thus freeing access to the vessel's internal equipment for decommissioning (2022-2026).

Brennilis: EDF has become fully responsible for the decommissioning of this facility⁽⁴⁾ in place of the CEA. The deconstruction works included in the scope of the Decree authorising partial decommissioning were finalised by end-2020. The safety concrete for the effluent processing station has been demolished, and the spoil removed. Following the final inspections, decommissioning works to allow this zone to be entirely relisted as a conventional zone will be completed in 2022. At the same time, examination of the decommissioning application⁽⁵⁾ with a view to the publication of a full decommissioning decree (allowing decommissioning of the reactor block itself) is ongoing: the permanent group on the application filed issued a satisfactory opinion without a recommendation and a public enquiry was begun on 15 November 2021 for a period of 7 weeks. On 17 January 2022, the Brennilis Local Information Commission (CLI) issued a favourable opinion on the proposed application. In addition, the enquiry commission appointed by the Rennes administrative court to conduct the public enquiry also issued a favourable opinion on 2 March 2022.

NUGG: the industrial strategy of the dismantling of the NUGG reactors was thoroughly reviewed at the end of 2015 with the shift from "in-water" dismantling to "in-air" dismantling. This choice, as well as the proposed new sequencing of operations, took into account the results of the pre-project studies conducted between 2013 and 2015. They result in longer decommissioning operations for the reactor caisson (about 25 years instead of the ten years initially planned), requiring the performance of tests in the Graphite Industrial Demonstrator (DIG), and then the complete decommissioning of an initial series unit (Chinon A2) before the complete decommissioning of the other five units. Updating the industrial decommissioning scenario for first-generation power plants, particularly NUGG plants, led to a €590 million increase in the provision at 31 December 2015.

This scenario forecasts an initial removal of the graphite from the first NUGG reactor by 2044 and postpones the need for a disposal route for the other graphite waste to 2070.

The ASN rulings published on 3 March 2020 have established a prescriptive framework for the operations and dossiers to be completed within the next 5-7 years on each of the sites. Unlike the aforementioned draft rulings submitted for public consultation, these defer the issue of the schedule for operations until the investigative phase for dossiers relating to decommissioning.

However, in a cover letter accompanying these rulings, the ASN deems that EDF should attempt to shorten the schedule for completing the operations "in view of the statutory obligation to decommission each reactor in as short a time as possible". EDF confirmed the implementation of a regular review of the schedule based on the results obtained on the industrial demonstrator and the first reactor.

In connection with its subsidiary Graphitech, EDF is already working on avenues for schedule optimisation that should make it possible to include a schedule similar to that of the draft ruling submitted for public consultation in the dossiers filed at the end of 2022 (decommissioning of reactors other than 'TTS' lead units from 2055 onwards). Consistently with these works, and in the absence of any further information from tests using the industrial demonstrator and the first real-life operations, there was no change in 2021 to the valuation of the estimated provisions at the end of December 2020.

On 27 December 2021, following an analysis of the periodic review reports on the NUGG reactors submitted by EDF, the ASN indicated in a press release that it had no objection to continuing decommissioning operations or preparations for decommissioning these reactors.

On 20 November 2020, an ASN exploratory procedure designed to verify the maturity of EDF for running complex projects was completed. The Graphite Industrial Demonstrator (DIG) and Chinon A2 projects were inspected by a team comprising members from the ASN, IRSN, and DGE. The ASN follow-up letter issued on 21 May 2021 confirms the strengths and areas for improvement presented during the hot debriefing. EDF's response is due within 12 months (May 2022).

(1) The "graphite liners" come from the operation of the former French natural uranium graphite gas (NUGG) reactors. These are hollow cylindrical graphite envelopes that surround the fuel.

(2) The "internal" equipment includes all equipment located inside the reactor vessel, with the exception of the fuel assemblies themselves, the reactivity control clusters and the core instrumentation.

(3) Water clouded by suspended solids.

(4) Decree no. 2000-233 of 19 September 2000.

(5) Filed in 2018.

In addition, the construction work on the DIG is completed and the building was accepted in late 2021.

Fessenheim: Article L. 311-5-5 of the French Energy Code, introduced by the French Energy Transition Act promoting green growth dated 17 August 2015, caps installed nuclear power generation capacity in France at 63.2MW, thus requiring EDF to take all necessary measures to close the two Fessenheim reactors.

On 27 September 2019, EDF sent the Minister of Ecological and Solidarity Transition and the Nuclear Safety Authority the declaration of the permanent shutdown of the two Fessenheim reactors and, on 30 September 2019, a request for termination of the authorisation to operate this plant. The submission of this request and declaration follows the signing, on 27 September 2019, by the French State and EDF, of the MoU establishing the schedule of detriment issues granting entitlement to remuneration and determination of the terms of this compensation. In accordance with the Decree of 18 February 2020 repealing this authorisation, reactors no. 1 and no. 2 were definitively shut down on 22 February 2020 and 30 June of the same year, respectively.

Pursuant to the MoU, compensation includes:

- initial payments corresponding to advance expenses arising from the closure of the plant (post-operation expenses, BNF tax, decommissioning costs, and staff redeployment costs); these will be made over a period of four years following closure of the plant;
- subsequent payments corresponding to any loss of earnings, in other words any profits that future output would have brought in, determined on the basis of the previous output from the Fessenheim power plant, through to 2041, calculated *ex post* on the basis of the sale price of nuclear power, more specifically observed market prices.

The French State decided to proceed with payment of the entirety of the fixed component, the amount of which was evaluated at €370 million. This amount may be readjusted as necessary, depending on actual post-operation expenses, BNF taxes, and staff redeployment costs.

EnBW, EDF's partner in the plant, will under certain conditions be entitled to a share of lost earnings in proportion to its contractual rights to the plant's generation capacity. For its part, the Swiss company CNP decided to end its involvement in the partnership. Once EDF took note of CNP's decision the contract between the two firms ended on 31 December 2017.

The decommissioning dossier was filed with the Minister of Ecological and Solidarity Transition and the ASN in December 2020, with the aim of obtaining the Decree prescribing decommissioning operations in 2025; this will mark the start of the decommissioning phase. In the end of 2020, the PREDEM Fessenheim project has been put into place to coordinate all the end-of-operation procedures (permanent locking-out and removal of certain equipment and support functions, removal of fuel, decontamination of primary circuits, etc.). At year-end 2021, the trajectory of activities in preparation for decommissioning is consistent with the forecast schedule, including, in particular, the end of fuel removal from unit 1 and the transfer to Cyclife Sweden of the upper portions of the six spent steam generators. In early 2022, the MSNR and the ASN acknowledged receipt of the "index B" Fessenheim decommissioning application, which was submitted on 23 December 2021 in response to the MSNR's letter of 4 August 2021, which marked the resumption of its investigation.

Furthermore, engineering studies on the decommissioning of Fessenheim have continued, so that the conclusions of the preliminary designs carried out on preparatory activities, on dismantling work, and on the suitability of the treatment channels for nuclear waste can be used to provide a reference for the decommissioning estimate for the PWR fleet.

In addition, Decree no. 2021-1785 of 24 December 2021 authorised the taking of water from and discharges into the Grand Canal in Alsace for the cooling of various auxiliary circuits at Fessenheim.

Decommissioning costs and assets constituted to cover long-term nuclear commitments

Since the beginning of operations at its power plants, EDF has made provisions to cover decommissioning operations, engineering, monitoring and maintenance of facilities, and site security (see section 6.1, note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020). The aim of decommissioning operations is to restore the condition of sites and enable the land to be reused for industrial purposes.

In addition, dedicated assets have been gradually established since 1999 to cover long-term nuclear commitments (see section 6.1 "Consolidated financial

statements at 31 December 2021", note 15.1.2.2 "Strategic allocation and composition of dedicated assets"). Article L. 594-2 of the French Environmental Code and its implementing regulation specified which liabilities are not associated with the operating cycle and must therefore be covered by dedicated assets (see in section 6.1, note 15.1.3 "Coverage of EDF's long-term nuclear commitments").

The external audit mandated by DGECE on "responsibilities in respect of decommissioning facilities currently permanently shut down and the management of radioactive waste from these facilities" was held from December 2020 to May 2021, pursuant to the letter of instruction received on 5 June 2020 from the General Directorate of the French Treasury (*DG Trésor*) and the DGECE. This audit covers historic shut down facilities excluding PWR technology, *i.e.*, Superphenix, Brennilis, and the 6 NUGG reactors. The final audit report was delivered to the audited party on 9 July 2021. The DGECE's follow-up letter was issued on 22 November 2021 and the audit report was posted on the Ministry's website.

The report notes "*an organisation structurally oriented toward completing decommissioning projects*", a "*costing and annual review process [that] is robust, and provides proper traceability of assumptions used and original data*" and "*a long-term industrial approach to overcoming the few remaining technological challenges*". Finally, the report confirms that "*provisions are consistent with the basic scenarios of the projects and cover the full range of expenses of the audited scope*" and determines they "*are adequately sized*" after testing the size of EDF's expenses and provisions.

In addition to the current mastery of processes and organisations, two minor deviations of little significance were reported (and were corrected during the revision of the estimates at year-end 2021). Areas for improvement were identified in connection with project planning, measuring the level of project maturity and the risks and uncertainties quantification process. They do not call into question the conservative assessment of the associated decommissioning and waste management costs. The audit report also highlights a set of good practices that are rarely implemented in decommissioning projects.

1.4.1.1.3 New Nuclear projects

For the risks associated with these projects, see section 2.2.4 "Operational performance related risks" – "4A – Management of large and complex industrial projects, including EPR projects".

1.4.1.1.3.1 Flamanville 3 EPR project

EDF is both the owner and manager of the Flamanville 3 EPR (European Pressurised water Reactor) project.

Interactions with the Nuclear safety authority (ASN) and administrative authorisations

The request for application for commissioning, submitted in March 2015, has been examined once and was updated in June 2017. A file amending this request was submitted in April 2019. EDF has submitted to the ASN a further update to the request for application for commissioning on 4 June 2021.

For this purpose, the project must undergo an environmental assessment based on the updated environmental impact study. This is a new regulatory procedure required by an amendment to the French Environmental Code. The ASN referred the matter to the Environmental Authority in early September 2021, which issued its opinion on 22 December 2021. It requests that the application, prepared on the basis of an impact study EDF carried out for the purpose of a future commissioning authorisation be completed on several points and, in particular, that it address the impacts of the prior construction phases of the Flamanville EPR and the Cotentin Maine very high voltage power line.

On 8 October 2020, pursuant to the French Environmental Code, the ASN authorised the arrival of nuclear fuel at the Flamanville site, after an on-site inspection on 18 and 19 August 2020 and after public consultation on the draft authorisation from 31 August to 21 September 2020. The ASN also authorised the use of radioactive gases to carry out efficiency tests on certain filtration systems. In addition, on 15 October 2020, pursuant to the French Defence Code (*Code de la défense*), the Senior Civil Servant for Defence and Safety (*Haut Fonctionnaire de Défense et de Sécurité*, HFDS) authorised the holding, use, and transfer of nuclear materials for the site.

The first fuel assemblies were delivered on site on 26 October 2020. The 245 fuel assemblies necessary for loading (241 assemblies for the first core, 4 assemblies for the reserve) were accepted at the end of the first half of 2021. The first regulatory fuel inspection (Euratom) was performed at the end of August 2021.



In a Decree dated 25 March 2020, the commissioning deadline specified in the Authorisation Decree (DAC) was extended until 11 April 2024, to take into account the weld repairs in the main secondary circuit whilst maintaining flexibility.

On 7 April 2021, EDF submitted an operation authorisation application in compliance with the 18-month period before fuel loading required by the Energy Code. The application submitted ensures that the national energy policy guidelines are taken into account (in particular, compliance with the 63.2GWe nuclear power ceiling). EDF received this operating authorisation on 30 August 2021, in an order issued by the Minister for the Ecological Transition.

Progress of on-site implementation

The year 2021 was marked by the following achievements:

- achieving the space depression criteria between enclosures;
- receipt and storage in the pool of the fuel building of all the fuel assemblies necessary for initial loading;
- the upgrade, before stress-relieving heat treatment, of the 8 penetration welds of the main secondary circuit steam pipes of the reactor containment building;
- the transfer of the Standard Command Control to the operator;
- the commissioning of the hot laboratory common to the 3 units of Flamanville;
- the continuation of finishing work (90% of the finishing work is now completed in the reactor building, the machine room and the diesel rooms).

Quality equipment manufacturing

Reactor vessel

In the first half of 2017 the ASN examined "higher-than expected" carbon levels in the vessel head and bottom on the basis of documentation submitted by Framatome, under the supervision of EDF. Based on the opinion of a group of ASN-appointed experts, the ASN concluded that the mechanical properties of the vessel head and bottom were adequate for their uses, including in the event of an accident⁽¹⁾. On 9 October 2018, the ASN authorised:

- the commissioning of the vessel bottom, subject to functional checks;
- the commissioning of the vessel head, by limiting the lifespan to 2024, unless the technical feasibility of checks is proven to be similar to the vessel bottom.

The project is now focused on replacing the vessel head by the end of 2024, the supply of a new equipped vessel head having been ordered from Framatome.

Therefore, the costs incurred for the manufacture of a replacement vessel head are not included in the target construction cost. Furthermore, arbitration proceedings have been engaged with respect to this matter by EDF, AREVA SA, AREVA NP, and Framatome. The arbitration tribunal issued its decision on 30 June 2021 and denied EDF's claims. It held that Framatome was not required to compensate EDF for the loss sustained due to the obligation to replace the reactor vessel cover.

Break preclusion and quality deviations in the welds of the main secondary circuit

On 30 November 2017, EDF declared a significant event to the Nuclear Safety Authority regarding the detection of a quality deviation in the welding in the main secondary pipes that transfer the steam from steam generators to the turbine (VVP pipework circuit).

This system was designed and manufactured according to the "break preclusion" concept. This approach consists in strengthening requirements for design, manufacture and monitoring in service. These strengthened requirements, requested by EDF, also involve a "high quality" requirement in the building of these systems⁽²⁾. Although these requirements were applied during the design phase,

they were not properly incorporated into the welding work. Failure to meet these requirements does not necessarily entail non-compliance with the nuclear pressure equipment regulations.

On 10 April 2018⁽³⁾, EDF notified the ASN of a significant event relating to the detection, during the initial comprehensive inspection⁽⁴⁾, of deviations in the inspection of the welding of the pipes of the main secondary circuit. In accordance with industrial procedures, the welds had been inspected by the consortium of contractors in charge of manufacturing the system. Each weld had been declared compliant by the consortium just as they were being completed.

Penetration welds

EDF began a further inspection during the second quarter of 2018 of all welds concerned in the main secondary system. For eight of these, known as reactor containment building penetration welds, on 3 December 2018 EDF suggested providing a specific 'as-is' design calculation file to the ASN. In a letter dated 19 June 2019, the ASN asked EDF to rework the eight penetration welds⁽⁵⁾ before commissioning.

EDF's proposal for reworking the penetration welds is the use of remotely controlled robots, designed to conduct high-precision operations within the pipework in question. The ASN approved this process on 19 March 2021. The 8 penetration welds concerned were all upgraded in 2021 and checked by EDF before stress-relieving heat treatment.

4 ARE penetration welds (on the steam generator water supply lines) are also subject to repair. The qualification of the repair process by the ASN is underway. This process is an adaptation of the one used for VVP penetration repairs.

Other welds

The technical investigation into reworking the welds located on the main secondary circuit with quality deviations and/or not complying with the requirements of the break preclusion reference is ongoing. 45 VVP and 32 ARE welds are involved. The rework on these welds started in the summer of 2021. Seventy per cent of the welds concerned (VVP and ARE) are currently being upgraded. Twelve VVP welds are completed to date before stress-relieving heat treatment.

In total, about 100 welds in the main secondary circuit (penetration and non-penetration) are concerned by the repairs to the VVP and ARE piping. As a last step, most of the welds will have to undergo an optimised stress-relieving heat treatment before a final conformity inspection. Repairing the penetration welds is one of the key challenges on the critical pathway of the project.

Deviations observed in the stress-relieving heat treatment historic process

Stress-Relieving Heat Treatment (SRHT) is a manufacturing operation that, in addition to giving the welded joint the expected mechanical properties, aims to reduce the residual stresses that develop within a material during a welding operation. SRHT is performed by heating the welded joint for a determined period of time at a temperature of about 600°C (+/-15°C).

In late 2020, Framatome reported to the ASN a deviation in the SRHT process historically used on the welds of the main secondary circuit of Flamanville 3. Framatome developed an "optimised" process to ensure compliance with the required temperature range.

The demonstration of the qualification of the SRHT processes must be approved by the ASN on the basis of supporting documentation.

In late 2021, the ASN approved this qualification demonstration of optimised SRHT processes for VVP penetration welds, as well as for "simple geometry" non-penetration welds.

ASN approval is expected for some 60 other welds (ARE penetration welds and other non-penetration welds, other than "simple geometry" welds).

(1) Opinion dated 11 October 2017.

(2) Given that these requirements were stated, the potential for pipes rupturing did not have to be considered during the safety demonstration. This proves, with a high degree of confidence, that accidents are physically impossible or extremely unlikely and that their consequences are limited to acceptable economic conditions.

(3) See EDF press release of 10 April 2018 "EDF has detected quality deviations on certain welds of the main secondary system of the Flamanville EPR and has begun additional controls".

(4) The initial comprehensive inspection is a regulatory requirement prior to the plant commissioning, which consists, in particular, in examining the welds of the primary and secondary systems.

(5) See EDF's press release of 20 June 2019: "Flamanville EPR: EDF notes the French Nuclear Safety Authority's decision".

Other technical problems (other than the main secondary circuit)

Main primary circuit

On 2 June 2020, ASN asked EDF to conduct fresh survey inspections of the main primary circuit in the "break preclusion" scope. EDF established a representative sample of welds for which additional X-ray inspections were performed between February 2021 and the second half of 2021, with satisfactory results. The ASN requested that this programme of additional X-ray inspections be supplemented by ultrasound inspections. These re-inspections were carried out on the sample and proved satisfactory.

In a separate development, on 2 March 2021 EDF declared a significant event to ASN. This concerned the incomplete consideration of the 2006 study referential in respect of the implantation of three nozzles ⁽¹⁾ on the main primary circuit.

Three scenarios were investigated by EDF and Framatome in the first half of 2021 at the request of the ASN. On 21 June 2021, EDF submitted a file to the ASN stating that it had chosen the solution consisting of installing a "retaining clamp" on each of the nozzles concerned. In a letter dated 8 October 2021, the ASN indicated that it had no objection in principle to this solution, although the design file for the retaining clamps would be examined by IRSN.

The ASN also stressed the need to demonstrate the quality of welds with respect to the requirements applicable to pressurised nuclear equipment. The X-ray inspections carried out between August and October confirmed that these welds are of good quality. These inspections must be supplemented by ultrasound inspections, for which the process and implementation schedule are currently being established.

Filtration sump SIS/CHR ⁽²⁾

The Flamanville EPR is equipped with a recirculation system for the water in the main primary circuit in the event of a pipe breach. In the event of an accident, this system recovers water from the bottom of the reactor building and recirculates it into the tank in order to cool the fuel assemblies.

A problem was detected during a "full-loop" test in the summer of 2021: the debris contained in the recirculated water was not effectively filtered by the filters located at the bottom of the reactor building.

To date, EDF has identified solutions to improve the efficiency of the filters and resolve this problem. EDF has presented the scope of these solutions to the ASN in a file submitted at the end of December 2021. Its investigation is underway.

Pressuriser valves

Following the discovery of corrosion on the pressuriser valves (PSRV valves) of the Olkiluoto EPR (Finland), EDF and Framatome carried out inspections on this equipment and also discovered traces of corrosion on the valves of the Flamanville EPR. EDF and Framatome have decided to take it into account and to modify the material used for certain valve pilot components. Several corrosion resistance tests were performed in order to select the best material. These components are being manufactured and will be installed at the site in the first half of 2022. In addition to dealing with this difficulty, the ASN is continuing to investigate the operation and reliability of the pressuriser valves.

Lessons learned from Taishan

EDF has analysed the potential impact of the technical issues encountered on reactor 1 of the Taishan plant (see section 1.4.5.3.6.1 "Activities in China") ⁽³⁾ on the commissioning of the Flamanville EPR. Inspections carried out on the relevant fuel assemblies showed mechanical wear of certain assembly components, a phenomenon that has already been encountered in several reactors in the French nuclear fleet. In the perspective of the commissioning of Flamanville 3, a solution will be instructed with the ASN in order to carry out the potential necessary modifications.

Commissioning schedule and construction costs

In its press release of 9 October 2019 ⁽⁴⁾, EDF specified that the provisional schedule for implementing the preferred scenario for repairing the penetration welds, subject

to the date on which the ASN would approve this scenario, would mean the fuel being loaded at the end of 2022, and a revised construction cost of €12.4 billion ⁽⁵⁾ excluding interim interest.

In its press release of 12 January 2022 ⁽⁶⁾, EDF updated these elements, taking into account the impact of the health crisis on the activities of the Flamanville EPR, the state of progress of operations to upgrade the welds of the main secondary circuit and the preparation of the commissioning of the facility. The fuel loading date has been shifted to the second quarter of 2023 and the estimated completion cost has been increased from €12.4 to €12.7 billion ⁽⁷⁾ excluding interim interest.

The additional costs relative to the October 2019 estimate were increased to €2015.18 billion and have been recognised primarily in "other operating income and expenses" ⁽⁸⁾ rather than as investments. For 2021, these additional costs booked as "other income and expenses" amounted to €573 million. The amount of interim interest as shown in the financial statements at the end of December 2021 amounts to €3,471 million.

The costs of post-commissioning modifications are not included in the construction cost of the project.

The project no longer has any margins, either in terms of its schedule or in terms of costs at completion. As works progress, new technical issues emerge and may increase the risk of a postponement and of budget overrun regarding the cost on completion. In addition, worksite delays entail a risk of equipment and materials ageing. Other risks may also emerge. The risk regarding the schedule and completion cost is therefore very high (see section 2.2.4 "Operational Performance related risks" – risk factor 4A "Management of large and complex industrial projects (including EPR projects)").

1.4.1.1.3.2 Other "New Nuclear" projects

A – Preparation of a programme to build new nuclear reactors in France (EPR2)

On 15 April 2016, EDF submitted a safety options file for the "New Model EPR" (NM EPR) project to the French Nuclear Safety Authority.

In early 2018, the permanent experts' group for nuclear reactors submitted its conclusions on the safety options file. In particular, it found that "most changes in the design used for the NM EPR project take into account the lessons learned from the feedback on Flamanville EPR and on the reactors currently operating as well as lessons learned from the accident at Fukushima Daiichi," and "is of the opinion that the design options used for the NM EPR project, complemented or modified in the light of the discussions held during the technical examination which have led to a number of commitments, are likely to ensure a safety level at least equivalent to that of the Flamanville 3 EPR reactor and complies with the recommendations of ASN Guide no. 22 (on the design of Pressurised Water Reactors)."

In its opinion no. 2019-AV-0329 of 16 July 2019 relative to the safety options file, the French Nuclear Safety Authority "considers that the safety handbook adopted for the planned NM EPR reactor is on the whole satisfactory, in particular as regards legislation, the guide dated 18 July 2017 [...] and international recommendations".

Furthermore, the work undertaken by EDF and Framatome on the New Model EPR project led to the finalising in 2017 of the technical configuration of a model named EPR 2 which could replace the nuclear fleet currently operating in France and ultimately expand the French nuclear industry's export offers. EPR 2 is an optimised version of the EPR, following on from the EPR in industrial terms, whilst integrating feedback from EPR worksites and power plants currently in operation.

As of this date, EDF informed the ASN of the new configuration. In the same opinion as the one on NM EPR, the ASN deemed that the findings relating to NM EPR would also apply to EPR 2.

(1) A nozzle allows to connect auxiliary circuits to the primary circuit.

(2) SIS = Safety injection system (used to add pressurised borated water to the reactor's primary circuit in the event of an accident that causes a major breach to this circuit). CHR = Containment Heat Removal system for the reactor building in the event of a severe accident (with core meltdown).

(3) See EDF's press release of 12 January 2022 "Update on the Flamanville EPR".

(4) See EDF's press release of 9 October 2019, "Flamanville EPR: EDF favours a scenario to rework the penetration welds on the main secondary circuit using robots and adjusts the schedule and construction cost estimation".

(5) In 2015 euros, excluding interim interest.

(6) See EDF's press release of 12 January 2022 "Update on the Flamanville EPR".

(7) In 2015 euros. This estimate takes into account the analytical allocation of a portion of the compensation paid by AREVA (for €225 million) under the settlement agreement EDF and AREVA reached on 29 June 2021 to the dispute over the defective welds in the main secondary circuit.

(8) IAS 16 paragraph 22 on abnormal costs incurred in connection with assets constructed by the Company. These costs will affect the years 2020, 2021, and 2022.

Pending a ruling on EPR 2, on 16 December 2020, the Board of Directors authorised EDF to continue the project until the end of 2022 with budgeted costs of around €1 billion.

On 25 January 2019, the French government published the main guidelines of the Multi-year Energy Programme adopted by a decree of 21 April 2020. The sector contract signed on 28 January 2019 by the French government and the Nuclear Sector Strategic Committee (CSFN) contains a section on the preparation of the industrial capacity necessary for the performance of a programme of construction of new reactors in France.

In accordance with these directions, the government has asked EDF to prepare a comprehensive file with the nuclear industry by mid-2021 relating to a programme of renewal of nuclear facilities in France. In May 2021, EDF, together with the nuclear industry, submitted a package of economic and industrial proposals to the French government for the launch of a new reactor programme in France. This package, based on the EPR 2 technology, describes what the regulatory and financing framework of such a programme could be. The programme calls for building three pairs of EPR 2s successively at Penly, Gravelines and a third riverside site in the Auvergne Rhône Alpes region (Bugey or Tricastin), while continuing the feasibility analysis on other nuclear sites.

At the request of the DGE, in the summer of 2021, this offer was subject to an audit that approved the methodology for estimating the schedule and costs.

To date, no decision has been adopted, and neither the regulatory nor the financing aspects have been defined.

On 9 November 2021, the French President announced the State's intention for France to build new nuclear plants on its territory. He confirmed this intention on 10 February 2022 in Belfort during his speech that detailed France's strategy to achieve "carbon-free energy in 2050". The French President detailed his intention to launch a phased construction programme to build new nuclear reactors, starting with the construction of three pairs of EPR2 reactors and studies for the construction of eight additional EPR2 reactors. He also stated that the objective should be to commission the first reactor "by 2035", and specified that EDF will build and operate these new EPR2 reactors. An appropriate funding and oversight plan will have to be set up for this programme.

Furthermore, on 2 March 2022, the national commission for public debate (CNDP) :

- On the one hand, appointed Ilaria CASILLO and Florian AUGAGNEUR, respectively, Vice-President and Vice-President of the CNDP to "carry out an advisory mission relating to public consultation in the context of the preparation of the draft programming law on energy and climate and the new Multi-Year Energy Programme (PPE)";
- On the other hand, decided the organisation of a public debate "on the project of creation of a first pair of EPR2 reactors on the Penly site as part of EDF's proposal for a programme of new reactors in France"; a public debate which "will be in the continuity of the public's prior participation in the national consultation on the preparatory work for the draft programming law on energy and the climate and the new Multi-Year Energy Programme (PPE)".

B – Small Modular reactors (SMR)

In the field of low-power reactors (SMRs), development of the NUWARD™ product, a 340MW pressurised water power plant composed of two 170MW modules, continued in 2021. In this power range, the product is designed to be widely marketable for export and to contribute to the massive replacement of fossil fuel power plants in the coming decades. This marketing will be backed by a flagship power plant in France, whose construction is scheduled to begin by 2030.

The development of the product, as well as its industrialisation and marketing, are carried out under the supervision of EDF. It enjoys the support of the CEA, Naval Group and TechnicAtome engineering departments. Given its export target, this development is the subject of an investigation into the viability of cooperation with one or more international partners, especially European partners.

The conceptual design phase currently underway has received public budgetary support of €50 million provided by the French government under the *France Relance* plan. Moreover, in his speech on 10 February 2022 in Belfort, the President of the French Republic announced an additional intervention of the State up to €500 million for the NUWARD™.

C – International developments

United Kingdom

In the UK, EDF Energy is involved in the construction project of two nuclear reactors at Hinkley Point, together with China General Nuclear Power Corporation (CGN). Nuclear New Build (NNB) is the project owner. EDF's New Nuclear Projects and Engineering Department (DIPNN) together with Edvance⁽¹⁾ are responsible for the design studies. Framatome supplies the components and the control system.

EDF is also working, as part of its partnership with CGN, on two nuclear construction projects in the UK: Sizewell C and Bradwell B. For more information regarding EDF Energy's activities, see section 1.4.5.1.2.5 "Nuclear New Build business".

China (Taishan)

In China, EDF owns 30% of TNPJVC (Taishan Nuclear Power Joint Venture Company Limited), which was set up to build and operate two EPR nuclear reactors in Taishan, in the province of Guangdong in China (see section 1.4.5.3.6.1 "Activities in China").

India

In March 2018, EDF signed a non-binding industrial cooperation agreement with the Indian national electricity company Nuclear Power Corp of India Ltd. (NPCIL) for the construction of 6 EPR reactors in India at the Jaitapur site. This agreement sets out the industrial plan, the roles and responsibilities of partners, and the next steps in the project. In this regard, EDF group and its partners will be supplying all the studies and equipment for the nuclear island, the conventional island, the auxiliary systems, and the heat sinks and galleries. EDF will not be investing in this project and the NPCIL customer will be the general project manager and integrator in the execution phase.

In accordance with the schedule determined by the IWFA⁽²⁾, EDF and its partners submitted a comprehensive conditional non-binding bid to NPCIL at the end of 2018, then in April 2021 a binding technical and commercial offer. Since then, EDF and NPCIL have continued their discussions in order to agree on technical and commercial issues permitting the signature of a General Framework Agreement.

Saudi Arabia

EDF is participating in the call for tenders initiated in Saudi Arabia by K.A. CARE (King Abdullah City for Atomic and Renewable Energy) and successfully responded for the first phase of the FEED-A (Front End Engineering and Design) consultation process. EDF is currently involved in the project preparation phase, which should lead to a formal call for tenders process in 2022 leading to the submission of a tender for the supply of engineering studies and equipment and the construction of two EPR-type reactors.

Czech Republic

EDF is also participating in the competitive process launched in June 2021 in the Czech Republic by the electricity company CEZ, its project company EDUII and the Czech government, for the construction of a 1,200MWe unit at the Dukovany site. EDF is proposing to develop the EPR1200 technology and has participated in the first phase, known as safety pre-qualification, which was completed at the end of November 2021. CEZ's formal call for tenders may be published in the first quarter of 2022 and is expected to request tenders for the supply of engineering studies and equipment and the construction of a 1,200MW reactor.

Poland

In October 2021, EDF submitted a preliminary non-binding offer to the Polish government. It covers a contract for the supply of engineering studies and equipment and the construction of four to six EPR reactors in Poland, representing a total target installed capacity of 6.6GWe to 9.9GWe on two or three sites. This preliminary offer covers all the key parameters of such a programme, such as the technical configuration of the future power plants, the envisaged industrial scheme, the development strategy of the local supply chain, the estimated cost of the programme and the associated execution schedule. The offer aims to meet the objectives of the Polish Nuclear Power Programme (PPEJ), which the Polish government adopted in October 2020. It establishes a framework for a Franco-Polish strategic partnership designed to support Poland's ambitious energy transition programme in line with the European carbon neutrality objectives.

(1) In 2017, EDF and Framatome created Edvance, a joint engineering subsidiary dedicated to the construction of new nuclear power plants in France and in the world.

(2) Industrial Way Forward Agreement.

1.4.1.1.3.3 The digital transformation of nuclear engineering (SWITCH programme)

Transformation of engineering feeds into EDF's CAP 2030 strategy, under sections related to managing current new nuclear projects, extending the operating life of the fleet in operation, expanding abroad and embracing digital transformation. It is a multifunctional programme involving all EDF players in the nuclear sector, including Framatome.

This programme aims to achieve significant performance gains in engineering by focusing on three areas:

- optimising and standardising products, processes, methods and tools to better grasp the complexity of large-scale industrial projects throughout their lifecycle;
- integrating the SWITCH programme launched in 2017 (implementing an integrated, collaborative and industrial information system) and the decisions of the excell Plan launched in 2019;
- an enterprise operation extended to partners and suppliers.

1.4.1.1.4 Nuclear generation activities: Framatome

Framatome is a key player in nuclear energy, acclaimed for its innovative solutions and high added value technologies for the nuclear fleet worldwide. Benefiting from its global expertise, backed by sound references and a workforce of 14,000 employees, the company designs, maintains, and installs components and fuel, as well as instrumentation & control systems for nuclear power plants.

Framatome is jointly owned by the EDF group (75.5%), Mitsubishi Heavy Industries (MHI – 19.5%), and Assystem (5%).

Framatome has a significant industrial presence in France, Germany, the United States and China. The company also has an industrial or sales presence in South Africa, Argentina, Brazil, Bulgaria, Canada, South Korea, Spain, Finland, Hungary, Japan, Czech Republic, United Kingdom, Russia, Slovakia, Kazakhstan, Sweden and Ukraine.

In 2021, Framatome hired approximately 1,600 employees to maintain and increase skills (see section 1.4.1.1.1 "The excell plan").

Framatome's strategy is based on its core business *i.e.* nuclear steam supply systems, and aims to offer safe and competitive solutions, industrialise them and carry out the projects as part of an industrial sector.

The company's customer base includes leading international energy players and it works on over 300 reactors in the world. With Framatome's experience in reactors of all types of technologies it can meet the specific needs of its customers worldwide.

1.4.1.1.4.1 Framatome's activities

With an experience built up over 60 years in the design and construction of nuclear plants, Framatome is present at every stage of the process. With its highly skilled engineers and operators, the company has completed more than 90 nuclear power plant projects around the world to date.

Engineering

Framatome's experts are specialised in the design of the principal items of equipment making up nuclear steam supply systems, and that includes mechanics and metallurgy, neutronics, the scientific calculation work, fluid mechanics and risk and nuclear safety analysis. Framatome's engineering services include the heart of the power plant, referred to as the "nuclear island", and the main components of the reactor's primary circuit such as steam generators, pumps, pressurisers, as well as the nuclear reactor pressure vessel itself. Its specialists and technicians are actively involved in major new nuclear power plant construction projects such as the new EPR reactors.

Equipment manufacturing

Framatome components equip more than 100 power plants in 11 countries. At its plants in Le Creusot, Saint-Marcel and Jeumont, in France, Framatome's manufacturing plants produce the key equipment for nuclear steam supply systems for electrical utilities all over the world to equip new-build power plants or to replace items of equipment at power plants in operation. The company manufactures advanced technology heavy equipment (reactor pressure vessels, steam generators, etc.) and mobile components (reactor coolant pumps and control rod drive mechanisms).

In 2021, the company continued to ramp up production at its Saint-Marcel plant, specialising in the manufacture of heavy components. It supplies the main forged components for new construction projects abroad, in particular for the EPR reactor project of Hinkley Point C in the UK, as well as parts for replacement components intended for French reactors.

At the same time, Framatome has joined EDF group's excell plan (see section 1.4.1.1.1 "The excell plan"). In this respect, Framatome component factories are rolling out plans designed to guarantee "right the first time" compliance of manufacture and construction. Actions are also being conducted to this end within the supply chain.

Framatome is also engaged in a skills maintenance programme. It aims to secure the production of primary equipment for nuclear boilers (steam generators, vessels, etc.). All stakeholders are involved with the aim of standardising activities by making the necessary investments for their industrialisation. It is based on a dedicated organisation that coordinates actions in Framatome's engineering departments and primary component manufacturing plants (Le Creusot, Saint-Marcel and Jeumont) for targeted projects (EPR2, Sizewell C). This industrialisation process is accompanied by the manufacture of components, sometimes in advance, in order to ensure the stability of the supply chain, control the manufacturing lead times of Framatome and its key suppliers, and maintain skills.

In 2021, Framatome continued its programme aimed at consolidating knowledge and mastering local stress-relieving heat treatment (SRHT) processes implemented on equipment supplied by Framatome. This programme includes mechanical tests on the properties of materials, which will continue until the end of 2022. It enabled the ASN to finalise and validate the files supporting the compliance certificates for the replacement steam generators for the Gravelines 6 and Flamanville 1 units. At the same time, in connection with this work, Framatome has quantified, using a numerical and experimental approach, the existence of possible residual stresses caused by the implementation of these local SRHT processes. In-depth work to verify the integrity of the relevant assemblies using methods available to date has been initiated and will continue in 2022.

Instrumentation & control systems

Framatome designs, manufactures and installs safe nuclear instrumentation solutions and control systems for plants in operation and new builds. Its solutions includes in particular safety instrumentation & control (I&C) systems, I&C systems for normal operation, nuclear instrumentation, lifecycle solutions, global I&C engineering expertise simulators, human-machine interface design and human factors engineering. Framatome has installed over 300 complete instrumentation and instrumentation & control systems on reactors of all types worldwide.

Fuel

Framatome designs, develops and manufactures fuel assemblies for pressurised water reactors, boiling water reactors and research reactors. The company's know-how spans the entire process: from the design of the fuel assembly to the production of zirconium and its alloys – zirconium being vitally important for fuel production – on to fuel fabrication and related services, right through to operations on the nuclear power plants.

The company performs all relevant calculations from general fuel management up to dedicated licensing for the highest performance and safety. Over 226,000 Framatome fuel assemblies have been loaded in more than 100 reactors in operation around the world.

Commissioning and licensing of nuclear power plants

Framatome has substantial international experience working with nuclear safety authorities on all types of reactors currently in service around the world. The company also offers support for operators through relationships with their respective safety authority and in the application of existing regulations in their country of establishment. In France, Framatome has expertise in the application of the Order relating to nuclear pressure equipment (*Arrêté relatif aux Équipements Sous Pression Nucléaire* – ESPN). The company also provides its international customers with technical centres where numerous tests are carried out each year to qualify their equipment. It assists them in the preparation of qualification studies and associated documentation.



Maintaining, modernising and extending operating lifetime of existing nuclear power plants

Framatome offers innovative solutions and services to maintain and modernise existing nuclear power plants, and extend the lifetime of existing installations, while guaranteeing the safety, performance and availability of operations. Framatome has 60 years' international experience of all types of technologies and maintenance of more than 300 reactors worldwide. Its teams have expertise and knowledge in maintenance, component replacement, inspections and checks, refuelling operations, and optimised management of reactor shutdowns for maintenance. More specifically, its activities cover supply of fuel assemblies and related services, management of equipment and spare parts, modernisation of I&C, and chemistry and radiochemistry services.

Management of large projects

Framatome's participation in the construction of new-build nuclear reactor projects spans across design, through procurement and supply, and on to commissioning. With recognised expertise in the management of complex projects, its teams are tasked with delivering to the most stringent security standards and fulfil the requirements of its customers. In the case of new-build construction projects, the company proposes solutions for the nuclear island scope. Framatome is actively involved with EDF in the construction, commissioning and maintenance of 5 EPR reactors worldwide: in France (Flamanville 3), in China (Taishan 1&2), and in the United Kingdom (Hinkley Point C, reactor 1 and 2).

In 2017, EDF and Framatome created Edvance, a joint engineering subsidiary for the construction of new nuclear power plants in France and in the world.

1.4.1.1.4.2 Key achievements by Framatome in 2021

The year 2021 was again marked by the health crisis, but it did not significantly impact its business and expected performance.

Framatome expanded its activities in control systems with the acquisition of the Civil Nuclear Instrumentation and Control (I&C) business of Rolls-Royce⁽¹⁾.

Framatome has reinforced the security of its supply by acquiring the French company Valinox Nucléaire SAS, a French specialist in the production of seamless tubes for nuclear use⁽²⁾.

Framatome expanded its engineering activities and strengthened its global presence by acquiring the Nuclear Division of RCM Technologies Canada Corp, a Canadian specialist in CANDU technology⁽³⁾, and VirtualPIE Limited (UK), a leader in fluid engineering products and services for the chemical and nuclear power industries⁽⁴⁾.

Framatome has signed a contract with Dominion Energy to support the long-term operation of the US energy company's nuclear power plants. The contract covers unit shutdowns and maintenance operations for the plants until 2026⁽⁵⁾.

Steam Generating Team (SGT), a partnership between Framatome and United Engineers & Constructors, Inc. (United), announced the signature of a contract for approximately CAD 350 million (EUR 236 million) with Bruce Power to replace the steam generators in Units 3 and 4 of the Bruce Nuclear Generating Station in Ontario, Canada⁽⁶⁾.

Framatome delivered the industry's first 100% Enhanced Accident Tolerant Fuel (EATF) nuclear fuel assembly⁽⁷⁾ to the Calvert Cliffs nuclear power plant in Maryland, operated by Exelon Generation.

In connection with the *France Relance* plan initiated in 2021 by the French government, several innovative projects proposed by Framatome have also been approved and will receive funding and support.

1.4.1.1.4.3 Nuclear facilities and safety

Basic nuclear facilities (BNF)

The two basic nuclear facilities (BNF) on the Framatome site in Romans (BNF 63 and BNF 98) were combined by Decree no. 2021-1782 of 23 December 2021. The facility grouping these two basic nuclear facilities is called BNF 63-U: Nuclear fuel manufacturing plant.

2021 results on nuclear safety⁽⁸⁾

As in 2020, no major safety or radiation protection event was recorded at Framatome's Romans-sur-Isère site. In 2021, Framatome's site declared 17⁽⁹⁾ significant safety events (SSE) classified at INES 0, 6 SSE at INES 1 and none at INES 2. No event declared in respect of the year 2021 had any impact on workers, the general public or the environment. The 2021 detailed results on nuclear safety are published in the annual report drawn up by the General Inspector for Nuclear Safety and in the TSN report of the Framatome site of Romans-sur-Isère⁽¹⁰⁾.

Dedicated assets

Dedicated assets have been constituted to cover long-term nuclear commitments (see section 6.1 "Consolidated financial statements at 31 December 2021", note 17.1 "Other provisions for decommissioning").

1.4.1.2 Thermal generation in mainland France

Thermal generation assets have a number of advantages: they are very responsive and flexible (quick to start up and power can be modulated), and they have relatively low investment costs and short construction times.

Thermal generation assets are one of the key components of the energy mix to ensure the balance of generation and consumption in real time by accommodating fluctuations in electricity consumption and renewable energy generation (sun and wind power in particular) and thereby contributing to maintaining suitable voltage and frequency levels across the grid. This role will increase with the massive inclusion of intermittent generation resources in French and EU electricity systems.

(1) See Framatome's press release of 8 November 2021 "Framatome completes purchase of Rolls Royce Civil Nuclear Instrumentation and Control".

(2) See Framatome's press release of 7 September 2021 "Framatome acquires Valinox, a tube specialist for nuclear reactor steam generators".

(3) See Framatome's press release of 3 August 2021 "Framatome acquires Nuclear Power Systems Division of RCM Technologies Canada Corp.".

(4) See Framatome press release of 3 September 2021 "Framatome completes acquisition of BHR Group in the United Kingdom".

(5) See Framatome press release of 6 April 2021 "Framatome signs multimillion-dollar contract to support long-term operation of the Dominion Energy nuclear fleet".

(6) See Framatome's press release of 9 July 2021 "The Steam Generating Team joint venture awarded steam generator replacement contract for Units 3 and 4 at Bruce Nuclear Generating Station."

(7) See Framatome's press release of 2 November 2021 "Framatome delivers industry's first complete accident tolerant fuel assembly."

(8) The objective of Framatome is to detect, report and treat in the best possible manner all deviations and anomalies occurring in connection with its activities. The purpose of this indicator is to enhance the sharing of experience, broaden analysis and the importance given to weak signals. Events declared at level 0 on the INES scale are safety deviations, considered as "weak signals". It is essential to take them into account as part of a continuous improvement process for a better management of risk prevention in the conduct of activities. In order to facilitate the reporting on "weak signals" and the sharing of experience, Framatome detects and records any deviation. The analysis of the latter, by the *Filière Indépendante de Sûreté* (independent safety reviewer), assesses the level of reporting to the safety authority.

(9) SSEs exclusively on BNF sites.

(10) Available on the www.framatome.com website.

1.4.1.2.1 EDF's thermal generation in mainland France

At 31 December 2021, the thermal generation facilities operated by EDF were of different types, both in terms of fuel and power:

Fuel	Unit capacity (in MW)	Number of units in operation at 31/12/2021	Total capacity (in MW)	Year commissioned	Net energy output (in TWh)	
					At 31/12/2021	At 31/12/2020
Coal-fired	580	2	1,160	in 1983 and 1984	3.01	1.04
Fuel oil and dual-fuel combustion turbines (gas and fuel oil)	85	4	340	in 1980 and 1981	0.34	0.46
	203	1	203	in 1992		
	134	1	134	in 1996		
	125 – 129	2	254	in 1998 and 2007		
	185	2	370	in 2010		
Combined Cycle Gas Turbine	179 – 182	3	542	in 2008 and 2009	7.17	7.35
	427	1	427	in 2011		
	465	2	930	in 2012 and 2013		
	585	1	585	in 2016		

Power generation in 2021

EDF's electricity generation from its thermal power plants in mainland France represented approximately 2.55% of its total electricity generation in 2021. By end 2021, this fleet had a total installed operating capacity of 4,945MW.

Thermal generation (net energy) in 2020 amounted to 10.53TWh in 2021, a higher level of operation than in 2020 (8.85TWh). In 2021, coal units supplied 3.01TWh, CCGT plants 7.17TWh and combustion turbines 0.34TWh.

The priority for these thermal means of generation required on a variable basis all year round is to ensure maximum reliability and availability. As in previous years, the reliability of the thermal fleet was confirmed in 2021. It is commensurate with European standards for CCGTs and combustion turbines, excluding specific technical contingencies. The fleet's adaptability to a sustained level of operation was demonstrated. In particular, combustion turbines were in high demand and had a very good response rate when called into operation.

1.4.1.2.2 Issues relating to thermal generation

Coal-fired fleet in transition

Between 2013 and 2015, EDF permanently shut down ten coal-fired generation units.

Between 2014 and 2016, it renovated the three newer technology production units located in Le Havre (1 unit) and Cordemais (2 units) to improve their reliability and efficiency.

EDF proceeded to shut down the Le Havre power plant on 1 April 2021. However, RTE's most recent provisional review reveals the need to maintain production at the Cordemais power plant until 2024, or perhaps even 2026, so as to maintain balance between demand and supply. In July 2021, EDF announced that it was halting the Ecomobust project, which aimed to develop green fuel (biomass) by recycling wood waste.

Emissions of the thermal fleet

In 2021, EDF's thermal power plants in mainland France emitted 5.70 million tonnes of CO₂ (4.05 million tonnes in 2020). The CO₂ content per kWh generated by EDF's thermal power plants in mainland France in 2021 is 535g/kWh net (449g/kWh net in 2020 ⁽¹⁾). This rise in the CO₂ component is the result of a higher proportion of coal units in EDF's thermal generation mix. These accounted for some 29% of thermal generation fleet output in 2021 (compared to 12% in 2020). It is to be noted that in 2010, the CO₂ content per kWh generated more than 900g CO₂/kWh net.

In 2021, EDF's thermal generation fleet in mainland France also emitted 2.08kt of SO₂, 3.90kt of NO_x and 0.03kt of dust. Per kWh generated, polluting emissions have fallen compared with 2010 by four times for NO_x, by over fourteen times for SO₂ and by over forty-two times for dust.

These drastic reductions in emissions were made possible by the shutdown of the oldest thermal plants, the renovation and installation of smoke treatment equipment using the best techniques available at the most recent plants, the use of low sulphur fuel and the commissioning of natural gas combined cycle turbines.

Cordemais units are thus equipped with flue gas desulphurisation and denitrification systems (90% reduction in sulphur dioxide emissions and 80% reduction in nitrogen oxide emissions) as well as dust collectors that trap almost all dust.

(1) This indicator is calculated by comparing CO₂ emissions to net energy in operation (including self-consumption by auxiliary unit systems).

Regulatory notice**Emission regulations**

Article 12 of Law no. 2019-1147 of 8 November 2019 on energy and the climate provides that the administrative authority shall set by decree "an emissions cap applicable, as of 1 January 2022, to fossil fuel-fired power generation facilities located in continental mainland France that emit over 0.55 metric tonnes of carbon dioxide equivalents per megawatt hour." Article D. 311-7-2 of the French Energy Code, which was adopted to implement the aforementioned law, sets an annual threshold of 0.7 kilotonnes of carbon dioxide equivalents per megawatt of installed electrical capacity. This corresponds to about 700 hours of annual operation for a coal-fired power plant.

This legal and regulatory mechanism makes the operator responsible for deciding whether or not to continue operating such installations after 2022, and makes no provision for compensation.

Due to the fact that RTE had placed the winter of 2021-2022 on heightened vigilance and to the need to ensure supply security ⁽¹⁾, the Ministry for the Ecological Transition submitted for public consultation, from 30 December 2021 to 20 January 2022, a draft decree to allow an exceptional derogation from compliance with the aforementioned annual threshold of 0.7 kilotonne for the first two months of 2022. Therefore, a new threshold of 1 kilotonne of carbon dioxide equivalents per megawatt of installed electrical capacity will apply for the period between 1 January 2022 and 28 February 2022, which is the period of peak winter consumption. This corresponds to about 1,000 hours of annual operation per unit during this period. The threshold will then be lowered to 0.6 kilotonnes of carbon dioxide equivalents per megawatt of installed electrical capacity for the remainder of 2022. Finally, the decree provides that as from 1 January 2023, the cap on greenhouse gas emissions will remain at 0.7 kilotonnes of carbon dioxide equivalents per year per megawatt of installed electrical capacity.

Thermal generation activities are also subject to other specific regulations, including those resulting from Directive 2012/18 of 4 July 2012 (known as "Seveso III"), as well as the more general air quality legislation resulting from EU Directive 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, Directive 2010/75/EU of 24 November 2010, as amended, on industrial emissions (IED), and Directive 2015/2193/EU on the limitation of emissions of certain pollutants into the air from medium combustion plants (sulphur dioxide, (SO₂), nitrogen oxides (NO_x) and dust).

The innovative Bouchain CCGT delivers improved capacity (600MW achievable in under 30 minutes) and return (over 60%) and offers good environmental performance with CO₂ emissions of around 360g/KWh on average, one-third of those of the old neighbouring coal-fired plant shut down in 2015.

Decommissioning of thermal fleet shut down units

EDF has planned all of the decommissioning operations on its units which were shut down or whose shutdown is scheduled. The provisions for these operations have been made in an amount that corresponds to the cost of decommissioning all of the units being operated and the clean-up of the sites (see section 6.1 "Consolidated financial statements", note 17.1 "Other provisions for decommissioning").

In 2021, EDF continued the decommissioning work on sites that had been definitively shut down. The main work carried out in 2021 was asbestos removal on the units withdrawn from operation at Cordemais and Le Havre, together with decommissioning on the Blénod site (chimneys).

EDF is careful to preserve the potential of its sites to the greatest extent possible, with precision allocation of space and the implementation of local monitoring of planning regulations so as to secure its own needs. This differentiated ground and space management has made it possible to free up EDF land from occupancy issues (freeing up new land resources, biodiversity potential, and restoring natural land), taking into account the Group's needs and assisting local authorities with the development of new types of activity (such as implementation of Cleantech Vallée on the Aramon site).

Regulatory notice**Regulations applicable to shutdowns**

Fossil fuel-fired power plants are subject to legislation on facilities that are classified for the protection of the environment (ICPEs), which is organised in the French Environmental Code. Activities covered by listed facilities legislation are listed in a register which places them in a declaration, registration, or authorisation regime depending on the level of risks and drawbacks which may arise. These regulations require sites to be restored when a facility is taken out of service, depending on the expected future use of the land; for certain facilities, the constitution of financial guarantees is also required. Depending on the nature of the hazards and/or drawbacks for each category of installation, these are designed to ensure surveillance of the site, the ongoing security of the facility, interventions in the event of accidents prior to or subsequent to closure, and restoration of the site after closure.

Closure of the oil-fired fleet

In spring 2018, EDF permanently shut down its last thermal power plant running operating on heavy fuel oil, in Cordemais.

Modernising the thermal generation fleet with natural gas combined cycle turbines

EDF commissioned the first Combined Cycle Gas Turbine (CCGT) plant in France at Blénod in 2011, then two CCGT plants at Martigues in 2012 and 2013 followed by a next-generation CCGT plant at Bouchain in 2016 in partnership with General Electric.

This modernisation of the thermal generation fleet reduces its atmospheric emissions of CO₂, nitrogen oxides and sulphur oxides.

The CCGTs in Martigues are the result of the repowering of former oil-fired units, a part of whose facilities, such as the steam turbine, the condenser and the water treatment facilities, were reused. The installed capacity of the Martigues site is 930MW and the return is over 50%, markedly higher than the return from coal-fired thermal units.

1.4.1.3 Renewable energy generation and storage

EDF group is now the leader in renewable energy in Europe and more specifically, the leading supplier of hydropower in the European Union. Hydropower generation is the Group's most significant renewable energy source, with installed capacity of 22.3GW ⁽²⁾. The Group is also leader in developing competitive industrial sectors, primarily wind and solar. EDF's goal is to achieve 21GW of net installed capacity in solar and wind power by the end of 2024. Renewable energies already account for over a quarter of the Group's overall installed capacity.

The EDF group's commitments in terms of developing renewable energy are also described in section 3.1.1.4 "EDF, a company committed to the development of decarbonated energy in Europe".

(1) Provided for in Article L100-1 of the French Energy Code.

(2) Excluding marine energies. 22.5GW including marine energies.

NET GROUP INSTALLED CAPACITY IN RENEWABLE ENERGY AT END 2021 ⁽¹⁾

(in MW)	Hydropower	Wind	Photovoltaic	Biomass	Geothermal	Marine	Total
France	20,501	1,655	397	182	1	240	22,975
Europe excl. France	1,156	1,760	83	3			3,003
America	205	4,642	1,488				6,335
Asia	432	704	447	23			1,606
Africa ⁽²⁾		285	559				844
TOTAL NET INSTALLED CAPACITY	22,294	9,047	2,975	208	1	240	34,764

(1) As a proportion of the percentage held.

(2) Including Middle East countries.

1.4.1.3.1 Hydropower generation in France

1.4.1.3.1.1 EDF's hydropower generation fleet

Hydroelectricity is the second source of electricity generation after nuclear power and the first source of renewable electricity in France. This is an important sector for the electricity system for many reasons, particularly in terms of grid security and balancing.

EDF's hydropower fleet in mainland France includes about 500 plants, including the plants belonging to French subsidiaries and cross-border companies (Franco-German and Franco-Swiss power plants). There were 427 plants within the scope of EDF at the end of 2021, with an average age of 76 years ⁽¹⁾:

Hydropower plants	31/12/2021	31/12/2020
Total Maximum Capacity (in GW)	20.1	20.1
Total Output Including Pumping (in TWh)	41.8	44.7

Within mainland France, hydropower plants are mainly located in mountainous areas in the Pyrenees, the Alps, the Massif Central and the Jura, as well as on the Rhine. In all, they represent an installed capacity of approximately 20.112GW (excluding French overseas *départements* and Corsica), or 23.3% of EDF fleet's installed capacity, for producible energy of more than 40TWh.

The various hydropower facilities are designed to optimise the use of water resources in the valleys where they are situated, as part of multi-purpose water management (detailed in section 1.4.1.3.1.4 "Issues relating to hydropower generation"). Given the size and variety of its fleet, EDF has facilities able to respond to all types of desired uses, from base to peak generation which also offer levers for optimisation due to their flexibility.

Facility category	Turbine capacity (GW)	Average gravity capacity over 50 years ⁽¹⁾ (TWh)
Run-of-river	3.6	16.7
Lake-supplied	8.2	14.5
Pondage	3.1	8.1
Pumped-storage ⁽²⁾	5.1	1.5
Tidal	0.24	0.5

(1) The average production over 50 years has been re-evaluated on the basis of observed climate change.

(2) Only gravity capacity is counted in the STEPs; pumped energy is not taken into account.

1.4.1.3.1.2 Performance of the hydropower generation fleet

In 2021, EDF's hydropower electricity generation in mainland France before deduction of power required to operate pumped-storage plants was 41.80TWh, amounting to 10.12% of EDF's total electricity production in 2021.

In 2021, EDF spent more than €476 million in mainland France for the development and maintenance of its hydropower generation fleet to ensure optimum and safe operation.

A highly-automated and remotely-managed fleet

In order to take advantage of the flexibility of its hydropower generation facilities, for some years now EDF has been initiating ambitious programmes involving automation, remote control of hydropower plants and centralised management for each valley. Currently, the largest plants in EDF's hydropower fleet, account for over 15.6GW (around 77% of its installed hydropower capacity) and are remote-controlled from four control centres able to make adjustments to the plants' operating programmes at any time in order to respond to the needs of the electricity system and to economic opportunities arising on the electricity market.

To improve the reliability of its largest power plants, EDF monitors physical parameters (including temperature and vibration) of machinery, from five regional operations centres. This enables any discrepancy to be speedily detected; incidents can be avoided thanks to greater familiarity with the status and operational behaviour of the equipment.

Technical performance of the fleet and hydropower conditions in 2021

Hydropower generation may witness substantial variations from one year to the next, depending on climatic fluctuations in water resources. 2021 saw a slight water deficit and good production performance. This was due to the mobilisation of all teams to ensure the availability and performance of hydroelectric power generation facilities during the energy crisis.

Anticipating needs relating to the expansion of variable renewable energy (solar and wind power), the emphasis is on increasing the flexibility of hydroelectric production resources and adaptation of power plant remote operation to capture the opportunities opened up by the development of European intraday power trading.

In 2020, the Nice hinterland was severely hit by storm Alex. One year later, 10 out of 14 plants have been put back in service thanks to the mobilisation of the EDF group's teams.

1.4.1.3.1.3 Hydropower safety

EDF performs regular monitoring and maintenance of dams, in particular by means of continuous structural health monitoring, contributing to hydropower safety. Hydropower safety comprises all the measures taken when designing and operating hydropower plants to reduce risks and hazards to people and property associated with water and the presence or operation of facilities. Hydropower safety is the major and permanent concern of the producer.

(1) Arithmetic mean.

It involves three main activities:

- the management of operational risks, by providing information to users (communication campaigns, information of the employees operating on waterways, hiring "hydro-guides" during the summer months) about changes to water levels or flow fluctuations in downstream waterways;
- the management of facilities during periods of exceptionally high-water levels, in order to ensure safety at the facilities and for the surrounding communities;
- measures to address the major risk associated with dam or reservoir failures, through the regular monitoring and maintenance of facilities under the supervision of public authorities. A danger study is on each 240 class A and B dam, conducted every ten or fifteen years (for class A dam and class B dam respectively). These studies consolidate an overview of the structures and associated countermeasures forming part of a risk mitigation procedure ⁽¹⁾. The 67 largest dams are subject to a special administrative procedure ("Special Intervention Plan") implemented by the relevant prefect.

See risk factor 4E – Hydraulic safety violations in section 2.2.4 "Operational performance related risks".

Regulatory notice

Regulation applicable to the safety and security of facilities

Articles R. 214-112 *et seq.* of the French Environmental Code contain provisions that are applicable to the safety and security of hydropower facilities that are authorised and operated under concession contracts. Dams are divided into three classes (A, B and C) according to their characteristics, in particular their height and the volume of the floodwaters. According to this classification and the legal rules applicable to the facility, the regulations require the operator or concession contract holder to fulfil a certain number of obligations in order to guarantee the safety and security thereof.

1.4.1.3.1.4 Issues relating to hydropower generation

Hydro power is a key component in energy transition, due both to the low-carbon nature of output and to its flexibility and storage capacity, which outperforms other energy storage solutions by far. Over and above the production of renewable energy and its expansion, hydroelectric power also plays a major role in managing water resources locally.

Concession renewals

Regulatory notice

Regulations applicable to hydropower facilities in France

In France, hydropower facilities are subject to the provisions contained in Articles L. 511-1 *et seq.* of the French Energy Code. They require concession agreements granted by the State (for facilities generating over 4.5MW), or an authorisation from the Prefecture (for facilities under 4.5MW).

Under the French Energy Code, the granting of a hydropower concession is preceded by public notice and competitive tendering in accordance with the terms and conditions set out in the French Public Procurement Code.

In accordance with Article L. 523-2 of the French Energy Code, when a hydropower concession contract is renewed or extended under the conditions provided for by Articles L. 521-16-2 or L. 521-16-3 of the French Energy Code, an annual concession fee that is proportional to the revenues generated by the concession contract is levied, which is paid in part to the French State and in part to the French *département* and municipalities through which the waterways used flow.

Hydropower concessions have an initial term of 75 years pursuant to the French Law of 16 October 1919 relating to hydropower use. Most hydropower concessions that expired before 2012 were renewed for terms of 30 to 50 years. However, the French State has not yet renewed 29 concession contracts which lapsed on 31 December 2021, corresponding to installed power of 2,677.4MW. Since their expiry these concessions have fallen under the "rolling delay" situation defined by Article L. 521-16 par. 3 of the French Energy Code as when a concession that has expired but not been renewed is extended under its former conditions until such time as a new concession is granted so as to ensure the continuity of operations in the meantime.

In this context, EDF is preparing for the renewal of concessions under the legal framework, combining improved energy efficiency, attention to aquatic environments, compensation of the government and municipalities through fees and regional development, while ensuring the safety and security of operations.

Discussions between the French State and the European Commission (EC) to resolve to formal warnings in this respect are ongoing. In the first notice dated 22 October 2015, the European Commission considers that the French State has infringed the provisions of on Article 106 section 1 of the Treaty on the Functioning of the European Union (TFEU) by awarding the majority of the hydroelectric concessions in France to EDF and renewing them with EDF as these steps strengthen EDF's dominant position on the French retail electricity markets. The State replied to this notice, which marked the beginning of an adversarial exchange of positions between the State and the EC, which does not affect the final decision that will be adopted by the EC. As the chief interested party, EDF sent its observations to the EC on 4 January 2016, firmly contesting the EC's analysis and the grounds for this analysis. EDF has since been involved in certain exchanges between the French State and the EC, particularly to provide technical details on the operation of the French market.

Furthermore, on 7 March 2019, the European Commission sent the French government a second formal notification concerning the renewal of hydropower concessions contracts. Seven other Member States also received formal warnings: Austria, Germany, Poland, Sweden, Portugal, and the UK, with Italy also receiving a second, additional formal warning. More specifically concerning France, the Commission alleged problems with the application of European law concerning public orders to these renewals as well as issues of non-compliance of French legislation governing these renewals with the same European Public Order law.

See also section 2.2.1 "Market regulation: political and legal risks", risk factor 1B – "Changes in the legislative and regulatory framework for hydraulic concessions".

Development of the fleet

The law on combating climate change and strengthening resilience against its effects supplements the provisions of the Multi-Year Energy Programme (PPE) on the development of hydropower exploitation and storage.

EDF is engaging in a development dynamic by aligning itself fully with the goals set by law and by the PPE for hydropower development. The PPE set ambitious goals for the development of hydroelectric power in France, aiming for 1GW of gravity capacity and 1.5GW of STEPs (pumped-storage hydropower plants) by 2030-2035.

This goal is being leveraged in a number of ways:

- increasing the capacity of infrastructures managed under concession: a provision in the French Energy and Climate Act of 8 November 2019 ⁽²⁾ made it possible to use a declaration procedure to implement a capacity increase, subject to a number of conditions, including acceptance by the administrative authority in question;
- the development of major storage projects to address energy transition requirements (including the integration of variable power sources into the electricity system) and the growing need to compensate for very low water levels due to climate change. EDF fully intends to enhance this hydro power asset *via* its storage plan, both in France and internationally. In particular, EDF is studying several STEP projects based on existing installations;
- the development of hydro power projects in France's overseas *départements* and territories to address the needs identified in these localities' multi-year energy programs (PPE);
- continuing to develop reserve-flow turbines with new projects for equipment planned throughout the territory;
- continued development of the "small hydro" segment by improving the performance of the existing fleet and developing additional power through acquisitions and certain disposals, as well as by developing new infrastructure projects.

(1) For further details, see the annual report of the Inspector of Hydropower Safety, available on EDF's website.

(2) Codified in Article L. 511-6-1 of the French Energy Code.

Regional anchoring in hydropower valleys

EDF has always taken care to ensure the sustainable and shared development of the areas near hydropower generation facilities, which are often rural and sometimes isolated. EDF has a clear commitment to strong local roots in this respect, combining a stance as a responsible concession manager based on dialogue with co-building alongside all stakeholders, supporting local economic development through its *Une rivière, un territoire* ("One River, One Territory") agencies. This commitment is reflected in EDF's close collaboration with actors from the economic, political and association sectors in the areas concerned and by maintaining a close dialogue with the people living near the facilities.

It is structured around two main pillars:

- first and foremost, employment, with the goal of maximizing economic benefits for local areas. EDF makes nearly two-thirds of its technical purchases (equipment, works, studies, etc.) in the hydro power valleys, which benefits the local industrial fabric (EDF's supplier panels list over 1,800 local companies representing trades specific to the hydropower sector). The assessment of the employment footprint of EDF's hydroelectric activity in metropolitan France is estimated at 4,340 indirect jobs ⁽¹⁾;
- ongoing dialogue with stakeholders, in 2021 illustrated in particular by:
 - consultation on the fish pass at Malaucène on the Garonne (Tarn-et-Garonne),
 - the 70th anniversary of the Bort-les-Orgues dam (Corrèze and Cantal) and the organisation of the "Let's talk revitalisation" (*Parlons revitalisation*) dialogue (revitalisation of small towns and rural areas),
 - the continuation of work on the Poutès dam (Haute-Loire),
 - the start of the consultation process for the construction of two fish passes on the Rhine in connection with the French government's recovery plan.

EDF is also continuing its dedicated "One River, One Territory" programme, which was launched in 2012. This local programme has created or maintained over 540 jobs in the valleys by means of loans to over 50 local companies. This should involve the creation or preservation of more than 750 jobs by 2025.

In 2021, EDF set up a smaller loan scheme to support the development of tourism around hydroelectric facilities. It has continued its "recovery loan" scheme to provide cash flow support for its service providers, as well as to essential players in the economic and social life of the valleys affected by the impacts of the health crisis.

Managing access to water

Regulatory notice

Regulation applicable to the balanced management of water resources

EDF's hydropower generation business is subject to the substantive provisions of water regulations. Such regulations cover in particular control over variations in water levels and flow rates, the safety of areas in the vicinity and downstream of hydropower facilities and, in general, maintaining balanced management of water resources.

The dams operated by EDF in France provide storage capacity for nearly 7 billion cubic metres of water. As well as generating electricity, hydro power infrastructures are also used to help with water management, and thus represent a major contribution by EDF to local life and economic development.

Over and above being a hydropower supplier, EDF is therefore also engaged as a contributor to the sustainable management of water resources. For example, it maintains the flows of many rivers in summer for the benefit of aquatic environments and other water uses: drinking water, irrigation, sports and leisure activities in rivers (canoeing, kayaking, etc.), etc. The Durance-Verdon and Saint-Cassien (Alpes-Maritimes) reservoirs also play a fundamental role in crop irrigation in Provence and the drinking water supply for the French Riviera.

EDF also maintains water levels commensurate with tourism at major reservoirs, allowing the development of recreational activities and the tourist economy as part of concerted policy initiatives. For example, in August 2021, the average occupancy

rate of accommodations in the Serre-Ponçon lake area was 13 points higher than the average rate for the Hautes Alpes ⁽²⁾.

In 2020-2021, EDF Hydro contributed to a CGEDD-CGAAER ⁽³⁾ expert assessment on the mobilisation of hydroelectric reservoirs to provide assistance in times of low water levels in Adour Garonne ⁽⁴⁾. In addition to the necessity to promote water conservation, this expert assessment concluded that there are available tools in addition to the current support provided to rivers in summer in Adour Garonne. These tools can be activated provided legal, financial and technical means are put in place to offset the energy flexibility that would be thus reduced.

Water management is carried out in consultation with the various stakeholders. In some cases, this includes agreements with local councillors, fishermen, farmers, and the managers of tourist destinations and industrial sites. EDF is thus very much a stakeholder in local water management governance. For instance, EDF has set up an innovative "Basin coordinator delegate" scheme, so that all EDF's business lines have representation in water-related authorities such as basin Committees and water agency Boards of Directors, on behalf of the UFE (*Union française de l'électricité* - French union of electricity companies).

This representation and coordinated action within EDF as regards water management ensures its business is sustainable and nurtures shared management of water resources. In order to contribute to the collective reflection on water management, EDF Hydro, through the UFE, participates in the work of the *Varenne agricole de l'eau* project initiated in May 2021 by the Ministries for Agriculture and the Energy Transition. It has contributed its viewpoint on hydropower, which deems it essential to share the adaptation and mitigation challenges created by climate change in a balanced manner.

1.4.1.3.2 Other renewable energies

1.4.1.3.2.1 Biomass and biogas

Through its holdings, the Group holds shares in France (notably through its subsidiary Dalkia) and abroad in several dozen heating networks and small-scale, mainly wood-fired generating plants, and has been committed for several years now to the development of anaerobic digestion, with the biogas produced used both in cogeneration and for direct injection into the natural gas distribution network.

1.4.1.3.2.2 Geothermal energy

To develop this type of energy, EDF is using its subsidiary Électricité de Strasbourg, which operates two industrial facilities in Alsace: one for heat at Rittershoffen, Ecogi, for a local industry, and the other for power generation, at Soultz-sous-Forêts.

1.4.1.3.3 EDF Renewables activities

Apart from hydropower, the EDF group's involvement in renewable energy is largely conducted by its a wholly-owned subsidiary EDF Renewables. The companies in the EDF Renewables group had a workforce of 4,382 employees at 31 December 2021.

EDF Renewables is fully engaged in the renewables market dynamic, with a strong presence in onshore and offshore wind power, as well as accelerating its solar power business.

EDF Renewables is also expanding into the storage sector, in line with EDF's Storage Plan, which calls for 10GW of fresh capacity by 2035, including 4GW from large-scale batteries.

Finally, EDF is also present in the decentralised renewable energy sector (rooftop solar power) for residential and corporate customers. It has operations in France (via its subsidiary EDF ENR) and abroad, in particular in the United States, China, the United Kingdom and, since 2021, in Vietnam and Israel.

EDF Renewables has seen marked growth in installed capacity (up 10%/year on average over the past five years). As of 31 December 2021, EDF Renewables had gross installed capacity of 15,577MW, net installed capacity of 10,113MW and 7,997MW gross currently under construction. The project portfolio totalled a gross capacity of 76GW at the end of 2021. The EDF group aims to achieve net installed capacity in renewables wind and solar power of 21GW by 2024.

(1) In accordance with commonly accepted academic definitions, on the basis of purchases of €437.6 million made from the French economic sector in 2021, and an indirect employment impact per million euros on 64 economic sectors; based on INSEE economic data.

(2) <https://www.dici.fr/vie-dici/2021/08/30/communique-de-presse-tourisme-saison-d-ete-2021-hautes-alpes-confirment-1561781>

(3) CGEDD: Conseil général de l'environnement et du développement durable (General Council for Environment and Sustainable Development). CGAAER: Conseil général de l'alimentation, de l'agriculture et des espaces ruraux (General Council for Food, Agriculture and Rural Areas).

(4) <http://www.cgedd.developpement-durable.gouv.fr/conditions-de-mobilisation-des-retenues-a3129.html>

With operations in over 20 countries, EDF Renewables is one of the benchmark players in the development and production of electricity from renewable energy sources, in particular in its main historic locations of North America (USA, Canada, and Mexico) and Europe, mainly in France and the United Kingdom. EDF Renewables has also rebalanced its business in geographical terms, increasing its presence in other countries with high potential for the development of renewable energy, including South Africa, Brazil, China, India, UAE, Saudi Arabia, Morocco, and Egypt.

EDF Renewables is an integrated operator in renewable energies and is involved in every stage of the value chain. EDF Renewables operates upstream, in project

development, as well as in engineering during the construction of power plants and their operation and maintenance. EDF Renewables develops projects on its own or in partnerships, as appropriate. At year-end 2021, its portfolio comprised 73% of wind power, 26% of solar power and 1% of storage, and it had embarked on its technological rebalancing initiative by accelerating its development in solar power.

As part of its business model, the Group is also involved in the Development and Sale of Structured Assets (an activity referred to as "DSSA"), which consists of selling projects it has built, in whole or in part, to third-party investors. With regard to DSSA, the net capacity sold in 2021 amounted to 896MW.

1.4.1.3.3.1 Fleet

INSTALLED CAPACITY BY SEGMENT AND COUNTRY

(in MW)	At 31/12/2021		At 31/12/2020	
	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾
Wind				
South Africa	145	73	111	56
Germany	175	173	175	173
Belgium ⁽³⁾	325	27	325	27
Brazil	571	480	329	238
Canada	560	506	560	506
Chile	175	88	115	58
China	905	380	617	216
Denmark	0	0	6	6
United States	4,016	2,943	3,618	2,803
France	1,808	1,637	1,695	1,528
Greece	264	238	264	238
India	364	262	269	177
Italy	0	0	40	25
Mexico	324	162	324	162
Portugal	0	0	546	149
UK ⁽⁴⁾	603	167	603	187
Turkey	0	0	559	280
Saudi Arabia	416	212	0	0
Poland	68	68	0	0
Total wind power ⁽⁵⁾	10,719	7,416	10,157	6,828
Solar power				
Brazil	399	199	399	199
Canada	61	42	61	42
Chile	261	131	261	131
China	128	123	117	113
Egypt	165	65	149	65
United Arab Emirates	1,065	170	1,065	170
United States	1,005	741	534	380
France	378	320	278	219
Greece	32	30	12	12
India	657	325	207	100
Israel	427	323	324	220
Mexico	120	120	120	120
Turkey	0	0	36	18
United Kingdom	5	2	0	0
Total Solar power ⁽⁵⁾	4,703	2,591	3,563	1,790
Storage				
United States	55	55	20	20
United Kingdom	100	51	49	25
Total Storage ⁽⁵⁾	155	106	69	45
TOTAL ⁽⁵⁾	15,577	10,113	13,788	8,663

(1) Gross capacity: total capacity of the facilities in which EDF Renewables has a stake.

(2) Net capacity: capacity corresponding to EDF Renewables' stake.

(3) MW in offshore wind exclusively.

(4) EDF Renewables owns 51% of EDF Renewables UK (the other 49% is owned by EDF Energy), see section 1.4.5.1 "United Kingdom".

(5) Corresponds to the sum of the exact values rounded to one decimal place.

In 2021, the electricity production of EDF Renewables' fully consolidated fleet across all segments and countries was 24.7TWh. The load factor reached at end 2021 31% onshore wind power generation and 19% in solar power generation.

1.4.1.3.3.2 Segments and highlights

For details of renewables activities in Italy and Belgium, see sections 1.4.5.2 "Italy" and 1.4.5.3.1 "Northern Europe" respectively.

Wind power

Onshore wind power

During the course of 2021, EDF Renewables pursued its development in onshore wind power, thus contributing to EDF group's CAP 2030 strategy. EDF Renewables had a gross total of 9,789MW onshore wind power capacity in operation as of the end of 2021. Onshore wind farms with a gross capacity of 1,533MW were commissioned in 2021. Onshore wind farms under construction represented a gross capacity of 1,445MW at 31 December 2021.

France

EDF Renewables pursued its development in onshore wind power, commissioning almost 123MW more in 2021, in wind farms in Beaujolais Vert (12MW), Longues Roies (43.6MW), Le Télégraphe (14.4MW), Les Vents de la Javigne (15MW), Roussac (15MW) and Champ Gourleau (22.8MW). In addition, nearly 54MW of wind power projects were under construction. In 2021, EDF Renewables continued to repower the Tenesa wind farm in Corsica (11.7MW) and to build the Sud Arrageois wind farm (21.6MW).

It launched two crowdfunding campaigns for onshore wind farms. In connection with the CRE call for tenders, it was awarded 5 wind power projects for a total of nearly 350MW. Finally, EDF Renewables signed 5 power sales agreements (corporate power purchase agreements (PPAs)) concerning 14 wind farms for a total of 144MW.

South Africa

In August 2021, EDF Renewables commissioned the Wesley wind farm (34.5MW) in the former Ciskei region, east of Cape Town. In October 2021, under a government call for tenders, it was awarded three projects with unit installed capacity of 140MW.

Saudi Arabia

EDF Renewables (lead contractor) finalises the construction of the Dumat Al Jandal project in a consortium with Masdar and Nesma ⁽¹⁾. With a gross installed capacity of 416MW, this will be the first such wind farm in Saudi Arabia and the most powerful one in the Middle East.

Australia

EDF Renewables acquired the Banana Range wind farm project in Queensland, with a maximum capacity of 280MW. It is continuing the development, construction and operation of this project.

Brazil

EDF Renewables has been operating in Brazil since 2015, and is one of the country's leaders in the renewable energy industry. Phase 2 of the Folha Larga Norte wind farm in the State of Bahia was commissioned in 2021 ⁽²⁾. The complex consists of 82 wind turbines with an installed capacity of 344MW.

EDF Renewables also owns the Ventos da Bahia wind farm located in the municipalities of Bonito and Mulungu do Morro, with a total capacity of 365MW including 138MW under construction.

In addition, EDF Renewables launched the construction of the new 242MW Serra de Seridó wind farm in the state of Paraíba at the end of 2021. It is expected to be commissioned in 2023.

Chile

In 2021, the Cabo Leones wind farm in northern Chile was expanded with an additional 60MW. In November 2021, EDF Renewables also won a concession for 1,300 hectares of land to develop new renewable projects.

China

In mid-2021, EDF Renewables and its partner commissioned the Rongshui I and II wind farm, with a capacity of 88MW.

United States

In 2021, EDF Renewables commissioned three wind farms in the United States. Two parks are located in Texas: Las Majadas (272.6MW), which was commissioned in February, and Coyote (242.5MW), which was commissioned in March. The Miligan wind farm (300MW), which is located in Nebraska, was commissioned in May. In addition, the King Creek wind farm (393.4MW) in Texas is currently under

construction. A 15-year power purchase agreement (PPA) for a 100MW share was signed by EDF Renewables and Pedernales Electric Cooperative Inc. (PEC) for this project.

During the extreme cold snap in Texas in February 2021, multi-day spikes in electricity prices were observed. EDF Renewables shut down four wind farms and had to purchase energy at very high prices in order to meet its contractual commitments.

Morocco

EDF Renewables and Mitsui & Co. Ltd., an international trading and investment group with a diversified business portfolio, continued the construction of the Taza wind farm (87MW) in northern Morocco. Commissioning is expected in 2022.

Poland

EDF Renewables commissioned three wind farm projects, with a total capacity of 68MW; these were awarded in calls for tender at the end of 2019.

Portugal

EDF Renewables sold 149MW net of wind power capacity to a local partner.

Turkey

EDF Renewables disposed of all its onshore wind investments in June 2021.

Offshore wind power

Offshore wind power represents a strong area in EDF Renewables' development. The company already has operations on the offshore wind power market, with 14GW of projects under development, under construction, in service, or under management and maintenance. EDF Renewables has operations in Europe (Germany, Belgium, France, Ireland, United Kingdom), where it is the eighth largest player, with nearly 2GW of projects under construction. It is also present in China, and has positioned itself in the United States.

France

EDF Renewables is the offshore wind power leader, with four out of seven projects awarded in the calls for tender launched by the French State.

- It won three projects in 2012, namely the offshore wind farms in Saint-Nazaire, Fécamp, and Courseulles-sur-Mer. Together they make up a capacity of nearly 1,430MW and cost around €6 billion. All relevant permits for the three wind farms were granted. The partnership arrangement brings together EDF Renewables, Enbridge Inc., and wpd for the Fécamp and Courseulles-sur-Mer projects. For the Saint-Nazaire project, EDF Renewables is associated with Enbridge Inc. In 2019, the French government confirmed these three offshore wind power projects. The construction of the Saint-Nazaire wind farm, which was begun in September 2019, continued in 2021 with the start of offshore work ⁽³⁾. The Fécamp project, which started in June 2020, is underway. In 2021, a crowdfunding campaign was carried out for this project. Finally, the construction of the Courseulles-sur-Mer offshore wind farm started in February 2021.
- In June 2019, the Dunkirk project was awarded to a consortium consisting of EDF Renewables, companies Innogy (now RWE) and Enbridge. In May 2021, following a public debate organised by the Commission for Public Debate on Specific Projects (*Commission particulière du débat public*) in the fourth quarter of 2020, the consortium responsible for the design, construction and operation-maintenance of the future wind farm with an installed capacity of nearly 600MW, together with RTE, which will be tasked with making the electrical connection, confirmed 2021 their joint decision to continue the development of the project ⁽⁴⁾. Since December 2021, following the withdrawal of RWE, EDF Renewables and Enbridge have increased their stakes in the Dunkirk wind project.
- In 2021, EDF Renewables was shortlisted for two offshore wind projects launched by the government. One is located in Normandy and the other in southern Brittany for a floating offshore wind farm.
- EDF Renewables is also conducting a pilot offshore wind farm project (Provence Grand Large) in the Mediterranean, based on floating wind power technology. The project financing transaction was completed in late 2021.

China

The 200MW Dongtai V wind farm was commissioned in late November 2021. The Dongtai IV and V wind farms, with total capacity of 502MW, are located off the coast of Jiangsu Province, north of Shanghai. They are owned by the joint venture between EDF (EDF Renewables and EDF China) and China Energy Investment Corporation (CEI).

(1) See EDF Renewables' press release of 12 April 2021 "Masdar-EDF Renewables-Nesma consortium reaches financial close and starts construction on 300MW solar project in Saudi Arabia".

(2) See EDF Renewables' press release of 5 May 2021 "EDF Renewables commissions a 344MW wind complex in Brazil".

(3) See EDF Renewables' press release of 28 August 2021 "Construction of France's first offshore wind farm in Saint-Nazaire: production of components finalised and offshore operations continued".

(4) See the EDF Renewables press release of 10 May 2021 "Development of the Dunkirk wind farm project and its grid connection moves ahead following public debates".

United States

At the end of 2018, EDF Renewables set up a 50-50 joint venture, Atlantic Shores Offshore Wind, LLC, with Shell New Energies US LLC (Shell). The purpose of this joint venture is to develop offshore wind turbines on a site located off the coast of the New Jersey (WEA) under a lease issued by the US federal authorities. In June 2021, the joint venture was awarded a project to develop 1.5GW of capacity ⁽¹⁾.

United Kingdom

In 2021, EDF Renewables continued the construction of the Neart na Gaoithe offshore wind farm in partnership with Irish electricity company ESB. This 450MW project is located in the Firth of Forth on the eastern coast of Scotland. The impact of the Covid pandemic on the global supply chain, as well as technical issues, caused delays in the projected project commissioning schedule.

EDF Renewables also entered into a partnership with the Malaysian company Tenaga for the Blyth Offshore Demonstrator Limited (BODL) experimental wind farm with a total capacity of 100MW. More than 40MW are currently in operation. The Blyth II floating offshore wind farm project is currently under development.

Photovoltaic solar power

EDF Renewables continued to expand in solar power. At end 2021, gross installed solar capacity was 4,703MWp (2,591MWp net), up by 801MWp net i.e. 45%, compared to end 2020.

EDF Renewables also has a portfolio of solar projects under construction of 4,300MWp gross.

France

EDF Renewables has structured its policy for contributing to the Solar Plan launched by the Group in December 2017.

EDF is implementing a strategy covering all market segments. Such strategy is based on an integrated development model for projects up to their operation, the quest for industrial excellence and continued investment in innovation. This strategy leverages EDF's research and development and the territorial networking of EDF's teams dedicated to local authorities and businesses. The lands targeted as a priority are sites referred to as "damaged", i.e. industrial wastelands, polluted, abandoned or former quarry sites, which can be rehabilitated with the development of photovoltaic projects. The company is also looking to develop agrivoltaic solar projects.

EDF Renewables commissioned 18 solar power plants in 2021, with total capacity of 100.6MW, and launched the construction of 30 solar power plants with 240MW net capacity. EDF's portfolio of solar projects in France includes 532MWp of authorised projects by the end of 2021.

EDF Renewables was awarded a total of 153MWp of ground-mounted solar capacity under the CRE's 2021 calls for tenders ("Innovation 3", "CRE 4.9" and "CRE 4.10") and is now the third most successful tenderer in these calls for tenders. In March 2021, EDF Renewables was awarded the 60MW solar power plant project at Deauville-Normandie airport ⁽²⁾.

Innovation also supports the development of solar power, notably in the form of:

- agrivoltaic projects: in January 2021, EDF Renewables, in conjunction with the French Chamber of Agriculture and the FNSEA, signed a charter to develop and better manage ground-mounted photovoltaic projects on agricultural land. In May 2021, EDF Renewables acquired a 45% stake in Green Lighthouse Development (GLHD), a pioneer in solar agrivoltaic projects in France;
- floating solar power plant projects: Lazer, the first project of the EDF group which is located on the Buëch river in the Hautes Alpes *département*, began construction since February 2021. The solar farm of a power of 20MWp will be installed on the hydroelectric reservoir i.e. covering three-quarters of the water body's total area.

Some projects include a crowdfunding campaign, enabling the inhabitants of a region to be involved with the funding of the projects in question. This was the case for 8 plants in 2021. Finally, EDF Renewables signed 2 power sales agreements (corporate power purchase agreements (PPAs)) for 2 solar plants for total capacity of 70MW.

South Africa

In September 2021, EDF Renewables and its partner, Pele Green Energy, were selected to build and operate a 100MW solar power plant at the Mogalakwena platinum mine in Limpopo province under a call for tenders launched by the mining company Anglo-American Platinum.

United States

At end-2021, EDF Renewables North America was building solar projects with capacity of nearly 1.2GW and, in particular, was nearing completion of the Maverick 6 and 7 solar plants in California with total capacity of nearly 310MW.

United Arab Emirates

In July 2020, the consortium formed by EDF Renewables and Chinese company Jinko Power Technology Co. Ltd. won the call for tender for the Al Dhafra solar power project. The future solar power plant will be located 35 kilometres south of Abu Dhabi. With installed capacity of 2GW, it will be the most powerful solar farm in the world, supplying electricity to the equivalent of 160,000 local households each year.

Greece

EDF Renewables is continuing its development in solar energy with the construction of two photovoltaic power plants with total capacity of 90MW, of which 20MW was commissioned in 2021.

India

EDF Renewables is developing its solar power business through EDEN Renewables India, a joint subsidiary created for this purpose in 2016 by EDF and Total EREN ⁽³⁾.

EDEN is completing construction of the SECI III photovoltaic plant (450MW) in Rajasthan, northern India.

Israel

EDF Renewables is the leader in this market with more than 20 photovoltaic power plants with a total capacity of 427MWp. In June 2021, it commissioned the Timna solar power plant in the Arava Valley, which has installed capacity of 60MW. EDF Renewables is currently building nine ground-mounted solar projects with total capacity of 120MWp, including three floating solar projects on water reservoirs.

Operating & Maintenance

As an integrated operator, EDF Renewables operates and maintains most of its own facilities. Dedicated first and foremost to EDF group wind and solar assets, this activity is also carried out on behalf of third parties. Worldwide, EDF Renewables operates 17.5GW at end-December 2021 with nearly 1,200 experts, engineers and technicians across nine countries. EDF Renewables has long been active in the operation-maintenance field in North America where it manages over 13GW. The business in Europe and the rest of the world exceeds 4GW at end 2021.

This activity is driven by commissioning new plants and choosing which facilities to operate on a case-by-case basis according to technology and region. The aim is to achieve maximum efficiency in every facility in conjunction with providers throughout the expected or extended useful life of equipment.

Accordingly, EDF Renewables recently set up a predictive maintenance oversight centre (e-Diagnostic Center) drawing on specific in-house expertise centralised and coordinated with the EDF group's R&D Department. It complements the facility remote monitoring and control system made up of three real-time oversight centres in Colombiers (France), Emden (Germany) and San Diego (California).

Since 2017, EDF Renewables owns a subsidiary specialising in the operation and maintenance of offshore wind farms, the German firm Offshore Wind Solutions GmbH (OWS). OWS is working on the BARD Offshore 1 wind farm (400MW) located 95km off the German coast in the North Sea.

EDF Renewables owns several European maintenance centres: in Belgium, Greece, United Kingdom, Germany and France. These operation-maintenance units are designed to place technical teams as close to wind or solar farms as possible. In late 2021, EDF Renewables opened its first offshore wind maintenance centre in France at La Turballe. Some 100 maintenance technicians will work there in 2022 to operate the future Saint Nazaire offshore wind farm.

(1) See EDF Renewables' press release of 1 July 2021 "EDF group wins a 1.5GW offshore wind project in New Jersey, USA".

(2) See EDF Renewables' press release of 26 March 2021 "Launch of the photovoltaic plant project at the Deauville-Normandie airport".

(3) Formerly EREN Renewable Energy.

Decentralised Energy France

EDF ENR is an integrated player in decentralised solar power production, carrying out design, development, construction, operation, and maintenance of rooftop and car park canopy installations. A wholly-owned subsidiary of the Group, it markets solar power offers for residential customers, professionals, and local authorities in metropolitan France and overseas *départements* and territories. With over 45,000 facilities completed, EDF ENR now occupies a leading position.

On the residential market, it carries out some 30% of all self-consumption installations in France. On the professional market, the offering features in the *EDF Solutions Énergétiques* catalogue.

In addition, EDF Renewables Technologies, a wholly-owned subsidiary of EDF Renewables, is present in the upstream segment. It owns 100% of EDF ENR PWT (Photowatt brand) which designs and manufactures photovoltaic modules using crystalline silicon technology with various applications ranging from residential equipment to land-based solar farms. Photowatt is rolling out an industrial model focusing on low-carbon production of high-technology silicon wafers and ingots. Alongside this joint project, Photowatt focuses on its R&D activities, renamed Photowatt Lab, in conjunction with the EDF group's R&D Department and solar energy research centres such as INES or the Photovoltaic Institute of Ile-de-France region.

United States

EDF Renewables is engaged in a growth strategy in the USA on the decentralised energy market. Since 2016, several acquisitions and partnerships have served to develop this business (acquisition in 2016 of Global Resources Options, Inc. (groSolar) and partnership in 2018 with EnterSolar).

At the same time, in 2019 in North America, EDF Renewables acquired PowerFlex Systems with the aim of speeding up large-scale deployment of infrastructures for electric vehicles in the USA. Based in Los Altos, California, PowerFlex is a pioneering firm in the field of charging technology.

In North America, EDF Renewables entered into a strategic partnership with EnterSolar in 2018 and took a 50% equity stake in the company. In 2021, it acquired the remaining 50% interest and consolidated all decentralised "behind the meter" activities under the PowerFlex brand. Bundling energy solutions for business and industry enables PowerFlex to offer customers a stand-alone or bundled package of on-site solar, battery storage, electric vehicle charging, microgrid and energy management systems.

China

In 2018, EDF Renewables together with Asia Clean Capital (ACC) launched a joint venture aimed at building and operating a portfolio of decentralised solar energy projects on rooftops.

In 2019, EDF Renewables acquired a majority stake in an asset portfolio comprising 77MWp of rooftop solar power installations with ACC.

Israel

In 2021, EDF Renewables successfully responded to the call for tenders of the municipality of Netanya to develop rooftop solar with potential capacity of about 40MWp.

Vietnam

EDF Renewables acquired a stake in SkyX Energy, a rooftop solar developer in Vietnam.

Storage sector

EDF Renewables contributes to the Storage Plan launched by the Group in 2018. In a context marked by the strong growth of renewable energy generation and by the closure of large-scale electrical facilities, battery storage technology, combined with a smart control system, helps smooth out the generation of electricity of the national grid. In this context, through its subsidiaries, EDF Renewables develops innovative storage systems in the US, the United Kingdom, Germany, France and South Africa.

EDF Renewables has also launched a new microgrid activity comprising solar projects equipped with a battery storage system that is connected to a local grid in remote areas (deserts, islands).

South Africa

In September 2021, EDF Renewables and its partner Perpetua Holding were awarded an innovative project in South Africa. It combines solar, wind and battery storage technologies. Umoyilanga consists of a 77MW wind farm and a 138MW solar plant, each equipped with a battery system.

United States

EDF Renewables commissioned a 35MW storage system for the Desert Harvest 2 solar project in California. Currently, 180MW of storage capacity attached to solar projects are under construction. The projects should be commissioned in 2022.

In September 2021, EDF Renewables signed a 15-year PPA to build and operate Desert Quartzite, a large-scale 377MWp solar capacity project coupled with a storage system (600MWh) in California.

United Kingdom

In June 2021, EDF Renewables, via its start-up Pivot Power, commissioned its first two grid-connected batteries, located in Cowley (Oxford) (in connection with the Energy Superhub Oxford project led by Pivot Power) and Kemsley, in June and October 2021 respectively.

In late 2021, Pivot Power also began construction of a battery storage facility that will be connected to the national transmission grid northwest of Birmingham. The 50MW/100MWh lithium-ion battery will store sufficient electricity to power over 100,000 homes for two hours. Commissioning is scheduled for spring 2022 and will initially include 38 fast and ultra-fast chargers.

Peru

In late 2021, EDF Renewables was awarded a tender for a renewable energy project in Iquitos. The company will develop, build and operate approximately 100MW of photovoltaic capacity and over 100MWh of battery storage capacity. The company signed a 20-year electricity sales contract with Electro Oriente, a Peruvian public electricity distribution company.



1.4.2 Sales and supply activities in France

Besides gas and electricity supply, EDF accompanies its customers by offering a wide range of services and energy solutions. EDF aspires to be a trusted partner for customers, engaging in responsible marketing and providing simple, intelligible offers.

28 million

CUSTOMER SITES IN FRANCE ⁽¹⁾

243.8 TWh

ELECTRICITY SALES IN 2021 ⁽²⁾

37.9 TWh

GAS SALES IN 2021 ⁽³⁾

(1) EDF Customer Division + Électricité de Strasbourg: electricity: 25.9 million, gas: 2.1 million.

(2) EDF Customer Division (excluding transfers to local distribution companies) + Électricité de Strasbourg.

(3) EDF Customer Division + Électricité de Strasbourg.

1.4.2.1 Presentation of the market in France

1.4.2.1.1 Competition

Since 1 July 2007, the French market for electricity and gas has fully opened-up, allowing each customer to choose their energy supplier.

Over the last six years, the number of active electricity suppliers in France excluding historical suppliers has more than doubled, from 24 at end-2015 to 51 at 30 September 2021 ⁽¹⁾.

In the electricity and gas markets many suppliers have been proposing offers to businesses and local authorities since the early 2000's. For residential customers, competition has intensified significantly since 2017 with the entry into the market of gas and electricity suppliers well established in other activities or geographical areas.

To supply their customers in 2021, EDF's alternative suppliers had access to their own generation capacities as well as to the wholesale electricity market and the ARENH for around 100TWh. During the November 2021 application process, the demand from alternative providers for the 2022 delivery year reached 160.33TWh for an ARENH distribution volume of 100TWh (see also section 1.4.3.3 "Regulated access to historic nuclear power (Accès Régulé à l'Énergie Nucléaire Historique, or ARENH)").

On 13 January 2022, given the context of rising electricity prices, the French government announced an exceptional increase of 20TWh in the ARENH volume that will be delivered in 2022, at a price of €46.2/MWh.

The Government published on 12 March 2022 in the Official Journal the Decree⁽²⁾ and Orders dated 11 March 2022 relating to the additional allocation of 20 TWh of ARENH volumes for 2022. The Decree provides that eligible suppliers, in order to benefit from the additional ARENH volumes over the period from 1 April to 31 December 2022 at the price of €46.2/MWh, will have to sell EDF the same volume that will be transferred to them by EDF under this additional allocation, at a price equal to the average of the wholesale forward prices recorded between 2 and 23 December 2021, for electricity delivery in mainland France in 2022, i.e. €257/MWh. The CRE will distribute the additional ARENH volumes between the suppliers, in the same way as the one that was followed for the delivery period started on 1 January 2022. This decision sets the purchase price for EDF of the additional ARENH volumes of 20 TWh which will have to be made available to suppliers in 2022. Following the publication of the ARENH decree and orders, EDF is studying all possibilities to preserve its interests.

See also in chapter 2 "Risk Factors and Control Framework", risk 1A in section 2.2.1 "Public policy and regulatory framework developments in France and in Europe in particular ARENH".

Regulatory notice

The Energy Regulation Commission (CRE)

The CRE is an independent administrative authority. Its responsibility is to ensure the proper workings of the electricity and natural gas markets for end consumers. In this respect, the CRE ensures, in particular, that the conditions for access to electricity and natural gas transmission and distribution networks do not impede the development of competition.

The CRE has significant powers: the power to make proposals, advisory powers and decision-making powers (approval power and regulatory power). The CRE makes proposals, in particular:

- to the Ministers for the Economy and for Energy regarding the amount of the costs that are attributable to the public service missions assigned to power producers, and the net amount of the related contributions;
- regarding the ARENH price once the Decree has been published that specifies the methods for identifying and recognising the costs that are taken into account for the calculation of the ARENH price.

Moreover, it has been the CRE's responsibility to send its reasoned proposals to the Ministers for the Economy and for Energy for changes in the regulated sales and transfer tariffs for electricity offered to the LDCs.

The CRE has decision-making power to establish Tariffs for Using the Public Electricity transmission and distribution Networks (*Tarifs d'Utilisation des Réseaux Publics de transport et de distribution d'Électricité*, TURPE).

Under its residual regulatory power, the CRE also takes network connection decisions, as well as decisions to define the rules for calculating and adjusting the rights of suppliers to the ARENH.

The CRE is also vested with very broad powers that enable it to obtain any information that it may deem useful for the fulfilment of its remit, as well as authority to settle disputes and to apply penalties, through the Settlement of Disputes and Sanctions Committee (CoRDiS).

The Law on Energy Transition for Green Growth also gives the CRE the possibility of having the information it obtains through its remits audited, at the expense of the audited undertakings.

Organic Law no. 2017-54 of 20 January 2017 on Independent Administrative Authorities and Independent Public Authorities and Law no. 2017-55 of 20 January 2017 on the General Statute of Independent Administrative Authorities and Independent Public Authorities, provided these authorities, including the CRE, with a common legal status and lay down the rules relating to the mandate and ethics of members, the operation and organisation of these authorities and parliamentary control.

(1) According to the CRE's retail market observatory report on the third quarter of 2021: providers who say they have offers available in at least 90% of all municipalities in metropolitan France connected to the grid (excluding Corsica). At 30 September 2021, just over 100 non-national electricity providers were active within this area.

(2) Decret no 2022-342 of 11 March 2022.

1.4.2.1.2 Regulated electricity sales tariff contracts

Access to regulated electricity tariffs

For details of the changes to the legal and regulatory framework and 2021 tariff changes for regulated electricity sales tariffs in France ("TRV" or "blue tariffs"), see notes 5.1.1 and 23 in consolidated financial statements in section 6.1.

Since the Energy-Climate Law entered into force in 2010, the situation for electricity, by category of customer, is as follows:

- residential and non-residential final consumers who have subscribed power for their site(s) exceeding 36kVA: since 1 January 2016 these sites can no longer subscribe to regulated sales tariff products which were cancelled on 31 December 2015;
- residential end consumers, including sole proprietors and co-owners' associations of a single residential building, who have subscribed power for their site(s) not exceeding 36kVA: these customers benefit from regulated sales tariffs. They can freely switch back and forth between regulated tariffs and market offers;
- for non-residential end consumers with subscribed power levels of 36kVA or less, only consumers with fewer than 10 employees and a turnover, total revenue, or balance sheet of less than €2 million will still be able to benefit from regulated sales tariffs after 31 December 2020. Consumers that do not fall into this category will lose the benefit of regulated tariffs on 31 December 2020, following the process described by the law;
- residential and non-residential final consumers for their site(s) located in areas not connected to the continental metropolitan network: these customers have the right to regulated sales tariffs.

Regulatory notice

"Blue tariffs" tariff changes

In accordance with Articles L. 337-4 of the French Energy Code, the CRE has been responsible for notifying the Ministers for the Economy and for Energy of its justified proposals for regulated electricity sales tariffs (TRV). If no objections are made within three months, the proposals are deemed to have been approved.

1.4.2.1.3 Electricity supply contracts

In France, residential and non-residential customers ⁽¹⁾ with subscribed power levels of less than 36kVA are entitled to regulated sales tariffs, and may also choose a market offer put forward by any supplier, including EDF.

With the exception of customers directly connected to the transmission network, who must sign separate supply and delivery contracts, all other customers may enter into a single contract with the supplier. In this regard, a commission is paid by the distributor to any supplier offering a single contract to its customers since in doing so, it provides customer management services on behalf of the distributor.

The quality of supply, which is the distributor's responsibility, is monitored on a regular basis under contracts with the distributors. EDF monitors the impact of outages and the quality of supply to its customers and their satisfaction with the aim of working with the distributor on a continuous improvement basis.

1.4.2.2 Activities of the Customer Division

EDF's Customer Division brings together all business relating to the sale of electricity, gas, and related services in mainland metropolitan France. It also performs all customer management functions, including the management of customer requests via all channels (telephone, email, etc.), complaints handling, invoicing, and debt recovery. The activity spans all customer segments: residential consumers, professionals, companies, and local authorities. For larger customers

(industry and service sectors), energy services are mainly marketed and provided by Dalkia, a subsidiary of EDF.

The Customer Division operates on the basis of recognised fundamentals:

- constantly seeking to further strengthen consumer confidence;
- local presence in the form of 6,200 customer advisers, all based in France, and its 8 Regional Commercial Divisions;
- permanent innovation in digital technology, electric mobility, self-consumption solutions, and electricity flexibility.

In 2021, EDF became the first energy company to obtain *Relation Client France* certification, which was set up by the Association Française de la Relation Client (AFRC) and the Association Pro France. This certification recognises French companies that choose to locate all of their customer service in France and that are committed to providing jobs for local communities through initiatives in the field of local integration, training and inclusivity.

1.4.2.2.1 Activity by customer category

1.4.2.2.1.1 Residential customers

EDF is innovating on a daily basis, and makes residential customer satisfaction a priority. Approximately 9 out of 10 customers are satisfied with their relationship with EDF following telephone contact. The annual report of the French national energy mediator published in May 2021 shows that EDF has the lowest rate of disputes, far behind its main competitors. The customer experience offered is both digital (customer space, chat, web call back, mobile application, digital solutions, social media, etc.) and human thanks to its agents which are all located in France.

Energy supply

EDF supplies electricity at the regulated sales tariff (TRV) and offers a comprehensive range of market offers in electricity. In 2021, EDF's market offering comprises the "Mes Jours Zen", "Mes Jours Zen Plus", "Vert électrique", "Vert Électrique Weekend", "Vert Électrique Auto", "Vert Électrique Régional" and "Digiwatt" options. The "Digiwatt" offer was however suspended in December 2021 in response to rising energy prices. In 2021, the "Vert Électrique Régional" offer welcomed two new regions, the Pays de la Loire and Occitanie, in addition to Brittany. This offer also obtained the ADEME *VertVolt Choix Engagé* label.

EDF offers a wide range of market offers in gas. "Avantage Gaz" offers a fixed price per kWh (before VAT) for a period of four years. Over and above the characteristics of the "Avantage Gaz" offer, "Avantage Gaz Durable" offers carbon offsetting based on the customer's estimated gas use. "Avantage Gaz Connecté" gives customers the possibility of managing their heating remotely with the purchase of a connected thermostat. Since 2020, the "Avantage Gaz Optimisé" offer, which is intended for customers who prefer to retain a reference to the price of the regulated tariff for the sale of gas, has extended this range. This offer is indexed at 2% below the price per kWh before VAT of the regulated gas tariff.

Features and services

In parallel with its supply offers, EDF assists its residential customers so that they can monitor and understand their energy use. The aim is to encourage them to make energy savings using the "Mes Éco et Moi" digital solutions ⁽²⁾. Customers who consult their energy use tracking tool more than 2-3 times a month can achieve savings of up to 12% on their bills ⁽³⁾.

EDF, in partnership with AXA, offers a comprehensive range of support services, called *Solution Dépannage Confiance* with three rapid repair options.

In collaboration with Axa, EDF also offers bill payment insurance. This service was repositioned and enriched in 2021 with the "Assurénergie+" policy. In the event of hospitalisation, sick leave, loss of employment, disability, accident or illness, the customer receives an indemnity equal to the estimated monthly amount of the energy bills, for up to one year. Assistance with their day-to-day tasks may also be proposed to them, depending on their situation.

(1) Eligibility conditions defined in the 29 January 2020 decision on regulated electricity sales tariffs applicable to non-residential consumers in continental metropolitan France.

(2) Available via the website customer space and the "EDF and Me" application.

(3) Internal survey, EDF R&D.

Launched by EDF in 2019, the local services platform IZI by EDF emerged as a player in energy renovation and electric mobility. In addition to the offers developed in 2019 (emergency repairs, minor works, indoor renovations, and boiler maintenance), IZI by EDF now has a turnkey energy renovation offer focusing on heating solutions (heat pumps and boilers), insulation, ventilation, and window installation (including calculation and deduction of all regulatory aid from the customer quote). It assists its customers by providing a dedicated contact person for the entire process, a strong commitment to quality and financing solutions.

IZI by EDF also offers a full-service solution to transition to electric mobility, including the installation of a home charging station, green electricity supply with *Vert Électrique Auto*, the *pass mobilité* (operated by IZIVIA) mobility pass to recharge anywhere in Europe, and electric vehicle leasing (see also section 1.4.6.1.4 "Other service activities of the EDF group" – "IZI by EDF").

As part of the *Coup de Pouce Chauffage* ⁽¹⁾ scheme, EDF launched in January 2019 the "*Mon chauffage durable*" offer, to finance replacing ageing heating systems by more efficient ones. This offer goes further than the state scheme, offering a complementary bonus.

In May 2020, EDF launched "Check", a smartphone-based removals assistant. Check is a web-based app that provides users with a personalised checklist to ensure nothing is forgotten, facilitating hassle-free removals, and offering advice for a successful house move. Customers who take out an energy contract with EDF also have access to special offers negotiated with leading partners in the removals business, household appliances, decoration, and building works.

Lastly, EDF is investing in open innovation with EDF Pulse & You, a digital collaborative platform for co-construction with internet users and startups. In particular, the platform allows connected objects to be co-built, application interfaces to be improved, and social acceptability of soft mobility to be accelerated.

In order to widen access to crowdfunding, in 2021 EDF set up an internet portal that is dedicated to crowdfunding for energy transition, which is supported by the Group and accessible from the EDF Pulse & You platform, in partnership with accredited crowdfunding organisations.

Earning of energy savings certificates (CEE)

Regulatory notice

The Energy Savings Certificates system (CEE), which was introduced in 2006, was updated on 1 January 2022 with the implementation of the fifth period of the system, after a fourth period (2018-2021), which targeted a total obligation of 2,133 TWhp.

The fifth period of the CEE (which will run from 2022 to 2025) increases the efficiency of the system (through a sharp decrease in subsidies, checks on operations before filing an application, emphasis on the comprehensive renovation of housing, and enhancement of the national CEE programmes), and improves the system for the benefit of households with severe energy poverty (through an increase in the poverty requirement, restricting the scope to households with severe energy poverty and increasing the poverty penalty to €20/MWhp), while imposing additional obligations on the suppliers of carbon-intensive energies. The national obligation is set at 2,500TWhp for the period, of which 730TWhp is a "poverty" obligation; the latter has increased significantly compared to the figure for the fourth period.

EDF is of necessity an actor in energy savings certificate legislation, and encourages residential customers to make energy savings, particularly by promoting home energy renovation through its Energy Savings Partners and distributor networks.

All residential customers who made energy efficiency alterations to their home qualify for a direct cash bonus from EDF by visiting www.prime-energie.edf.fr ⁽²⁾.

Solidarity policy

Solidarity is a core value of EDF which has been pursuing a policy dedicated to economically disadvantaged customers for close on 30 years. Accordingly, at the end of 2021 EDF undertook to assist its residential customers with unpaid bills by deciding not to cut off their electricity at any time during the year. With this

measure, EDF goes beyond its regulatory obligations outside of the winter truce period ⁽³⁾ by replacing cut-offs with a power restriction of 1kVA. See section 3.3.4 "Energy poverty and social innovation".

1.4.2.2.1.2 Business customers

EDF is firmly rooted in local territories and is committed alongside its Business and Local Authority customers to hastening the achievement of their aims in sustainable performance, competitiveness and lower carbon intensity, in conjunction with national objective of carbon neutrality.

EDF's offers

EDF proposes various ranges of electricity and gas supply offers, as well as offers of services. These are designed to support business and professional customers, in particular in their efforts to reduce carbon intensity.

For small businesses and professionals, EDF provides straightforward contracts combined with management services, whilst optimising their energy supply. For those customers using more energy, contracts can be personalised (with specific durations and fixed or indexed prices) based on their expectations and budget forecasting capabilities. In addition, EDF provides support to customers with the highest consumption levels by means of personalised offers and rewards for customers that can shed load.

EDF structures its products to encourage its customers to optimise consumption according to generation costs by offering different prices for peak hours and off-peak hours and even summer and winter prices for heavier users during these times of year. For its business customers, EDF also offers an innovative offer for professionals with low prices during evenings after 8pm, at weekends, and on public holidays, using the potential offered by smart meters.

EDF has an enhanced range of solutions and services for all electricity and gas customers, and for large and small businesses. These take the form, for example, of online consultation of consumptions, paperless bills, breakdown assistance and advice (optimisation of the contract power, energy audits and advice, assistance with implementing ISO 50001 certification, etc.). These offers are aimed in particular at customers who wish to commit to an energy management system. In addition, EDF offers electrical engineering services, in order to ensure the safety of its customers' interior electrical installations.

EDF has put into place offers dedicated to very large customers. These offers make it possible to assist them in their objectives of reducing carbon intensity through control over their energy consumptions and their CO₂ emissions.

EDF also works with its Business and Local Authority customers as they seek to engage in energy transition:

- EDF offers all its customers across all its products the possibility of choosing an option which provides guarantees that the equivalent of 100% of their consumption will come from electricity generated from renewable energy sources. It facilitates their communication with their own customers regarding their commitment to energy transition;
- with its subsidiary Agregio, EDF also develops PPA-type (Power Purchase Agreement) solutions for its major customers using facilities that generate renewable-origin electricity;
- optimised solar power solutions for self-consumption of electricity may be offered based on their needs, together with a range of related services, including financing, maintenance, supervision, and performance monitoring, in liaison with its subsidiary EDF ENR. EDF also has new offers for its self-consuming customers to complement their electricity supply tailored to their profile, whereby they can maximise their savings from self-generation and, where necessary, manage their consumption. EDF is also innovating by experimenting with services and technical systems aimed to facilitate the organisation and management of collective self-consumption operations;
- EDF also supports its Business and Local Authority customers' electric mobility projects, in the form of advice about the dimensioning of installations and through the sale and rental of electric charging stations and related services, via its subsidiary IZIVIA. EDF has also concluded partnerships with automotive leaders and manufacturers.

(1) The initiative was launched on 14 January 2019.

(2) Subject to meeting the strict requirements of the applicable rules on CEE and provided that supporting documents were submitted.

(3) During the winter truce period, from 1 November to 31 March, electricity suppliers cannot cut off the supply of electricity to a primary residence due to unpaid bills (Article L. 115-3 of the French Social Action and Families Code and Decree no. 2014-274 of 27 February 2014, which amended Decree no. 2008-780 of 13 August 2008).

Earning of energy savings certificates (CEE)

In addition, EDF encourages its industry, services, and local authority customers to achieve energy savings by carrying out work on industrial processes and insulating collective and tertiary premises. EDF contributes to the fulfilment of "social insecurity" goals by liaising with social landlords and renovating their housing stock. By funding CEE programmes, EDF also raises awareness of ecological transition and eco-mobility among young people.

Customer satisfaction

EDF has made customer satisfaction a key priority for many years. In a rapidly changing environment, it has undertaken major changes to significantly and constantly improve Customer Experience and the quality of service provided.

EDF implemented a customer support scheme covering every step of Customer Relations, so as to anticipate changes and expectations in terms of the supply of energy, services, information, and assistance. This policy resulted in a significant rise in overall satisfaction for all EDF customer segments since 2017. Those results were highlighted in the annual report of the French national energy mediator published in May 2021, which shows that EDF has the lowest rate of disputes, far behind its main competitors.

EDF and regional authorities, social housing landlords, local distribution companies (LDCs) and public service providers

Regarding energy transition, EDF offers customised solutions for local authorities and public institutions with decentralised decision-making powers (hospitals, universities and major graduate schools, chambers of commerce and industry, CROUS student service centres, ports and airports).

The EDF group is active for these customers in three areas:

- the supply of electricity and gas at market price, responding to their energy problems (proposal of offers and solutions adapted to the needs described in calls for tender);
- the development of offers and services in terms of energy transition: local climate plans, eco-districts, local generation, road lighting, electric mobility, energy efficiency of buildings, etc.;
- in addition, with respect to its public service missions, EDF is in charge of:
 - the conclusion of concessions agreements to supply electricity at the regulated sales tariff,
 - the supply of electricity at the regulated sales tariff,
 - the fight against energy poverty.

Overall satisfaction of EDF Collectivités customers in 2021 remains high with more than 9 customers out of 10 satisfied or very satisfied.

Concerning control over energy consumptions, agreements have been signed with regional authorities. They aim to provide support to these authorities in taking specific initiatives in the fields of energy transition and renewable energies. An "Expenses amount" device for social housing landlords aims to improve the energy efficiency of social housing, and makes it possible for EDF to issue energy savings certificates. In 2020, 130,000 social housing homes received assistance for renovation works. EDF also funds Economy Savings Certificates programmes, in particular for local authorities.

1.4.2.2.2 For sustainable cities and regions

Cities and regions have to reconcile local appeal with responsible development. EDF group addresses the needs of local development stakeholders by identifying the various energy solutions and services available in the light of projects' technical and economic characteristics, assisting with energy transition and low-carbon strategies.

EDF has developed a range of consultancy offerings with a view to:

- designing low-carbon neighbourhoods;
- developing housing stock renovation strategies based on an asset strategy;
- vehicle fleet electrification, and charging station location plans with its subsidiary IZIVIA; and
- installing solar panels with its subsidiary EDF ENR or other partners.

45 Development Managers are present across all regions so that EDF can better meet the needs of large cities, urban communities, medium sized cities, rural areas.

1.4.2.2.3 Customer data protection

Specific attention is paid to the protection of EDF customers' data, and more generally to the protection of its information assets. Its goal is, in particular, the compliance of the processing of personal data with the General Data Protection regulation (GDPR). Regular audits are carried out each year on the asset protection aspect, as well as on the information systems security aspect.

EDF curates the classification of information and documents on the basis of their degree of confidentiality and ensures commensurate security measures are implemented. All customer advisers are regularly informed and trained in this matter, so that they can respond to requests relating to personal data protection and the exercise of related rights. All Customer Division advisers are issued with laptop computers and secure remote access facilities. Surface encryption is activated on all adviser workstations. Requests by customers to exercise their rights are usually managed jointly with the Data Protection Officer (DPO).



1.4.3 Optimisation activities in France



Since electricity cannot be stored, EDF has to supply just the right amount of electricity, matching customer demand, at all times, at best cost. The aim of optimisation is to predict this demand and implement the necessary trade-offs between the resources available to satisfy demand (production resources, long-term supply contracts, purchases on wholesale markets, etc.). Optimisation of EDF's production also consists in covering physical, financial, and market risks.

Regulatory notice

Wholesale energy market – REMIT regulation

Regulation (EU) no. 1227/2011 (REMIT regulation) on the integrity and transparency of wholesale energy markets entered into effects on 28 December 2011 and is designed to enhance consumers and market players confidence in the integrity of electricity and gas markets.

Strengthening wholesale energy market integrity and transparency must foster open and fair competition on these markets, in particular so that prices set on these markets reflect a fair and competitive interplay between supply and demand. The regulation prohibits insider trading and market manipulation, and establishes an obligation to publish inside information as defined in the REMIT.

The European Agency for the Cooperation of Energy Regulators (ACER) is primarily responsible for monitoring wholesale trades in energy products, in order to detect and prevent transactions based on inside information and market manipulations. ACER also collects the data needed to assess and monitor markets. The regulation provides that market participants, or a person authorised to do so on their behalf, provide ACER with a detailed statement of the transactions in the wholesale energy market.

Market participants that perform transactions for which a declaration to ACER is mandatory must register with the national regulatory authority of the Member State in which they are established (the CRE in France) or, if they are not established in the European Union, that of a Member State in which they do business.

At a national level, national regulation authorities also work together and monitor wholesale energy product trading; Member States determine the regime for sanctions applicable to REMIT breaches.

In France, the applicable regulations are as follows:

- the Brottes Act 2013-312 of 15 April 2013 entrusts the duty of ensuring REMIT is observed to the CRE, and the responsibility for sanctions for REMIT breaches to CoRDIS (the CRE's Sanctions and Dispute Settlement Commission);
- Order 2016-461 of 14 April 2016, specifying the remit of the CRE in terms of collecting information, registration, and the obligations of persons organising professional transactions;
- Order 2020-891 of 22 July 2020 on procedures brought before CoRDIS (based on Article 57 paragraph II of French Act 2019-1147 of 8 November 2019 on energy and the climate).

1.4.3.1 Role and activities of the Upstream/Downstream Optimisation & Trading Division (DOAAT)

The balance between electricity supply and demand is managed right down to a real-time basis, in line with the framework established by risk policies, developed in line with the Directives issued by the Group's Risk Control Department and validated by EDF's Executive Committee (see in particular section 2.2.2 "Financial and market risks", risk factor 2C "Energy market risk").

Climate variations affect this management. Hence, a fall in temperature of 1°C in winter leads to a rise in electricity consumption in France of the order of 2,400MW⁽¹⁾ and EDF's portfolio bears a large part of this thermosensitivity. In addition, depending on the run-off, the amplitude of hydraulic generation in the EDF scope, between one extreme year and another, can amount to around 20TW hours.

The DOAAT ensures that it has, in all timeframes, sufficient resources in order to enable it to meet its commitments. To do this, it manages a set of leveraged actions:

- scheduling of maintenance operations of generation means (in particular nuclear);
- management of inventory (fossil fuels, hydro-electric reserves and customer load shedding);
- purchases and sales in wholesale markets via EDF Trading, which is in charge of market access on behalf of DOAAT (see section 1.4.6.3 "Optimisation and trading: EDF Trading").

DOAAT also manages the exposure of EDF's upstream/downstream portfolio to price variations in the energy and fuel (gas, coal, petroleum products) wholesale markets and in the CO₂ emissions licensing market, with the assistance of EDF Trading.

With respect to RTE in its capacity as electricity transmission network operator, DOAAT plays the role of "balance responsible entity" on EDF's perimeter in mainland France. In this regard, EDF is committed to financially compensate RTE in the case of a deviation onto its balance group. The optimisation consists of offering RTE an offer schedule that is balanced with the demand, which makes it possible to minimise the supply cost of EDF's contractual commitments.

1.4.3.2 Long-term electricity purchase and sales contracts

EDF maintains commercial relations through energy purchase or sales contracts with European operators. These contracts are of many types, and confer:

- rights to the energy generated by facilities, primarily nuclear, over the duration of the exploitation of the facility (see section 1.4.1.2.1 "EDF's nuclear fleet in France and its operation");
- drawing rights for totally or partially guaranteed electrical power, for a duration generally comprised between 15 and 25 years.

1.4.3.3 Regulated Access to Historic Nuclear Power (*Accès Régulé à l'Énergie Nucléaire Historique, or ARENH*)

Please refer to notes 5.1.1 and 23 in the 2021 consolidated financial statements in section 6.1 and to section 1.4.2.1.1 "Competition".

1.4.3.4 Capacity mechanism

Please refer to note 5.1 in the notes to the 2021 consolidated financial statements.

1.4.3.5 Specific balancing and capacity perimeters for Purchase Obligations and sales to markets

Regulatory notice

EDF is a mandatory purchaser of the electricity generated by the generation facilities the government wishes to support and develop (renewable energy sources and energy efficient cogeneration). By law (Article L. 121-7 of the French Energy Code), the additional costs stemming from this obligation are offset for EDF on the basis of an electricity market benchmark price (concept of "avoided cost"). Following the CRE resolution of 16 December 2014, all electricity purchased in this manner is managed within a dedicated 'balancing perimeter' for installations subject to Purchase Obligation (OA) agreements, implemented on 1 July 2015.

(1) Source: RTE.

The DOAAT organises the sale of the energy produced by the installations under Purchase Obligation contracts directly on the energy markets, which makes the management of this perimeter completely independent of that of the EDF portfolio. Thus, since November 2015, electricity volumes under Purchase Obligations that can be forecast over the short-term (one day for the next, known as the "random component of the Purchase Obligations") are sold on EPEX Spot. Since January 2016, the volumes which are foreseeable over the long term (share of the Purchase Obligations referred to as *quasi certain*) have been sold via transparent and non-discriminatory requests for bids.

Similarly, within a dedicated Purchase Obligation perimeter, the Upstream-Downstream Optimisation & Trading Division (DOAAT) carries out certification of the capacity of production installations subject to Purchase Obligations, together with the necessary rebalancing and sales to the market of the related capacity guarantees.

Since 1 January 2017, the management costs for this public-service mission have been offset.

1.4.4 Regulated transmission and distribution activities in France



Power transmission and distribution activities in mainland France are the remit of the transmission system operator (RTE) for high and extra high voltages, and of distribution network operators (Enedis and LDCs in their respective exclusive service areas) for medium and low voltage.

RTE, which is an Independent Transmission Operator (as defined by EU law), and Enedis are subsidiaries that are managed in accordance with the rules on management independence, as provided for by the French Energy Code.

1.4.4.1 Transmission - Electricity Transmission Network (RTE)

105,970km

HIGH AND EXTRA HIGH
VOLTAGE CIRCUITS

51

CROSS-BORDER LINES

407TWh

WITHDRAWALS IN 2021
ADJUSTED FOR WEATHER EFFECT

€1,578 million

INVESTMENTS IN 2021

Réseau de Transport d'Électricité (RTE) was founded on 1 July 2000 and has been a subsidiary since 1 September 2005. It is the owner and operator of the French electricity transmission network, which it operates, maintains and develops. At the end of 2021, with less than 100,000 kilometres of overhead power lines, more than 6,000 kilometres of underground power lines, 2,900 substations operated individually or jointly, and 51 cross-border lines, this is one of the largest networks in continental Europe. RTE's geographical location places it at the core of the European electricity market.

RTE guarantees the correct operation and safety of the electricity system, and provides free and fair access to all the network users. In its role as an industrial operator with responsibility for energy transition, RTE is optimising and converting its electricity network in order to be able to connect generation facilities, irrespective of future energy choices. RTE contributes its expertise and publishes reports to assist the public authorities in making informed choices.

As at 31 December 2021, RTE is indirectly owned (50.1%) by EDF via the company Coentreprise de Transport d'Électricité (CTE). Its specific conditions of governance mean that RTE is not fully consolidated by the Group, but rather accounted for using the equity method.

1.4.4.1.1 Governance of CTE and RTE

CTE

CTE is a limited company (*société anonyme*) with a Board of Directors, owned by EDF (50.1%), Caisse des Dépôts et Consignations (CDC) (29.9%) and CNP Assurances (20%). CTE holds 100% of the share capital of RTE. In accordance with its articles of association, the sole purpose of CTE is the acquisition and holding of RTE's shares, and more generally, all commercial, financial, intangible and tangible property transactions relating directly, or indirectly, to its corporate purpose or that may facilitate the fulfilment thereof or stimulate business growth.

CTE's Board of Directors is composed of eight members, who are appointed for a term of six years, including four EDF representatives, two CDC representatives and two CNP Assurances representatives. RTE's Compliance Auditor General attends meetings of CTE's Board of Directors.

RTE

RTE is a limited company (*société anonyme*) with both an Executive Board and a Supervisory Board. RTE's Supervisory Board is composed of twelve members appointed for five years. Six are representatives of the shareholder CTE, two are appointed pursuant to Articles 4 and 6 of Ordinance no. 2014-948 dated 20 August 2014 on the governance and equity transactions of companies in which the State holds shares (the French State and the Board member appointed at the proposal of the French State), and four are employee representatives.

Other individuals attend Supervisory Board meetings but are not members:

- a Government Commissioner;
- an Auditor General from the CGEfi (*Contrôle général économique et financier*);
- the Secretary of RTE's Central Social and Economic Committee (CSE-C);
- RTE's Compliance Auditor General;
- the members of RTE's Management Board.

RTE's Management Board is made up of five members, who perform their duties under the oversight of the Supervisory Board, within the limits fixed by the French Energy Code and RTE's articles of association. Subject to the prior agreement of the Ministry of Energy, the Supervisory Board appoints the President of the Management Board and, at the President's proposal, the other members of the Management Board.

1.4.4.1.2 RTE's activities

In France, RTE manages the public transmission network and carries out its missions under the conditions set out in standard specifications, which were approved by a decree that is applicable until 2051. In accordance with the French Energy Code, transmission network operators must be certified according to a process associating the CRE and the European Commission. This process aims to ensure that the entity concerned fulfils the independence conditions laid down by this Code. RTE obtained certification from the CRE in 2012 and on 11 January 2018 (after of change of shareholder) as an ITO (Independent Transmission Operator). This certification was confirmed by the CRE decision dated 2 July 2020, following the reorganisation of the CDC's shareholdings.

RTE thus manages the transmission infrastructure, guarantees access to the transmission network and manages energy flows.

RTE has to face a variety of challenges in its mission as an electricity transmission network operator:

- integration of the European market;
- extensive restructuring of the generating fleet;
- societal changes reinforcing the constraints of integrating new infrastructures of common interest; and
- maintenance of its industrial facilities in order to meet the requirements of customers and the community at large.

On 25 October 2021, RTE published the main findings of its prospective study entitled *Futurs énergétiques 2050*, which is a detailed analysis of the ways in which the French electricity system is changing. This report sets out consumption trajectories and six power generation mix scenarios that will ensure security of

supply, while complying with the commitments made by France under the 2015 Paris Agreement (COP 21). This ground-breaking work is the first of its kind in Europe, on account of the extent of the analysis provided and of RTE's consultation with the stakeholders.

Regulatory notice

Tariffs for Using the Public Electricity transmission and distribution Networks (TURPE)

Pursuant to Article L. 341-3 of the French Energy Code, the tariff for using the public electricity transmission network is set by way of a reasoned decision by the CRE, which defines the framework, structure, and level thereof.

TURPE 6 HTB was set by a CRE decision dated 21 January 2021, which was published in the French Official Journal on 23 April 2021. This new tariff entered into force on 1 August 2021 for a period of four years, with an initial increase of 1.09%. Over the 2021-2024 tariff period, the decision provides for an average increase of 1.57% annually (based on the scenario of average inflation of 1.07% over the period). The financial return of RTE assets is the result of the product of the regulated asset base (RAB) and a nominal rate before tax. For the 2021-2024 tariff period, the tariff decision set the rate of return at 4.6%. On 1 January 2022, the RAB totalled €15.1 billion ⁽¹⁾. The value of the RAB includes RTE's commissioned industrial assets, minus investment subsidies, and is calculated excluding assets under construction (which are remunerated at the debt rate, i.e., 2.4% as from 2021 pursuant to the TURPE 6 tariff) (see note 5.1.1 "Regulatory change in France" in the notes to the Group's consolidated financial statements in section 6.1).

1.4.4.1.2.1 Maintenance of the transmission infrastructure

RTE manages the assets of the transmission network through maintenance, refurbishment or replacement of structures and emergency repairs.

The gradual integration of new technologies, in particular monitoring, makes it possible to optimise technical policies and to develop conditional and predictive maintenance, which further enhances the effectiveness of each intervention by limiting action to what is strictly necessary. Digitalisation of the grid and large-scale monitoring make it possible to carry out remote diagnosis and deploy new maintenance technologies such as drones, 3-D visualisation, and augmented reality. Alongside this, test and simulation software provide decision support for grid management. Massive data analysis will allow new asset management strategies to be developed, with the potential to achieve different balances between maintenance, renovation, and renewal.

1.4.4.1.2.2 Development and completion of new capital investments

Energy transition is modifying the fundamentals of the French electricity system. In response, RTE is adapting its business in order to prepare for and support these major changes.

Each year, RTE draws up an annual investment programme that is submitted to the CRE for approval. In 2021, RTE's total investments within the scope regulated by the CRE amounted to €1,578 million. The main investments relate to:

- the continuation of construction works on the "Savoie-Piedmont" direct current interconnection between France and Italy and the completion of the "IFA 2" connection between France and the United Kingdom that was commissioned in January 2021;
- the launch of connection works for the future offshore wind farm in Calvados;
- the continuation of the connection works for the Saint-Nazaire, Fécamp and Saint-Brieuc offshore wind farms;
- the completion of the reconstruction of the 400,000V Avelin-Gavrelle line between the south of Lille and the north-west of Arras (commissioned in December 2021);
- the continuation of the construction works on the 400/225kV Sud Aveyron substation and the works to increase the capacity of the 400kV Eguzon-Marmagne line;
- the start of refurbishment works on the 225kV Champagnole-Saône-Génissiat line and the reconstruction of the Champvert Saint-Eloi line;
- the continuation of the local-initiative power line burial works ("MESIL" in Villeneuve-la-Garenne);
- the continuation of the Haute-Durance programme (securing supply to the Haute-Durance Valley).

Over the period 2021-2025, RTE is planning a continual increase of its investment programme (+50% over four years). This reflects, in particular, the implementation of the trajectory presented in the ten-year plan for development of the network (*Schéma décennal de développement du réseau*, SDDR) to contribute to meeting the European climate goals and support energy transition, as well as the changes arising from EU market integration. The programme is characterised by ongoing major investments in the expansion and renewal of the network, and of the IT systems and real estate.

The following are primarily concerned:

- the modernisation of the aging network, with the aim of rebuilding/refurbishing the "network for everyday needs" that was built when electricity became commonplace in French homes during the fifties. Due to the age pyramid of RTE's "network" assets, the increase in renewal investments will be continued during the second half of the decade;
- the development of the offshore network, with projects to connect offshore wind farms that are materialising (commissioning of the St-Nazaire wind farm in 2022) and proliferating (launch of an eighth call for tenders as part of the multi-year energy programme).

As an infrastructure manager, RTE is supporting these changes in the French energy mix and updating its practices, in order to enhance its performance. RTE's 2022 investment programme, which was approved by the CRE amounts to €1,857.2 million.

1.4.4.1.2.3 Operation of the electricity system

The operating procedures for the electricity system and for the management of market mechanisms (including the management of interconnections), and the coordination of networks in Europe are organised in accordance with the European legislative and regulatory texts (network codes, Clean Energy Package, etc.).

Management of the electricity system

RTE manages the flows on the transmission network in real time. It makes use of the resources available to it through the adjustment mechanism to ensure the balance between supply and demand in real time. The cost that corresponds to the adjustments made by RTE and due to the negative differences between the projected flows and those already realised is passed on to the "balance responsible entities" (producers, traders, suppliers, etc.) in proportion to their difference. In the case of a positive difference, RTE compensates the balance responsible entities financially.

Management of the interconnections

RTE manages access to international interconnections in collaboration with the neighbouring European transmission network operators. These interconnections ensure the transmission of energy from one country to another, the operating safety of the electricity transmission networks and the development of the European electricity market. They ensure that electricity market players can sell and purchase energy in another European country, by taking advantage of the price differences on either side of the border, and can better pool the means of generation at the European level (including renewable energies).

Network coordination in Europe

The regulatory texts also define the services that Coordination Centres will provide to the transmission system operators, within a harmonised framework and by implementing complementary and robust terms and conditions of supply between them. The first five services, the complete implementation of which is pending, concern the design of shared network models, capacity calculations, security analyses, the coordination of structure removals and the assessment of the extent to which supply matches demand. The Clean Energy Package includes a list of 16 additional services (*ex post* analyses, regional sizing of reserves, training, etc.) for which the network operators and Coordination Centres are currently designing common methodologies prior to implementation. The first such methodologies will be implemented as from mid-2022.

(1) Amount to be confirmed by the CRE.

1.4.4.1.3 2021 Energy report

In France, the adjusted electricity consumption ⁽¹⁾ (including Corsica) ended 2021 at 468TWh ⁽²⁾. This is an increase of 1.7% compared to the 2020 figure of 460TWh. This increase is attributable to the upturn in the economy after 2020, which was marked by the health crisis.

In 2021, the French balance of trade fell slightly (by 0.2%) compared to the previous year, totalling 43.1TWh ⁽³⁾. The export balance was still positive in 2021, except with regard to the CWE zone ⁽⁴⁾.

The quality of electricity supplied by RTE is estimated on the basis of two indicators: the equivalent outage time and outage frequency. The values of these indicators for 2021 are still provisional. Based on information available to date, the equivalent outage time is 4min 5s (the target set by the CRE is 2min 48s) and the outage frequency is 0.33 (the target set by the CRE is 0.46).

1.4.4.2 Distribution - Enedis



As a distribution network operator, Enedis' main mission is to operate and develop the public electricity distribution network. Enedis guarantees the security and safety of the network, and oversees the balance of electricity flows at all times. Enedis now serves around 95% of the population in continental metropolitan France. The remaining 5% are served by Local Distribution Companies (LDCs).

In 2021, Enedis distributed electricity to more than 37.7 million customers (points of delivery). It enabled feed from more than 514,532 production sites in mainland France by means of a network of around 1.4 million kilometres. In addition to these

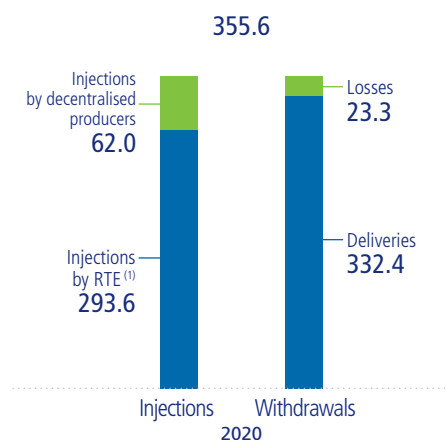
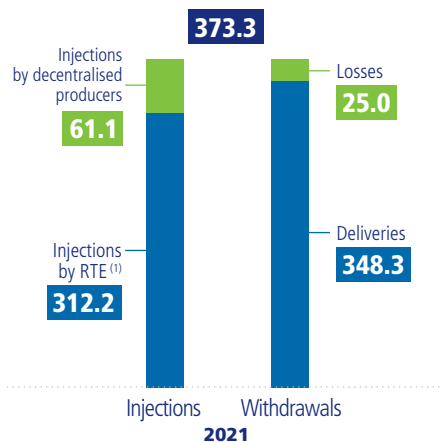
figures, 22,108 producers have declared non-grid-feeding self-consumption installations, bringing the total number of production installations up to 536,640.

At 31 December 2021, the distribution network for which Enedis is the concession holder was made up of around:

- 658,836 kilometres of A-type high-voltage (HVA) lines of 20,000 volts;
- 732,881 kilometres of low-voltage (LV) lines of 400 volts;
- 2,243 HVB/HVA source substations;
- 801,385 HVA/LV transformer stations.

Simplified report of energy flows

(in TWh)



(1) RTE injections volumes are presented net of backfeeding from distribution to transmission grid.

NB: The values correspond to the expression to the first decimal of the precise values.

Electrical losses are inherent in the functioning of the distribution network. They primarily result from physical effects, which are directly dependent on the amount of electricity delivered. Enedis must compensate these losses to complete the amount of energy delivered to all the customers connected to the distribution network.

Energy purchases made to compensate losses recognised in the accounts, including restatements of prior fiscal years, amount to €1,495 million. To compensate these

losses, Enedis buys the corresponding electricity from the wholesale market, either through organised market platforms, or through calls for tender that are open to around 20 qualified suppliers. Enedis also takes part in the consultations organised by the Purchase Obligation mission, within DOAAT.

Enedis' access to ARENH rights to cover losses is implemented, as applicable, through specific calls for tender with a panel of qualified suppliers for this product.

(1) Electricity consumption that would have been observed on the basis of reference temperatures and in the absence of 29 February for leap years.

(2) Data as at 20 January 2022, source: Electricity report.

(3) Source: RTE Electricity report.

(4) Central West Europe, including France, Germany and the Benelux countries, in which market prices have been coupled since 2010.

1.4.4.2.1 Organisation of Enedis

Pursuant to the EU Directives, in order to comply with the rules on non-discriminatory access to networks and on management independence that are binding on network operators, said operators must be independent from any energy supply and production activity. If the distribution network operator is part of a vertically integrated company, it must be legally separate in order to guarantee its functional and decision-making independence.

In this regard, EDF and Gaz de France, now Engie, made their distribution network operators subsidiaries in 2008. ERDF was founded in 2008, and changed its name to Enedis on 1 June 2016. This new name reflects the company's strong commitment to energy transition in the wake of COP21. It will also raise the profile of the network operator and clarify its purpose, as the CRE recommended.

Enedis and GRDF share a "common service" in accordance with the legal framework (see section 1.4.4.2.3 "Service shared by Enedis and GRDF").

- The Supervisory Board comprises fifteen members, of which:
 - eight are appointed by the Ordinary Shareholders' Meeting;
 - five are representatives of the employees elected in accordance with the conditions set out in Law no. 83-675 dated 26 July 1983 relating to the democratisation of the public sector;
 - one member is appointed by the French State by virtue of Articles 4 or 6 of Ordinance no. 2014-948 dated 20 August 2014; and
 - one member, representing the organising authorities for the public electricity distribution network, is appointed by decree pursuant to Article 153 of Law no. 2015-992 relating to energy transition for green growth.
- Pursuant to the possibility offered by Ordinance no. 2014-948 dated 20 August 2014 (Article 15) and in compliance with Decree no. 2015-38 dated 19 January 2015, the French State appointed by a Decree dated 21 April 2020 a Government Commissioner for the purposes of attending the meetings of the Enedis Supervisory Board.
- Since 1 August 2020, the Management Board is made up of five members, who perform their work under the oversight of the Supervisory Board, within the limits fixed by the French Energy Code and Enedis' articles of association.

Enedis' missions in France

Enedis, pursuant to the conditions set by law and the concession contracts signed with each of the public electricity distribution contracting authorities, performs its missions as the public distribution network operator in mainland France. These missions are:

- define and implement operational, investment and development policies in relation to the electricity distribution network;
- provide connection and access for users to these networks under objective, transparent and non-discriminatory conditions, as well as inter-connection with other networks;

GROSS INVESTMENTS MADE BY ENEDIS

(in millions of euros)	2021	2020
Connections and reinforcement	1,856	1,584
Regulatory, safety and transmission channel obligations	499	409
Work instruments and operational resources	458	379
Network modernisation ⁽¹⁾	1,565	1,589
TOTAL INVESTMENTS OF ENEDIS	4,379	3,962
WORK ALLOWANCES BY THIRD PARTIES AND LOCAL AUTHORITIES ⁽²⁾	743	730
TOTAL NETWORK INVESTMENTS	5,122	4,692

(1) Of which Linky: €492 million in 2021, €682 million in 2020, €722 million in 2019, €792 million in 2018 and €612 million in 2017 (rollout costs and costs related to the post-experimentation phase).

(2) After deducting PCT ^(a) and Article 8 ^(b) for the part funded by Enedis.

(a) PCT (portion covered by the tariff): portion paid to project manager contractors from the contributions to the delivery tariff for financing a connection.

(b) Article 8 of Annex 1 of the concession specifications relating to the integration of works into the environment (for example, work to bury power lines).

- provide users with the information needed to access the network efficiently (information protected by regulations or law excepted);
- oversee relations with the energy regulation authorities (Ministry of Energy, the Energy regulation Commission (CRE), public distribution contracting authorities) in line with its activities;
- oversee relations with local authorities in respect of its activities;
- negotiate, conclude and manage concession contracts;
- operate, maintain and repair the electricity distribution networks;
- design and build infrastructure, as well as manage work on these networks;
- carry out metering activities for users connected to the networks, particularly as regards supply, installation, meter inspection, maintenance and renewal of metering devices, as well as managing data activities and any other missions relating to its work as a whole;
- ensure that the market works properly, and provide equal access to the network and data for market players;
- encourage the integration of renewable energy in the grid and the implementation of energy efficiency initiatives;
- ensure the monitoring of the load shedding perimeters;
- be the guarantor of the distribution and accounting of energy flows between the network user players, and the fair compensation of losses on these networks.

1.4.4.2.2 Distribution activities

Change in investments

In 2021, Enedis invested €4,379 million. €1,856 million was earmarked for connections (consumers and producers) and adjusting the grid to the load. €2,064 million was dedicated to the quality of the service, to securing the networks, to the security and preservation of the environment and rolling out the Linky meters. These are all areas where the identified expectations of customers, local authorities and contracting authorities are particularly strong. Lastly, €458 million was invested in information systems and operational resources (vehicles, machinery, real estate, etc.).

Investments in connections are at their highest level since 2015 due to a sharp increase in demand. On the customer side, this is driven by individual and multi-family housing, and charging points for electric vehicles. On the producers' side, this is the result of the impacts of energy transition and the growth of renewable energies (wind and solar power).

In addition, the contracting authorities invested €743 million in 2021. In all, almost €5,122 billion was therefore invested on the distribution networks in 2021 in mainland France.

Furthermore, Enedis continues its efforts in the preventative maintenance of networks, including work relating to tree topping. This came to €332 million in 2021 (compared to €314 million in 2020).

Quality of service

Quality of service is one of Enedis' main objectives. In 2021, the average outage time, excluding transmission incidents and exceptional incidents, was 57 minutes. This result, one of the best in 15 years, stems from the combination of a relatively favourable year of weather and the benefit of the resilience initiatives taken in recent years. The quality of service provided is also reflected by maintaining steady voltage levels, kept as close as possible to the level set by regulations, and by minimising the number of outages.

To respond to large-scale incidents, Enedis relies on an Electricity Rapid Intervention Force (FIRE). This system allows it to mobilise, at any time, in an affected region, the teams and resources from other regions in order to restore customers' electricity as rapidly as possible. In 2021, FIRE intervened on five occasions.

Development of renewable energies

Within the Enedis scope, in 2021, the number of solar panel generation installations connected to the network grew significantly, with 2,539MW of new photovoltaic facilities connected (compared to 876MW at the end of 2020). The increase in wind power generation connected to the public distribution network also continued, with 1,008MW connected in 2021 (compared to 789MW in 2020).

At the end of 2021, a total of around 27.8GW in photovoltaic and wind power generation was connected to the Enedis grid. It is made up respectively of 11.7GW from photovoltaic plants and 16.1GW from wind power generation. To the power thus generated are added other sources of power generation, in particular hydropower plants (1.6GW), cogeneration (2.6GW), biogas, biomass and dispatchable fossil-fuel thermal. In all, at the end of 2021, the generation fleet connected to Enedis was around 33.9GW.

In 2021, more than 51,790 photovoltaic self-consumption facilities were also connected, representing close to 96% of the year's connections for small producers.

In addition, Enedis has continued its efforts to develop capacities for accepting renewable energies. It has initiated construction work on sources as part of the regulatory framework in the regional plans for the grid connection of renewable energies.

Electricity market

The number of market players continued to increase in 2021. In five years, the number of balance responsible entities increased by 37% and the number of suppliers doubled. At the end of 2021, 70 balance responsible entities were active. Enedis reconstitutes the flows within their scope in order to provide information to the balance responsible entity mechanism managed by RTE. 93 electricity suppliers, which operate on the French market, have a contract with Enedis that sets out the operating procedures between the supplier and distributor when the customer takes out a single tapping contract that encompasses the supply and delivery of electricity. Moreover, more than 470 new third-party players have a contract with Enedis to exploit granular consumer data, with the consumers' authorisation, for energy services-related purposes.

Regulatory notice

Tariffs for Using the Public Electricity transmission and distribution Networks (distribution TURPE)

Over 90% of Enedis' sales are made up of revenues made from electricity transmission. The Tariff for Using the Public Electricity transmission and distribution Networks (TURPE), in terms of levels and structure, is set by the CRE in a transparent and non-discriminatory manner, in order to cover all the costs borne by efficient network operators. See section 5.1.1 "Regulatory change in France" of the notes to the Group's consolidated financial statements.

Concessions

At 31 December 2021, Enedis and EDF were co-concession holders of 415 concessions contracts, covering around 95% of the population in continental metropolitan France.

The concession contracts are generally concluded for a period of 25 to 30 years.

On 21 December 2017, the French National Federation of Licensing Authorities (Fédération nationale des collectivités concédantes et régies, FNCCR), France Urbaine, EDF and Enedis signed a framework agreement based on a new concession agreement model. Twenty-five years after the 1992 agreement with the FNCCR, this new framework agreement includes France Urbaine, which represents municipalities, large urban inter-municipalities and cities. Most of its members have contracting authority status for public distribution of electricity.

The new standard agreement endorsed by this agreement restates the principles of the French concession model: public service, regional solidarity and national optimisation, while at the same time taking into account issues involving energy transition. The official introduction of this new model opens the way to a modernised and lasting relationship between Enedis and the contracting authorities.

Despite the health crisis, renewal of concession agreements continued at a sustained pace in 2021. At 31 December 2021, 291 concession contracts had thus been entered into on the basis of the new model. Negotiations have continued with the goal of renewing the remaining contracts that were signed using existing contract templates, as soon as possible.

Regulatory notice

French legal system applicable to concessions

In accordance with Articles L. 121-4 *et seq.* and L. 322-1 *et seq.* of the French Energy Code, and Article L. 2224-31 of the French Local Authorities Code, the public distribution of electricity is operated under a system of public service concessions. Pursuant to this body of law, the contracting authorities organise the public electricity distribution service through concession agreements and general specifications that set forth the respective rights and obligations of the contracting authority and the operator. Currently, the contracting authorities are most often public institutions formed by associations of several municipalities cooperating together, some of which may cover an entire *département*.

The separation of production and supply activities on one hand, and network activities on the other imposed by European Directives has led to the identification of a public service with two distinct missions: on the one hand, the regulated tariff supply mission entrusted to EDF and the LDCs in their respective exclusive service areas and, on the other hand, the development and operation of the public electricity distribution networks, entrusted to Enedis and the LDCs in their respective exclusive service areas, and EDF for areas not interconnected to the continental metropolitan network.

Article L. 334-3 of the French Energy Code specifies that concession contracts must be tripartite, signed by the contracting authority, the distribution network operator (or the territorially competent LDC) for aspects relating to the management of the public distribution network, and by EDF (or the territorially competent LDC) for aspects relating to regulated tariff distribution.

Within the limits defined by statute and by case law precedent, the contracting authorities are the owners of the distribution networks, which constitute returnable assets ⁽¹⁾.

Pursuant to Article L. 3213-1 of the French Public Procurement Code, which transposed Article 10.1 of Directive 2014/23/EU of the European Parliament and of the Council of 26 February 2014 into domestic law, concession contracts for the operation of the public distribution network and the supply of electricity at regulated tariffs are concluded directly, *i.e.*, with no publicity and competitive bidding procedures.

1.4.4.2.3 Service shared by Enedis and GRDF

The common service function shared by Enedis and GRDF ⁽²⁾ is not a legal entity in its own right. Enedis and GRDF's relations in this common service are governed by an agreement that defines the scope of the service and the resulting division of costs. The agreement has an indefinite term and can be terminated at any time subject to 18 months' notice: in such a case, the parties undertake to renegotiate the agreement during the notice period. It is updated regularly. In 2019, the governance agreements between Enedis and GRDF were completely reviewed.

(1) Returnable assets are those that must imperatively be returned to the contracting local authority at the end of the concession. These assets are deemed to have belonged to this local authority from the outset. They are defined by the concession contract or even by the law. Unless stipulated otherwise, assets that are essential for the performance of the concession service are generally regarded as being returnable.

(2) Defined by Article L. 111-71 of the French Energy Code.

1.4.4.2.4 Future challenges

In order to address the complexity of Energy Transition, the electricity distribution network is continuing its digital revolution.

It is becoming increasingly complex to manage and coordinate electricity networks in real time. This is linked, in particular, to the huge influx on the distribution network of electricity generated from renewable sources, which are by nature intermittent.

In this context, and in order to respond to the challenges of ecological transition, Enedis is drawing on new digital technologies that make it possible, among other things, to fit networks with hundreds and thousands of sensors. This will allow for improved management of electricity flows, but will also make the networks more resistant to climate hazards. Enedis' goal is thus to increase its investments significantly, starting in 2022, to €3.6 billion (excluding Linky meters), and ultimately to €4 billion by 2025. Enedis plans to maintain at least this level until 2035, which represents cumulated investments of more than €60 billion. Enedis has also developed scenarios with a 2050 horizon concerning network transformation.

To date, the rollout of smart grid technologies on an industrial scale is crucial as a means of making it possible to accelerate ecological transition. The leading example is the Linky bi-directional meter. The widespread rollout phase of the Linky meters, which was launched on 1 December 2015, was completed on 31 December 2021. This rollout is a success: the final cost of the project is less than the initial budget, the deadlines were met and the metering system is performing satisfactorily. The cumulated investments (2014-2021) total €3,907 million, which correspond to 34.26 million Linky meters installed ⁽¹⁾, 34 million of which provide access to all services. The percentage of Linky meters installed was thus 90.1%, slightly above the benchmark value defined by the CRE for the end of 2021 (90%). The equipment to household ratio of smart meters that provide access to all services is 89.4%, in excess of the incentive target set by the CRE (84.5% at the end of 2021).

Regulatory notice

Linky regulation

The Linky project, led by Enedis, is subject to a specific regulatory framework regarding the lifespan of the meters (20 years), with a dedicated regulated asset basis (RAB) for the meters installed between 2015 and 2021 and the associated information systems.

The CRE's decision dated 17 July 2014 thus set a nominal return rate before tax of 7.25% for the assets and a 3% additional premium combined with an incentive regulation concerning compliance with costs, deadlines and system performance, which brings the total return on the RAB to 10.25%. The incentive regulation can also result in penalties that potentially reduce the net return, although not below a minimum amount set at 5.25%. As provided for in the decision dated 17 July 2014, the incentive regulation of the system's performance for 2020 and 2021 was set by the CRE in a decision dated 23 January 2020.

In addition, a deferred surcharge, which is designed to ensure that Linky remains tariff-neutral for customers, means that some Enedis income for the 2014-2022 period will be shifted to the 2023-2030 period. This deferred surcharge, plus an amount to cover financing costs (set at 4.6%), will thus be collected in full by the end of 2030. At 31 December 2021, the surcharge to be collected is +€1,954 million (this represents a claim by Enedis against network users, which is not recognised on the Group's balance sheet at 31 December 2021, pursuant to the accounting standards in force on this date).

Enedis is also determined to publicise and enhance the services that are made possible with Linky, in particular the creation of new offers by suppliers and the release onto the market by equipment manufacturers of smart devices that can interface with Linky (charging stations that start up during cheap rate periods, automatic management of charging, assistance with consumption management for vulnerable customers, etc.).

Enedis also aims to equip more than 25,000 public distribution substations with smart objects by 2025. Enedis has also developed and launched new source substations, which are a key grid component, on an industrial scale. These are source substations that can be brought online quickly, the design and factory pre-assembly of which make it possible to save one year in terms of connection time to a generator, while optimising their cost. One-quarter of the substations that will be built between now and 2035 will be based on this system.

Innovation is crucial for optimising investments and operating infrastructures with a high degree of efficiency, while taking into account eco-design as from the launch phase of projects. The digital revolution on Enedis' grids and in its business lines is undertaken in cooperation with the entire innovation ecosystem, in the fields of both smart grids and FrenchTech. This innovation policy systematically draws on the support of research laboratories, universities, start-ups, associations and undertakings of all sizes. This approach represents job and growth opportunities for local communities and gives these achievements international visibility.

Enedis (with RTE) was thus behind the creation of Think Smartgrids, the association of the *Français des Réseaux Électriques Intelligents* sector that promotes the smart grid industry internationally. It currently has over a hundred members.

Data management, a key aspect of the digital revolution

In a few years, Enedis has also become one of the energy sector's leaders in the field of data. At present, around 500 types of data per year are made available to customers, local authorities and market participants. Enedis was one of the first companies in its sector to launch a Europe-wide Open Data platform. It was also the driving force behind the creation of the ORE (Energy Grid Operators) Agency ⁽²⁾, which brings together all the electricity and gas network operators in France. This Agency releases comprehensive data on all the operators.

Enedis' remit to collect, protect and make data available has made it possible to develop industrial solutions for the entire French population, along the same lines as the Linky programme. The use of this data is of strategic interest to Enedis. This data also makes it possible for Enedis to improve its industrial performance and the quality of the service provided to customers. This moreover raises significant new challenges in the field of cybersecurity and requires enhanced protection of systems and data. All of Enedis' information systems comply with the rules on individual data protection. In this regard, Enedis complies with the standards and rules laid down by the French Data Protection Agency (Commission nationale informatique et liberté, CNIL).

A public service with a positive impact that supports ecological transition

Enedis is a major player in the French electric system, and is convinced that there can be no industrial and economic performance without exemplary conduct from a social, societal and environmental standpoint.

Enedis has put together a company project for the years 2020-2025. It is based on a ground-breaking experiment involving dialogue with internal and external stakeholders that was launched in May 2020. Upon completion of this consultation, Enedis was able to assert its values and its informal *raison d'être*: "Become France's preferred public service that supports ecological transition in local communities".

Expectations on the subject of Corporate Social Responsibility (CSR) have very clearly emerged. Consequently, the company's CSR policy has been made clearer and thus more visible. It sets out new principles, such as exemplary conduct in the role of employer, greater integration of stakeholders in regional governance, sharing of data from smart meters for improved proficiency in the new uses of electricity, and the development of the local communities and the contribution to their sustainable development policies.

The goals and commitments of this new CSR policy are organised around three pillars: public service that has a positive effect for the planet, for women and men, and for local communities. They are divided into 15 key actions, which are part of the efforts to achieve 10 of the UN's 17 Sustainable Development Goals.

(1) Including experimental meters.

(2) The ORE Agency federates all the French electricity and gas distribution market participants. It provides an overview of distribution in France, using a one-stop-shop approach, and makes data available free of charge. It provides aggregated data on multiple energy types and multiple network operators in order to support energy transition in local communities throughout France, using an open data approach and in the form of data visualisations.

France in the lead as a result of Enedis' smart grid

The French public electricity distribution service scored highest in the 2021 edition of the SGI ⁽¹⁾. It received the highest score for the smartness of its grid out of all the countries measured ⁽²⁾. Based on several criteria, Enedis' overall score was 96.4% (of 100%). Enedis is maintaining its industrial, technical and technological momentum with a view to making the public distribution network in France a global benchmark for years to come.

Action to mitigate climate change

Enedis aspires to contribute to achieving "carbon neutrality" by 2050 by drastically reducing its own greenhouse gas emissions. Above and beyond this, it wishes to undertake an ambitious initiative with its suppliers in the spirit of the French Supplier Relations and Sustainable Procurement label (*Relations Fournisseurs Achats Responsables*, RFAR). Residual emissions will be offset by the financing of certified and auditable projects, through, for example, reforestation operations, most of which are planned after 2030.

Enedis also intends to contribute to achieving COP21 targets by accelerating the large-scale rollout of low-carbon electricity solutions and the controlled consumption of electricity by means of smart meters and smart grids.

Enedis will help to achieve carbon neutrality by 2050 by drastically reducing the 1.2Mt CO₂eq of its own emissions (Scopes 1 and 2) and by driving an ambitious procedure with its suppliers and providers to reduce the figure of 2.4Mt CO₂eq (Scope 3) to the greatest extent possible.

To achieve an initial target of a 20% reduction by 2025 compared to 2017 (the year of the last overall CO₂ balance), Enedis plans the following:

- ongoing electrification of its vehicle fleet, aiming for 100% of its light commercial vehicles to be electric by 2030, and 100% of its construction vehicles to be electric by 2050 at the latest (at the end of 2021, the company's fleet comprised 3,647 electric vehicles, i.e. 20.5%);
- progressive replacement of its backup generators with low-CO₂-emission mobile solutions (batteries, fuel cells);
- reduction of its SF₆ emissions through optimised maintenance of source substations and a change of technology to new HV cells (already implemented by some of its suppliers);
- reduction of its emissions arising from loss purchases by means of a lower electricity emission factor, as renewable energy production replaces some high-carbon power generation;
- reduction of the energy consumption of its service sector sites, including those relating to information technology, at the reduction rate specified in the "service sector decree" (*décret tertiaire*) (40% less in 2030 compared to 2010);
- optimisation of personal and professional travel through the development of teleworking, reducing the number of call-outs to customers by means of the Linky meter, and reducing the number of face-to-face meetings, which are increasingly being replaced by videoconferences;
- making its suppliers and providers commit to moving towards carbon neutrality by leveraging commitment charters, environmental criteria, eco-design of equipment, and the use of recycled materials. To this end, in 2021 Enedis proposed a day of "raising awareness of decarbonised purchases" involving all Enedis' purchasers.

Enedis will be a key player in the implementation of France's National Low Carbon Strategy, by favouring innovative electricity solutions, replacing fossil energy, and deploying smart management of the electricity system to manage consumption.

Enedis is also mobilised in several other ways:

- facilitating the integration of new electricity solutions in the distribution network: renewable energy (67GW of renewable energy by 2035), electric charging stations (12 million connected to the network by 2035), self-consumption, and storage;
- developing the use of electricity and of more efficient processes, such as heat pumps;
- controlling consumption by means of smart electricity grids and smart meters;
- ensuring smart management of the electricity system at controlled cost, by developing new forms of flexibility.

To validate its low-carbon strategy, Enedis will contribute to the greenhouse gas reduction commitments made by the EDF group with a view to obtaining Science Based Targets (SBTi) certification, an initiative led by the EDF group.

In addition to its pro-climate actions, Enedis is working to preserve biodiversity. For example, it has initiated actions to protect birds from the risk of electrocution through its partnership with the French Bird Conservancy Society (*Ligue de protection des oiseaux*, LPO) that was renewed in 2021. It supports other initiatives through the *Entreprises engagées pour la nature* programme, which is run by businesses that are committed to nature conservation.

Moreover, Enedis has undertaken a vast operation to raise the awareness of its employees to climate change through increased use of the "Climate Collage" (see section 3.1.3.5.2 "Innovation and collective intelligence focused on climate action" – the "Climate Collage"). At the end of 2021, the awareness of almost 5,000 employees had been raised through workshops on the causes and consequences of climate change.

Moreover, the Enedis plan for adaptation to climate change is currently being finalised. It has been produced in accordance with the principles of the TCFD (Task Force on Climate-related Financial Disclosures) and takes into account both the physical and transition risks.

1.4.4.3 Island Energy Systems

Island Energy Systems (IES) brings together the electricity systems operated by EDF that are not connected to the mainland metropolitan network. These provide power to Corsica, the overseas *départements* (except Mayotte) and the overseas territories of Saint-Barthélemy, Saint-Martin and Saint-Pierre and-Miquelon, as well as several of the Ponant Islands (Sein, Ushant, Molène and Chausey).

EDF's organisation in these regions is based on two structures:

- the Island Energy Systems (IES) Department, which is responsible for the supply and demand balance on a daily basis. It manages all the networks and carries on a sales and marketing activity with regulated sales tariffs, guided by an active energy efficiency policy;
- the subsidiary EDF Production Électrique Insulaire (EDF PEI), which is responsible for building and operating new means of generation.

The additional generation costs in these territories compared to the equivalent costs on the mainland are regarded by the legislature as a public service cost and, as such, are offset by the State budget.

The costs incurred by the network operator are, in contrast, covered by the Tariffs for Using the Public Electricity transmission and distribution Networks (TURPE) paid by network users and by the Electricity Equalisation Fund (*fonds de péréquation de l'électricité*, FPE).

(1) 2021 edition of the Singapore Power Group Smart Grid Index. The Smart Grid Index measures the smartness of power grids globally by comparing more than 80 utilities across 37 countries, in seven key dimensions, such as green energy, data analytics, DER integration, digitalisation, cyber security, customer satisfaction, etc. The comparative analysis also identifies the best practices to build smarter grids that deliver better value to customers.

(2) Distribution Network Operator.

IES KEY METRICS

	Data at end-2021
	Total
Number of customers	1,200,000 approximately
Network length (in km)	38,900 approximately
Net installed capacity of the fleet * (in MW)	2,005
of which hydropower fleet and other renewable energy sources	22%
of which thermal fleet	78%
Net output * (in GWh)	6,061
of which hydropower output	23%
Purchases of energy from third parties (in GWh)	3,904
of which renewable energies, including bagasse	49%
of which other energies	51%
TOTAL ENERGY GENERATED * AND PURCHASED FROM THIRD PARTIES	9,965

* Data including the EDF IES Division and EDF Production Électrique Insulaire (PEI), a wholly-owned subsidiary of the EDF group.

Changes and outlook

Investments to decarbonise and reinforce the electricity generation fleet

The electricity generation plants commissioned by EDF PEI between 2012 and 2015 in Réunion, Martinique, Guadeloupe, and Corsica are equipped with innovative technology. They make it possible to deliver the best industrial and environmental performance. They also help to meet some of the emerging electricity needs of these territories.

In accordance with the local multi-year energy programmes (PPE), the EDF group has undertaken to replace the main power plants that are at the end of their useful lives. The new power plants will be constructed and operated by the subsidiary EDF PEI. In areas where this is specified in the PPE, EDF PEI is planning to operate new power plants that will use liquid biomass (to meet the requirements of the RED II Directive) or gas (on Corsica).

EDF PEI is also considering converting its existing plants to bioliquid.

EDF PEI is currently a partner in a photovoltaic plant with battery storage in French Guiana, and in a wind power plant with battery storage in Martinique (commissioned in 2019). EDF PEI is also strengthening its renewable energy capacity through common projects with EDF Renewables.

Investments in electricity networks

The continued increase in consumption in most of these communities, despite being offset to a certain extent by the energy efficiency actions undertaken, the development of renewable energies and the growing number of generation facilities coming online, have led the EDF network operator to continue the expansion and reinforcement of the electricity networks. In total, EDF group invested over €300 million in Production (including EDF PEI) and Network activities in 2021.

A commitment to projects devoted to improved integration of renewable energies in the electricity generation mix and to optimising the management of electrical systems

France's Energy Transition Act establishes 2030 as the target date for energy autonomy for the French overseas *départements*, and 2050 as the target date for Corsica.

The EDF group supports the emergence and development of electricity generation methods based on renewable energies adapted to Island Energy Systems: biomass, marine and river energies, waste recovery and biogas. The methods favoured are those that provide abundant and guaranteed energy, at competitive generation costs that are also sustainable over time. The aim is to position them as credible alternatives to thermal generation.

EDF also contributes to improving technical capacities for the introduction of non-synchronous renewable energy generation into IES. It proposes changes to their

technical specifications, by adapting the electricity system to make it more resistant to power disruptions, and by developing smart metering systems.

EDF has also brought online and manages several centralised storage systems that are used as a power reserve, in the event of loss of a generation means, or to cover peaks in consumption.

Work is ongoing to create micro-networks that are 100% powered by renewable energies in certain isolated areas. In 2017, an innovative system combining photovoltaic, digital monitoring and storage was installed on the Island of Sein. It provides a supply of 100% renewable energy for several hours each day. Part of the Cirque de Mafate on Réunion is supplied with solar power, and is equipped with a battery and a hydrogen fuel cell. In 2021, in Saint-Georges-de-l'Oyapock in French Guiana (4,000 inhabitants) EDF commissioned a micro-network that is fuelled solely by renewable energy (hydropower and solid biomass), combined with a battery and a smart management system.

Energy efficiency is a crucial energy transition lever in the island systems. EDF contributes to the elaboration and implementation of the demand-side management (DSM) territorial strategy. One of the main tools are capital grants (over €600 million approved by the CRE for 2019-2023). EDF actively promotes DSM operations financed by these grants for all types of customers, particularly through the *Agir Plus* label.

EDF has committed to deploying 1.2 million digital meters in the overseas *départements* (excluding Mayotte) and Corsica by end-2023. This represents an investment of €268 million. These digital meters will contribute to an extensive modernisation of customer relations and enhance the effect of energy transition drivers. At end-2021, over 715,000 meters had been installed.

1.4.4.4 Électricité de Strasbourg (ÉS)

The ÉS group is an Alsatian energy producer that is committed to the long-term energy and economic performance of the area it serves through its four business lines: electricity distribution ⁽¹⁾, energy supplies, energy services and renewable energy generation. This portfolio of business lines enables the ÉS group to provide the best possible support to its customers for energy transition.

ÉS also provides services to Local Distribution Companies (LDCs), primarily in eastern France.

EDF Développement Environnement (EDEV) owns 88.64% of the ÉS group. The remaining shares are owned by the public and the company's employees. Its shares are listed on Euronext Paris.

1.4.4.4.1 Distribution

Strasbourg Électricité Réseaux is the ÉS subsidiary in charge of distribution. It acts as a network operator for the electricity distribution network in accordance with the rules on management independence.

Strasbourg Électricité Réseaux operates, maintains, develops and renews an electricity network of over 15,000 kilometres in the 400 Alsatian municipalities that chose it to operate their electricity distribution networks under concession

(1) The distribution business line is managed by Strasbourg Électricité Réseaux in accordance with the rules on the management independence of network operators.

agreements. These concession agreements were renewed between 1993 and 2001 for a term of 40 years. The area serviced covers three-quarters of the Bas-Rhin *département*. It includes more than 575,000 points of delivery for various voltage levels, as well as connections with the Enedis network and two other downstream network operators.

1.4.4.4.2 Sales and marketing

ÉS Énergies Strasbourg is the sales and marketing subsidiary of the ÉS group. At end-2021, ÉS Énergies Strasbourg supplied power to more than 563,000 electricity customers (including renewable source electricity), and more than 113,000 gas customers, both individuals and businesses (in the tertiary and industrial sectors) as well as local authorities.

In addition to supplying electricity and gas, ÉS Énergies Strasbourg offers related services. These include electricity, gas and plumbing corrective maintenance and digital services designed to help customers better manage their energy consumption. For its individual customers, ÉS Énergies Strasbourg has continued the implementation of support services. They cover the renovation and construction of housing, *via* a portal that puts customers in touch with a network of local partners. ÉS Énergies Strasbourg is also active in the development of solar power. It promotes sustainable transport, in particular charging infrastructures for electric vehicles.

1.4.4.4.3 Energy services

ÉS Services Énergétiques, a subsidiary that specialises in energy services, is owned by ÉS and Dalkia on a 50-50 basis. In the field of energy transition, ÉS Services Énergétiques has positioned itself as a provider of sustainable solutions and a creator of energy performance. It provides attractive solutions on world performance markets and for energy performance contracts, as well as for managing and securing networks (heat, electricity, and public lighting networks). It also carries out engineering work for mass catering providers. ÉS Services Énergétiques operates three major heating networks in Eurométropole de Strasbourg, as well as the biomass power plant that provides these networks with green energy, which makes it possible to avoid 40,000 tonnes of CO₂ emissions per year, *i.e.*, the equivalent of emissions from 17,000 cars.

1.4.5 International activities



EDF group supplies electricity and gas to some 38.5 million customers worldwide: residential customers, businesses, and local government. It is a major energy provider on key European markets: France, the UK, Italy, and Belgium. The Group is seeking to move into new geographical areas, developing low-carbon solutions in growing countries and strengthening its positions in Europe.

1.4.5.1 United Kingdom

EDF group activity in the United Kingdom (UK) is led by EDF Energy and EDF Trading (see 1.4.6.3 "Optimisation and Trading: EDF Trading") and also consists of other Group companies (Imtech, EDF Renewables UK, Pod Point).

The purpose of EDF in the UK, the country's largest low-carbon electricity producer, is to help Britain achieve Net Zero. It does this by leading the transition to a decarbonised energy system in its seven business areas:

- the generation of electricity in the UK and delivering decommissioning services;
- the supply of electricity and gas and energy solutions to residential and business customers;
- building a new nuclear power station at Hinkley Point, in partnership with CGN;
- developing further new nuclear power stations;
- renewables, through EDF Renewables UK, which is a subsidiary of EDF Energy and a joint venture (JV) between EDF Energy and EDF Renewables;
- technical services, energy and low-carbon solutions at customer sites through Imtech, in JV with Dalkia;
- electric mobility industry.

1.4.4.4.4 Renewable energy generation

Deep geothermal energy

In France, the ÉS group is one of the leading players in the deep geothermal energy sector. Since 2016, it has operated the first deep geothermal power plant for industrial use in Rittershoffen. The plant's renewable superheated water output is approximately 180GWh/year. This water comes from a geothermal source located at a depth of 2,500 metres.

ÉS also operates the Soultz-sous-Forêts geothermal power plant, which generates around 6GWh/year.

In addition, ÉS launched a third geothermal project, in Illkirch-Graffenstaden to the south of Strasbourg. The work, which started in 2018, is currently suspended following seismic events presumably caused by a third party that affected Eurométropole de Strasbourg at the end of 2020. Moreover, as the technical results of the first borehole were significantly below the target level for future operations, ÉS wrote down these assets during the 2020 fiscal year.

Biomass

The Strasbourg biomass cogeneration plant uses residue from the wood industry in the Vosges and Black Forest mountains. This 37MW thermal power plant produces 70GWh of electricity from renewable sources per year and 112GWh of heat from renewable sources per year.

Hydropower

The Le Framont hydropower plant, which has a capacity of 400kW, was inaugurated in September 2019. Subject to water availability, it can produce approximately 1.5GWh/year, which is equivalent to the annual electricity consumption of 350 homes.

Moreover, since 2011, ÉS has held a 35% stake in Groupe SERHY, a company that specialises in the construction and operation of hydropower plants, primarily in the Alpine and Pyrenean mountain ranges. SERHY produces around 160GWh/year from renewable energy sources.

In addition, EDF Trading is providing optimisation and risk management services to the EDF group as well as third parties.

EDF Energy is one of the UK's largest energy companies and the largest producer of low-carbon electricity. It produces around 14% of the nation's electricity ⁽¹⁾. EDF Energy supplies gas and electricity to around 6 million business and residential customer accounts as at December 2021. The company employs 11,141 people at sites throughout the UK as at December 2021.

EDF Renewables UK operates and develops new renewable generation and storage projects in the UK and Ireland, with almost 1GW of gross capacity in operation and almost 4GW in planning and development, also including development of large-scale batteries and high-volume power connections to enable rapid electric vehicle charging through Pivot Power ⁽²⁾.

Imtech is one of the leading technical and engineering service providers in the UK and active from engineering services and contracting (Imtech Engineering Services and SUIR) to technical facilities management (Imtech Inviron), systems integration and digital solutions (Capula) and energy services and energy performance contracting, especially in the public sector (Breathe).

In electric mobility, EDF has a majority stake in Pod Point, a leading electric vehicle (EV) charging company in the UK ⁽³⁾. In November 2021 Pod Point listed on the London Stock Exchange, with EDF Energy retaining a majority stake. EDF in the UK aims to maintain and build its leading position on UK charging point operations;

(1) Calculation taking into account EDF Energy's electricity production from its nuclear, coal and gas-fired power stations and wind farms in proportion to its percentages of ownership. If EDF Renewables' capacity is added, EDF's total contribution to the country's low carbon electricity is 15.76%. EDF also produced 1.1% of the electricity from coal and gas-fired plants.

(2) <https://www.pivot-power.co.uk/who-we-are>

(3) See EDF press release of 13 February 2020 "The EDF group acquires Pod Point, one of the UK's largest electric vehicle charging companies".

develop smart charging; and offer low-carbon tariffs as well as wider services to support UK drivers in going electric.

EDF in the UK is working to help deliver the UK Government's "10-point plan" for green recovery ⁽¹⁾ including a plan to enable over £50 billion of investment in Britain's low-carbon generation by 2035.

1.4.5.1.1 EDF in the UK strategy and sustainability

EDF in the UK contributes to EDF group's greenhouse gas emissions reduction targets and carbon intensity trajectory. Its Sustainable Business Roadmap explains the progress and plans of the business to help Britain achieve Net Zero and meet wider sustainability objectives. During the year of the COP26 climate conference in Glasgow, EDF in the UK has campaigned both externally and internally with employees to increase awareness of Net Zero and its stakes.

Recent energy price increases, driven by global gas prices, are strongly impacting the UK operating environment. Whilst creating affordability challenges for customers and significant financial pressures on energy suppliers, the crisis has also triggered an unprecedented level of supplier exits from Britain's energy retail market. Following the cessation of trading by Green Network Energy, Utility Point and Zog, EDF stepped in to take on their combined 590,000 residential customers through Ofgem's supplier of last resort process. The price levels have further highlighted the need for investment in low-carbon electricity and technology to end UK's reliance on fossil fuel imports, and the value of reliable, resilient suppliers such as EDF.

In its Customer business, EDF Energy serves 3.7 million British homes and businesses as well as the public sector, delivering industry-leading customer service (EDF has maintained a "Great" rating on Trustpilot and is rated 3rd out of 22 energy suppliers by Citizens Advice based on July-September 2021 data, and 2nd of the large suppliers, as defined by Ofgem). EDF Energy supports British households, businesses and the public sector achieve Net Zero, in areas including electric mobility, low-carbon heating, flexibility services and smart meters combined with data services.

EDF Energy is working toward delivering on its regulatory obligations as a leader on energy efficiency installations through the energy company obligation (ECO) scheme and through a cost-efficient roll-out of smart meters to homes and small businesses, as part of the national programme. In 2021, EDF Energy has installed a further 452k smart meters.

The pandemic, combined with the default tariff cap on the residential GB market, the 2021 energy crisis and a fiercely competitive environment, shows that cost efficiency and an effective, resilient operating model remain key priorities. To evolve its offering and build further on its industry-leading customer service, EDF has announced a commercial partnership with Kraken Technologies to migrate its 3.7 million residential and SME customers onto their market-leading EnTech platform, starting in 2023 with an 18-month timeline to complete the project. The adaptable platform also allows EDF to meet its customers' future energy requirements – whether they are switching to an electric car or installing a heat pump for instance.

In electricity generation, EDF's key priority is to sustain safe, reliable and commercially viable operations. This includes supporting security of supply through the West Burton A coal power station, which has UK capacity agreements until September 2022 when the station will stop generating, two years ahead of the UK Government's deadline to phase out coal.

EDF Energy is already decommissioning the Cottam coal power station that closed in 2019, exploring sustainable decommissioning and deconstruction approaches such as circular economy principles. A key element of a just and low-carbon transition is also workforce support on which EDF has been working closely with trade unions.

In August 2021, EDF completed the sale of the West Burton B CCGT power plant (1,332MW) alongside a 49MW battery on the same site.

EDF's UK fleet of existing nuclear power stations, accountable for supplying around 15-20% of the country's power since the mid-1970s, is in a period of much anticipated change. Since its acquisition of the UK nuclear fleet in 2009, EDF has invested £6 billion and in addition, generated over 30% more low carbon electricity than originally anticipated.

EDF Energy has taken the decisions to move Dungeness B into the defueling phase from June 2021, Hunterston B into defueling by January 2022 and Hinkley Point B by July 2022. The remaining four AGR nuclear power stations are currently due to close by 2028. EDF is responsible for defueling all seven AGR power stations over the next 10+ years under an agreement with UK Government signed in June 2021.

EDF is committed to ensuring nuclear excellence and doing what it can to preserve technical skills and capabilities during this transition period for the nuclear industry.

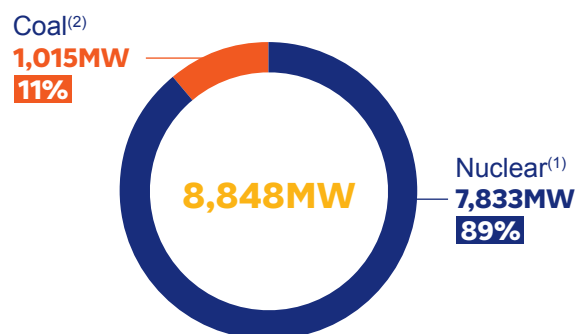
In partnership with China General Nuclear Corporation (CGN), EDF is building two new nuclear units (3.2GW capacity in total) at Hinkley Point in Somerset, based on the EPR technology. EDF Energy is also leading the development of plans for a similar 3.2GW EPR project at Sizewell in Suffolk, with active support from the UK Government and discussions ongoing regarding the funding of the project (see 1.4.5.1.2.5 "Nuclear New Build business"). As a part of its plans, EDF Energy is also exploring models using nuclear to produce hydrogen and heat.

(1) EDF working to help deliver Government's "10 point plan" for green recovery (EDF contribue à la mise en œuvre du « plan en 10 points » du gouvernement pour une « révolution industrielle verte ») <https://www.edfenergy.com/about/green-recovery>.

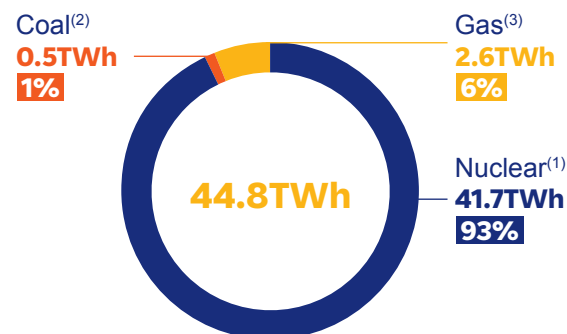
1.4.5.1.2 Activities of EDF Energy

Installed capacity and output of EDF Energy in the United Kingdom - 2021

Installed capacity



Electricity output



(1) The figures shown represent 100% of nuclear capacity and generation output, shared 80%/20% by EDF and Centrica.

(2) Coal capacity represents transmission entry capacity.

(3) Including 1.35MW of Barkantine CHP.

NB: The values take into account rounding.

EDF Energy	31/12/2021	31/12/2020
Electricity supplied ⁽¹⁾ (in GWh)	43,372	40,850
Gas supplied (in GWh)	36,032	29,462
Number of residential customer accounts (in thousands) ⁽²⁾	5,512	4,837
Number of employees ⁽³⁾	11,141	11,717
Total Recordable Incident Rate ⁽⁴⁾	0.71	0.59
Total number of sockets (Pod Point)	153,677	91,610

(1) Power supplied to final consumer including previous year metering cut-offs.

(2) Year-end Figure.

(3) Headcount at the end of the period, including staff on maternity leave. Pod Point employees not included.

(4) Total Recordable Incident Rate: Annual total combined number of Lost Time Incidents, fatalities, Restricted Work Injuries and Medical Treatment Injuries (excluding First Aid)/number of hours worked $\times 1,000,000$. This covers all employees, agency and contractor staff. Excludes EDF Renewables UK and Hinkley Point C project. Accident Frequency Rate (AFR) for HPC is 0.062 at end December 2021.

1.4.5.1.2.1 Regulatory regime applicable to nuclear facilities in the UK

The following regime is applicable to both EDF Energy's generation and new build assets in the UK.

Regulatory notice

Basic nuclear facilities in the United Kingdom

In the United Kingdom, EDF Energy is required, under the Nuclear Installations Act 1965 ("NIA 1965"), to hold a nuclear site licence for each of its existing nuclear power plants and nuclear power plants under development and comply with a certain number of licence conditions. The Planning Act 2008 ("PA 2008") introduced the concept of Development Consent Orders ("DCOs"), which are the authorisations required to build a new nuclear power plant in the UK. The DCO application process involves conducting an environmental impact assessment, implementing environmental mitigation measures and holding a certain number of public consultations.

Office for Nuclear regulation (ONR)

In the United Kingdom, the Office for Nuclear regulation (ONR) and the Environment Agency (EA)/Scottish Environment Protection Agency (SEPA) are responsible for the safety, security, emergency planning and environmental regulation that applies to the UK's nuclear sites.

The ONR is responsible for the regulation and inspection of nuclear facilities and the following laws are overseen by the ONR:

- the Health and Safety at Work Act 1974 (HSWA 1974), which defines EDF's obligations for the safety of workers and others on its sites;

- the Nuclear Installations Act 1965 (NIA 1965), under which operators of nuclear power plants need to obtain a nuclear site licence, comply with that licence and maintain nuclear liability insurance;
- the Energy Act 2013 (Part 3) (EA 2013) conferred statutory body status on the ONR. It also confirmed ONR's purposes in respect of nuclear safety, nuclear site health and safety, nuclear security, nuclear safeguards and transport. Schedule 8 of the Act details the powers of ONR Inspectors;
- the Ionising Radiation regulations 2017 (IRR 2017), which are based on the Basic Safety Standards Directive and provide for the protection of workers and the public against ionising radiation;
- the Environmental Permitting (England and Wales) regulations 2016 and the Environmental Authorisations (Scotland) regulations 2018. The 2016 regulations provide the current permitting framework for radioactive substances. The 2018 regulations provide a framework for the authorisation of environmental activities and currently include only Radioactive Substances activities. The EA and SEPA are the responsible regulators for these 2016 and 2018 regulations respectively.

When assessing the measures that may be required to reduce the risks from activities within the scope of HSWA 1974, the ONR requires risks to be reduced as low as reasonably practicable.

The ONR uses the powers granted to it under the NIA 1965, the EA 2013 and the 36 standard Nuclear Site Licence Conditions as the basis for its monitoring and enforcement regime. The ONR has extensive inspection powers allowing it to inspect nuclear facilities, request documents and conduct investigations. It begins with a detailed review and assessment of the safety of the design and continues throughout the operation and decommissioning of the facilities.

Under the NIA 1965, the ONR is authorised to grant licences to applicants and to impose licence conditions which may be varied or revoked. In particular, the ONR can prohibit certain nuclear operations or revoke the licence of a nuclear site. More commonly, the ONR may agree to specific actions, approve arrangements or require changes/variations to operations. The maximum penalty for non-compliance with safety legislation is an unlimited fine or imprisonment for a term not exceeding two years for directors or both.

1.4.5.1.2.2 Nuclear generation

EDF Energy owns and operates eight nuclear power stations in the UK (15 reactors) with a total capacity of 8.9GW (at 1 January 2021). Centrica plc. (Centrica) holds a 20% shareholding in Lake Acquisitions Limited, the parent company in which the nuclear generation assets sit (except Nuclear New Build).

On 7 June 2021 it was announced Dungeness would not return to service and would be moved to defueling operations with immediate effect. At Hunterston B, Reactor 3 ended power generation on 26 November 2021 as previously planned.

Total capacity at the end of the year was 7.8GW.

Nuclear generation fleet technology

Seven of the eight nuclear power stations are AGR power stations (Dungeness B, Hartlepool, Heysham 1, Heysham 2, Hinkley Point B, Hunterston B and Torness) and the eighth, Sizewell B, is a Pressurised Water Reactor (PWR) power station.

CAPACITY AND OUTPUT BY POWER PLANT

Power Plant	Power ⁽¹⁾ (in MW)	Output ⁽²⁾ (in TWh)	
AGR Power Plants		2021	2020
Dungeness B	1,090	(0.2)	(0.2)
Hartlepool	1,185	5.7	8.5
Heysham 1	1,060	5.8	6.1
Heysham 2	1,240	5.8	8.9
Hinkley Point B	965	4.8	1.8
Hunterston B	985	6.4	2.3
Torness	1,200	6.7	9.9
PWR Power Plant			
Sizewell B	1,198	6.7	8.4
TOTAL	8,923	41.7	45.7
LOAD FACTOR ⁽³⁾		59%	58%

(1) Capacities are stated net of all power consumed for the power stations' own use, including power imported from the grid at 1 January 2021. At 31 December 2021, Dungeness B and Hunterston B Reactor 3 had been moved to defuelling operations and the capacity of the generating reactors became 7,343MW.

(2) Output in each year reflects any refuelling, planned and unplanned outages. Dungeness B imports are excluded from the output from 1 December 2021.

(3) Load factors are obtained by dividing the actual output by the output that would have been achieved by each power plant operated at its stated capacity appropriate for the period. For 2021, Dungeness B has been included up to 31 March and Hunterston B Reactor 3 up to 30 September i.e. the end of the last quarter before end of generation, consistent with the WANO treatment of operational performance indicators.

Operational review of the existing nuclear generation fleet

The nuclear generation fleet produced 41.7TWh during 2021, 4.0TWh less than 2020 (45.7TWh). The reduction in output is largely due to:

- five statutory outages carried out in 2021 versus two in 2020;

Safety and radiological protection

Nuclear safety is EDF Energy's overriding priority. In 2021, 7 events on the International Nuclear Event Scale (INES scale) were recorded, 6 of which were rated at Level 1 (anomaly) and 1 at Level 2 (incident) related to a loss of grid connection to the Heysham site.

EDF Energy operates to strict procedures to minimise and control the radiation doses received by employees and contractors at all of EDF Energy's existing nuclear power stations. In 2021, the average individual dose received by all workers on EDF Energy's existing nuclear sites was approximately 0.050mSv. The highest individual dose received in 2021 was 5.9mSv, with the legal dose limit being 20mSv per year.

Lifetime of power stations

The actual lifetime of each power station is determined primarily by the technical and economic practicability of supporting its safety case. This is assessed at each statutory outage for the following operating period through inspection, maintenance, testing and assessment of plant performance. Following the outage, consent is required from the Office for Nuclear regulation (ONR) before restarting the reactor. The operating period between statutory outages is normally three years for the AGR power stations and eighteen months for Sizewell B.

In addition, every ten years, the stations are subject to a more detailed and wide-ranging Periodic Safety Review (PSR) of design, operational and organisational safety which must also be accepted by the ONR in order to secure continued operation. The next PSR due for submission to ONR is in January 2024 for Sizewell B, with their decision expected in January 2025.

The AGR were designed with a nominal 25-year lifetime, and Sizewell B with a 40 year lifetime. However, with the aggregation of technical information, and operational and safety experience of EDF Energy, it has been possible to extend the expected AGR lifetimes. Since British Energy was acquired by EDF, the AGR lifetimes have been extended by an average of six years.

See also section 2.2.5 "Risks specific to nuclear activities" – Risk 5A "Nuclear plants in the United Kingdom".

- unplanned losses resulting from the suspension of on-load refuelling at Heysham 2 & Torness and a thermal sleeve repair at Sizewell B and securing a boiler tube leak safety case at Hartlepool; partly offset by
- non-recurring losses incurred in 2020, principally Hunterston B & Hinkley Point B graphite safety case outages and a 50% reduction in output from Sizewell B, between May and September 2020, at the request of National Grid, due to significantly lower than normal summer demand.

Planned statutory outages were carried out on Hartlepool Reactor 1, Heysham 2 Reactor 7, Hunterston B Reactor 4, Sizewell B and Torness Reactor 1.

Dungeness B began the year shut down to address a number of safety case challenges. On 7 June it was announced that the station would not return to service and would be moved to defueling operations with immediate effect.

At Hunterston B, Reactor 3 ended power generation on 26 November 2021 and Hunterston B Reactor 4 on 7 January 2022 as previously planned.

Both reactors at Hinkley Point B returned to service at the end of Q1 2021 with the intention to run each reactor for two six-month periods of operation, subject to a

graphite inspection and further regulatory approval between each run. The decision was taken in 2020 to end power generation at Hinkley Point B no later than 15 July 2022.

On-load refuelling is suspended on all four reactors at Heysham 2 and Torness while modifications to a component of the fuelling machine are being pursued. It is expected that refuelling will therefore continue off load through 2022.

The statutory refuelling outage at Sizewell B was extended by three months to address the degradation of a number of control rod drive mechanism thermal sleeves. The station is now back at full load.

CURRENT EXPECTED OPERATING LIVES * AND CLOSURE DATES

Power Plant	Type of reactor	Start of Generation	Power Station Lifetime (Formally Declared)	Life Extensions (Already Formally Declared)	Associated Scheduled Closure Date
Hinkley Point B	AGR	Feb. 1976	46 years	21 years	2022
Hunterston B	AGR	Feb. 1976	46 years	21 years	2022
Dungeness B	AGR	Apr. 1983	38 years	13 years	2021
Heysham 1	AGR	July 1983	41 years	15 years	2024
Hartlepool	AGR	Aug. 1983	41 years	15 years	2024
Torness	AGR	May 1988	40 years	15 years	2028
Heysham 2	AGR	July 1988	40 years	15 years	2028
Sizewell B	PWR	Feb. 1995	40 years	–	2035

* As formally recorded by EDF Energy and approved by the NDA.

Radioactive Waste Management and decommissioning

In the UK, radioactive waste is classified into four categories:

- Low Level Waste (LLW), for which a disposal route exists – including the LLW near-surface Repository at Drigg West Cumbria;
- Intermediate Level Waste (ILW), for which no disposal route is currently available in the UK;
- High Level Waste (HLW) is defined as radioactive waste in which the temperature may rise significantly as a result of the radioactivity, so this factor has to be taken into account in the design of storage and disposal facilities;
- Higher Activity Waste (HAW) – this is effectively HLW, ILW and any LLW that are unsuitable for near-surface disposal.

EDF Energy nuclear generation's strategy for LLW and HAW reflects that the UK and Scottish Governments are focused on application of the waste hierarchy (reduce, reuse, recycle, recover). The use of a range of waste recycling and disposal routes will help to make the best use of the UK's Low Level Waste Repository (LLWR) in Cumbria. Only a disposal route for LLW currently exists in the UK.

HAW is stored for the medium-term in safe, purpose-built facilities at EDF Energy's stations while longer term national solutions are being established within England and Scotland.

Spent fuel from the AGRs is transported to Sellafield nuclear reprocessing site (owned by Sellafield Limited, a subsidiary of the NDA) for long term storage.

PWR spent fuel from Sizewell B is stored on site in a purpose-built spent fuel dry storage facility which will safely store all of the spent fuel that will be generated over Sizewell B's life. Following long-term surface storage, the Sizewell B PWR spent fuel will be disposed to a future UK geological disposal facility.

The AGR spent fuel arrangements were agreed at the time of the restructuring of British Energy and through them EDF Energy pays for long term storage (and in previous years reprocessing) of spent nuclear fuel. Sizewell B's fuel storage strategy is approved by the NDA as it is funded by the Nuclear Liabilities Fund. EDF Energy has policies to continually improve and minimise the spent fuel and waste arising through the company's wider safety, sustainability and environmental policies.



Regulatory notice**Radioactive waste**

In the United Kingdom, EDF is required, under nuclear site licence Condition 34, to ensure, so far as is reasonably practicable, that radioactive material and radioactive waste on its sites is adequately controlled or contained so that it cannot leak or escape.

In England the Environment Agency (EA) regulates the disposal of radioactive waste from licensed nuclear sites under the Environmental Permitting (England and Wales) regulations 2016. These regulations also regulate what was previously governed by Pollution Prevention and Control, Water Resources Act discharge consents, Flood Risk activity consents and Waste Management licensing.

The Committee on Radioactive Waste Management (CoRWM) published its recommendations for the long-term management of higher activity waste in 2006. In response, the UK government decided to prefer the use of deep geological disposal facilities for the storage of higher activity waste in England. It set the framework for the management of long-term storage through geological storage, combined with a safe and secure interim storage.

In Scotland, the Scottish Environmental Protection Agency (SEPA) regulates the disposal of radioactive waste from licensed nuclear sites. The Scottish Government is pursuing a near surface near site long storage or disposal policy for HAW arising from Scottish sites.

Decommissioning of nuclear facilities

In the United Kingdom, EDF is subject to nuclear site licence Condition 35 which forms the basis for the detailed decommissioning plans and programmes required by the ONR, but its requirements must be taken into account with other legal provisions such as the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) regulations 1999 which require an assessment of the environmental impact of decommissioning and mitigation measures to reduce the environmental impact.

Decommissioning is usually carried out in stages, with ONR formal approval required to move on to the next stage. The ONR may order operators to start or cease decommissioning at any time and must approve decommissioning plans for each stage of the decommissioning process.

Prospective operators of nuclear power plants are required to submit in their FDP (Funding Decommissioning Programme), a Decommissioning and Waste Management Plan (DWMP), setting out the operator's costed plans for meeting its decommissioning and waste management and disposal obligations, and a Funding Arrangements Plan (FAP), explaining how the operator will make financial provision for its obligations. Chapter 1 of Part 3 of the Energy Act 2008 (EA 2008) sets out the rules governing the decommissioning and clean-up of nuclear sites, along with detailed provisions on FDPs. Also see note 15.2.3 "Provisions for nuclear plant decommissioning" of consolidated accounts.

EDF Energy is party to a suite of agreements (the Restructuring Agreements) that set out how qualifying decommissioning and uncontracted liabilities costs will be funded by the Nuclear Liability Fund (NLF) as well as including a guarantee by the UK Government for the costs of decommissioning the existing nuclear plants. The NLF was funded initially through a UK Government contribution and since privatization by EDF Energy Nuclear Generation Ltd. making quarterly payments to the NLF under the terms of a contribution agreement. In 2020, the UK Government made an additional contribution to the NLF of £5 billion.

EDF Energy and the UK Government signed an update to the Restructuring Agreements on 23 June 2021. The changes and clarifications to the Agreements confirm the recovery of qualifying costs and stipulate that once the AGR stations have finished defueling under EDF Energy responsibility, they will all be transferred to the Nuclear Decommissioning Authority (NDA) which will be responsible for subsequent decommissioning activities. Also see note 15.2.1 "Regulatory and contractual framework" of consolidated accounts.

1.4.5.1.2.3 Thermal generation and gas storage

Power Plant	Location	Year commissioned	Number of units	Type of station	Capacity (in MW)	Output (in TWh)	
						2021	2020
West Burton A	Nottinghamshire	1969	2	Coal-fired and OCGT ⁽¹⁾	1,000	0.5	1.2
West Burton B	Nottinghamshire	2013	3	Combined Cycle Gas Turbine	1,332	2.6	4.9
TOTAL ⁽²⁾	UNITED KINGDOM		5		2,332	3.1	6.0

(1) Open Cycle Gas Turbine.

(2) Differences in total number due to the rounding.

The Cottam Power Plant closed on 30 September 2019 after more than 50 years of being in service. The decision to close the station was made following market changes together with a drive to actively remove carbon from the power generation process. Currently plans are progressing well with the decommissioning work and the likely timescale for completion of demolition is Q4 2025.

The West Burton A Power Station entered into partial decommissioning on 1 October 2021, reducing the available units from 4 to 2 (reducing Capacity from 1,987MW to 1,000MW). West Burton A has announced that it will close on 31 September 2022 and go into full decommissioning (after satisfying its 2021/2022 capacity market agreement). The decision to close the station is in line with EDF's commitment to Net Zero. In 2021, West Burton A generated 0.5TWh of electricity, 0.7TWh less generation than last year mainly due to the strategic decision to reduce current coal stock and be the station of last resort in preparation for its closure.

The West Burton B CCGT power plant was sold on 31 August 2021, it generated 2.6TWh from 1 January 2021 to 31 August 2021, a decrease of 2.30TWh from 2020.

EDF Energy also operates a mid-cycle gas storage facilities in Cheshire. Hill Top Farm became commercially operational in mid-January 2015 with three cavities. A fourth cavity became commercially operational in 2018 with the remaining cavity brought into service in December 2019. During 2020, the decision was made to decommission the Hole House Facility due to challenging market conditions coupled with requirements for some significant investment to the plant. Decommissioning work is progressing well, it is expected to be complete by Q4 2024.

Carbon Pricing

As the largest producer of low-carbon electricity in the country, EDF Energy benefits over the long term from the increase in the wholesale power price as a result of the application of a carbon price to the carbon emissions of fossil fuelled generation. Electricity producers in Great Britain are subject to two main carbon pricing mechanisms, the UK Emissions Trading System (UK ETS) and the UK's Carbon Price Support tax.

The UK Emissions Trading Scheme (UK ETS) came into operation on 1 January 2021, replacing the UK's participation in the EU ETS and operating with broadly similar rules to the EU ETS. UK ETS auctions commenced in May 2021. The UK ETS

has delivered broadly similar carbon prices to the EU ETS but, as expected in a significantly smaller scheme, the UK ETS market has been less liquid than the EU ETS and prices have been more volatile. Further developments of the UK ETS are expected over the next few years, including the alignment of the cap on the number of allowances with the UK's transition to net zero. In the December 2020 Trade and Cooperation Agreement, the UK and the EU agreed to give serious consideration to linking the UK ETS and EU ETS but made no commitment to do so. There has been no indication of any progress towards this linkage during 2021.

The Carbon Price Support tax applied to electricity producers in Great Britain is set at £18/tonne until March 2024

1.4.5.1.2.4 Customer business

	31/12/2021	31/12/2020
Customer electricity supplied (in GWh)	43,372	40,850
Customer gas supplied (in GWh)	36,032	29,462
Number of domestic product customer accounts at the end of the period (in thousands)	5,512	4,837

The Customer business is responsible for the supply of gas and electricity to residential and business customers across Great Britain and the wholesale market optimisation of EDF Energy's generation and customer assets.

EDF Energy sells energy to two major customer segments: residential and business customers. The size of business customers ranges from large public sector contracts to small privately-owned businesses. EDF Energy adopts different risk management strategies for residential and business customers.

EDF Energy continues to seek out opportunities to offtake power from major renewable energy sites. In 2021 EDF signed a fifteen-year agreement with RWE for the offtake of all power from the Sofia windfarm which will be one of the largest offshore windfarms in Europe when completed in 2026.

EDF Energy is one of the UK leaders in energy efficiency installations, through the Energy Company Obligation Scheme (ECO). The platform I&C Battery Flexibility Services have secured an additional 211MW in the year for contracts between 7 and 12 years in length.

EDF remains committed to its Smart Meter installation programme, part of upgrading the UK's energy infrastructure to enable concepts such as smart grids and time-of-use tariffs, which contribute to grid resilience as the UK moves towards a low carbon future.

Residential

EDF Energy supplied 12.541TWh of electricity and 35.228TWh of gas for the residential segment in 2021. As at 31 December 2021, EDF Energy had 3.252 million electricity accounts and 2.261 million gas accounts. The 2021 churn at 17% showed a slight decrease compared to 2020 (at 20%), driven by the Energy Crisis slowing churn in H2 2021. EDF Energy's market share increased from 9.3% at the end of 2020 to 10.5% ⁽¹⁾ at end-October of 2021.

The Coronavirus pandemic had a substantial impact on the business in 2020, however this has been limited in 2021 as the economy has recovered following the removal of restrictions. However, given the economic downturn now being followed with a cost-of-living increase across the UK, there is concern over the affordability of energy bills for vulnerable customers, particularly as bills are rising because of higher global gas prices. Therefore EDF is highly engaged with the UK Government and the regulator Ofgem to review issues such as supplier resilience, the tariff cap methodology and customer affordability concerns.

Energy Crisis

Gas and power wholesale prices in the UK have risen significantly over winter 2021, driven by lower gas storage levels following a cold winter, delays to the Nordstream II gas pipeline certification, high gas demand in Asia and an unplanned interconnector outage between UK-France. These price rises can largely be passed onto B2B consumers, however residential customers are protected to the extent that the Standard Variable Tariff (SVT) cap is fixed based on market forward prices in the previous six-month period.

This inflexibility in the cap price methodology means that the SVT tariff is now the cheapest in the market, and considerably below the marginal cost of supply. In total c.30 suppliers have failed in 2021, the largest being Bulb with 1.7 million customers and Avro Energy which had 580k customers. Some small-medium suppliers have collapsed as a result of an insufficient hedging policy. Others have collapsed because they could no longer meet the cash requirements of continuing to trade when prices for power are so high.

The customers of these failed suppliers have their supply protected by the Ofgem Supplier of Last Resort (SoLR) process, which appoints a new supplier or failing that, a special administrator. Costs to remaining suppliers of fulfilling their obligations as a SoLR can be recovered through an industry mutualization process, which sees levy claims, approved by Ofgem, submitted to the Gas and Electricity Network Operators for recovery through distribution costs. Ultimately these costs will then be passed onto consumers in supply tariffs. There is a time lag between incurring costs and the recovery, which places a significant cash burden on energy suppliers that act as a SoLR in the current market context.

EDF Energy was appointed as SoLR for Utility Point which had 220k customer accounts, these customers were migrated onto EDF Energy's IT systems over November-December 2021. EDF Energy was also appointed as SoLR for Zog Energy's 11,700 accounts.

EDF Energy faces further financial losses from the high energy prices, due to the requirement to offer capped Standard Variable Tariffs (SVT) to all customers. Most of the customers whose fixed offer is expiring are currently choosing an SVT tariff, which in the current market circumstances does not allow EDF Energy to charge tariffs that reflect the real costs of supply. An additional risk is the uncertainty regarding the supply and hedging policy linked to the fact that customers can, depending on the evolution of market prices, end their SVT contract at any time, without any exit fees.

EDF Energy is engaged very actively with the Regulator, UK Government and other stakeholders in the discussions on the market regulations reform.

(1) Cornwall insight figure.

Regulatory Change

Default Tariff Cap

- Ofgem introduced a cap on default tariffs for residential customers on 1 January 2019.
- The cap level is updated to reflect revised costs every 6 months. As of 1 January 2020, the scope of the default tariff cap covered residential customers supplied through both credit and prepayment meters.
- In August, Ofgem made a recommendation to UK Government that the default tariff cap should remain in place for 2022.
- In July 2021, the UK Government announced that it intends to introduce new legislation that would allow the tariff cap to remain in place beyond the end of 2023, if needed.
- On 3 February 2022, Ofgem announced the new energy price cap for the SVT, applicable from April 2022 for the following six months. The 54% increase announced is estimated to correspond to an average +£693 cost per year for a standard consumer profile. The British government which announced parallel measures to reduce this burden for households and Ofgem are continuing to consult on potential changes to the price cap methodology to ensure it appropriately reflects the costs, risks and uncertainties facing suppliers.

Smart Metering Policy

GB energy suppliers were required to take "all reasonable steps" (ARS) to install smart meters for their residential and small business customers before the end of December 2021.

UK Government has confirmed there will be a new obligation on all suppliers to continue installing smart meters for the period January 2022 to December 2025. The UK Government has consulted on the annual minimum installation targets all suppliers will have to meet for the first two years: 2022 and 2023. The targets will not be covered by ARS. These targets are challenging and there are real risks that suppliers will fail to achieve them, given that smart meters remain optional for customers. EDF and other suppliers are working with UK Government to develop future targets which strike the balance of completing smart meter roll out in a way that maintains pace, the correct technical standards and a positive customer experience.

EDF Energy remains committed to delivering smart meters to all residential and small business customers who want to benefit from this new technology. In 2021, EDF Energy has installed a further 452k smart meters and at the end of 2021, 43% of EDF Energy customers in scope for the rollout have smart meters. This meant that EDF Energy has installed a total of 2.4 million smart meters to date. This continued progress is despite several serious challenges, including a Covid-19 related pause of all smart meter installation activity to ensure the safety of its customers and operatives and a nationwide fuel shortage.

Non-residential customers

In 2021, the non-residential segment supplied a total of 30.83TWh of electricity, of which 1.94TWh was supplied to 221k small business customers ("SME") and 28.89TWh to 9.2k medium and 5k large business customers ("I&C"). The business customer electricity market in the UK is c.164.1TWh in total, making EDF Energy the second largest supplier to business customers by volume.

The industry has recovered from the Covid-19 demand reduction seen in 2020. Whilst UK non-residential electricity segment has seen an increase of 0.3TWh in the 6 months from 30 April 2021, a volume increase of 1.3TWh YoY was seen for EDF Energy non-residential electricity segment in 2021.

In SME, managing the risks which have arisen from the pandemic has been the primary focus for much of 2020 and 2021. Steps were taken to price-in additional risk, increase credit restrictions and limit winning higher risk sectors in order to protect EDF's position. Despite this, SME has developed its channels as customer numbers grew 10% in electricity and 31% in gas this year.

EDF's Medium Business segment have continued its focus on the number of meters, which has increased by 42% since the start of the year.

In the Large Business segment, the continuation of a targeted new-business approach has led to the successful acquisitions of 12 new customers in 2021

(double previous years). Additionally, 21 Large Business contracts have been renewed.

In the electricity purchase market, EDF has grown its Power Purchase Agreement business and has become the largest renewable power offtaker (based on owned and 3rd party capacity) according to the latest industry market report. EDF has also successfully bid to become the offtaker of the Sofia Wind Farm, 6.5TWh of annual volume expected to become fully operational in 2026.

Wholesale Markets Optimisation

General principles

The policies surrounding EDF Energy's energy purchasing and risk management activities are carried out in accordance with EDF group's policies and ensure that EDF Energy's activities are optimised and its services delivered at a competitive price while limiting its gross margin volatility.

The Wholesale Markets Optimisation (WMO) Division's purpose is to manage the wholesale market risk of EDF Energy in one place within pre-defined risk limits and control framework. It provides an interface with the wholesale markets, via EDF Trading. WMO also provides modelling services to the whole of EDF Energy, as well as negotiating and managing asset backed commercial structures with third parties including providing route to market agreements for producers.

Electricity sales and procurement

Since April 2010, 20% of the output from nuclear generation is separately sold to Centrica, the minority shareholder of the current nuclear fleet, under the agreements entered into with Centrica. The remaining 80% is sold internally under the same transfer price as used for the transaction with Centrica, based on published market prices, smoothed over forward electricity prices where liquidity allows.

Over and above its own generation, EDF Energy also sources electricity through export power supplied from power purchase agreements which are mainly with renewable and CHP producers. In 2021, EDF Energy acquired approximately 6.7TWh through this channel.

EDF's innovative Powershift platform gained its first customers in 2019. It offers customers flexibility and forecasting services for storage and small-scale generation to earn revenues from reducing or shifting energy demand.

For delivery in 2021, EDF Energy's net position on the wholesale market was a purchase of approximately 1.1TWh (including structured trades). In 2021, EDF Energy sold approximately 31.0TWh and bought 32.1TWh.

Gas, coal and carbon rights procurement

Coal and gas contracts (physical and financial) and CO₂ emissions rights are entered into by EDF Energy to hedge the fuel requirements of its power plants, gas storage and gas consumers. Purchases are based on generation forecasts and target fuels stock levels. In 2021, EDF Energy's coal deliveries totalled 45kt, all of which were from international sources.

Pod Point

The Pod Point acquisition has strengthened and created significant value for EDF Energy in the UK. In 2021, EDF Energy sold 8,565 electric vehicles (EV) related products.

EDF Energy accelerated the promotion of EV solutions for its existing customer base, capturing a significant share of customers churning when buying an EV.

This acquisition brings together the first mover advantage of Pod Point, who is already well adapted in the growing EV market, and EDF Energy's strong industrial expertise on operations and logistics with smart metering experience allowing EDF to be the leader in this market demanding high quality service.

Pod Point was successfully floated on the London Stock Exchange on 4 November 2021 raising £105 million of third party financing to fund future growth in the UK electric vehicle market. The IPO valued Pod Point at £352 million, a significant uplift on the valuation at the time of EDF's initial investment in February 2020 (EDF stake: 77.7%). EDF has retained a 54.05% stake in Pod Point following the IPO.

1.4.5.1.2.5 Nuclear New Build business

Following the final investment decision (FID) made by EDF's Board of Directors on 28 July 2016, EDF and China General Nuclear Power Corporation (CGN) signed contracts for the construction and operation of two EPR reactors on Hinkley Point site in Somerset ("Hinkley Point C" or "HPC" project).

At the same time, agreements were signed for the development in the UK of two nuclear power plants at Sizewell in Suffolk ("Sizewell C" project, based on EPR technology) and Bradwell in Essex ("Bradwell B" project, based on UK HPR1000 technology).

Hinkley Point C (HPC)

EDF's share in HPC is 66.5%, with CGN owning the remaining 33.5%.

As with any project of this scope, the project presents important risks in terms of schedule and budget overruns at completion of the project. These risks are detailed in section 2.2.4 "Operational performance related risks— 4A – Management of large and complex industrial projects (including EPR)".

Management of the Covid pandemic

Since the beginning of the pandemic, the project has taken extensive measures to guarantee the safety of workers on site and in its offices. These measures are being continuously adapted and evolve to apply best practices and to be able to keep the number of infections as low as possible. From July 2021, measures on site have been eased in line with Government guidance, allowing the project to increase capacity on site, with some prevention measures remaining in place.

Thanks to the approach adopted, the site has remained open and running since the beginning of the pandemic. However, works performed on-site and off-site have remained affected by Covid in 2021. In particular, social distancing measures prevented an increase to the number of workers on site as planned during part of the year and productivity has been impacted. The number of people working on site at peak has increased from c. 5,000 in January 2021 to c. 7,400 by the end of 2021.

Progress of the project

- On Unit 1, the 1.5m and 5.15m slabs in the Reactor Building have been completed, and in the conventional island, the 2,500 m³ concrete table upon which the turbine will sit is complete.
- The 1.8km Outfall tunnel drive is completed and works have started on the second intake tunnel. The manufacturing of the 6 intake and outfall heads is complete.
- Civils handed over the first room to MEH. On Unit 2, the first liner ring has been lifted into position into the reactor building in November 2021, 11 months after the same operation on the first reactor.
- Manufacturing of key equipment is progressing. For instance, the polar crane quadrilateral beam has been completed and the first low pressure rotor, measuring 20 metres long, has been manufactured.

Financing of the project

- EDF has taken note of the UK Government requirement not to have the control of HPC sold down during the construction period without the prior approval of the UK Government.
- The agreements between EDF and CGN include a compensation mechanism between both shareholders in case of overrun of the initial budget or delays. This mechanism is applicable and will be triggered when the time comes. These arrangements are part of a Shareholders' Bilateral agreement signed between EDF and CGN in September 2016 and is subject to a confidentiality clause (see section 2.2.4 "Operational Performance related risks", risk factor 4A "Management of large and complex industrial projects (including EPR)").

- As the project's total financing needs exceed the contractual commitment of the shareholders (committed equity), shareholders will be asked to provide additional equity (voluntary equity) with an end date, estimated to date, at the end of 2023. This could lead the Group to increase its contribution to the financing of the project and to increase its stake (currently 66.5%) if its partner decided not to contribute to these additional equity commitments.

Project Costs and Timeline

The project's targets in terms of schedule and cost at completion were updated on 27 January 2021 on the following basis ⁽¹⁾:

- the start of electricity generation from Unit 1 has been set at June 2026, compared to end-2025 as initially announced in 2016;
- the project completion costs are estimated in a range of £₂₀₁₅22 to £₂₀₁₅23 billion ⁽²⁾ corresponding to £26 to 27 billion in nominal ⁽³⁾;
- the risk of COD delay of Units 1 and 2 is estimated respectively at c. 15 and 9 months. The probability of realisation of this risk is high;

The risks on the schedule and cost at completion targets have increased in 2021 due to continuing impact of Covid ⁽⁴⁾, lower than expected civil performance, tensions in global building materials markets and Brexit impacts. In addition, progress on offshore marine works has been slowed down due to permit delays, with an ongoing judicial review.

Plans are being developed to mitigate the delays and actions are in place to drive civil performance.

At the end of 2021, the actual costs excluding interim interest for the project as a whole ⁽⁵⁾ stood at £15.3 billion (at nominal values), or £₂₀₁₅13.6 billion. The interim interests stand at €835 million.

Due to the difficulties encountered by the project, notably on civil performance and marine works, and the increase in risks such as the Ukrainian conflict, Brexit, COVID, supply chain disruption and inflation, a new comprehensive review to update the costs and schedule estimates announced in January 2021 ⁽⁶⁾ is underway and is expected to be finalised by summer 2022. See also in Chapter 2, Risk 4A "Hinkley Point C - EPR (UK)".

Exchanges with the UK Office for Nuclear regulation (ONR)

ONR has been regularly informed of the management of the Covid-19 situation and the mitigation plans implemented. ONR confirmed that the Covid control measures were in place and in line with Public Health England guidance.

ONR approved commencement of the bulk MEH erection in November 2021.

Agreement from ONR will be needed for the dispatch of the first components coming from Framatome and for the delivery of fuel on site.

Contract for Difference (CfD) ⁽⁷⁾

The HPC project company, NNB Generation Company (HPC) Limited and the Department of Energy and Climate Change (DECC) have agreed, on October 2015, on the full terms of the CfD for HPC, which was approved by the European Commission in October 2014, ruling that the terms complied with EU state aid rules. The Commission's decision has been challenged by Austria, which sought the annulment of that decision before the General Court of the European Union, which dismissed its action by a judgment of 12 July 2018. On 22 September 2020, the European Court of Justice rejected Austria's appeal and confirmed the Commission's decision approving United Kingdom aid for HPC nuclear power station.

The CfD was signed on 29 September 2016 alongside all the other contracts with the UK Government and it is a contract to provide security in respect of revenues generated from electricity produced and sold by HPC through compensation based on the difference between the strike price and the market price, for a period of 35 years from commissioning of Unit 2.

(1) See EDF's Press release of 27 January 2021 "Hinkley Point C project update".

(2) Costs net of operational action plans, in 2015 sterling, excluding interim interest and at a reference exchange rate for the project of £1 = €1.23. Costs calculated on 27 January 2021 by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index.

(3) Costs calculated on the basis of a 2% inflation assumption for the construction period.

(4) The schedule announced in January 2021 assumed the ability to begin a ramp up back to normal site conditions from the second quarter of 2021.

(5) Costs at the project's boundaries which is consistent with the Project completion cost.

(6) See EDF's press release on 27 January 2021 "Hinkley Point C project update".

(7) Terms of the contract are available on the UK government website: <https://www.gov.uk/government/publications/hinkley-point-c-documents>.

From the plant's start date, if the reference price at which the producer sells electricity on the market is lower than the strike price set under the terms of the contract, the producer will receive an additional payment. If the reference price is higher than the strike price, the producer will be liable for the difference.

The key elements of the Contract for Difference are:

- the strike price for HPC is set at £₂₀₁₂92.50/MWh. The strike price will be reduced to £₂₀₁₂89.50/MWh if the Sizewell C project enters into a Contract for Difference or equivalent support, with further compensation from Sizewell C to HPC in order to share UK first of a kind costs of EPR across both projects;
- the strike price is fully indexed to UK inflation through the Consumer Price Index (CPI);
- the payment term is 35 years; in case of a delay to Unit 1 leading to its commercial commissioning after 1 May 2029 or a delay of Unit 2 leading to its commercial commissioning after 31 October 2029, the corresponding 35-year payment term would be decreased commensurately with the deadline overrun;
- moreover, any delay in the commercial commissioning of Unit 1 exceeding 4 years after the deadline specified by the contract for Unit 2 (i.e. beyond 31 October 2033, unless this date is postponed pursuant to the terms of the contract) authorises (but does not oblige) the UK Government to terminate the contract. In view of the pandemic, HPC has made a request to the LCCC ⁽¹⁾ to extend the COD windows, citing *force majeure* as allowed by the CfD. Discussions with the LCCC continue;
- the project is protected against certain unfavourable regulatory and legislative changes; provision has also been made to review the costs (up or down depending on the assumptions used) in the fifteenth and twenty fifth years, and to review certain conditions for the costs corresponding to decommissioning and waste management operations (Funding Decommissioning Programme).

There is no explicit volume guarantee in the CfD, nor is there a ceiling; however, the contract is protected against change in law risk and any curtailment on the export of electricity so that the project is put back in the same position it would have been had the change in law or curtailment event not occurred.

Exposure and management of foreign exchange, interest rate and inflation risks

Beyond the commissioning phase, the IRR of the euro investment is mainly dependent on fluctuations in sterling and UK inflation, as revenue is generated in sterling and linked to inflation.

HPC project is protected against power market price changes during the CfD period and is exposed to fluctuations in electricity prices beyond the CfD period. Post CfD, a change in the price of electricity of £₂₀₁₅10/MWh has an impact of 0.1% on the IRR.

In terms of foreign exchange, c. 1/3 of the project costs are denominated in Euro. This exposes both the project and EDF group to the GBP/EUR exchange rate. Should sterling fall against the euro, the Sterling cost of the project will go up and its IRR will therefore drop. A hedging strategy has been implemented at project level.

Nevertheless, at EDF group level, a Sterling devaluation will trigger a fall in euro funding requirements and therefore lower Group debt. Given the long-term investment horizon in the HPC project, EDF group has implemented a gradual strategy to cover the risk of an increase in sterling value for its HPC investment.

Funded Decommissioning Programme (FDP)

Contracts for the Funded Decommissioning Programme (FDP) of HPC were signed on 29 September 2016. For detailed explanation of statutory requirement for nuclear operators, see 1.4.5.1.2.2.

SIZEWELL C

Key aspects of the project

EDF and CGN signed the Sizewell C Project equity documents on 29 September 2016 alongside the HPC contracts, for the development, building and operation of two EPR reactors at Sizewell in Suffolk for a total capacity of 3.2GW. The power plant would provide electricity to 6 million households for around 60 years. The

development of the project is led by EDF which holds 80% of the project as of end of 2021, with CGN owning the remaining 20%.

The project is based on an objective of replicating HPC as much as possible.

By the date of the final investment decision (FID) at the latest, EDF plans to reduce its stake to no more than 20%, and to deconsolidate the project from the Group's financial statements (including in the calculation of the economic indebtedness by the rating agencies). Therefore, the project aims at achieving the conditions enabling third party investors and debt holders to invest in the project.

After the FID, EDF group intends to supply the design, some key nuclear equipment and components (including nuclear steam supply systems, instrumentation & control, fuel) as well as associated services.

UK government support for the development of large-scale nuclear projects

On December 2020, as part of the steps to achieve net zero carbon emissions in 2050, the UK Government announced its ambition to bring at least one large scale nuclear project to the point of Final Investment Decision by the end of this Parliament (2024), subject to evidenced value for money and all relevant approvals.

On 27 October 2021, as part of the Spending Review 2021, the UK Government announced:

- up to £1.7 billion allocated to the development of large-scale nuclear projects over the period 2022-2025;
- that it is in active negotiations with EDF on the Sizewell C project.

Regulation model and risk sharing mechanism

On 26 October 2021, the UK Government introduced the legislation (Nuclear Energy (Financing) Bill) to establish a revenue model to fund future nuclear projects, using the Regulated Asset Base (RAB) model. The final reading was passed by the House of Commons on 10 January 2022, at which point the Bill has gone to the House of Lords for consideration.

The RAB model is a method typically used in the UK to finance large scale infrastructure assets such as water, gas and electricity networks. Under this model a company receives a licence from an economic regulator to charge a regulated price to consumers in exchange for providing the infrastructure. The regulator sets an allowed revenue level for a project to recover costs (construction and operation) plus a financial return on the capital investment (a return on asset value). This model aims to enable investors to share the project's construction and operating risks with consumers. With a nuclear RAB model, electricity suppliers would be charged, as the users of the electricity system, the cost of the project. The allowed revenue would be received from the start of the construction phase, reducing the overall cost of financing. The Sizewell C Project aims at being designated eligible to receive the benefit of the RAB licence condition.

In addition, a Government Support Package (GSP) that protects investors and debt holders from some risk events would be defined.

The terms of the RAB model and GSP for the Sizewell C project are currently being discussed.

Financing of the project

The agreements between EDF and CGN set out a cap in the shareholders' funding of the development phase, without any commitment to fund the project beyond the development phase. Discussions with the UK Government are ongoing on the financing of the remaining development costs until the final investment decision.

The aim is for the construction of the power plant to be largely financed by private equity and debt. The financing model has never been implemented in the UK for projects of this scale before and therefore would be one of the largest ever equity and debt issuance and project financing on the European scene. The project aims at obtaining an investment grade credit rating to attract private investors. Securing an appropriate regulation model and risk-sharing mechanism is, among others, key to achieve this objective.

On 27 January 2022, the UK Government decided a £100 million government funding in exchange for an option over the site land or over EDF's shares in the project company.

(1) Low Carbon Contracts Company.

EDF has planned to pre-finance the development up to its share of an initial budget of £458 million.

The project could face difficulties in accessing the necessary financing for its development due to the minority presence of a Chinese company operating in the nuclear field.

Progress on consents and permitting

In June 2020, Planning Inspectorate accepted the application for the Sizewell C development consent order (DCO) for examination. The examination process took place between April and October 2021. As part of the planning process, the executed Deed of Obligation (the mitigation measures program) and Environment Trust (additional support to environment protection) have been agreed.

The Examining Authority is now considering the final version of the draft DCO as well as all the other documents (technical assessments, mitigation measures etc.). A decision on the DCO application by the Secretary of State is expected by the end of May 2022, which will then be followed by a six-week period open to potential judicial review.

The Environmental Permits Application and the Nuclear Site Licence Application were submitted in May and June 2020. The applications are currently under review. The conditions to obtain a Nuclear Site Licence are currently expected to be fulfilled in 2022.

Conditions for a final investment decision

EDF's ability to participate in the final investment decision on Sizewell C alongside other investors and to contribute to the financing of the construction phase depends on the fulfilment of some conditions including:

- sufficient funds to finance the development costs until a Final Investment Decision;
- a regulation model, risk-sharing mechanism and Government Support Package, allowing private investors (debt and equity) to invest;
- an appropriate financing structure during construction and operation and sufficient investors and debt holders willing to invest into the project. This is subject in particular to achieving an investment grade credit rating by the credit agencies;
- an agreement with the key suppliers on the key construction and operation contracts;
- obtaining the required consents and permits, including Development Consent Order, Nuclear Site Licence and Environmental Permits;
- the ability not to consolidate the project in the Group's financial statements (including in the calculation of the economic indebtedness by the rating agencies) after the final investment decision.

Not meeting these conditions could lead the Group not to take a final investment decision (see section 2.2.4 "Operational Performance related risks", risk factor 4A – "Management of large and complex industrial projects (including EPR)").

BRADWELL B

EDF and CGN signed agreements alongside the HPC and Sizewell C contracts on 29 September 2016 in order to:

- obtain the design certification of the Chinese-based design HPR1000 in the UK (UK Hualong Pressurised Water Reactor – UK HPR1000) through the Generic Design Assessment (GDA) process. This process is supervised by a joint venture between General Nuclear Systems Limited (GNSL) and EDF (owned 65.5% by CGN and 33.5% by EDF);
- develop a nuclear power plant at Bradwell-on-Sea in Essex using the UK HPR1000 technology. This process is led by a joint venture ("Bradwell" or BRB) currently owned at 66.5% by CGN and 33.5% by EDF.

The HPR1000 technology has been developed by CGN. Two Hualong units are under construction in China at CGN's Fangchenggang plant and are expected to be commissioned in 2022.

The GDA is a 4-step process, which started in 2017 and was completed on 7 February 2022 when the ONR issued a Design Acceptance Confirmation (DAC ⁽¹⁾) and the Environment Agency a Statement of Design Acceptability (SoDA ⁽²⁾). It confirms that the UK HPR1000 reactor meets regulatory expectations on safety,

security and environmental protection at this stage of the regulatory process. Therefore, this reactor is suitable for construction in the UK, subject to the necessary licensing, planning permission and environmental permits. The GDA process is separate from applications to build reactor power plant at specific sites.

There is great uncertainty around the development perspectives of the Bradwell Project, mainly related to the political opposition to a Chinese company leading a critical UK infrastructure project and from the lack of local stakeholder support (see section 2.2.4 – risk 4A). The risks of not being in a position to carry out the Bradwell project are high and have increased in 2021.

EDF's commitment to fund GNSL and Bradwell is subject to an equity cap, without any obligation to fund the project beyond the funding cap.

1.4.5.1.3 Brexit

The UK left the European Union (EU) on 31 January 2020, entering into a Transition Period that ended on 31 December 2020.

The EU–UK Trade and Cooperation Agreement (TCA), agreed on 24 December 2020, sets the basis for the EU-UK relationship from 1 January 2021. Nevertheless, it was widely recognised that further work would be required to develop several important aspects of the new EU-UK relationship. Although there has been progress in some areas during 2021 (e.g. the EU-UK Data Adequacy Agreement), there remain some important outstanding issues.

EDF had identified the business risks arising from the UK's exit from the EU and was well prepared, enabling the business to manage most of the adverse impacts.

During 2021, EDF's main focus has been to manage the impact of cross-sectoral issues affecting international trade, including the implementation of border controls, access to EU labour and services and the risks arising from some companies (particularly small and medium sized) not being fully prepared for the new trading arrangements.

Some risks still remain despite elements of the new arrangements are finalised, including full UK border controls and the introduction of the UK Conformity Assessed (UKCA) marking regime (replacing EU CE marking in the UK).

EDF believes that the risks are relatively low and are manageable in respect of issues specific to the electricity sector, including the longer-term relationship in the areas of energy trading, new interconnector trading arrangements and North Seas Co-operation.

The civil nuclear agreement, the EU-UK Nuclear Cooperation Agreement (NCA), is similar to other NCAs that the EU has signed with third countries. It will operate for an initial period of 30 years, providing a commitment to cooperation on civil nuclear, including safeguards, safety and security. It also provides a framework for trade in nuclear materials and technology, facilitates research and development, and enables exchange of information.

EDF will continue to work closely with the UK Government and trade associations to monitor and adapt to the evolving EU-UK trade relationship as the new arrangements are fully implemented.

1.4.5.2 Italy

1.4.5.2.1 EDF group market and footprint in Italy

Italy is one of EDF's four key markets in Europe alongside France, the UK and Belgium. The Group is mainly present in Italy through its 97.172% shareholding in Edison ⁽³⁾, which is a major player in the Italian electricity and gas markets and a well-known Italian brand. The EDF group is also present in Italy via Citelum.

1.4.5.2.2 Edison strategy

Like the majority of European energy systems, the Italian market is currently facing a certain number of challenges. Thanks to its current position and integrated presence in the gas and electric power value chain, Edison is well-placed to seize opportunities created by market changes, while pursuing efficiency and profitability, in line with the EDF group strategic priorities and international and Italian energy policies.

(1) DAC: Design Acceptance Confirmation.

(2) SoDA: Statement of Design Acceptability.

(3) Equity stake; 99.473% share of voting rights.

During 2021, Edison pursued the implementation of its transformation strategy, designed to pursue its repositioning as a responsible leader in the context of energy transition, so as to reach its decarbonisation objectives, in accordance with the Italian PNIEC (*Piano nazionale integrato per l'energia e il clima*), the European Green Deal and the United Nations Sustainable Development Goals (SDGs). Therefore, Edison has adopted a sustainability policy based on the SDGs to work for the preservation of the environment and the improvement of the quality of life.

The company concentrated on streamlining and extending renewable generation, the construction of two latest generation gas-fired power plants with low CO₂ emissions, the development of energy services, increase in the number of end customers and development of "green" gas.

On 17 December 2020 ⁽¹⁾, Edison announced the disposal of its oil & gas exploration and production activities to Energean, excluding Algeria and Norway. Edison withdrawn entirely from this industry in Norway in March 2021, following the finalisation of the agreement for the disposal of 100% of Edison Norge AS entered into with Sval Energi on 30 December 2020.

In 2021, Edison has strengthened its social commitment and its approach based on joint planning and creation of shared value together with local communities and territories. With the creation of the EOS Corporate Foundation or *Edison Orizzonte Sociale*, Edison contributes to the objectives of the UN 2030 Agenda for Sustainable Development. Edison works in particular in the areas of education, social inclusion, reducing inequality and promoting sustainable communities.

In November 2021, Edison and Crédit Agricole announced the first securitisation transaction based on ESG criteria in Italy, which includes the setting of a sustainability indicator consistent with the company's climate change targets.

Going forward, the main avenues of development are as follows:

- **power generation:** Edison aims to increase its renewable energy generation by promoting specific capital investments in hydro power, wind power and solar power projects to optimise its electricity generation portfolio in Italy and to reduce its carbon emissions so that it may reach 5GW capacity in 2030. Simultaneously, Edison aims to develop tools for managing flexibility such as additional storage capacity for intermittent unscheduled renewable energies. The increase in installed capacity of renewable energies will also include a share of green hydrogen production;

- **service offering:** Edison's goal is to strengthen its position on the Italian market by means of an innovative offering, in particular through the development of energy services designed for the end customers, in particular for residential consumers and industrial, services, and public administration customers. Edison aims to increase its market share by helping customers and territories increase their competitiveness, efficiency, environmental sustainability and individual well-being;

- **gas:** Edison is the EDF group's gas platform. Since 2017 the company has had a service agreement with EDF enabling it to provide integrated management of all assets and develop EDF's upstream gas business (in particular the supply of gas and LNG, contract management, medium to long-term optimisation, transport, and storage). The Group also benefits from EDF Trading, responsible for asset optimisation, as well as from short-term operations on wholesale markets on the continent and in the UK.

In addition, Edison aims to develop the latest generation of gas-fired power plants to compensate for the intermittency of non-programmable renewable sources and reduce emissions. It also aims to be a key contributor to the development of green gases (H₂ and bio-CH₄).

Finally, Edison aims to ensure the competitiveness of gas supply and maintain a balanced mix of flexible contracts, by diversifying the sources of supply while adapting contracts to the pace of the energy transition.

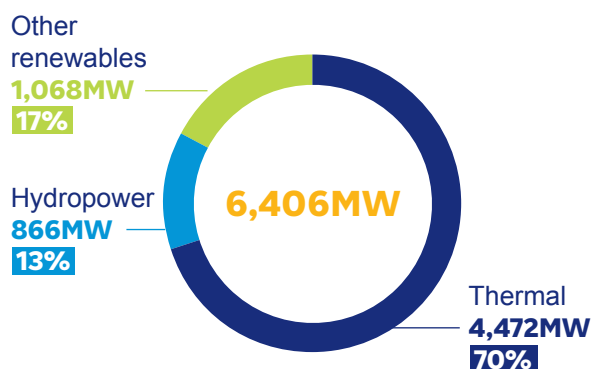
The rating agencies have assessed Edison's strategy favourably in 2021: Moody's has upgraded Edison's rating from Baa3 to Baa2 in view of the company's improved industrial risk profile, earnings growth and cash flows. In August 2021, the agency raised the company's outlook from negative to stable, following the upgrade of EDF's rating. Standard&Poor's upgraded Edison's rating to BBB with a stable outlook due to strong operating results and favourable growth expectations.

In February 2022, Standard & Poor's reviewed Edison outlook to negative from stable, following the downgrade of EDF by one notch to BBB with negative outlook. Moody's also reduced Edison's rating to Baa3/negative outlook. Standard & Poor's and Moody's both noted Edison's strong underlying operating performance, its solid credit metrics, its improved business risk profile and the progresses made in Edison's strategic repositioning.

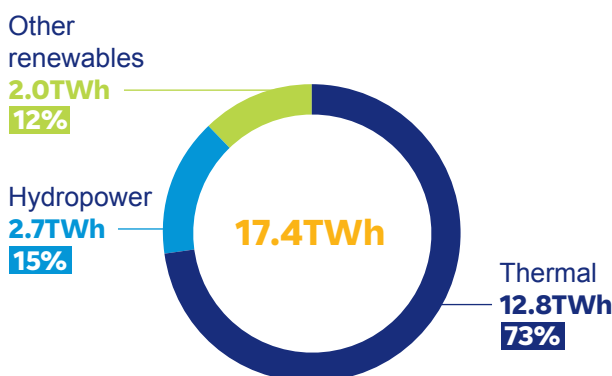
1.4.5.2.3 Edison's business

Installed capacity and output of Edison in Italy ⁽¹⁾ - 2021

Installed capacity



Electricity output



(1) On a consolidated basis, including customer energy efficiency services.
NB: values are rounded up.

(1) See Edison's press release of 17 December 2020.

1.4.5.2.3.1 Electricity generation

In Italy, as of 31 December 2021 Edison's installed capacity amounted to 6.4GW, with net electricity production of 17.4TWh in 2022, a decrease of almost 7.3% from the 2020 figure.

Based on power generation data for 2020 ⁽¹⁾, Edison is the third-largest producer at the national level. Its net power output in Italy accounted for around 6.3% of net Italian electricity generation.

Edison's generation fleet (excluding Fenice) is currently made up of 98 hydropower plants, 14 thermal power plants, 50 wind farms and 64 photovoltaic plants. Combined-Cycle Gas Turbines account for 73% of electricity generation, while hydropower accounts for 15% and combined wind and other renewable energies 12%.

The decrease in Edison's production is due mostly to the fall in thermal power production (12.8TWh, down 7.8% on 2020), itself due mostly to the shutdown of two power plants for maintenance activities and because of breakdown).

In 2021, Edison's hydro power output totalled 2.7TWh. The decrease of 16.8% compared to 2020 is mainly due to the deconsolidation of Dolomiti Edison Energy Srl as of 1 July 2020 and a decrease in hydraulicity in 2021.

Wind power and other renewable energy production amounted to 2.0TWh (up 14.2% on 2020) in 2021. This increase is attributable to the change in the scope of consolidation related to the acquisition of Futuren and the commissioning of facilities that have been completely rebuilt (*Integrali ricostruzioni*) in Abruzzo and Apulia.

In order to guarantee the flexibility and security of the national electricity system, Edison continued the construction of the Marghera Levante (780MW) and Presenzano (760MW) CCGT plants, launched in 2019 and 2020 respectively. These two installations are highly flexible and efficient (with energy efficiency of 63%, have a low environmental impact (with CO₂ emissions 40% lower than the national average and 70% fewer NO_x emissions). Power generation should begin in 2022 and 2023 respectively. The two power plants should benefit from the fixed contribution of €75,000/MW for 15 years linked to the capacity market, with a positive impact on the volatility of Edison's margins, subject to the commissioning date deadlines being met.

In February 2021 ⁽²⁾, Edison finalised the agreement with F2i (*Fondi italiani per le infrastrutture*) to acquire a 70% stake in E2i Energie Speciali. This company, a leader in the wind power industry in Italy, was already 30% owned by Edison.

In December 2021, Edison announced the signing of an agreement with Crédit Agricole Assurances to become the financial partner of Edison Renewables through a 49% share. Edison retains control over the business and governance of the company. This long-term collaboration will enable Edison to accelerate its investments in renewable energy in Italy, and implement its portfolio of projects. It will thus enable it to contribute to the country's energy transition ⁽³⁾.

Internationally, Edison is well-established in Greece, where it owns a 50% stake in ElpEdison SA, one of the country's main electricity operators. It owns two CCGT plants: one in Thessaloniki (426MW) and the other in Thisvi (410MW) built by Edison, which sells electricity on the residential market.

Last, Edison holds a 50% stake in Ibritermo, a subsidiary in Brazil, which operates a 226MW CCGT plant, and 20% stake in Kraftwerke Hinterrhein AG, which operates 626MW of hydropower in Switzerland.

1.4.5.2.3.2 Gas business

For the implementation of its gas strategy, the EDF group, through Edison, benefits from experience along the entire value chain of natural gas. Edison's Italian gas supply portfolio is based mainly on a series of long-term agreements. As of the end of 2020, these covered:

- approximately 12.7 billion cubic metres of imports *via* gas pipelines and LNG from Libya, Qatar, Azerbaijan and Algeria;
- 6.2 billion cubic metres bought on the market, through short-term contracts, or produced in Italy or Algeria.

In 2021, total sales of gas in Italy amounted to 18.9 billion cubic metres (compared with 16.6 billion cubic metres in 2020). Edison delivered 5.8 billion cubic metres of gas to the industrial sector, 2.0 billion cubic metres to the residential sector, 5.0 billion cubic metres to the thermoelectric sector (including Edison's own requirements), 6.0 billion cubic metres on the wholesale market, and 0.1 billion cubic metres of sales of production abroad.

In January 2021, Edison, Tenaris and Snam signed a letter of intent to launch a project to decarbonise Tenaris' steel plant in Dalmine. The project looks to generate hydrogen and oxygen through an electrolyser that will be installed on-site and to adapt the steelmaking process to use green hydrogen instead of natural gas.

In September 2021, Edison signed a memorandum of understanding with other operators for the joint development of the *Puglia Green Hydrogen Valley* project, to become one of the first large-scale green hydrogen production and transmission initiatives in Italy. The project proposes to build three green hydrogen production plants in Brindisi, Taranto and Cerignola (Foggia) powered by photovoltaic generation. The green hydrogen will be used mainly by industries in these regions, but will also be injected into the local gas network and/or used for sustainable mobility.

Gas infrastructures

Edison contributes to the development of gas import infrastructure projects through IGI Poseidon which Edison owns a 50% stake (see section 1.4.6.2.2.2 "Infrastructures").

IGI Poseidon is promoting the following three projects:

- Eastmed, an interconnection between Greece and the eastern Mediterranean which will provide direct access to gas resources in the eastern Mediterranean (Israel, Cyprus), connecting them to the Greek, Italian and other European markets. The project is based on a 10bcm/year offshore/onshore line, expandable up to 20bcm/year, whose viability and sustainability have been demonstrated from a technological and economic point of view by an extensive array of studies and engineering surveys carried out since 2014. The strategic relevance of the project has been largely confirmed by the 2020 intergovernmental agreement and by the Greek government granting the project the status of national importance and public utility. The project is in the final stage of development, so it may be ready for an investment appraisal in 2022;
- Poseidon, an interconnection between Greece and Italy, which will allow available gas resources to be transferred from Greece to Italy by connecting to Eastmed. The project is a mature asset with finalised engineering activities and has obtained the required permits in Greece and Italy. In May 2020, it was declared a project of national importance for Greece;
- IGB, a gas pipeline belonging to ICGB, in a 50/50 partnership with Bulgarian Energy Holding, connecting Greece and Bulgaria. Construction started in December 2019 and commercial operation is due to start in the first half of 2022. The project benefits from an exempted regulatory regime issued by the national regulatory authorities. It has been approved by the European Commission. The gas pipeline, now over 70% complete, will be 182km long and have a transmission capacity of 3 billion cubic metres per year.

These projects are among the European Commission's Projects of Common Interest, and benefit from EU aid: IGB has received €84 million for its construction. Eastmed will receive a matching contribution from the European Commission covering 50% of its development costs (i.e. about €37 millions).

Edison also has the right of use of 80% of the Rovigo offshore regasification terminal's capacity (6.4 billion cubic metres per year) where LNG imported from Qatar with Ras Laffan Liquefied Natural Gas Company Limited II (RasGas II) is regasified.

Concerning LNG, since 2018 Edison has been engaged in the "small-scale LNG transportation" project for the development of an LNG marketing supply chain, with the aim of helping to reduce emissions by maritime and road transport. The project led by Depositi Italiani GNL (owned 30% by Edison ⁽⁴⁾) comprises the construction of an onshore depot at the port of Ravenna where the LNG will be stored at a small, dedicated LNG terminal. The facility, which is now complete, has a capacity of over 1 million cubic metres of LNG per year (Edison will have right of use to 85% of its capacity). It will be able to supply LNG to 12,000 trucks and up to 48 ferries.

(1) Data published by the ARERA (ARERA report, vol. 1, p. 88, fig. 2.1); 2021 data will be released in mid-2022.

(2) See Edison's press release of 16 February 2021.

(3) See Edison's press release of 3 December 2021.

(4) A 19% stake is held by Scale Gas Solutions (a company controlled by Enagas), and a further 51% stake by Petrolifera Italiana Rumena.

The LNG marketing activity started in November for wholesale customers.

In October 2020, Edison and Kuwait Petroleum Italia (Q8) presented a joint project for the construction of an onshore depot at the port of Naples. This project is subject to the granting of a permit.

In March 2021, Edison started the permitting process for the construction and operation of the Brindisi coastal storage facility. The approval in principle required under the Seveso Directive has been obtained.

1.4.5.2.3.3 Sales and marketing

In 2021, Edison sold 28.4TWh of electricity in Italy (compared with 31.2TWh in 2020, i.e. down 9%), of which 16.8TWh were generated ⁽¹⁾ and 10.9TWh were purchased on the markets. The remaining 0.7TWh correspond to the energy and environmental services. Sales to end customers amounted to 13.3TWh, down 1.7% compared to 2020 due to a reduction in volumes, especially in the business customer segment.

For gas sales of 18.9 billion cubic metres, a decrease in sales for civil use (-5.3%) was observed due to lower contracts with wholesalers and lower sales for thermoelectric use (-11.7%) due to the contraction in production.

Sales for industrial use and other sales rose by 12.4% and 66.6% respectively, thanks to higher consumption than in 2020, which was affected by the health crisis, a higher number of contracts, a cold winter and temperatures below the historical average in the spring.

At the end of 2021, Edison was serving around 1.59 million customers in electricity and gas, in the business and residential segments.

Development of marketing continues to be a priority for Edison, being seen as a foundational business to support expansion into the field of energy services and renewable production. In recent years, the company has reinforced its innovative services platform for residential customers with a full range of household services: domestic appliance maintenance and home insurance (through Assistenza Casa, wholly owned by Edison), domestic solar power and electric mobility and home services (notably "Edison Risolve").

To strengthen customer relations, Edison operates across Italy with 674 sales outlets ⁽²⁾. The company strengthened its position in digital sales to rise to the challenges of the health crisis. In parallel, Edison intends to maintain its position as a leader in the business-customer market by developing an advisory approach in energy as well as innovative products and services made possible by market and regulatory changes. As in the residential segment, B2B customers can benefit from an environmentally-friendly offering combining solar power, batteries, and the use of electric vehicles.

1.4.5.2.3.4 Energy services

Edison develops, sells and manages energy and environmental services.

The solutions on offer are dedicated to the development of energy efficiency projects aimed at major industrial customers, businesses, and public administrations, growing sectors in which Edison is seeking to consolidate its position. The offer available to customers also includes environmental services offered by the Sersys Ambiente subsidiary (consultancy, wastewater treatment, sampling and analysis of environmental matrices, waste disposal, and industrial cleaning).

The business models are adjusted to customer requirements: Edison designs, builds, and manages assets for its customers, including cogeneration/tri-generation plants, solar power installations, substations, thermal power plants for industrial use, cold production plants, compressed air plants, fluid distribution systems (electricity, gas, hot and refrigerated air, compressed air, industrial gas, water) and industrial water treatment plants. The range of services is completed by a consulting activity in terms of energy, management of environmental securities and internal and external training for customers and partners.

Edison's clients are in the industrial and business sectors. Contracts with the Stellantis group still form a large part of the business with major-account customers.

Projects are developed with customers in the form of industrial partnerships or performance agreements. The business model is flexible and may range from customer assistance to third-party financing or direct investment by Edison in the projects (the Esco model).

Edison is active in the public services sector via Edison Facility Solutions, which specialises in energy efficiency and integrated energy management, notably for hospitals.

Lastly, energy efficiency activities are conducted internationally by subsidiaries in Spain, Poland, and Morocco, all of which are wholly owned by Fenice.

In 2021, Edison and Michelin Italiana signed a multi-year agreement on energy efficiency, environmental sustainability and carbon footprint reduction at the Michelin plant in Cuneo, which provides for the construction of a low environmental and energy impact power plant coupled with a photovoltaic plant and a biomass plant, guaranteeing a significant production of renewable energy.

Edison has also completed the first phase of construction of the new heating system in the city of Alzano Lombardo. The project, which is the result of cooperation between a public body and a private entity, is being implemented and managed by Edison Teleriscaldamento, a company wholly owned by Edison.

1.4.5.2.3.5 Regulated activities

Gas storage

Edison owns 100% of the Edison Stoccaggio company, dedicated to regulated gas-storage activities. Edison also operates three storage facilities in depleted reservoirs (fields which have been depleted of natural gas): Cellino (since 1984), Collalto (since 1994) and San Potito & Cotignola (since 2013). The volume being worked upon on all of the sites is 1 billion cubic metres.

Distribution

In April 2021, Edison sold 100% of Infrastructure Distribution Gas (IDG) to 2i Rete Gas for a value of €150 million, pursuant to the agreement signed on 14 January 2021.

1.4.5.3 Other international

1.4.5.3.1 Northern Europe

Belgium

The Benelux region features important interfaces with the Franco-German electricity marketplace. Moreover, projects for new links with Germany and Great Britain are being examined. Benelux also constitutes an important node in the European gas market because of its numerous import and transit infrastructures, such as the Zeebrugge hub and the Dunkirk LNG terminal nearby.

The EDF group is present in Belgium through EDF Belgium, Luminus and Citelum (for Citelum see section 1.4.6.1.2).

EDF Belgium

As part of a long-term nuclear energy cooperation agreement with Electrabel, EDF holds 50% in undivided co-ownership of the Tihange 1 nuclear power plant, through its wholly-owned Belgian subsidiary, EDF Belgium. The capacity attributed to EDF represents 481MW (or 2% of Belgian generation capacity). Tihange 1 output, which is attributed to EDF Belgium is sold to EDF (via a long-term contract renewed at the end of 2015 for 10 additional years) which, in turn, resells the electricity to Luminus at a market price.

Belgium's 2003 nuclear phase-out legislation originally provided for the closure of Tihange 1 on 1 October 2015. Nevertheless, it was finally decided to extend its operation upon 2025, following the adoption in 2012 by the Belgian government of the Equipment Plan, and the Law of 2013 amending the Law of 2003 pertaining to the timeframe for the phasing out of nuclear energy. This extension was the subject of an agreement concluded on 12 March 2014 between Electrabel, EDF and the Belgian State, defining its terms and conditions.

The extension of the lifespan of Tihange 1 requires significant investment, with EDF's share amounting to around €320 million, spread over the period from 2011 to 2021.

(1) Production data calculated in line with consolidation criteria.

(2) Only a small part of which is owned by Edison.

Luminus

At the end of 2021, the EDF group held 68.63% of the Luminus company through its subsidiary EDF Belgium, with the remaining equity held by Belgian public shareholders.

Luminus is the second largest player in the Belgian energy market and holds a balanced upstream/downstream portfolio. The company, whose market share is close to 25%, possesses almost 10% of total Belgian generation capacity with 2,357.62MW installed at the end of 2021. The electricity generation of Luminus reached 7.0TWh in 2021. The company employs around 2,400 people.

As part of the Group's CAP 2030 strategic plan, Luminus has the ambition of developing its wind farm fleet and accelerating the deployment of its energy services in order to provide its customers with innovative and sustainable solutions, whilst pursuing its objective of reducing costs and rationalising its thermo-electrical generation fleet.

Luminus owns 10.2% (419MW) of Belgium's Tihange 2 and 3 nuclear power plants (commissioned in 1983 and 1985 respectively) and the Doel 3 and 4 plants (commissioned in 1982 and 1985 respectively), which have a lifespan of 40 years.

Luminus also has 100MW drawing rights on the French Chooz B nuclear power plant, based on a band of guaranteed output according to the average availability of the French fleet.

Apart from the drawing rights in the nuclear fleet, Luminus also possesses a thermal fleet comprising several power plants (combined cycles and open cycles) for an installed capacity of 1,208MW.

The Seraing steam gas turbine met its strategic reserve obligation for the period from November 2017 to the end of October 2018.

Luminus also operates in renewable energy. The company operates 7 hydropower plants, and as of the end of 2021 owns 82 onshore wind farms, with a total of 263 turbines across Wallonia and Flanders. Since the end of 2015, the company has been the leader in onshore wind farms in Belgium and has an installed capacity of 658MW at the end of 2021. In 2021, Luminus erected 25 wind turbines for a total capacity of 67MW.

Under its "Luminus" brand, EDF supplies electricity and gas to around 2.1 million residential and business customers ⁽¹⁾ in Belgium. In May 2021, Essent Belgium was acquired by Luminus to increase the size of the portfolio, a key investment that enables Luminus to strengthen its number two position in the electricity and gas supply business.

The company is involved in the energy services segment for residential customers through its subsidiaries Rami Services, Dauvister, Leenen and Insaver, mainly by providing boiler installation and maintenance, installing solar panels, and providing "Home Assistance" services in the event of unexpected damage at home. At the end of 2021, the B2C portfolio for these last three services exceeded 175,000 contracts thanks to bundle ⁽²⁾ sales through Luminus website.

Luminus together with ATS, Vanparijs, Dauvister and Newelec, offers comprehensive integrated electricity and heating solutions. Its subsidiary Luminus Solutions (in which Luminus and Dalkia own a 51% and 49% stake respectively) provides energy efficiency services for administrative buildings, hospitals, schools, sports facilities, swimming pools and apartment complexes on the basis of an energy performance contract.

In 2021, despite the impact of the health crisis, Luminus maintained its expansion strategy around two axes: on the one hand, electric mobility, through the acquisition of a stake in Powerdale, one of the main players in the Belgian market and, on the other hand, the strengthening of the regional poles on which the ATS group (Elektro Clarysse) is built. With a view to strengthening the "Luminus" brand and its service offering, especially for industrial customers, it was decided to bring the Dauvister and Newelec brands under a single management at the end of 2021.

Citelum

In Belgium, renovation work on the LED lights on Wallonia's motorway network has continued. In 2020, several use cases for smart lighting have been implemented with the installation of various traffic and detection sensors, as well as an interface with the centralised remote management system based on the platform developed by Citelum called MUSE[®].

The 20-year PPP agreement for the design, modernisation, funding, management, and maintenance of 100,000 lights was awarded to the LuWa consortium (comprising Citelum (lead contractor), Luminus, CFE, and DIF) in 2019. Ultimately, this will result in 76% energy savings, avoiding the equivalent of 166,000 tonnes of CO₂ emissions.

See also section 1.4.6.1.2.

The Netherlands

Through a joint venture, Sloe Centrale BV, the EDF group and PZEM ⁽³⁾ Group (each holding 50%) own an 870MW CCGT power plant in the southwest of the Netherlands, whose two 435MW units were commissioned in 2009. Thanks to its excellent technical performance, further enhanced by recent innovations and optimised renegotiation of the maintenance agreement with Siemens (LTSA), the Sloe power plant was brought into service for 5,029 hours in 2021.

Sloe shows excellent availability (98.98% at the end of 2021) with a lower service factor than in previous years (48.5% at the end of 2021 versus 69% on average over the last two years), mainly because of market conditions (gas and carbon prices), scheduled maintenance shutdowns but also to a restriction of the network operator (Tennet).

The good results of the latest audits also allow Sloe to move towards ISO 55001 certification for asset management and ISO 27001 certification for data management and cyber security.

Sloe Centrale BV continues to develop its CSR programme and improve the working conditions of its employees, as well as aligning with the Group's mobility programme and investigating new technological solutions to lower its carbon footprint, thus remaining an active player in energy transition.

Germany

EDF has had operations in Germany for over 25 years. With some 3,800 employees and more than 100 researchers, EDF group has a large number of activities in Germany, in particular in renewable energy, energy services, and innovation. EDF offers sustainable business models and innovative energy solutions, calling on the expertise and knowhow of its subsidiaries.

EDF supports and contributes to energy transition in Germany, which draws extensively on renewable energy, energy efficiency, smart energy systems, and other innovative energy solutions.

EDF group entities operating in Germany:

- EDF Deutschland GmbH, a wholly-owned subsidiary of EDF International SAS based in Berlin, is in charge of the Group's activities in Germany. It focuses on the promotion and development of the Group's business, in particular new business models for energy and innovative solutions to support energy transition in Germany (*Energiewende*). EDF Deutschland also represents the Group in leading German political and economic circles.
- In 2020 Hynamics, a subsidiary in the Group in charge of putting forward an effective low-carbon hydrogen offering for industry and mobility, set up its German subsidiary, Hynamics Deutschland GmbH. This is part of a consortium of ten partners contributing to the *Reallabor Westküste 100* project. This consists in creating a regional industrial ecosystem in northern Germany focusing on hydrogen production from renewable energy, notably using the installation of a 30MW electrolyser for the Heide refinery. The partners are studying the possibility of installing additional electrolyser capacity in this region within the next 5 years, aiming at the symbolic figure of 700MW.
- Including the installed capacity of Futuren in Germany, EDF Renewables had 173MW of gross installed wind power capacity as at 31 December 2021, and operated 334MW of onshore wind power capacity.
- EDF Distributed Solutions is an EDF storage offering for industrial clients, deployed only in Germany and based on the peak-shaving model ⁽⁴⁾. This EDF Renewables subsidiary owns and operates 1,900kW of electricity storage systems, divided between three industrial sites.
- EDF group owns 100% of the share capital of the German company Energy2market (e2m), specialising in the aggregation of renewable production and local flexibility (see section 1.4.6.1.4 "Other service activities of the EDF group").

(1) Number of points of delivery.

(2) Bundled offers.

(3) Formerly Delta.

(4) Capping

- EDF Energiewende & Neue Ressourcen GmbH is a wholly-owned subsidiary of the EDF group with headquarters in Berlin and operations throughout Germany ⁽¹⁾. Its business model is the supply, maintenance and supervision of energy management and optimisation products and services for commercial and industrial companies, public services and renewable energy development companies.
- Based in Erlangen (Bavaria), Framatome GmbH has 3,000 employees, making the subsidiary Framatome's second largest engineering concern. Its main business is maintaining, prolonging and upgrading nuclear plants all over the world (especially Instrumentation & Control systems). It is also involved in the building of EPRs in France, Finland, China and the UK. Framatome is active in electricity and hydrogen storage in Germany. Framatome's other German subsidiary, Advanced Nuclear Fuels GmbH (ANF), makes fuel assemblies for PWRs (pressurised water reactors) and BWRs (boiling water reactors) in Germany and Western Europe and has 440 employees in Lingen (head office) and Karlstein.
- Metroscope, a subsidiary of EDF Pulse Holding develops AI for industrial asset MOC. Based in Berlin, Metroscope seeks to improve the performance of German electricity generation plants.
- Since July 2020, Urbanomy has been deploying specific resources for its development in Germany. Urbanomy offers consultancy in urban & energy planning using virtualisation and decision support solutions.
- EDF Trading actively participates on commodities market in Germany, especially the intraday and gas markets.

EIFER, a research centre which reports to EDF's R&D Department, is based in Karlsruhe and has more than 100 employees. EIFER is 50% owned by EDF ⁽²⁾. Its work focuses on the optimisation of energy resources and decentralised generation (integration of renewables), energy in cities and local communities as well as energy conservation and the environment (electro-mobility, Power-to-Gas, Smart Cities).

Investments

- EDF Deutschland holds a 25% stake in Hypion GmbH, a company that originates and develops hydrogen-related projects in the north of Germany.
- Electranova Capital holds a stake of 13.4% in Sunfire, a Dresden-based company which develops high-temperature electrolyzers (*Power-to-Gas* and *Power-to-Liquids*).
- EDF Pulse Holding has a 14.14% stake in McPhy, manufacturer and integrator of hydrogen-based energy storage equipment.
- The Group owns 50% of a run-of-river hydropower plant located in Iffezheim on the Rhine River (148MW, 5 turbines).
- EDF group also has storage for natural gas in salt cavities located in Etzel in Lower Saxony. The aboveground facilities are operated through a 50/50 joint venture with EnBW (see section 1.4.6.2.2 "Gas assets and projects"). Through its subsidiary EDF Gas Deutschland, EDF also holds a 16% stake in BEP gas pipeline (Bunde-Etzel-Pipelinegesellschaft).

1.4.5.3.2 Central and Eastern Europe

Russia

EDF group has operations in Russia in energy services through the Dalkia subsidiary Dalkia Rus and through its Moscow-based office which is in charge of the promotion and development of the Group's business and new activities in energy transition in Russia.

Central Asia

The Group's engineering Divisions (thermal, hydraulic, networks and systems) are active in this region to provide services.

In Uzbekistan, at end 2021, a consortium formed by EDF, Nebras (Qatar) and Sojitz (Japan) was selected by the Uzbek authorities to finance, build and operate for 25 years a 1,600MW combined-cycle gas turbine power plant at the Syrdarya site. The project benefits from a shaping contract with the state-owned NEGU (National Electric Grid of Uzbekistan), which supplies the gas and receives the electricity in

return. This contract is guaranteed by the Uzbek government. Commissioning is estimated to take place during 2026.

1.4.5.3.3 Southern Europe

Spain

At 31 December 2021, EDF International SAS held 31.48% of the share capital of Elcogas, a company owing a 320MW ICCG (Integrated Combined-Cycle Gasification) power plant, alongside Endesa Generación (40.99%), Iberdrola Generación (12.0%), and EDP (8.54%). Elcogas is currently in the process of being wound up. Due to a regulatory change affecting the profitability of the plant, it has been shut down and subsequently dismantled. Therefore, the Shareholders' Meeting on 13 May 2019 resolved to dissolve the company and place it in liquidation.

The Group is also present on the Spanish market through Fenice's local subsidiary, EDF Fenice Ibérica, and Citelum (see section 1.4.6.1.2 "Citelum").

EDF Trading operates in this market from its trading platform in London (see section 1.4.6.3 "Optimisation and trading: EDF Trading").

Framatome Spain is active in Spain through various engineering and maintenance contracts with firms that own nuclear reactors.

EDF also operates through its Madrid-based representation office EDF Peninsula Iberica, and is in charge of the promotion and development of the Group's business and new activities in energy transition in Spain and Portugal.

1.4.5.3.4 North America

The EDF group operates throughout the North American continent, with a strong presence in the United States.

It has more than 6GW of gross installed capacity in North America. It also manages, on behalf of third parties, around 49.2GW of installed capacity under operation and maintenance or optimisation services contracts.

EDF's activities in North America mainly include:

- until 6 August 2021, investments in nuclear generation, related to its 49.99% stake in CENG ("Constellation Energy Nuclear Group"), a joint venture with the Exelon Corporation (leading American nuclear operator) in three nuclear power plants. CENG had installed capacity of 4GW (*i.e.* 2GW consolidated by EDF group). Exelon was the licensed operator of these three facilities. EDF has sold its stake in CENG to Exelon;
- renewable energies, with a gross installed and under construction capacity of 7.1GW, mainly located in the United States through EDF Renewables North America, a wholly-owned American subsidiary of EDF Renewables. Equally, EDF Renewables Services (a wholly-owned subsidiary of EDF Renewables North America) manages close to 12.9GW in North America through operation and maintenance contracts on its own account or on behalf of third parties;
- trading throughout the entire value chain in North American gas and electricity markets through EDF Trading North America, and the supply of energy management products in the US and Canada through EDF Energy Services (a wholly-owned subsidiary of EDF Trading North America);
- energy services, local management of energy and energy efficiency, and public lighting under the management of Dalkia and its subsidiaries Dalkia Energy Solutions (formerly Groom Energy Solutions) and Aegis Energy Services;
- R&D and Innovation, as part of EDF Innovation Lab.

1.4.5.3.4.1 Nuclear activities in the United States

Nuclear generation: Constellation Energy Nuclear Group (CENG)

EDF held a 49.99% stake in CENG until 6 August 2021. EDF obtained an option to sell its equity interest in CENG to Exelon. The put option was exercisable between 1 January 2016 and 30 June 2022. On 20 November 2019, EDF initiated the put procedure by notifying Exelon of its intention to the exercise of the put option ⁽³⁾. The approval of the Federal Energy Regulatory Commission (FERC) and the New

(1) See EDF's Store and Forecast press release dated 7 October 2021: "Three EDF group affiliates join forces to support energy transition in Germany".

(2) The institution is also 50% owned by Karlsruher Institut für Energie (KIT).

(3) See EDF's press release dated 20 November 2019: "EDF notifies the exercise of its put option on its participation in CENG".

York Public Service Commission (PSC) was required as a condition precedent to closing the transaction. FERC and the PSC approved the transaction on 30 July 2020 and 15 April 2021, respectively. On 9 August 2021 EDF announced that EDF and Exelon had entered into a settlement agreement pursuant to which Exelon purchased EDF's equity interest in CENG for a net purchase price of \$885 million ⁽¹⁾. The transaction closed on 6 August 2021.

1.4.5.3.4.2 Other activities in North America

See section 1.4.6.3 "Optimisation and trading: EDF Trading".

See section 1.4.1.3.3 "EDF Renewables activity".

See section 1.4.6.1.1 "Dalkia".

For research and development, see section 1.5.1.5 "EDF R&D partnerships internationally".

Operating in nuclear energy in the United States since the 1950s, Framatome holds a large share of the market, involved in providing power to some 36 million American households. Its mission consists in ensuring the maintenance and modernisation of the American nuclear plants in operation and providing it with the fuel required and supporting the potential construction of new plants (also see section 1.4.1.1.4 "Nuclear generation activities: Framatome").

1.4.5.3.5 South America

In South America, the EDF group is present in the Brazilian and Chilean markets, and is extending its ambitions in certain countries in the region, in which it is prospecting for development opportunities.

1.4.5.3.5.1 Brazil

Since April 2014, the Group has held 100% of EDF Norte Fluminense SA (EDF NF). EDF NF built and has operated, since the end of 2004, the Combined-Cycle Gas plant of Norte Fluminense, with installed capacity of 826MW, located in the region of Macaé, State of Rio de Janeiro. A 20-year Power Purchase Agreement (PPA) for 725MW is in place with Light, the distribution company for the city of Rio de Janeiro. EDF NF supplies the equivalent of almost 25% of the electricity energy consumed in the Rio de Janeiro metropolitan area (2,5 million of clients). The power plant's generation in 2021 was 6.360GWh.

In addition, on 11 December 2014, through its subsidiary EDF Norte Fluminense, EDF acquired a 51% stake in Sinop Energia, responsible for building, maintaining and operating the Sinop hydropower plant. Located in Mato Grosso and 70km away from the city of Sinop, it has an extension of 342km², built on the Teles Pires River. The plant began operations in 2019 with an installed capacity of 402MW supplying the equivalent of 50% of the State of Mato Grosso (1,6 million clients).

Since the reservoir was impounded, some fish mortality events have been observed in 2019 and 2020 downstream of the dam and are subject of in-depth studies by two groups of independent experts in France and Brazil. This phenomenon is rare but has occurred on other sites around the world, including in Brazil. As for Sinop, the experts have concluded, among other things, that the water quality in the reservoir is not to blame and that this phenomenon does not occur during normal operation of the plant but is essentially linked to the use of the spillways, which in particular generate gaseous supersaturation phenomena. The expert groups made several recommendations in 2020 that were implemented in 2021. They concern spillway operating procedures, the installation of probes to measure parameters in real time, particularly oxygen levels, and the implementation of fish barriers. There have not been any fish mortality events since these recommendations have been implemented.

In 2021 EDF NF signed a contract for the construction assistance, operation, and maintenance of the Marlim Azul CCG plant for a 10-year term.

In the renewable energy field, the EDF Renewables subsidiary has a portfolio of:

- 398.5MW of solar energy from Pirapora power plant (one of the largest solar power plant of South America located at Minas Gerais State);
- 329MW of wind energy in operation and 379MW under construction in the state of Bahia.

EDF is also present in Brazil *via* Edison, of which the 50%-held subsidiary Ibiritermo operates a CCGT of 226MW in the state of Minas Gerais.

1.4.5.3.5.2 Chile

Since 2013, EDF was jointly developing with its Chilean partner Andes Mining & Energy (AME) a gas to power project combining the design, construction, and operation of a CCGT-type power plant with a power output of around 600MW, a storage infrastructure and an LNG Floating Storage Regasification Unit (FSRU).

Via its subsidiary EDF Chile, created in 2014 for this purpose, the Group has a 50% shareholding in the two project companies (GNL Penco and Central El Campesino – which was renamed GM Holdings), alongside BiobioGenera (50%) of which AME is the controlling shareholder.

The project nonetheless suffered a setback when the Chilean Supreme Court, in a decision on 30 January 2017, revoked the permit for the Penco Lirquen regasification terminal. The project was restructured in order to be able to supply the 4TWh per year, in accordance with the 20-year Power Purchase Agreement won in 2014. In particular, GM Holdings acquired in May 2018 ESSA, owner of a 750MW thermal generation asset.

In addition, on 30 September 2021, EDF and AME finalized the financing of Chile's largest solar park with a capacity of 480MW.

EDF Renewables is also active in Chile *via*:

- the Bolero solar plant (146MWp) in the Atacama Desert;
- the Santiago Solar photovoltaic project (115MWp) which is jointly held with AME and opened in January 2018; and
- the Cabo Leones 1 wind farm (115MW) which came online in June 2018. Currently, Cabo Leones 1 is undergoing a 60MW capacity expansion.

1.4.5.3.5.3 Peru

Since 2018, the Group is present in Peru *via* its subsidiary EDF Peru SAC which is prospecting for development opportunities and working on the predevelopment phase of power generation assets, especially from photovoltaic, hydraulic sources and gas.

1.4.5.3.5.4 Colombia

Since 2020, the Group is present in Colombia *via* EDF Andes which is prospecting for development opportunities and working on the predevelopment phase of power generation assets, especially from hydraulic sources.

1.4.5.3.6 Asia-Pacific

The EDF group's activities in the Asia-Pacific region are focused on China and fast developing countries. The presence in the sectors of electricity generation, networks and services constitutes an industrial challenge for the Group. In nuclear power, in addition to the EPR project in Taishan, the Group is pursuing new innovative projects.

EDF's objective is, thus, to maintain its competitive and technological advantages in the international arena focused on the global nuclear programme and the perspective of the French fleet renewal.

1.4.5.3.6.1 Activities in China

EDF group has had operations in China for over 35 years, and is now one of the largest foreign investors in electricity generation and energy services. EDF operates around 3.4GW of net installed capacity ⁽²⁾, in particular *via* stakes in the Taishan EPR power plant, the Dongtai IV and V offshore wind farms, coal-fired thermal power plants and operation of heating and cooling networks.

48% of electricity from EDF's assets in China was CO₂-free in 2021, higher than the Chinese national average.

The EDF group has been developing partnerships with leading Chinese electric energy companies, which open up new prospects for investment in the nuclear industry, renewable energies, energy services and engineering.

Please see section 2.2.4 "Operational performance related risks" – Risk Factor 4A - "Management of large and complex industrial projects (including EPR projects)" and 4E - "Operational continuity of supply chains and contractual relationships".

(1) See EDF's press release dated 9 August 2021: "EDF completes sale of its interest in CENG".

(2) Share in the capacity corresponding to EDF's stake.

These sections detail the risks to which the Group is exposed in a context of deteriorating diplomatic and/or commercial relations between the countries involved in the projects in China.

Nuclear power generation activities

Daya Bay, Ling Ao and Taishan EPR power plants

EDF led the design, construction and commissioning in 1994 of the Daya Bay power plant (two nuclear reactors of 1,000MW each). EDF also assisted the Chinese group China General Nuclear Power Co. (CGN) in the construction of the Ling Ao Phase 1 power plant (two reactors of 1,000MW commissioned in 2002 and 2003), followed by Phase 2 (two additional reactors of 1,000MW commissioned in 2010 and 2011).

EDF is currently providing assistance to the CGN group with the operation of its entire fleet. The performance recorded by these plants since they were commissioned is one of the Group's main references in China, bearing witness to the cooperation between the two countries.

EDF owns a 30% shareholding in Taishan Nuclear Power Joint Venture Company Ltd. The company's purpose is to fund, build and operate two EPR nuclear reactors in Taishan (1,750MW each), in the province of Guangdong. TNPJVC operates the power plant. Through this transaction, the Group represents the first foreign investor in Chinese nuclear power generation. Unit 1 came into commercial operation on 13 December 2018, and Unit 2 on 7 September 2019. After their first 18-month fuel cycle, each of the units carried out its first "initial comprehensive inspection" shutdown with reloading.

Feedback on the technical issue encountered on Taishan No. 1 reactor

Monitoring of the Taishan No. 1 reactor gradually revealed an atypical evolution of the radiochemical parameters leading to the suspicion that the fuel assembly rods had become unsealed ⁽¹⁾. TNPJVC, which is in charge of the operation, shut down the reactor at the beginning of August, as announced on 30 July 2021, to begin defueling operations, which were completed on 22 August. These operations were carried out in conjunction with Framatome's technical experts.

According to investigations on the fuel assemblies and the reactor vessel, the loss of sealing of the assembly rods would be due to a deterioration of the rod cladding owing to a mechanical wear phenomenon, located in the lower part of the rod. This mechanical wear would be the result of the rupture of small rod hold-down systems in the assemblies ⁽²⁾.

After an investigation by the competent authorities, these studies could eventually lead to adjustments to the manufacturing process and the implementation of a different technology to hold the rods in place in the assemblies.

Furthermore, the inspections carried out on the assemblies and the inside of the vessel also revealed a localised phenomenon between the assemblies and a component covering the core related to hydraulic exposure. Studies are underway to determine arrangements to reduce interactions between the assemblies and the core barrel.

Concerning the impact of this feedback on the start-up of the Flamanville EPR, see section 1.4.1.1.3.1 "Flamanville 3 EPR project" – "Taishan feedback".

The analysis concerning the other EPR projects is ongoing.

See also paragraph c2.2 relating to Taishan EPR in risk 4A – Management of large and complex industrial projects (including EPR projects such as HPC, FLA3, Taishan) of section 2.2.4 "Operational performance related risks".

Production of the Taishan EPR

The net production in 2021 was 18,487TWh. It was affected by the scheduled shutdown of unit 2 (first initial comprehensive inspection) and by the fortuitous shutdown of unit 1 for 5 months in the 2nd half of the year due to the technical issue encountered.

Tariff conditions applicable to nuclear power plants

The Chinese authorities have initiated consultations with the parties concerned with a view to defining the tariff conditions applicable from 2022 onwards to China's third generation nuclear power plants, in particular the Taishan plant. At the

beginning of 2022, the decision has not yet been taken by the authorities (see also section 2.2.4. – 4A – c.2.2 "Taishan EPR").

Partnership agreements

EDF is developing partnerships with key players in the Chinese nuclear industry, in particular its peers CGN and CNNC, to the benefit of the Group's business lines. The General Partnership Agreement between EDF and CGN was signed in 2007 and complemented in 2014 by implementation of agreements related to engineering, providers, R&D, and plant operation-maintenance.

The partnership with CGN enabled the initiation of discussions concerning its participation in joint nuclear projects in Great Britain, which resulted in the signature by EDF and CGN of the final contracts for the Hinkley Point C power plant on 29 September 2016. An agreement covering the development of the UK Hualong technology was also signed at that time.

The EDF group has set up a facility based in Beijing and Shenzhen (the Group's front office for China's nuclear industry) with the aim of promoting the EDF model of an integrated architect-assembler operator while acting as a flagship for French industry and positioning itself to support the Group's projects partnership with the Chinese nuclear sector. Experts in this facility are working, in particular, to further promote French codes and standards, as well as the Group's nuclear safety guidelines. They are also a source of technical exchanges benefiting EDF group's nuclear activities.

EDF also chairs the Partenariat France Chine Électricité (PFCE), made up of qualified suppliers of EDF which are seeking to develop in China.

In 2010, the Group concluded a partnership framework agreement with China National Nuclear Corporation (CNNC), extended in March 2014 and renewed in 2019, aimed at developing their cooperation along deeper, global lines.

In addition, an agreement between AFCEN ⁽³⁾ and NEA (National Energy Administration) was signed in November 2017. Its objective is to promote mutual recognition of nuclear codes and standards and to establish a basis for cooperation between France and China enabling both countries to operate on the international nuclear market.

The action plan for Franco-Chinese relations backed by the French and Chinese Presidents in November 2019 acclaims the cooperation between French and Chinese industrial groups on the EPR, in particular in Taishan, and calls for ongoing cooperation in China and on third-country markets, as well as continuation of the joint work on projects in the UK (Hinkley Point C, Sizewell C, and Bradwell B) (see also section 1.4.5.1.2.5 "Nuclear New Build business").

Framatome

Framatome has had operations in China for over 35 years. It is the designer of units 1 and 2 of the Taishan plants.

Framatome is supplying some equipment and technology building blocks for the Hualong project (RCP, I&C, etc.) along with the fuel.

Framatome operates in China via joint ventures with Dongfang Electric Corporation (FDJV) and China National Nuclear Corporation (CAST) and through its wholly-owned subsidiary Framatome Nuclear Services (FNS).

Coal-fired thermal power generation activities

Shandong Zhonghua Power Company, Ltd. (SZPC)

The EDF group holds 19.6% of SZPC, a company which owns three coal-fired power plants in the Shandong province, commissioned between 1987 and 2004, with a total capacity of 3,060MW. The other shareholders are China Energy Investment Group ⁽⁴⁾ and the Hong Kong electricity producer CLP. From 1 January 2022, SZPC will start to progressively transfer its generation units to China Energy Investment Group with the Shiheng I&II units (1,260MW), with the total divestment of the asset being completed by 31 December 2028.

Datang Sanmenxia Power Generation Company Ltd. (DSPC)

The EDF group holds 35% of DSPC, the company that owns the Sanmenxia 2 power plant in Henan province, commissioned in 2007, with an installed capacity of 2×600MW, using a technology known as "supercritical coal". The other shareholders are two Chinese companies, including the Datang Group, which has a majority stake in DSPC.

(1) See EDF's press release dated 14 June 2021 "Information relating to reactor n°1 of Taishan nuclear power plant" and dated 22 July 2021 "EDF's communication regarding the Taishan Nuclear Power Plant's No. 1 reactor".

(2) See the EDF press release dated 12 January 2022: "Update on the Flamanville EPR".

(3) French Association for the Design, Construction and Operating Supervision of the Equipment for Electronuclear Boilers.

(4) Formerly Guodian group.

Fuzhou Power Generation Company (FZPC)

The EDF group holds 49% of FZPC, a joint-venture created in 2014 with a subsidiary of the Datang group to build and operate an "ultra-supercritical" power plant (2×1,000MW) in the Jiangxi province. This technology makes it possible to reach high levels of temperature and pressure in the boiler, assuring a better output (close to 44% for Fuzhou) than a traditional power plant, while decreasing coal consumption and CO₂ per kilowatt-hour generated. The first unit was commissioned in December 2015, the second in April 2016.

EDF and Datang have entered into discussions to redeploy their partnership to low carbon activities. This commitment led to the signing of a "Low Carbon Strategic Cooperation Framework Agreement" on 18 June 2021.

Renewable energy

Through the Chinese subsidiary of EDF Renewables, EDF group has a stake in 7 wind farms in operation, with gross total installed power of 403.3 (254.2MW net) and a pipeline of projects under development totalling several hundred MW.

In 2018, EDF Renewables diversified its business into distributed solar power with the creation of a joint venture with ACC, aimed at developing rooftop solar power solutions for industrial customers (130MW is in operation or under construction to date).

In the sphere of offshore wind power, in March 2019, EDF concluded an agreement with the China Energy Investment electricity company for the construction of two projects (Dongtai IV and Dongtai V) off the shore of Jiangsu province. The two partners are building and operating these wind farms, with total capacity of 502MW, together. The first phase (Dongtai IV – 302MW) was commissioned in December 2019; the second phase (Dongtai V – 200MW) in November 2021.

Research & Development (R&D) activities

The R&D centre's activities in China involve the generation and storage of low-carbon electricity, innovative electricity grids, local multi-energy systems, energy engineering, electric mobility and open innovation. Benefiting from the highly dynamic and innovative Chinese ecosystem, EDF's R&D centre in China is working on applications of digital technology and artificial intelligence to energy business lines. The first edition of EDF Pulse China was organised in 2021 with the participation of over 200 Chinese start-ups.

Energy services

In the city of Sanmenxia (Henan province), EDF set up a joint venture (of which 65% is held by EDF) for the construction and operation of an urban heating network using the recovery of waste heat emitted by thermal power plants of its partner Datang. The 30-year concession agreement was signed on 9 August 2016.

In the city of Lingbao (Henan province), EDF set up a joint venture (of which 65% is held by EDF) to build and operate a heating network powered by a 30 to 35MW biomass cogeneration power plant. The 30-year concession agreement was subscribed on 9 January 2018. The outcome of the ongoing grant process is currently uncertain.

In the city of Sanya (Hainan province), EDF and its partner Changfeng Energy were chosen in August 2017 by the municipal government to build the first cooling power plant, which was initiated in September 2021 and will provide air conditioning systems to hotels in this region.

In January 2021, EDF and Jinan Heating Group signed a 25-year contract to develop an urban air-conditioning network in a new business district of Jinan (9 million inhabitants), which began operating in August 2021.

In partnership with car manufacturer Beijing Automotive Group (BAIC), EDF inaugurated a first battery exchange station for a fleet of taxis for the City of Sanya (Hainan Province) in August 2020. Several other stations are being developed in Haikou (capital of Hainan province) and Zhuhai (Guangdong province).

EDF is also present in this country for public lighting, through the 15-year contract signed with Kunming city (the capital city of Yunnan province) where it manages 113,000 street lights.

1.4.5.3.6.2 Southeast and Southern Asia

The EDF group's activities in Southeast and Southern Asia are focused on the development of the electricity sector, particularly through projects for the design, construction and operation of new thermal gas and hydraulic generation plants in countries offering Independent Power Plant (IPP) type opportunities. EDF is also

involved in the field of renewable energies, nuclear, smart cities, microgrids, electric mobility and innovation.

Vietnam

At 31 December 2021, EDF owned 56.25% of Mekong Energy Company Ltd. (MECO), the company owning Phu My 2.2, a combined cycle gas power plant with a capacity of 715MW. The other shareholders are TEPCO (JERA) and SGM2 (Sumitomo). This is the first IPP project financed exclusively by foreign investors in Vietnam. The BOT (Build, Operate, Transfer) contract has a term of 20 years. In 2005, EDF provided "turnkey" delivery of the power plant, and operations are now managed by MECO.

Once built, the high-efficiency and environmentally-optimised CCGT Son My1 plant with a capacity of 2,250MW in Binh Thuan province, situated north-east of Ho Chi Minh City will be operated by EDF for a period of 20 years. The EDF group was chosen to head the consortium tasked with studying the project alongside local partner Pacific Corporation and Japanese partners Sojitz Corporation and Kyushu Electric Power Co. with stakes of 37.5%, 25%, 18.75% and 18.75% respectively. A memorandum of understanding setting out the general terms of the project was signed with Vietnam's Ministry of Industry and Trade (MOIT) in November 2018 and amended in December 2020. On 27 October 2021, the project was granted an "in-principle investment decision" from the Ministry of Industry and Trade. The working schedule for 2022 will consist in obtaining final approval for this feasibility study from the MOIT and moving forward in the negotiation of a concession agreement and other contractual documents required for commissioning of the first unit by the end of 2025.

Laos

At 31 December 2021, EDF Invest holds a 40% stake in Nam Theun 2 Power Company (NTPC), which owns the hydropower complex Nam Theun 2 with an installed capacity of 1,070MW. Nam Theun 2 was built by the EDF group under a "turnkey" contract and commissioned in 2010. The other shareholders are a Thai company, EGCO (Electricity Generating Public Company Limited), which holds 35%, and a Lao State company, LHSE (Lao Holding State Enterprise), which holds 25%. NTPC company operates the power plant on a 25-year concession agreement concluded with the government of Laos.

2021 business focused on the operational management of installations (first major overhaul since commissioning), in a difficult hydrological year in Laos, whilst also continuing with social and environmental support missions in the region of Nam Theun (the Nakai Nam Theun National Park was accepted as candidate to the International Union for the Conservation of Nature's Green List of Protected and Conserved Areas).

A project to develop a floating solar wind farm with capacity of 240MWp on the Nam Theun 2 hydroelectric dam reservoir was launched in 2019. The project was formalised by the signature of a Memorandum of Understanding (MoU) with the Lao government in July 2019 and then with our partners in June 2020. During the year 2021, important steps were taken, including the signing of a Project Development Agreement (PDA) with the Lao government and an MoU with partners, to optimise and develop production by NTPC. The benefits of this hybridisation between two power sources are manifold. In particular, it allows a better production capacity in the dry season, thanks to optimised water storage in the reservoir, and the development of a low-carbon energy without major environmental or social impact.

India

India was hit hard by the Covid epidemic in 2021. This crisis has had a significant impact on the development of the Group's activities in this region.

In the field of nuclear energy, for details of the cooperation agreement for the project to construct six EPR reactors in Jaitapur, see section 1.4.1.1.3.2 "Other New Nuclear projects".

EDF continued developing its smart meters and smart grid business with the EESL3 project. The project provides for the installation of nearly 5 million smart meters in five Indian states, under the French-Indian Cooperation Plan. The roll-out phase was launched in 2021 and is expanding massively after a slowdown due to the health crisis. The EDF International Networks subsidiary, established in India since 2019, is coordinating the implementation of the project.

EDF Renewables continued growing its solar and wind power businesses in India, the latter established in 2016 (see also section 1.4.1.3.3 "EDF Renewables activities").

Burma

Following the *coup d'État* on 1 February 2021, EDF announced the suspension of the Shweli 3 project in Burma, a 671MW hydroelectric dam development project on the Shweli River in northeast Burma (Shan State). Respect for fundamental human rights is a prerequisite for every project in which EDF is involved. Therefore, since the *coup*, the Shweli 3 consortium has decided to suspend the development of the project, including the activities of its subcontractors.

In addition, EDF has also decided to suspend its development of hybrid microgrids (solar and battery) in several remote villages in Burma.

The Group is ready to resume its activities in Burma when political and social conditions allow.

Indonesia

The EDF group is continuing its development strategy in Indonesia, favouring renewable energy projects and accelerating access to electricity for the country's remotest island locations, with the development of microgrids.

Singapore

Following an agreement signed in June 2013 with the Singapore Housing and Development Board, the city's largest construction firm, with the aim of developing an innovative urban modelling tool, the EDF group, in 2014, opened a centre of excellence for sustainable cities in Asia: EDF Lab Singapore Pte. Ltd (the "Lab").

In addition to the MASERA (Microgrid for Affordable and Sustainable Electricity in Remote Areas) micro-grid demonstrator, the Lab is also involved in two "Electricity Networks" research projects, partially funded by the Singaporean authorities:

- "Platform for Interconnected Microgrids Operation" (PRIMO): this is a research project led by the Lab with local academic partners (NTU, SIT, TUM@CREATE);
- "Descartes": this is a 5-year research project led by the CNRS in conjunction with 25 university partners and 5 industrial pilots, including the Lab, in charge of the "Digital Energy" package. This project aims to develop a hybrid artificial intelligence platform to improve decision-making for critical urban systems (energy, air quality, transport, etc.).

The Lab brings its expertise in feasibility studies of electricity import projects to Singapore, as well as in the development of activities related to electric mobility.

The Group is now well-established in Singapore to better manage its interests in Southeast Asia, strengthen its synergies with the Lab, and embed itself in the development and innovation ecosystem of smart grids, electric mobility, smart cities and interconnections. The aim is to increase the share of renewable energies in traditionally high-carbon countries.

1.4.5.3.7 Africa

The Group wishes to develop on the African continent by assisting countries with high-energy demand, on a selective basis appropriate to each geographic region, and by building sustainable and multi-industry partnerships. EDF is also intensifying its action in the supply of competitive off-grid energy.

South Africa

EDF group has had operations in South Africa since 1978 with the construction of the Koeberg nuclear power plant. EDF has also been assisting national electricity supplier ESKOM with the operation and maintenance of this power plant under a multi-year technical assistance contract, renewed in 2015. Framatome is also a major supplier to ESKOM (general maintenance and fuel). In 2014, a contract was signed to change the power plant's steam generators: this is due to take place in 2022.

The EDF group established a subsidiary (EDF Development South Africa) in 2007 in Johannesburg, with a view to preparing the relaunching of the South African nuclear programme. The South African subsidiary is also responsible for developing EDF's business activities in Southern Africa, particularly as regards generation projects as well as the sale of services relating to thermal and hydropower engineering, transmission and distribution. In December 2018, EDF Development

South Africa purchased 30% of South African engineering company GIBB Power to support the development of its engineering activity in the Southern Africa Region.

EDF group's renewables activities in the country began in 2011 with the acquisition of Innwind, in which the Group now has an 84% stake, allowing it to respond to renewables calls for tender issued by the South African government. Three wind power projects were won in 2012 and one in 2015, totalling 142MW (35MW of which are currently under construction). This programme of government calls for tender was frozen between 2015 and 2019.

In October 2019, the new government promulgated an Energy Master Plan for the country (Integrated Resource Plan 2019-2030). This plan provides for an additional 20GW of renewables capacity by 2030 and 3GW of gas. It also includes strategic thinking to consider the relaunch of a nuclear programme including small modular reactors (SMRs). The implementation of this master plan is underway, with the launch of a request for information for new nuclear capacity, to which EDF group responded in October 2020, and the launch of call for bids in renewable energies (RMIPPP and REIPPP Round 5).

In 2021, EDF Renewables (South Africa) was awarded several significant contracts in these government tenders. In March 2021, EDF was named preferred bidder for a 75MW hybrid wind, solar and battery project (RMIPPP programme). In October 2021, EDF was named preferred bidder for 3 wind projects totalling 420MW (REIPPP programme Round 5). In addition, EDF Renewables won a tender by the mining company Anglo American for a 100MW photovoltaic capacity to supply its Mogalakwena mine (Limpopo).

The Group is also present in South Africa via the company KES (Kukhanya Energy Services), created in 2002 (see section 1.4.5.3.9 "Off-grid energy").

Mozambique

The Group has been active in Mozambique since the end of the 1980s involving the provision of engineering services and has formed preferred partnerships with EDM (Electricidade de Moçambique).

Morocco

The EDF group has been active in Morocco since the 1970s. To help support its development in the region, the Group created EDF Maroc in 1997, EDF Renouvelables Maroc in 2012 as well as EDF Fenice Maroc in 2016.

It has formed preferred partnerships with National Office of Electricity and Drinking Water (ONEE) and Moroccan Agency for Sustainable Energy (MASEN), electricity distribution authorities, and industrial players. The Group does business in the areas of renewable, thermal and hydraulic generation, as well as in networks and training.

The Group is contributing to the decarbonisation of the Moroccan energy mix. After having been selected by ONEE in a call for tenders, the consortium led by EDF Renewables in partnership with Japanese group Mitsui & Co. is developing the 150MW Taza wind farm, for which the construction of phase 1 (87MW) commenced in September 2020.

EDF Renewables, in a consortium with Masdar and Green of Africa, is also carrying out the design, construction, operation, and maintenance of the first phase of the Noor Midelt solar complex following an international call for tender won in May 2019. This 800MW capacity project is an innovative hybrid power plant combining concentrated solar power and photovoltaic solar power, a world first.

EDF-R Maroc is supporting MASEN in the renewal of the Koudia al-Baida wind farm with the objective of doubling its capacity to 100MW. This project, which will start in 2022 following the signing of a memorandum of understanding in 2018, will be the first of its kind in Africa.

The Group also has operations in Morocco in energy efficiency activities through EDF Fenice Maroc, a subsidiary of Fenice Iberica (Edison). The Company is involved via a circular economy contract with a multinational group in the food industry.

Senegal

The Group is also present in Senegal, through the wholly-owned company ERA, the operator of the rural electrification concession in Kaffrine-Tambacounda-Kédougou.

In an electricity sector that is undergoing new institutional changes (a new electricity code was adopted in July 2021), the question of the economic sustainability of the rural electrification concession model remains topical through issues of tariff revision. In January 2021, ERA submitted a request to the regulator for an exceptional tariff review, which is still pending.

Cameroon

Nachtigal Hydro Power Company (NHPC), owned by EDF International (40%), IFC (20%), the Republic of Cameroon (15%), Africa50 (15%) and STOA (10%) have begun construction of the Nachtigal 420MW hydropower dam, situated on the Sanaga River, close to Yaoundé on 1 February 2019. In July 2016, Nachtigal Hydro Power Company was created to assist with the project and signed a Concession Agreement for Electricity Generation in April 2017. The Nachtigal financial closing was completed on 24 December 2018.

The Nachtigal hydroelectric power plant is a sizeable project for the country and will, on commissioning, be the most important generation resource in Cameroon. It aims at providing around one third of the electricity needs and generating numerous economic benefits for the local economy.

At the end of 2021, the updated schedule includes a 10-month delay due to the impact of the Covid health crisis. The transmission line of more than 50km, linking Nachtigal to Yaoundé, is completed. Commissioning of the first unit is scheduled for mid-2023 and operational commissioning is planned for mid-2024.

Following the MoU signed with the Government of Cameroon awarding EDF exclusive development of the Kikot hydroelectric project on the Sanaga River, discussions between the Republic of Cameroon and EDF enabled an agreement to be signed, on 25 June 2021, on the joint development of this project and a JDA (Joint Development Agreement).

EDF continues to act as consultant to Eneo, the incumbent electricity operator in the distribution sector.

Egypt

The two Benban 65MW solar power plants, developed on a parity basis with Egyptian company Elsewedy Electric, were commissioned in August 2019, and are delivering very satisfactory performance. The PPA is for 25 years.

In 2019, EDF Renewables took out a strategic stake in KarmSolar, a major player on the emerging market for privately produced and distributed solar power in Egypt. The company also operates microgrid projects that include storage. KarmSolar has a portfolio of 30MW of operational solar power plants and 200MW of plants under development.

EDF is also assisting Egypt with its energy transition in a consultancy capacity. In the field of transmission with EETC (Egyptian Electricity Transmission Company), EDF is supervising the engineering and construction of the dispatcher in the Delta (2017 contract) and the new national dispatcher to be located in Egypt's new administrative capital (2019 contract).

To support the EIB, EDF is pursuing its consultancy activity with EETC for the development of its transmission network.

For EEHC (Egyptian Electricity Holding Company), in the field of distribution, in 2021 EDF International Networks completed the deployment of 53,000 smart meters as part of a consortium led by French manufacturer Sagemcom and including the Egyptian company Globaltronics.

Ivory Coast

EDF group is developing the "Biovéa" project for a biomass electricity power plant with two 23MW units in partnership with SIFCA, an Ivorian agro-industrial group in West Africa, and Meridiam, an investment firm. This project is included in Ivory Coast's development master plan. An agreement on the transmission price for electricity was entered into with the State of Ivory Coast on 30 November 2017. The concession agreement with the State was signed on 9 December 2019. The signing of the financing documentation and the construction contract took place in June 2021. The financial closing took place at the end of 2021 and the start of construction is scheduled for early 2022.

In 2019, EDF International became a 49% shareholder in Conergies Group with strong development and innovation expertise in the fields of heating, ventilation, industrial cooling and solar power in West Africa.

In August 2016, the Group created a local subsidiary to support its development strategy in the Ivory Coast and in the subregion. In October 2016, EDF created the ZECI company, a joint-venture with the US company Zola Electric, for the deployment of an off-grid energy project for rural and peri-urban populations (see also section 1.4.5.3.9 "Off-grid energy").

Ghana

The Group is also present in Ghana through the ZEGHA company (see also section 1.4.5.3.9 "Off-grid energy").

Togo

The Group is present in the country through BBOXX Togo Capital, a joint venture created with the British company BBOXX, for the deployment of off-grid energy solutions for rural and peri-urban communities (see also section 1.4.5.3.9 "Off-Grid Energy").

In early 2020, EDF created a branch to support its development strategy and ensure the continued provision of engineering services.

Kenya

Since July 2018, EDF group has been contributing to the development of Kenyan company SunCulture to support the sale, installation, and maintenance of solar pumps for rural households, mainly in Kenya.

In 2020, EDF acquired an indirect interest in Bboxx Capital Kenya, which for the past few years has been carrying out the sale, installation, and maintenance of solar kits for rural households in Kenya (see also section 1.4.5.3.9 "Off-grid energy").

In February 2021, EDF invested 50% in Econet Energy Kenya (EEK), a company specialised in distributed solar power for the business market. EEK develops solar self-consumption solutions ranging from design to maintenance and financing. It operates assets in the industrial and tertiary sectors.

1.4.5.3.8 Middle East

The EDF group engages in development and project monitoring activities in the Middle East, and has a regional location based in the United Arab Emirates covering business in the region. In addition, the Group has locations in Qatar (Doha), Saudi Arabia (Riyadh), Lebanon (Beirut), Bahrain and the United Arab Emirates (Abu Dhabi and Dubai).

These locations generate commercial business and projects in these countries, where the main challenge in the coming years is to make progress in the post-petroleum energy transition.

The major projects in the zone are located notably in the **United Arab Emirates** with, in 2021, in **Abu Dhabi**:

- a joint-venture for the development of solar power, energy efficiency and public lighting named Emerge was created in April 2021 with Masdar, one of the world leaders in the field of renewable energy. Emerge is developing its offer primarily for commercial and industrial customers in the United Arab Emirates and Saudi Arabia. It is thus contributing to the ambitious objectives of these two countries in terms of energy transition;
- the start of construction of the Al Dhafra solar photovoltaic project. The Al Dhafra solar power project was awarded to the consortium comprising EDF group, through its subsidiary EDF Renewables, and Jinko Power. The two entities in charge of development have since been joined by co-shareholders Taqa and Masdar, two major energy players based in Abu Dhabi. The future solar power plant, with installed capacity of 2GW, will be the most powerful in the world. It should enable the avoidance of 2.4 billion tons of CO₂ per year (see also section 1.4.1.3.3 "EDF Renewables activities");
- EDF, as part of a consortium comprising KEPCO and Kyushu Electric Power Co. signed a \$3.6 billion strategic project on December 2021 to develop and operate a high voltage direct current (HVDC-VSC) submarine transmission system, a first in the Middle East and North Africa region. This major project will link ADNOC's ⁽¹⁾ offshore production activities to cleaner, more efficient energy supplied through the Abu Dhabi onshore power grid, owned and operated by TAQA's transmission and distribution companies. The project will reduce ADNOC's offshore carbon footprint by more than 30%, while supporting the UAE's "Net Zero by 2050 Strategic Initiative".

(1) Abu Dhabi National Oil Company.

Other major projects are located in **Dubai** with the customer DEWA (in charge of water and electricity in the Emirate):

- a development contract for an 800MW solar photovoltaic power plant, called "DEWA III". EDF, through its subsidiary EDF Renewables, has developed this project alongside Masdar and the customer DEWA. This plant was, at the time of its inauguration in 2020, the largest solar power plant in the world (see section 1.4.1.3.3 "EDF Renewables activities"). In August 2021, EDF Renewables and its partner Masdar created Energize O&M Co to operate and maintain the plant. Thanks to the production of DEWA III, 240,000 households in Dubai will be supplied with carbon-free electricity;
- an assistance agreement for the management of a 250MW dam pumping station planned for the Hatta mountains in the Emirate of Dubai, the construction of which has already started, for the customer DEWA (at the end of the first half of 2024). As an extension of this contract, DEWA has awarded EDF a contract to supervise the Dubai Summit project. This consists of building a tourist cable car above the Hatta hydropower site (scheduled for completion by mid-2025);
- an engineering consultancy project for the construction of a 3 x 233MWe thermal power plant in Al Aweer.

Also in the UAE, the EDF group has sought to establish a long-term relationship with Nawah, the operator of the Barakah nuclear plant and subsidiary of Emirates Nuclear Energy Corporation (ENEC). In 2018, EDF and Nawah signed a long-term master agreement under which EDF will assist Nawah with the operation and maintenance of the Barakah plant through various services such as safety, radiation protection, fuel cycle management and environmental monitoring. A second agreement was signed in June 2021 between Framatome and Nawah for the provision of maintenance services.

Another major engineering consultancy project for the customer Kahramaa (water and electricity in Qatar) is currently being conducted in Doha, along with the construction of substations and high-voltage power line networks. Several projects of high technical and strategic value including the development of renewable energies and the improvement of the performance of the transmission network have been won and are ongoing with this customer.

The major projects in **Saudi Arabia** include the following:

- in 2014, the EDF group signed a partnership agreement with the Saudi Electricity Company (SEC), the country's benchmark electricity operator, enabling a broad cooperation between the two groups, including training initiatives. In the extension of this agreement, the two GOC "Generation, Optimisation Center" contracts signed in 2016 and 2019 provide for support by EDF for the implementation of regional generation optimisation centres;
- in addition, via its subsidiary EDF Renewables in partnership with Masdar and Nesma, a Saudi company, EDF won in 2019 a call for tender for the financing, construction, and operation of the first wind power project in Saudi Arabia, with installed power of 400MW, at Dumat Al Jandal (see section 1.4.1.3.3 "EDF Renewables activities"). The fleet started production in July 2021;
- in 2020, in a renewed partnership with Masdar and Nesma, EDF Renewables was awarded the South Jeddah project in a tender organised by the Ministry of Energy ("Repdo 2"). Construction of this 300MW solar photovoltaic power plant began in early 2021. It will be EDF Renewables' first solar power plant in Saudi Arabia.

EDF has had operations in **Israel** since 2010 through its subsidiary EDF Renewables. At end 2021, it operates solar power projects connected to the grid with total gross capacity of 425MW, currently has 104MW under construction. The subsidiary is preparing for the construction in 2022-2023 of around 70MW of floating photovoltaic projects, 30MW of solar roofs, 225MW of ground-mounted photovoltaic projects associated with storage and 98MW of wind projects. These projects have been won through tenders organised by the State or by local authorities. Furthermore, EDF Hydro's Hydraulic engineering centre supplies services to the first Israeli project for the storage of electricity through pumping, on Mount Gilboa.

1.4.5.3.9 Off-grid energy

The EDF group has more than twenty years' experience in off-grid power provision in Africa via companies created for that purpose based on territorial concessions. Since 2017, the EDF group has joined forces with innovative start-ups to supply power and services to customers in rural areas and on urban outskirts in line with their income and needs. Solutions include supplying power to central grids, installing mini-grids and providing solar power kits.

Such services enable more than 1.5 million people in South Africa, Ivory Coast, Ghana, Senegal, Kenya, Zambia and Togo to light and power their low-consumption household appliances such as a television or a radio, or to recharge their mobile phones. Customers in Kenya and Togo can also buy solar-powered water pumps and thereby significantly improve their crop yields.

The EDF group, via EDF Pulse Holding with a 17% stake, teamed up with investment firm Meridiam to create NEOT Offgrid Africa with the aim of contributing to financing energy supply and services solutions.

Togo - Bboxx

EDF International holds a 50% stake in Bboxx Capital Togo. The company undertakes the sale, installation and maintenance of solar kits for rural households in Togo. In addition to the sale of Solar home systems, a partnership for the deployment of solar pumps was set up in 2020 with Kenyan company SunCulture and the Togo government.

South Africa - KES

In South Africa, the KES (Kukhanya Energy Services) company, created in 2002, is 50% owned by EDF International, 15% by the local operator, Calulo, and 35% by Total. It initially developed its business through photovoltaic kits in KwaZulu-Natal, and then extended its activities into the Eastern Cape region.

Kenya - SunCulture

Since July 2018, EDF group has been contributing to the development of Kenyan company SunCulture to support the sale, installation, and maintenance of solar pumps for rural households, mainly in Kenya. EDF assists SunCulture with its international development through a 16.1% stake held by EDF International in Savant Group, the parent company of SunCulture.

Kenya - Bboxx

In 2020, EDF International took out a stake in Bboxx Kenya (via a 38.5% stake in EDF Bboxx Kenya, which owns 60% of Bboxx Kenya). The company carries out the sale, installation, and maintenance services of solar kits in rural households in Kenya.

Zambia - SMG

In order to develop its offer in mini-grids, in 2020 EDF International took out a 12% stake in Standard Micro Grid Initiatives Limited, a start-up identified through the "EDF Pulse Africa" competition, which develops and installs mini-grids using a solution with standardised containers and smart meters, enabling the sale of energy blocks on demand.

Ivory Coast - ZECI

ZECI, created in October 2016, ensures the installation and maintenance of solar kits intended for households in rural areas and on urban outskirts. In June 2021, Zola Electric withdrawn from the company's capital. At the end of December 2021, a new shareholder partner, Meridiam, entered the capital of ZECI, 50/50 with EDF International.

Ghana - ZEGHA

Zola Electric, the Ghanaian company CH Group and EDF International decided to create ZEGHA, in which they respectively hold a 50%, 20% and 30% stake. The pilot phase linked to the start of the company was launched in December 2017 on the Ivorian model.

1.4.6 Energy services and other activities



In a regulatory and societal environment which places the fight against climate change at centre stage, and in line with its *raison d'être*, EDF group aspires to significant growth in energy services in order to deliver high-performance, innovative and sustainable solutions to its customers.

These services address the issues raised by local authorities, businesses and residential customers in a wide variety of fields: decentralised energy production, low-carbon heating networks, green hydrogen, smart lighting, electric mobility, smart building management, energy saving advice, and energy efficiency. The range of solutions offered by the Group is innovative and meets customers' emerging requirements, notably reducing carbon emissions and improving energy performance.

1.4.6.1 Energy services

The services proposed draw on the Group's expertise, in particular in R&D, and are implemented through its various subsidiaries.

In 2017, EDF group created "EDF Pulse Croissance", a team tasked with exploring ecological and digital transition by means of investment and intrapreneurship levers, in order to provide Group customers with innovative and competitive offers and services. In 2021, this team was made part of the new Innovation and Pulse Programmes Department (see section 1.4.6.1.3).

In 2018, EDF group launched the Electric Mobility Plan to help decarbonise the transport sector, which is responsible for 31% of CO₂ emissions in Europe ⁽¹⁾. This policy was further enhanced in 2019, in particular through the creation of Dreev, and in 2020 with the acquisition of Pod Point. For its own fleet of light commercial vehicles, the Group is also rolling out the EV100 ⁽²⁾ programme and gradually converting its ICE vehicles into electric vehicles; the target is to be 100% complete by 2030.

In 2019, EDF entered the local services market with the acquisition of Hello Casa, now known as IZI Solutions. This new activity is aimed at improving home comfort and energy performance.

1.4.6.1.1 Dalkia

The EDF group has held a 99.94% equity interest in Dalkia since July 2014. Dalkia is a leading player in the European energy services market that provides a full range of services and has an excellent sales network in France. The company is expanding internationally in six geographical zones (Great Britain, Ireland, USA, Poland, Russia and the Middle East).

Dalkia provides its customers with expertise to develop, produce, and manage more environmentally-friendly and economical energy systems. Thanks to its nearly 80 years of experience in managing heating and cooling networks, optimising industrial utilities, improving the energy performance of buildings, or using alternative and renewable energies, Dalkia offers its customers tailor-made solutions to reduce their energy consumption and to improve the environmental and economic performance of their installations.

Dalkia (including its subsidiaries) manages over 90,000 energy installations in France and abroad.

Dalkia achieved 6.2TWh of energy savings in 2021, as well as enabled its customers to avoid the emission of 4 million tonnes ⁽³⁾ of CO₂.

Dalkia's operations

Dalkia and the development of renewable energy

Dalkia's core business is to make the best use of local energy sources for heating and cooling networks. Dalkia uses local sources of energy to provide its customers – both businesses and local authorities – with sustainable energy solutions:

- the development of renewable energy is a focus of Dalkia's priorities, particularly through the use of renewable and recovered energy sources, such as biomass, biogas, geothermal and recovered energy;
- Dalkia encourages the production of energy from waste reclamation through a circular economy-type approach, which limits the use of fossil fuels and contributes to the achievement of Dalkia's decarbonisation goals.

Dalkia and energy savings

Dalkia's second business line is "energy savings", in particular through Energy Performance Contracts:

- Dalkia develops energy saving solutions, through smart buildings that consume less and less, and energy renovation works to make buildings more efficient;
- Dalkia also optimises its customers' consumption by processing their data using *Dalkia Energy Savings Centres*, which are energy performance management centres that combine digital and human intelligence.

Main subsidiaries of Dalkia in France

Dalkia Smart Building

Dalkia Smart Building, a wholly-owned subsidiary of Dalkia, specialises in designing and implementing solutions to help its customers adapt to the energy shift and digital transition in France. Dalkia Smart Building, the activity of which is highly complementary to that of Dalkia, designs and implements solutions for building renovation.

Dalkia Froid Solutions

Dalkia Froid Solutions, a wholly-owned subsidiary of the Dalkia Group, specialises in industrial and commercial refrigeration and HVAC. Its aim is to supply its customers with controlled temperatures, by optimising energy consumption and protecting the environment through innovative end-to-end management of the process, encompassing consultancy, design, installation, and maintenance.

Dalkia Air Solutions

Dalkia Air Solutions, a wholly-owned subsidiary of the Dalkia group, provides a complete range of auditing, design, installation and maintenance services for compressed air, nitrogen, and breathing air systems aimed at all sectors of industry. Compressed air is an energy intensive utility that requires a significant amount of electricity, and thus has a potential for energy savings.

Dalkia EN

Dalkia EN (*Énergie Nucléaire*, Nuclear Energy) is a wholly-owned subsidiary of the Dalkia group that is dedicated to the nuclear environment. The entity has a headcount of over 600 employees working in two business lines: maintenance of backup electricity production resources, and cold generation and ventilation systems for nuclear power plants, as well as coordinating providers and building maintenance for nuclear and thermal power plants.

Dalkia Electrotechnics

Dalkia Electrotechnics is a wholly-owned subsidiary of Dalkia ⁽⁴⁾. It provides electrical engineering services primarily in two fields:

- high voltage: private or public electricity networks, lighting, industrial processes, transport, etc.;
- medium and low voltage: smart sensors, access controls, video surveillance, traffic lights, etc.

Dalkia Electrotechnics designs, installs, operates and maintains electrical installations and offers a range of services that are tailored to its customers' needs.

Citelum France, in particular, has been part of Dalkia Electrotechnics since January 2022.

(1) Source: French Ministry for Ecological Transition, *Chiffres clés du climat* (Climate: Key Figures), 2022 edition, page 38.

(2) EV100 is a global initiative that was launched in New York at Climate Week NYC in September 2017. It aims to bring together multinationals that are committed to the development of electric mobility and to ensuring its widespread adoption by 2030.

(3) 3.7 million tonnes excluding CO₂ avoided through gas cogeneration.

(4) See the Dalkia press release dated 25 January 2022 *Dalkia lance sa filiale de génie électrique* ("Dalkia launches its electrical engineering subsidiary").

Dalkia Biogaz

Dalkia Biogaz, a wholly-owned subsidiary of Dalkia, is a company specialising in biogas generation, treatment and recovery. Dalkia Biogaz has expertise in the field of methanation. The biogas produced is used both in cogeneration and for direct injection into the natural gas distribution network.

CRAM

CRAM is a wholly-owned subsidiary of Dalkia, located primarily in north-western France (Normandy, Picardy and Ile-de-France). It provides services and designs and implements projects in the field of operations and maintenance, management and construction of heating and climate control facilities. The company has a workforce of 650 employees and manages over 7,000 installations.

Main subsidiaries of Dalkia abroad**Dalkia Polska Solutions and Dalkia Polska Energia (Poland)**

Dalkia Polska Solutions, based in Poland, designs, builds and maintains technical facilities (ventilation, heating, air conditioning, fire protection, etc.) for commercial buildings and industrial sites. It also provides innovative solutions for the building's energy performance management.

Dalkia Polska Energia is mainly specialised in the generation and distribution of heat in the region of Katowice in Poland (Upper Silesia). It has recognised expertise in the energy recovery of mine gas as an alternative to coal to be used by heating networks and electricity distribution facilities.

Dalkia Rus (Russia)

Dalkia Rus specialises in energy efficiency for industrial customers and is one of the pioneers in the energy services sector in Russia.

Imtech (United Kingdom)

Imtech, jointly owned by Dalkia and EDF Energy, specialises in major HVAC and electrical engineering works, technical facilities maintenance, and data acquisition and control systems integration. Imtech provides its services to the construction, industry and tertiary sectors, and public authorities.

Imtech is established in the United Kingdom. Its subsidiary, Suir Engineering, is established in the Scandinavian countries and Ireland. Its subsidiary, Breathe, is a specialist in energy performance in the UK.

Dalkia Energy Solutions (United States)

Based in Massachusetts, Dalkia Energy Solutions provides companies and industrial customers with a comprehensive approach to consultancy, project management and the performance of energy efficiency work, with nationwide coverage in the United States.

Aegis Energy Services (United States)

Aegis Energy Services LLC, which is based in Massachusetts, specialises in small gas cogeneration plants and facilities, which it designs, builds, commissions and maintains.

Dalkia Middle East Energy Company Limited (Middle East)

Dalkia Middle East Energy Company Limited was incorporated in 2021 and is active in the field of power plants and cooling networks, energy performance contracts and multi-technical maintenance.

1.4.6.1.2 Citelum

The EDF group has initiated a process for the geographical and operational reorganisation of the activities of Citelum, a subsidiary dedicated to public lighting and associated services, as part of the growth of its energy services business, in particular in the field of electrical engineering.

This reorganisation is designed to meet a twofold objective of improving the quality of services provided to its public- and private-sector customers, and of developing synergies between the energy services managed by the main service subsidiaries of the Group, in particular by means of improved integration of the business activities conducted in the field of public lighting by Citelum.

Accordingly, Citelum's business activities in France and Belgium have already been transferred respectively to Dalkia Electrotechnics, Dalkia's new specialised subsidiary ⁽¹⁾, and to Luminus. The Mexican business activities, on the other hand, have been sold to an investment fund.

Citelum moreover continues to enjoy significant commercial momentum. Thus, for example, Citelum, in a consortium with Eiffage, was awarded a contract by the City of Paris for public lighting and traffic light systems, as well as festive and

architectural lighting. To date, this is the largest contract to date awarded in France in the area of public lighting and traffic light systems.

2022 will be an opportunity to finalise this project to consolidate electrical engineering activities within EDF group.

1.4.6.1.3 EDF Pulse Holding**The new Innovation Division of EDF group**

In 2021, EDF created a new Innovation Division called DIPP (*"Direction de l'Innovation et des Programmes Pulse"*) that is structured around five core functions:

- strategic framework for innovation: elaborate an annual strategic framework for innovation, applicable to the scope of EDF group ⁽²⁾, that identifies priority areas for innovation and key projects, as well as their associated action plans. This framework is prepared in close collaboration with R&D and EDF group's business lines;
- performance and development: define the Group's key performance indicators (KPIs) for innovation and pool expertise on innovation tools and methods, in order to provide support for the Group's business lines through the Pulse Programmes (*cf.* section 3.3.3.6.7);
- incubation, Ventures and Major Innovative Industrial Projects: identify and develop new growth levers for EDF group through the following three programmes:
 - › the EDF Pulse Incubation programme, for the development of intrapreneurship projects,
 - › the EDF Pulse Ventures programme, for investment in start-ups and in funds that are dedicated to innovation,
 - › the Major Innovative Industrial Projects team whose goal is to position the Group on industrial projects that are not mature enough for the Group's business lines but that are still strategic for the Group;
- operations: provide HR, financial, legal, financial control, ethics & compliance, CSR and IT support services to the DIPP and to the portfolio of subsidiaries, equity interests and incubated projects.
- communication & Marketing: provide communication support to the DIPP, as well as to all the innovative projects, to enhance the Group's image as an innovator.

The DIPP includes the former EDF Pulse Croissance entity, whose stakes in start-ups and investment funds are now managed by EDF Pulse Holding. The development of the EDF Pulse Holding portfolio is directly linked to the activities of the EDF Pulse Incubation and EDF Pulse Ventures programmes, which are detailed below.

EDF Pulse Incubation

The EDF Pulse Incubation programme draws on the ideas and know-how of the Group's employees to design and develop new business and services. The incubator programme offers bespoke support for employees and enlists in-house and third-party experts to test, create, and develop business models, as well as foster the professional development of intrapreneur employees.

This support helps intrapreneur employees, as well as EDF group as a whole, since it contributes to the Group's evolution and the upskilling of its employees. Due to the close proximity of EDF Pulse Incubation's teams to those of EDF Pulse Ventures, incubated projects benefit from an "investment-driven" vision, while continually monitoring market trends and needs.

Intrapreneurial projects may lead to the incorporation of a new EDF group subsidiary. This was the case, for example, of:

- **Hydramics**, which produces and markets low-carbon hydrogen from water electrolysis using low-carbon electricity for the heavy-duty mobility and industrial markets;
- **Metroscope**, which has developed digital twin software for improving the performance of industrial facilities;
- **Exaion**, which provides environmentally-friendly, competitive and sovereign cloud-based blockchain and high-performance computing solutions;
- **Urbanomy**, which provides both private and public sector undertakings with support for spatial planning and the energy optimisation of projects, with the aim of achieving carbon neutrality, through strategy consulting services, technical and economic studies, and visualisation solutions.

(1) See the Dalkia press release dated 25 January 2022 *Dalkia lance sa filiale de génie électrique* ("Dalkia launches its electrical engineering subsidiary").

(2) Excluding Enedis and RTE.

EDF Pulse Ventures

The role of the EDF Pulse Ventures programme is to identify new, innovative activities and solutions outside of EDF group, in order to expand the investment portfolio managed by EDF Pulse Holding by acquiring interests in start-ups and venture capital funds.

The programme can also result in the creation of joint ventures with start-ups that are capable of exploring new business models and winning new markets in France and abroad. The goal is primarily to build an industrial and commercial partnership between these start-ups and the business lines of EDF group, with the support of EDF Pulse Holding as a shareholder.

Since 2017, around €270 million have been invested through the EDF Pulse Incubation and EDF Pulse Ventures programmes, in 25 in-house and external start-ups and in 20 investment funds, primarily in France, but also in Europe and North America.

New additions to the EDF Pulse Holding portfolio in 2021

Enerbrain

Enerbrain is an Italian start-up that specialises in smart building solutions. It has developed a solution to optimise the energy efficiency of tertiary buildings, using IoT smart sensors with a software layer that incorporate artificial intelligence in order to manage each building's electrical consumption. During a €5.2 million investment round for Enerbrain, EDF Pulse Holding acquired a stake in the company, alongside other financial and institutional investors.

Persefoni

Persefoni is a US start-up that provides companies and institutional investors with solutions for measuring, analysing, planning, anticipating and publishing their carbon footprint. The Persefoni platform uses artificial intelligence to enable organisations to manage their transactions and the inventory of their carbon emissions with the same strict standards as their financial transactions. Persefoni was designed for both companies and institutional investors. It provides a complete carbon footprint management system. EDF Pulse Holding acquired a stake in this start-up during a Series B investment round of \$101 million.

Algar

Algar is a French start-up that specialises in the streamlining and management of procedures to obtain planning authorisations for the general public and professionals. It provides a complete service for facilitating legal procedures that enables owners to obtain planning authorisations using an entirely online process. Algar is thus one of the property technology ("PropTech") start-ups that is transforming the real estate sector by means of digital technologies. EDF Pulse Holding acquired a stake in this start-up during a Series A investment round of €3.2 million.

ITK

ITK is a French company that was founded in 2003. It specialises in agri-intelligence. ITK designs and develops agronomic modelling and artificial intelligence solutions to improve agricultural performance and reduce the greenhouse gas emissions caused by farming. ITK's technology simplifies the management of crop profitability and the impact of crops on the environment, as well as of animal health and well-being. ITK has three sites: Montpellier (Occitania), Rennes (Brittany) and San Francisco (California, USA). EDF Pulse Holding acquired a stake in this start-up during an investment round of €10 million.

"Clean H2" infrastructure fund

EDF Pulse Holding has acquired a stake in a fund that is dedicated to the development of clean hydrogen infrastructures. This fund is managed by Hy24, a joint venture held on a 50/50 basis by Ardian, a world-leading private investment house, and FiveT Hydrogen, a clean-hydrogen private investment and asset management platform. This fund will invest in the entire renewable low-carbon hydrogen value chain in the most promising regions of America, Asia and Europe. In the capacity of partner, it will invest alongside other major developers and/or industrial players, in large-scale clean hydrogen projects, in both the upstream and downstream sectors.

1.4.6.1.4 Other service activities of the EDF group

Other entities and subsidiaries of the EDF group complete the range of energy services that EDF offers. They are active in specific areas, and target various categories of customers (residential, professional, business and local government). They cover a wide range of activities including research, construction, equipment maintenance, investment financing and assistance with obtaining permits and subsidies.

Datanumia

To help customers manage their energy and utilities consumption, EDF group provides facility monitoring and management solutions. The subsidiaries Netseenergy and Edelia, which, for the past 15 years, have been focused on this strategic line of action, merged on 1 January 2021, thus leading to the creation of Datanumia. Datanumia is a wholly-owned subsidiary of EDF group. It provides innovative digital solutions so that each type of customer (residential, business and local government) can optimise their energy consumption and their carbon footprint by leveraging new forms of energy.

The company specialises in energy intelligence for buildings and industrial processes. Datanumia assists companies and local government in energy transition throughout the energy management value chain. Datanumia processes almost 10 million items of data daily for around 45,000 sites in total, using bespoke solutions tailored to the needs of its customers: energy performance control, innovative energy audits, and more. Datanumia specialises in the IoT (Internet of Things). It collects data from 60,000 smart objects every day, and provides energy management for total building space of over 120 million square metres.

Datanumia also designs and implements solutions for individuals to monitor and control their energy consumption. Datanumia thus provides a digital platform so that EDF customers can benefit from a range of innovative digital solutions in order to monitor and obtain a granular understanding of their energy consumption (electricity and gas). This platform currently has around six million active residential customers.

Sowee

Sowee is a wholly-owned subsidiary of EDF group that was founded in 2016. Its goal is to give each customer the means to achieve more efficient energy consumption. Sowee provides residential customers with solutions and services for managing energy consumption, which can be separate from the energy supply contract. All Sowee customers are able to monitor their consumption and their invoices in their mobile application. They can also receive warnings if their consumption exceeds certain limits. For a customer, understanding their energy consumption is the first step towards planning and controlling their expenses.

For customers who have a gas boiler or electric radiators Sowee also provides the Sowee Smart Station as an additional tool. This provides remote, smart management services for customers' heating systems, without them having to change their installation.

The Smart Station also facilitates access to services that help with daily life through the integration of Amazon Alexa and the display of practical information, such as the indoor (CO₂ and humidity) and outdoor air quality, weather forecasts, ephemeris, etc. Lastly, Sowee also launched a "managed load shedding" option in 2021 for its customers who own the Smart Station.

IZIVIA

IZIVIA, a wholly-owned subsidiary of EDF group, is a flagship player in the electric mobility market in France. IZIVIA provides charging solutions for electric vehicles targeted at local authorities, energy consortia, and businesses. It provides support to its customers at all stages of their electric mobility projects (technical and commercial operation of charging services, maintenance of charging points and management of user services).

IZIVIA is the leader on the public charging market, with a share of more than 25%. It is one of the key players, with around 20% of the market for charging points that are eligible for the Advenir subsidy ⁽¹⁾. The company operates 14,500 charging points.

Cham

Cham is wholly-owned subsidiary of the EDF group, specialising in the installation, maintenance, and repair of domestic electric heating, ventilation and air conditioning equipment: heat pumps, gas and oil-fired boilers, air conditioners, thermodynamic tanks, etc.

(1) The Advenir programme was started in 2016 and provides subsidies for financing the rollout of charging point infrastructure.

With over 1,000 employees across France, Cham completes more than of 800k call-outs a year, meeting the needs of homeowners, private and public collective housing, and businesses.

Cham draws on 70 local offices and its digital channels in order to win over and serve customers. Cham continues to expand its portfolio of heat pumps in order to assist its customers in energy transition. The company is also trialling remote diagnosis and repair.

Driven by relentless pursuit of growth, Cham is positioning itself as a specialist home energy renovation services provider based on three key strengths: professional staff, network expertise and strong local markets.

IZI by EDF

IZI by EDF was launched in February 2019. It is EDF's brand that provides services other than energy in France for residential customers and very small businesses, irrespective of whether they are EDF customers, to support their facilities and energy transition.

In 2020, IZI by EDF released a full-service offering for sustainable homes and electric mobility:

- a turnkey energy renovation offer focusing on heating solutions (heat pumps and boilers), insulation, ventilation, and window installation (with calculation and deduction of all regulatory aid from the customer quote), as well as a finance solution and a quality commitment;
- a full-service solution to transition to electric mobility, including the installation of a home charging station, green electricity supply with Vert Électrique Auto, the pass mobilité (operated by IZIVIA) mobility pass for charging anywhere in Europe, and electric vehicle leasing.

In 2021, IZI by EDF continued to expand its range of solutions by offering exterior wall insulation, air-to-air heat pumps, services to bring electric installations up to standard and the complete exterior refurbishment of housing. This expanded range of solutions led to IZI by EDF doubling its turnover compared to 2020 and generated a threefold increase of its sales of air-to-water heat pumps and domestic charging points for electric vehicles.

Through IZI by EDF, EDF can act as a general and lead contractor for its customers. It assumes liability, guarantees successful services and issues the ten-year warranty itself. It thus makes serious commitments to the quality of work and customer relations, with the support of carefully selected and qualified contractors.

IZI by EDF also provides services from EDF group's specialist subsidiaries (Cham and IZIVIA) and certain other strategic partners ⁽¹⁾.

Local Energy Management

In the summer of 2019, EDF group created the Local Energy Management (LEM) entity to speed up the development of innovative offers relating to decentralised energy management. LEM provides coordination for companies that are expanding through intrapreneurship or acquisition-based growth, including Agregio, Dreev, e2m, PowerShift, and Store & Forecast, in a range of business lines:

- aggregating, managing, and promoting local flexibility, both upstream (intermittent production from wind and solar farms, flexible storage or generation facilities) and downstream (consumer load shedding capacities);
- marketing renewable energy production through new supply models such as Power Purchase Agreements (providing renewable energy from renewables producers), Virtual Power Plant platforms, and peer-to-peer sales, through which residential customers can buy from producers using blockchain;
- smart charging solutions for electric mobility;
- software solutions for energy optimisation of local electricity systems through energy forecasting and storage.

A wholly-owned subsidiary of EDF, **Agregio** is an aggregator directed at three types of customer: producers of renewable electricity (wind and solar power, etc.), electricity consumers (industries, companies, etc.) and managers of storage facilities. For electricity producers, Agregio offers tailored solutions to optimise and sell/deliver their production, capacity and origin guarantees, on the electricity markets or to consumers, thereby securing their long-term revenues. Agregio is also

aimed at industrial and tertiary consumers who are willing to load shed or modulate their consumption in exchange for compensation, according to the needs of the electricity system. Agregio also optimises storage systems.

Energy2market (e2m), is a company specialising in the aggregation of renewable production and local flexibilities. It manages and operates over 5,000 smart, decentralised energy production and flexibility sites (wind farms, solar farms, cogeneration sites, biomass plants, storage batteries, etc.), which represent a total installed capacity of over 4GW.

At the end of 2021, EDF group was one of the European leaders on these new markets, with a portfolio of 9GW of decentralised assets.

1.4.6.2 Gas business

In Europe, the EDF group uses approximately 270TWh of gas. Its gas strategy aims to ensure the security of gas supply for its more than 5.99 million customers ⁽²⁾, its cogeneration plants and its gas power plants.

Thus, EDF group is present on the natural gas market in France and across Europe, mainly through Edison, EDF Energy, and Luminus. Since August 2017, Edison has become EDF group's gas platform under a service agreement to manage assets and develop its upstream business (see section 1.4.5.2.2 "Edison strategy").

It also relies on EDF Trading for its short-term operations relating to transactions on the continental and United Kingdom wholesale markets, and on Dalkia (for cogeneration plants).

The optimisation of EDF's LNG asset portfolio flexibility is managed by JERA Global Markets, a joint venture between EDF Trading Limited (33.33%) and JERA Trading International Pte (66.67%).

Lastly, the Group is present outside Europe, especially in the United States, where EDF Energy Services is an important natural gas supplier of major industrial customers and distributors.

1.4.6.2.1 Natural gas end-market

In Europe, on 31 December 2021, the downstream customer portfolios were as follows:

- France (EDF, Dalkia and Électricité de Strasbourg): around 2.1 million customers (ranging from retail to key accounts), with a total volume sold of around 39TWh;
- Italy (Edison): around 0.9 million customers, with a total volume sold of around 84TWh of gas;
- United Kingdom (EDF Energy) ⁽³⁾: around 2.3 million customers, with a volume sold of around 36TWh;
- Belgium (Luminus): around 0.8 million customers, with a total volume sold of around 13TWh.

1.4.6.2.2 Gas assets and projects

1.4.6.2.2.1 Supply sources

In Europe, the Group's gas and LNG supply comes from short- and medium-term gas markets and from a diversified portfolio of short-term and long-term contracts, originating from Qatar, Russia, the United States, the North Sea, North Africa and Azerbaijan.

In the United States, the majority of the supplies originate from the gas markets.

In the rest of the world, specific contracts have been signed to ensure the supply of the Group's gas power plants.

With the aim of maintaining its position on the end market, the Group optimises and diversifies its portfolio of medium and long-term sources of gas. For LNG, EDF has entered into medium and long-term contracts, primarily with the goal of enhancing the regasification capacity of the Dunkirk LNG terminal.

Furthermore, in 2021, Edison started importing one billion cubic metres of gas per year from Azerbaijan under a long-term contract (see section 1.4.5.2.3.2 "Gas business").

(1) Arval, AXA and Homiris.

(2) Customers are broken down by number of delivery points at end 2021.

(3) Excluding Northern Ireland.

1.4.6.2.2.2 Infrastructures

Gas pipelines

Apart from its various rights to transport capacity in the European network, EDF group participates, through its Edison subsidiary, in infrastructure projects for gas importation (see section 1.4.5.2.3.2 "Gas business").

Liquefied natural gas (LNG) regasification terminals

In line with the Group's gas strategy, EDF is the main shipper that uses the Dunkirk LNG terminal in the long term.

EDF retains the right to use 80% of the Rovigo offshore terminal's regasification capacity, *i.e.* 6.4 billion cubic metres per year, through Edison (see section 1.4.5.2.3.2 "Gas business").

The Group also holds regasification capacities in the terminal of Zeebrugge (Belgium).

Small scale LNG supply chain

Since 2018, Edison has been overseeing the small scale LNG project, the aim of which is to develop a supply chain to sell LNG in Italy, as well as build the first coastal depot facility and a small scale LNG terminal. The goal is to help reduce CO₂ emissions for road and sea transport (see section 1.4.5.2.3.2 "Gas business").

The first depot facility, which is now completed, has a capacity of over 1 million cubic metres of LNG per year (Edison will have right of use to 85% of the facility's capacity). The sale of LNG started in November for wholesale market customers.

Storage

In Germany, the EDF group has storage for natural gas in salt cavities located in Etzel. EDF has around 190 million cubic metres of volume capacity. The aboveground facilities are operated through a 50/50 joint venture with EnBW.

With respect to storage activities of the Group in Italy and in the United Kingdom, see respectively, sections 1.4.5.2.3.5 "Regulated activities" and 1.4.5.1.2.3 "Thermal generation and gas storage".

The Group also holds storage rights in the Netherlands, Belgium and France.

1.4.6.2.2.3 Exploration and Production

In December 2020, Edison announced the sale of its oil & gas exploration and production business, excluding Algeria and Norway, to Enegean. In March 2021, Edison withdrew from this sector in Norway, having finalised the agreement for the sale of 100% of Edison Norge that was signed with Sval Energi on 30 December 2020.

1.4.6.3 Optimisation and trading: EDF Trading

EDF Trading (EDFT) is the EDF group's interface to the wholesale energy markets providing market, optimisation and risk management services to EDF group as well as third parties. The company operates across Europe, North America and Asia in the wholesale markets for electricity, natural gas and LPG. EDFT also provides counterparties and customers with access to financial oil and environmental products. For LNG, coal and related freight activities, EDFT carries out these activities through JERA Global Markets in partnership with JERA of Japan. Through its North American subsidiary, EDFT is one of the main service providers to electricity producers and energy suppliers and one of the three leading electricity suppliers per volume for major-account customers in sales and industry.

EDF Trading's registered office is located in London. The company has around 840 employees globally and its regulated activities are authorized by the UK's financial market regulator, the Financial Conduct Authority.

Among other things, EDFT provides a full range of wholesale market services to EDF DOAAT (see section 1.4.3 "Optimisation activities for EDF in France") and EDF Customers Division in France and serves as a route to market for other entities of EDF group.

European Electricity market

EDF Trading is a leading participant in the European electricity wholesale market trading almost 2,000TWh annually. The company provides a full range of risk management services to EDF group's asset operators and to third parties. It has an extensive geographic footprint and scale of activity which makes it able to adapt quickly to changes in the market and to develop new business, to take advantage of market opportunities where appropriate.

European Gas market

EDF Trading is a leading participant in the European gas wholesale market trading 590bcm annually. It optimises EDF entities' gas assets including production, transmission rights, long-term supply contracts and re-gasification and storage capacities. This enables EDFT to support the EDF group and third parties with complete gas wholesale market solutions. In 2021, EDFT expanded its flow activities with an increasing number of counterparties or suppliers in Europe and some major players accessing the European markets to hedge their portfolio.

North American wholesale markets

EDF Trading North America is a leader in the wholesale energy markets in North America, where it benefits from broad geographical coverage, offering solutions to customers across the entire North American energy value chain. It provides energy management solutions, natural gas supply, and real-time services for electricity producers in the USA. As one of the leading suppliers of generation services for power plants in the USA, EDF Trading North America manages over 30GW for 105 electric power plants. For retail energy aggregators, it provides supply services on the wholesale market, as well as services to interface with Independent System Operators (ISOs) in various states in North America.

Retail sales operations in North America

Ranked in the top three electricity suppliers per volume to commercial and industrial customers in North America, the retail supply and services team offer natural gas, electricity, and environmental products to a portfolio of commercial and industrial customers, managing a portfolio of 2.6GW of customer demand response. In 2021, EDFT expanded its market coverage and developed its activity to serve the interest of C&I customers for renewable energy supply.

Environmental products

EDF Trading is committed to the environmental products marketplace and, in line with the EDF's *raison d'être*, it offers a broad range of multi-commodity hedging solutions that support the EDF group and third parties decarbonization targets around the world. EDF Trading is active in the compliance and voluntary carbon markets, guarantees of origin certificates in Europe, Renewable Energy Certificates in the US, and International Renewable Energy Certificates in the rest of the world. In addition, it is a recognised provider of risk management products in the European weather market. In 2021, EDF Trading developed its activity to support EDF group entities' green marketing initiatives and to propose high quality certificates to counterparties interested in offsetting their carbon footprint. In 2021, EDFT continued to develop its PPA ⁽¹⁾ activity to support renewable energy development and established a green fuels trading desk to support the transition to less CO₂ intensive sources.

International markets

Following the sale of its coal and freight business to JERA in April 2017 and the merging of their LNG optimisation and trading activities into JERA Global Markets in 2019, EDFT holds a 33% financial stake in JERA Global Markets, a leading seaborne energy trader. In 2021, the Company continued to develop its global activities, in particular in the LPG market and the Japanese Power market.

(1) Power Purchase Agreement.

1.4.6.4 Equity interests

EDF Trading Logistics

With a fuel oil supply volume of approximately 1 million tonnes and 1 million tonnes of coal processed in 2021, EDF Trading Logistics acts as the EDF group's agent for fuel oil and bioliquids purchases. It organises fuel oil, bioliquids and coal supply logistics operations for all of the EDF group's thermal plants in mainland France, Corsica and France's overseas *départements*, in close collaboration with

DOAAT, EDF PEI and SEI. It controls the coal terminals in the ports of Le Havre and Montoir-de-Bretagne.

In addition, EDF Trading Logistics provides the Group with its expertise in regard to managing risks related to the transportation of fuel oil (hazardous materials), an activity which received ISO 14001 certification that was renewed on 31 October 2019. It is also active in the management of the environmental crises associated with this line of business.

1.5 Research & development, patents and licenses

The EDF group's Research & Development (R&D) activities are handled by the Research & Development Division – EDF R&D and also by certain Group subsidiaries. These activities are complementary and in line with the Group's *raison d'être* and CAP 2030 strategy. A *Charte R&D* coordination scheme for these has been drawn up at Group level.

EDF group's R&D is both integrated and cross-disciplinary, in order to facilitate synergies and method transfers between the different Divisions within the Group. It employs 2,263 ⁽¹⁾ persons worldwide.

Skills cover all the Group's field of activities: renewable energies and storage, networks, nuclear generation, thermal, hydropower, energy management, trade and services, IT systems and environment. They are specific to particular disciplines, business lines and projects, and also come together for work on major systems.

EDF R&D is organised on a multi-site basis, with several sites located in France and abroad, mainly in Germany, the UK, China, the United States, Singapore and Italy.

EDF R&D's main centre is located in Palaiseau on the Paris-Saclay campus where it opened in 2016. At the end of 2021, EDF R&D employed 1,782 people in France, representing 30 nationalities.

The main missions of the EDF group's Research and Development Division (R&D) are firstly, to support the Group's Divisions and subsidiaries on a day to day basis, by providing them with its top-level expertise and high performance practices, and

secondly, to contribute to building the Group's future by anticipating the developments and major challenges with which it is confronted.

R&D is engaged in pursuit of the goal expressed in EDF's *raison d'être*. Its avenues of research, which are drawn from its new *Plan Scientifique*, are structured around four broad topics:

- reduce the carbon intensity of our customers' energy consumption by means of electricity;
- boost the performance levels of the generation means;
- invent the electricity systems of tomorrow;
- accelerate digital transition.

In 2021, the EDF group's total R&D budget was €661 million. It comprises EDF R&D budget of €487 million, as well as the R&D carried out by certain wholly-owned subsidiaries, mainly Framatome, EDF Energy and Edison. This is one of the largest R&D budgets of any major electricity company.

It should be noted that 99% of EDF R&D's operating budget in France is dedicated to decarbonation and energy systems transition. In particular, the expenditure covers research into energy efficiency, uses of electricity as a substitute for fossil fuels, renewable energies and their insertion into the grid, energy production and storage, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of disturbances.

1.5.1 R&D priorities

EDF R&D's work serves all the Group's business lines. For each of them, it offers technological solutions designed to improve their performance, and prepare the Group's future in the longer term. It is one of the reasons why EDF has become a leading global industrial group that provides low-carbon electricity systems.

Its avenues of research focus on four main areas, in line with the Group's *raison d'être* and CAP 2030 strategy:

- **reduce the carbon intensity of our customers energy consumption by means of electricity:** EDF, a leader in the field of low-carbon electricity, wishes to place this final energy at the forefront of decarbonation. Nevertheless, not all activities can use electricity to reduce carbon intensity. This has led to research into how other energy carriers can achieve decarbonation;
- **boost the performance levels of the generation means:** in most of the world's countries, the decarbonation of electricity generation is still a priority. In contrast, in France, a country that already benefits from a low-carbon electricity mix, the challenge will be to generate electricity with ever-increasing efficiency, by combining the renewal of the nuclear fleet with the development of controllable renewable energies (hydropower) and variable renewable energies (wind and solar power), with the aim of increasing synergy;
- **invent the electricity systems of tomorrow:** throughout the world, more than one-half of electricity generation facilities that are commissioned each year are now low-carbon, with the majority being powered by variable renewable energies (solar and wind). The amount of electricity generated by variable energies and with a near-zero marginal cost will therefore increase significantly in the coming decades, which will create numerous challenges that will have to be overcome if the electricity system is to function properly;
- **accelerate digital transition:** the environment in which EDF operates is increasingly digital. The 2020 health crisis accentuated this trend by highlighting new ways of working and the importance of robust defence

against the risk of cyber attacks. Digital modelling and simulation remain essential tools for EDF R&D.

The research work on grids on behalf of Enedis is carried out under a services contract, which defines obligations that guarantee the protection of commercially sensitive information and compliance with the principle of the independent management of the distributor. Enedis also runs its own R&D programme, independently of EDF.

1.5.1.1 Decarbonising our customers' uses with electricity

In parallel with the publication by the European Commission of its "Fit for 55" roadmap and of the Plan France 2030, EDF R&D is working on the topic of the extensive decarbonation of the industrial sector. The work is based on knowledge of the main emitting sectors (steel, cement, chemicals, agri-food, paper, etc.) and advocacy of levers to reduce their carbon intensity. These levers range from those that have been in use for some time (resistance, induction, electric arc furnaces and mechanical vapour compression) to those that are more innovative. There is strong focus on the development of very high temperature heat pumps (for temperatures that exceed 100°C).

The implementation of the new RE2020 regulations was also one of the key events of 2021. In order to encourage the adoption of these new regulations by project owners and extend their influence to existing structures, EDF R&D is undertaking joint development work on heat pump solutions with manufacturers in order to widen the range and cover all the needs, and is monitoring feedback from benchmark operations that will make it possible to establish scientifically and share widely the performance levels obtained *in situ* by this equipment.

Households are devoting more and more of their savings to building or renovating less carbon-intensive homes. EDF R&D is fully committed to supporting the Group's business lines by designing tools for the pre-sale phase (sizing), help with

(1) Calculated as full-time FTEs.

installation (algorithms for automatic parameterization) and operational support (cause tree and e-maintenance).

In the field of mobility, manufacturers are shifting their vehicle ranges more quickly to low-carbon products. Reliability, durability, interoperability and simplicity are the watchwords that accompany EDF R&D's actions to support the Group's business lines. The teams of researchers are developing smart charging solutions, which will make it possible in the near future for mobility not to place additional strain on the grid during peak consumption times and to offer flexible options that will enable the system to function in an optimal and sustainable manner, with a significant portion of the electricity that will come from variable renewable energy sources.

1.5.1.2 Improving the performance of the means of production

In the field of centralised, nuclear, hydro and thermal power generation, EDF R&D is developing tools and methods to improve the safety of production resources, optimise their operational lifespan, and increase their performance in terms of output and environmental impact.

1.5.1.2.1 Stronger, longer-lasting nuclear power production by the EDF group, with low CO₂ emissions

1.5.1.2.1.1 EDF

R&D is working to protect EDF's assets through actions in line with its policy to improve the safety of facilities, particularly with regard to enhanced performance and extended operating lifespan.

More broadly, the EDF group (EDF and Framatome) works on R&D in a partnership with the CEA as part of the Institut Tripartite and is developing the Nuclear Plant of Tomorrow Initiative comprising technological building blocks for existing plants and nuclear new build.

To support these programmes, R&D is developing digital simulation tools and experimental test resources, as well as tools that are capable of handling the fresh challenges raised by the increase in large sets of digital data, IT security, and new information and communication technologies.

Encouraged by the success of the ConnexLab experiment, which aims to test out new operating and maintenance concepts, EDF R&D is pursuing and expanding the development of the "Digital Reactor" project. This project has started to produce significant R&D results for the nuclear industry, and brings together nine key partners (EDF, CEA, FRAMATOME, SMEs, MSEs, and academics). It will also give engineering departments and design firms that work in the industry a computing environment based on the best available techniques, both in terms of available computing power and in terms of state-of-the-art scientific programming.

R&D is pursuing the development of digital initiatives, while continuing to give priority to strong partnership-based relationships with the other stakeholders in the nuclear industry. It thus launched two new projects, which are recognised and supported by the *France Relance* plan, to build rapid prototypes of control rooms for nuclear plants, SMRs in particular (Project ICAREX), and to be able to benefit from an industry platform for mechanical engineering calculations (Project MECANUM).

All these innovations in the digital field, but also in other complex technical fields, have enabled R&D to make a significant contribution to the existing fleet:

- to the existing fleet, by helping to improve the performance of unit shutdowns, optimise developments and increase the lifespan of nuclear units; and
- to the new generation of nuclear plants, by participating in innovative projects (for example the Small Modular Reactors and the Nuward project, in particular).

1.5.1.2.1.2 Framatome

Framatome R&D aims to master the most advanced technologies, in order to attain the highest standards of safety and performance for its activities as a designer and supplier of nuclear steam supply systems, nuclear equipment and services, as well as fuel.

This R&D activity is primarily carried out within Framatome's development teams and Technical Centres, in partnership with EDF R&D.

Framatome also relies on the capabilities of the CEA, within the Institut Tripartite, for simulation codes, higher resistance nuclear fuels and "technological building blocks" of "the nuclear plant of tomorrow".

International partnerships have also been set up (with the US Department of Energy, the European Horizon Europe programmes and the *France Relance* Plan, etc.).

During the past year, the R&D work that was carried out within the Technical and Engineering Division BU (Business Unit) mainly comprised:

- the building of a "Design School" to enable engineers to familiarise themselves with the tools and design cycle of nuclear steam supply systems;
- the continued development of the advanced neutron simulation chain project ("ODYSSEE"), which is carried out in partnership with EDF, and that has already yielded improved results for the French fleet;
- studies of multi-recycling in PWR with EDF, ORANO and the CEA;
- the receipt of a 1:1 scale model of the DEMOCRITE PWR primary coolant system return, which was manufactured using hot isostatic pressing, and the start of its detailed description studies.

Developments of the Installed Base Business Unit's service activities have resulted in significant progress: constant improvement and automation of intervention equipment for PWR and BWR power plants, and the extension of an innovative digital product and service offering to enhance our customers' performance.

1.5.1.2.2 Support for the development of renewable energies, storage, and hydrogen

The second priority is support for the development of renewable energies in France and abroad, which play an increasingly important role in the European and global energy landscape.

For renewable energies, storage and hydrogen, EDF R&D's goal is to identify technological breakthroughs that offer a significant competitive advantage, and to help the most promising technologies emerge industrially, working in partnership with academia, industry and startups. EDF is investigating a wide range of low carbon hydrogen technologies and storage solutions: hydropower, photovoltaics, onshore and offshore wind power, solar thermodynamic power, biomass, marine energies, geothermal power, electrochemical batteries, flywheels, thermal storage, thermochemical storage, flow cells, supercapacitors, electrolyzers, fuel cells (hydrogen) and thermal energy storage (heat and cold).

In the field of offshore wind power, R&D has developed specific modelling tools for the hydrodynamic and mechanical sizing of fixed and floating offshore wind turbines.

R&D is also working to develop tools and methods to enhance operational performance and optimise the cost of projects on electricity generation systems that are based on renewable energies, projects on storage and systems for hydrogen generation by electrolysis powered by EDF group's low carbon electricity.

1.5.1.2.3 Environmental acceptability of facilities

Climate change, the marked decline in biodiversity and Earth's limited resources make EDF a legitimate choice for a low carbon energy mix. The aim of the R&D Division's initiatives is:

- to contribute to determining the ways in which changes to the regulatory environment are implemented;
- to provide justification for our production facilities being on par with the best available techniques (BAT), at an economically acceptable cost, and to leverage these best available techniques in new projects;
- to acknowledge and manage our impact on terrestrial and aquatic environments, enhance the value of our improvement initiatives, limit and enhance the value of our sub-products;
- to know how to anticipate and adapt to the impacts of climate change, for example foresee changes in the availability and quality of local water resources and assess the robustness of the heat sinks for plants in light of future climate change;
- to contribute to leveraging our positive actions with regard to stakeholders, including locally.



For many years, EDF has set up research teams dedicated to biodiversity issues. An ambitious research programme is seeking to develop high-performance tools to assess and manage the impacts of EDF's production resources on biodiversity and constantly improve biodiversity in the vicinity of power plants.

1.5.1.3 Conceiving the electricity systems of the future

Energy transition towards a low-carbon economy in Europe hinges on strong integration of variable and decentralised renewable energies, in particular on the distribution network. This integration requires more intelligent electricity systems, or smart grids, to be developed, in order to have the capacity to manage a more decentralised electricity systems, with a much higher number of stakeholders. The major issues are technical, economic and regulatory, and this will involve taking on new challenges such as:

- developing transmission grids and grids to connect to European coverage, and reinforcing links between the European wholesale markets in order to optimise flows of electricity;
- managing the intermittence of production sources that use renewable energies and pushing back the limits of their inclusion in electricity systems, both for the management of local energy flows and electricity grid stability.
- integrating new uses of electricity by optimising the production mix and grid requirements, and by exploring flexibility levers and how they are structured;
- optimising decentralised energy systems (demand-side management, decentralised generation and storage, etc.) by integrating them into larger scale energy management systems;
- adapting the coordination of electricity systems in order to address a reduction in inertia of the electricity system in a context of increasing use of power electronics in order to factor in patterns of use and new production sources.

These challenges require work on the transmission and distribution grid materials, generation and storage means, their communication functionalities and protocols, on control materials and methods, and also on the economy of consumption, electricity services and the related markets.

1.5.1.4 Accelerate digital transition

Digital transition impacts the entire electric power system and is a key driver of the electric and climate transitions described above. The information technology research programme focuses on:

- understanding and anticipating the impacts on the Group's businesses and the possible disruptions that may be caused by booming technologies such as artificial intelligence, the internet of things, 5G telephony, cyber security of industrial systems, blockchains, quantum computing, virtual reality, etc.;
- maintaining and developing a cross-disciplinary ecosystem of scientific computing to support the studies conducted by EDF R&D and engineering.

The following could be mentioned as examples of major events involving disruptive technologies in 2021:

- confirmation of the relevance of the SINCLAIR joint laboratory, with other major industrial groups, in order to pool and accelerate our work on the applicability of AI to critical systems;
- the Group's 5G Task Force, whose coordination was entrusted to EDF R&D, which made it possible to identify key use cases for group business lines. Experiments have started this year and EDF R&D has launched its 5G Living Lab;
- the project, which started three years ago, concerns quantum computing and has delivered its initial findings.

1.5.1.5 EDF R&D partnerships internationally

To conduct its research and development programmes, EDF R&D nurtures a large number of partnerships both in France and internationally, the purpose of which is to maintain its expertise at the highest global level in the disciplines that are central to EDF's concerns, and to supplement its in-house reservoirs of skills.

R&D's partnership policy is embodied in a variety of ways, both nationally and internationally.

France

In France, R&D has entered into framework agreements with major public research organisations. The main academic partner in France is the French National Centre for Scientific Research (CNRS), with which EDF renewed its partnership framework agreement for five years, in 2019. Over the past few years, R&D has also set up about twenty laboratories and teams on a joint basis with academic partners and technical or industrial centres. With them, it is participating in collaborative research projects funded by several national or European agencies. In 2021, the framework partnership agreement with the BRGM, the French Geological Survey, was renewed and three new framework agreements were implemented with CentraleSupélec, the IFPEN and Gustave Eiffel University in Marne-la-Vallée. The sponsorship with the Fondation mathématique Jacques Hadamard on the Paris-Saclay University campus has also been renewed and is focusing on the Gaspard Monge programme for research optimisation. In addition, a new joint team has been set up with the Paris Inria Saclay Centre and École Polytechnique, namely the IDEFIX team for "*Solution d'équations différentielles pour l'imagerie et la physique*" ("*Differential Equations Solution for Imaging and Physics*").

R&D also supports a few specially targeted teaching and research chairs.

R&D is also active within several Energy Transition Institutes (ITE), which have been set up as part of the Future Investments Programme, such as the Ile-de-France Photovoltaic Institute (IPVF), France Énergies Marines, which focuses on marine energies and offshore wind power, Efficacy, which works on energy efficiency, Supergrid Institute, which specialises in electricity networks of the future and Vedecom, which works on electric mobility, as well as in the IRT SystemX, which is located in the heart of the Paris-Saclay research hub.

The EDF group is the driving force behind ConnexITy, an R&D programme aimed at connecting, through digital technology, players in the nuclear sector in order to simplify power plant operation, site preparation and design.

EDF is also a founding member of several European associations recognised at the EU level, such as Nugenia and the SNETP for nuclear power and EASE for storage.

Other developments include several partnerships within the Paris-Saclay campus ecosystem, including the SEISM Scientific Interest group on earthquakes, which brings together CentraleSupélec, ENS Paris-Saclay, the CNRS, BRGM, EDF, and the Institute of Mechanical Science and Industrial Applications (Institut des sciences de la mécanique et applications industrielles, IMSIA) Joint Research Unit, which brings together ENSTA, the CNRS, CEA, and EDF.

EDF R&D has also set up the Materials Ageing Institute (MAI), an international research centre on materials ageing that brings together, alongside EDF, most of the world's major nuclear operators.

Germany

Internationally, since the early 2000s, EDF has had a research centre in Germany, EIFER, in collaboration with the Karlsruhe Institute of Technology (KIT). EIFER is the centre of reference for the hydrogen industry. In this respect it supports the EDF group's subsidiary Hynamics, which is dedicated to the commercial development of hydrogen solutions for industrial markets and heavy-duty mobility. EIFER teams are also fully engaged with topics relating to local decentralised energy systems, sustainable cities and territories, geothermal energy, and biofuels.

United Kingdom

EDF R&D UK consolidates the Group's positions in the British research ecosystem, particularly through Strathclyde University in the field of renewables, as well as with Manchester University, Imperial College, the National Nuclear Laboratory (NNL) and the University of Bristol in the field of nuclear energy. The centre provides direct support to the activities of EDF business units, whether in the existing nuclear field (extension of AGR reactor lifespans, and decommissioning following EDF UK's announcement of the planned shutdown of several reactors), or for new projects, including setting up a unit in Bristol to support the HPC project, in particular for solving the site's environmental problems. The centre is also fully committed to digital solutions for clients and offshore wind farm projects, for which it is the reference centre for all the Group's projects in France and abroad.

Italy

In Italy, Edison's Research, Development & Technological Innovation Division (RD&TI) provides medium to long-term support for strategy and, in the shorter term, informs the development of new services and offerings from Edison. Staff and laboratories are located mainly in innovation spaces in the two Italian *Politecnici* (Milan and Turin), thus nurturing cooperation and firmly embedding Edison RD&TI in the world of innovation and research in Italy.

Asia

The Beijing centre is an asset in terms of participating in the work of major Chinese demonstrators for smart grids, or nuclear facilities (see section 1.4.5.3.6.1 "Activities in China"). In 2021, the centre actively contributed to the setting up of the electricity trading platform established by the EDF China subsidiary with a local partner, as part of the market deregulation decided by the Chinese government. The centre also operates on the field of local multi-energy projects combining electricity, biomass, and heating and cooling networks.

Singapore's R&D centre focuses more especially on the industrialisation of microgrid solutions at competitive prices using renewable energy, which is developed and tested with its demonstrator on Semakau Island off the coast of Singapore.

It is also involved in the feasibility studies on electrical interconnections in the South-East Asia region, electrical mobility projects in Singapore and the major Descartes project led by the CNRS, with partners from Singapore, in the field of artificial intelligence.

United States

EDF group has had an R&D and Innovation centre in Silicon Valley for several years, which supports its development in the USA and contributes to innovation in the Group. This laboratory's research areas include direct support to the subsidiary EDF Renewables North America, as well as the analysis, using a dedicated team, of technological and digital trends, market design and the assessment of new business models for the Group in the USA.



1.5.2 Intellectual property

Intellectual property plays a major role in protecting the EDF group's technologies and know-how from competition, and in leveraging these assets through licensing agreements.

Patents

At the end of 2021, EDF group's portfolio (mainly EDF and Enedis) comprised 756 patented innovations, protected by 2,158 property titles in France and abroad.

The strengthening of the patent portfolio is a priority. The aim of this is to facilitate R&D cooperation, protect the innovations and development of EDF's activities,

EDF is keen to strengthen its industrial property portfolio in order to make the most of its capacity for innovation and technological expertise. The portfolio is comprised of patents, registered software and formalised expertise.

contribute to EDF's external image, boost the motivation of researchers, and provide maximum leverage for inventions.

In 2021, EDF filed 49 patent applications ⁽¹⁾ (66 in 2020).

(1) Enedis filed three patent applications.

€18 billion

GROUP EBITDA
FOR 2021

1

LEVEL 2 ESS ⁽¹⁾

2.1

GLOBAL LTIR ⁽²⁾

79 %

OF EMPLOYEES
TRAINED ⁽³⁾

(1) In 2021: ESS = Significant nuclear safety event on the INES scale.

(2) In 2021: LTIR of the EDF group and its providers.

(3) % of employees who took a skills development course in 2021 despite the health crisis.





2 RISK FACTORS AND CONTROL FRAMEWORK

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2.1 Risk management and control of activities

This section presents the business control and risk management systems applicable to the entire Group for 2021. These systems, developed and implemented with due respect for the management independence of network infrastructure managers, are in line with the framework defined by the Group's policies. They also comply with

the general principles set out in the AMF risk management and internal control system reference framework (published on 22 July 2010). They are also based on developments in the main international reference frameworks, in particular COSO-2013.

2.1.1 Control environment

Framework and objectives

The EDF group organises the control of activities and risks in the form of forty Group policies, validated and signed by the Executive Committee. This corpus defines all of the long-term and cross-functional requirements to be implemented in all of the Group's entities and subsidiaries. Regular updates make it possible to adapt requirements to regulatory changes and strategic orientations. They are fully in line with the Group's *raison d'être*.

The system for controlling the Group's risks and activities, defined in the Group "Functioning Principles/Risk Management and Internal Control" policy aims to:

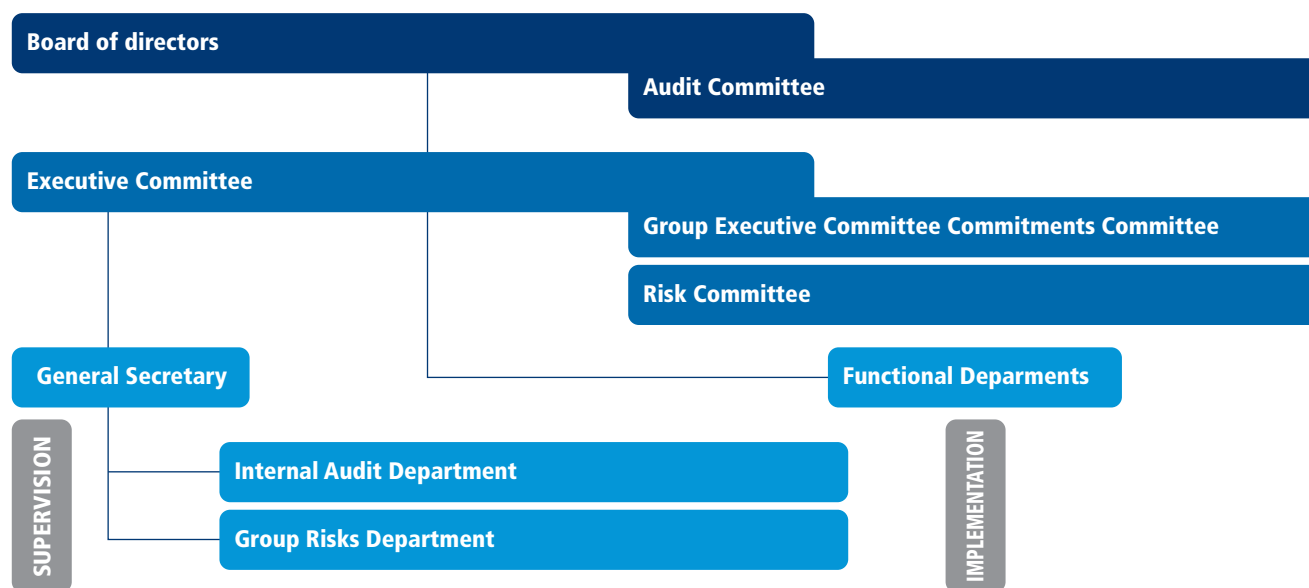
- identify and periodically reassess the significant risks and opportunities that may impact the Group's targets in order to ensure the existence of relevant and effective action plans;

- constantly ensure:

- › compliance with laws and regulations, including those relating to the management independence of network infrastructure managers;
- › the smooth running of processes and projects;
- › the reliability of financial and non-financial information;
- › compliance with Group policies; and
- › the control of risks and activities of any kind.

Organisation

The organisation of EDF's Executive Management is described in section 4.3.1. "Members of the Executive Committee". Each member of the Executive Committee is responsible for implementing all actions necessary to controlling the risks within their scope.



The Board of Directors

In line with the strategy defined, the Board of Directors regularly examines opportunities and risks as well as the measures taken as a consequence. All of the Board's committees contribute to ensuring the effectiveness of risk management and internal control systems.

Audit Committee

The mission of the Audit Committee is to monitor, under the responsibility of the Board of Directors, the effectiveness of the internal control, risk management and internal audit systems.

Executive Committee Commitments Committee

To strengthen the appraisal and monitoring of projects, the Group Executive Committee Commitments Committee (CECEG) thoroughly examines the most significant projects in terms of the extent of the commitments and/or the risks incurred before decisions are made by the Executive Committee (see section 2.1.3.4 "Approval of commitments").

Risk Committee

The Executive Committee meets at least twice a year as a Risk Committee, at which time it examines in particular the mapping of Group risks, the assessment of internal control activities and audit activities (annual programme, results). It identifies the priority risks for the Group, shares the related strategy for mitigation and designates the members of the Executive Committee who are its sponsors.

Scope

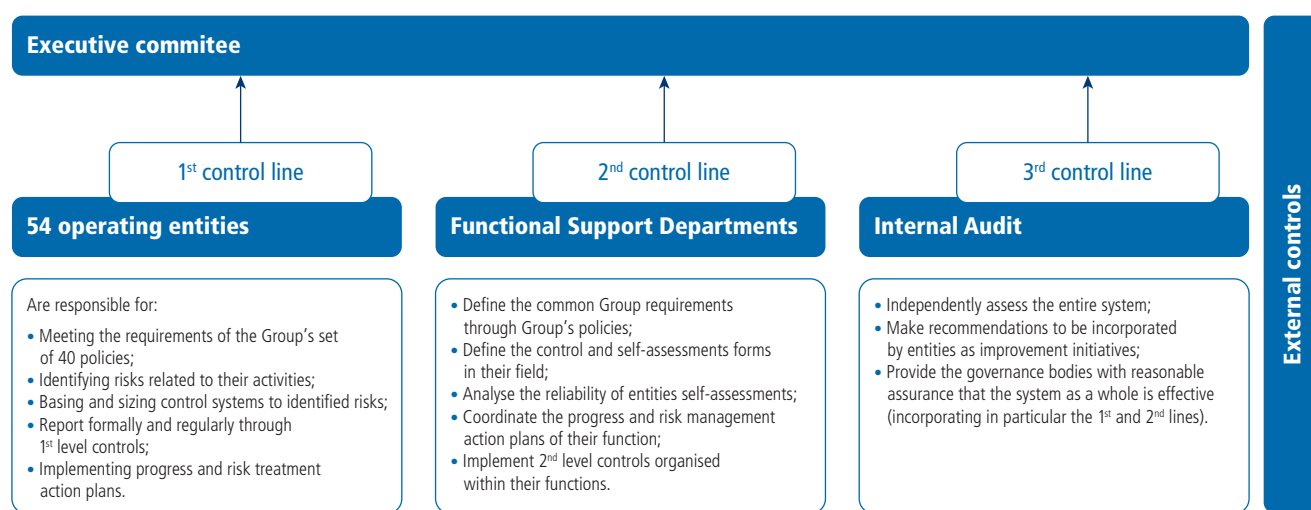
Regarding the scope of control (excluding subsidiaries managing regulated infrastructures), these purposes and principles are implemented by the entities or subsidiaries, who themselves ensure their implementation in the entities or subsidiaries they control.

Regarding the Group's other subsidiaries (subsidiaries that are operators of regulated infrastructure and significant shareholdings), EDF representatives within

the governing bodies make sure that a system for controlling activities and risks is put in place. They provide regular information on the map of risks, internal control and audit activities (programme and main results). They can also check the effectiveness and appropriateness of each of these measures through a periodic audit of the respective entities. The applicable principles are adapted for the operators of regulated infrastructure to ensure compliance with obligations related to their management independence.

2.1.2 Principles of execution

All of these measures based on the three control lines provide the managers and governing bodies of the Group with "reasonable assurance" concerning the identification and coverage of the main risks.



1st line of control: management of operations

Report on the control of the activities and risks of the entities

Each Group entity (53 entities in 2021 covering the scope of EDF and controlled subsidiaries) prepares an annual report on the control of its activities and risks based on a self-assessment, which includes a description of its improvement actions. Each report gives rise to a commitment signed by the Director of the entity on the level of control achieved and the actions undertaken.

Entity self-assessments report on the control of all the entity's "business line" activities and all the requirements of the other cross-functional areas identified in Group policies, in line with their risk mapping. The self-assessments report in particular on the control of the requirements relating to accounting and financial internal control, in line with the AMF framework (see section 2.1.3.5 "Reliability of financial information – internal accounting and financial controls").

Within the Group, 83% of the entities subject to a "risk and control of activities" self-assessment report indicate that they have an ICP (internal control plan) defining a set of controls to be implemented annually.

Entities risks mapping

The entities produce an annual risk map based on a methodology common to the entire Group. The process for constructing the risk map for the entities is based on:

- the principle of management accountability;
- a typology of risks, including internal or external risks and operational or strategic risks, as well as opportunities;
- a qualitative evaluation method for the impact, the probability and the level of control of each risk;
- the description of action plans for dealing with risks and the evaluation of their effectiveness.

Numerous discussions take place between the Group Risk Department and the entities to review the relevance of risks and the soundness of the control actions undertaken.

Methods and tools: Several methodological documents and tools are made available to the entities to support risk and internal control processes:

- a risk analysis methodological guide and a software package to support entity risk mapping;
- an internal control guide, a detailed self-assessment framework and a digital platform for sharing and summarising self-assessments.

2nd line of control: risk management and control of activities

The second line consists of all the Group's support functions. In particular, these support functions are responsible for leading and coordinating the implementation of Group policies for which they are responsible.

GROUP POLICIES

- | | |
|---|---|
| <ul style="list-style-type: none"> ● Management and operation <ul style="list-style-type: none"> › Operating principles / Risk management & Internal control › Governance of subsidiaries and minority shareholdings › Project management › Crisis management and business continuity ● Ethic & Compliance policy and related instructions ● Safety & Security <ul style="list-style-type: none"> › Nuclear Safety › Security of assets against malicious acts ● Corporate social responsibility policy ● Human Resources <ul style="list-style-type: none"> › Health & Safety › Remuneration & social security benefits › Talent › Experts › Skills Development Group in France › International Mobility & France Mobility ● Suppliers policy | <ul style="list-style-type: none"> ● Real Estate & General Services <ul style="list-style-type: none"> › Group travel › France tertiary real estate ● Group Legal risk management policy and related instructions ● Finance & Markets <ul style="list-style-type: none"> › Economic and financial performance management › Financing cash management and financial risk control › Commitments › Energy market risks › REMIT › Tax and customs › Insurance › Financial and accounting reporting and related instruction ● Communication <ul style="list-style-type: none"> › Communication / Institutional relations / Partnerships › Financial communication ● Information system & Numeric transformation <ul style="list-style-type: none"> › Governance of information systems and digital transformation › Data management › Security of information systems |
|---|---|

Group risk mapping

The Group risk map includes:

- risks associated with the political and regulatory context and legal and compliance issues;
- financial risks;
- strategic risks, risks related to the transformation of the Group, including in particular risks related to climate issues;
- risks related to the Group's operating activities and its supply chains, as well as to the Group's major projects, in all its businesses, particularly nuclear. These risks also relate to health, personal safety, asset protection and IS security.

These risks are laid out in §2.2 "Risks to which the Group is exposed". In addition, some risks are set out in detail in chapter 3, in particular risks related to climate and environmental issues, the duty of vigilance and personal health and safety.

On the basis of the risk maps and activity control reports drawn up by the Group's entities (1st line of control), supplemented by cross-reviews with the 2nd line of control and with the Internal Audit Department, the EDF group's Risk Management Department draws up a consolidated map of its major risks, including an overall assessment of internal control, and provides Management and the governance bodies with a consolidated, prioritised and regularly updated view of the major risks and their level of control. These documents are validated by the Risk Committee and are presented to the Board of Directors after examination by the Audit Committee.

3rd line of control: the Group's audit unit

The Group's audit unit is composed of all of the Group's audit resources exercising an internal audit activity. Pursuant to a decision of the Chairman & Chief Executive Officer, this unit is led by the Group Audit Director. It includes the Internal Audit

Department ("IAD", reporting to the General Secretary) and audit teams specific to each of the main French and foreign subsidiaries. The relationship between the IAD and Enedis audit teams, as well as their respective prerogatives, have been defined to ensure compliance with the principle of management independence. The IAD carries out functional supervision of the unit (co-appointment and co-evaluation of the subsidiaries' Audit Directors by the IAD – excluding Enedis –, sharing best practices, training, sharing tools and methods, etc.). At the end of 2021, the Group audit unit consisted of 70 FTE employees.

Operating standards for EDF and controlled subsidiaries

The IAD applies the international standards defined by the Institute of Internal Auditors and monitors their compliance.

The assignments, powers and responsibilities of the auditors as well as the rights and duties of the audited parties are defined in a charter that was issued in July 2019. It sets out the fundamental principles governing audits, the procedures for drawing up the programme, the types of assurance assignments entrusted to it, and the duties of the audited parties and auditors. It includes a code of ethics applicable to the entire unit. This Code has for purpose to promote an ethical culture and to remind that the auditor must respect and apply certain basic principles relevant to the profession and the conduct of internal audits.

The Internal Audit Department has direct access to the Chairman & Chief Executive Officer; it reports on assignments to the Audit Committee, which issues an opinion on the risk-based internal audit universe, reviews the performance of audits and verifies the adequacy of the workload and resources dedicated to internal audits. The IAD's processes, from the definition of the audit programme to the monitoring of action plans, are outlined and managed.

Auditors are trained in the same methodology, in line with international standards, and are evaluated at the end of each assignment. The IAD's processes for all activities (from the definition of the audit programme to the monitoring of action plans) are outlined and managed. The audit unit regularly submits voluntarily to evaluation by IFACI ⁽¹⁾. The last evaluation of 2018 stated, as previously, that the audit practices complied with the international standards of the profession.

(1) Institut français de l'audit et du contrôle interne (French Institute of Audit and Internal Control).

Operating procedures

The Group's audit unit conducts audits of the entities and controlled subsidiaries, business units, projects and cross-functional functions. These audits include a review of the robustness of internal control and are carried out every three to five years depending on their level of significance. The IAD conducts corporate cross-functional audits, whereas the Audit Departments of the subsidiaries only conduct audits within their scope. The IAD is the only entity competent to carry out audits of BUs/projects involving a corporate level risk.

The audit programme is drawn up on the basis of the Group's priority risk universe; all Group BUs, projects and processes must be audited on a regular basis.

All audits give rise to recommendations which, once validated by the audited parties and their management, become the subject of action plans drafted by the aforementioned management and audited parties. These action plans are sent to the IAD for its opinion, which subsequently monitors them starting no later than six months after the audit report is circulated. A half-yearly summary report recaps the main findings of the corporate audit and the follow-up of action plans. The half-yearly report also presents the results of the audit programme, the level of satisfaction of the audited parties, the activity of the entity as well as an assessment of skills and the budget. Furthermore, it identifies any recurring or generic problems observed in several audits and that deserve special attention. Finally, it provides an

audit-based view of the Group's level of risk control. This report is presented to the Chairman & Chief Executive Officer, the Executive Committee, and then to the Audit Committee and the Board of Directors.

External controls

Like all listed companies, the EDF group is subject to review by the AMF. As a company majority owned by the French State, EDF is also subject to control by the Cour des comptes (French court of auditors), State Controllers, the Inspectorate of Finance, Economic Affairs Committees or *ad hoc* Committees of inquiry of the French National Assembly and Senate.

According to law, the Statutory Auditors certify the annual financial statements (parent company and consolidated financial statements) and perform a limited review of the Group's half-yearly condensed consolidated financial statements. Their report on the annual financial statements includes the verifications of the information on corporate governance required by Articles L. 225-237-3 *et seq.* of the French Commercial Code.

In the light of its business activities, EDF is also subject to control, in France, by the Energy Regulation Commission (CRE) and the French Nuclear Safety Authority (ASN).



2.1.3 The main programmes for controlling activities

The activity control programmes are implemented to ensure that the requirements set out in the Group's policies, validated by the Executive Committee (see box in §2.1.2), are met and are selected according to the major risks.

2.1.3.1 The Group Ethics and Compliance programme

The Group Ethics and Compliance Department implements the Group Ethics and Compliance programme on the basis of the following referentials (see section 3.1 "EDF, a responsible company"):

- the Group Ethics and Compliance Policy (PECG) lays down the main rules that Managers must know, comply with and ensure compliance with within their entities, in strict accordance with the risks of these entities. The PECG is backed up by instruction notes and support guides designed to assist its deployment, including notably the integrity of business relations monitoring, financial ethics, protection of personal data, the fight against fraud, the management of gifts and invitations, the prevention of conflicts of interest and the duty of vigilance. The PECG is the supra-reference to the Group Ethics Charter and the Ethics and Compliance code of conduct, which can be updated according to new applicable regulations and is subject to audit;
- the Group Ethics Charter, built around the Group's three values (Respect, Solidarity, Responsibility), which defines the requirements that should guide the actions and conduct of the Group's employees on a daily basis;
- the Ethics and Compliance code of conduct, reviewed in 2021, which is set out in the internal regulations of the entities, is the reference document for the prevention of corruption and applies to all employees (requirements of the Sapin II Act);
- the EDF group ethics and compliance whistleblowing system, which allows the Group's employees and external collaborators (temporary staff, employees of a service provider, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.), to submit a report in accordance with the "Sapin II" Act of 9 December 2016 relating to transparency, the fight against corruption and the modernisation of economic life (see section 3.3.2.4 "Whistleblowing system"). The same whistleblowing system is also made available to third parties for issues covered by the "Duty of Vigilance" Act of 27 March 2017 relating to the duty of vigilance obligations of parent companies and ordering companies.

2.1.3.2 The Information Systems and Assets Security programme

The main strategic orientations for controlling activities aim to generalise a culture of safety throughout the Group, legitimise and strengthen governance and management at entity level, in particular by making available tools for acculturation and incident monitoring. The Assets Security programme is covered by the Security

of Assets against Malicious Acts policy. It aims to prevent the risks of damage to the Group's assets and limit the impact of any such damage.

The Information Security and Information Systems programme is covered by the Security of Assets against Malicious Acts policy and the Security of Information Systems policy, which both aim to prevent the risk of attacks and limit the impact of any such attack. These policies are supplemented by guidelines on the protection of personal data.

The main strategic orientations for controlling activities aim to: legitimise and strengthen governance and management, generalise a culture of safety throughout the Group, secure the most critical functions in close collaboration with the business lines, and anticipate, strengthen and maintain the uniformity of monitoring and the ability to react in the event of an incident.

A charter regarding the use of IT resources is annexed to the Company's internal regulations. IS security training and awareness-raising courses adapted to different profiles (users, project managers, IS security managers, etc.) are offered on a regular basis to employees. The Executive Committee and the Audit Committee of the Board of Directors receive reports on cybersecurity risk management. Several dozen security audits are carried out each year by external PASSI qualified IS security audit companies (IS security audit providers) by the ANSSI (the National Cybersecurity Agency of France), both on IT infrastructures and on business information systems. In addition, the EDF group SOC (Security Operational Center) reports on IS security incidents on a monthly basis.

Lastly, IS crisis and cybersecurity drills are regularly carried out to test the various measures put in place.

The main cybersecurity risk control actions implemented in 2021 are set out in chapter 2.2.4 "Operational performance related risks" (4D).

2.1.3.3 The Health and Safety programme

The EDF group's health and safety programme is set out in chapter 3.3.1.3.1 "Health and safety policy".

2.1.3.4 Approval of commitments

The EDF group's Commitments policy sets the framework for decisions on commitments in terms of management, governance and control. This policy applies to all commitment projects, regardless of their amount, for all EDF entities and subsidiaries, excluding regulated subsidiaries, while respecting the governance of listed companies. Before each commitment decision, the proposed projects undergo a risk analysis according to a methodological reference framework made available to the entire Group. Strategic projects (beyond the thresholds defined in the Commitments policy) are reviewed by the Group Executive Committee Commitments Committee (CECEG).

Commitment projects are reviewed, where applicable, by the Board of Directors as described in sections 4.2.2.3 "Powers and duties of the Board of Directors" and 4.2.2.9 "Activity of the Board of Directors in 2021".

Strategic disposal projects are examined separately and supervised by the Disposals Committee (part of the CECEG) to preserve confidentiality and responsiveness.

2.1.3.5 Reliability of financial information – internal accounting and financial controls

The EDF group has organised its financial risk management around the following functions:

Performance Management, reporting, tasked with:

- contributing to the management of the performance of the Group's entities by implementing the Group's performance plans and by challenging the measures implemented by the entities and business lines. For this purpose, the Finance Department implements a set of management indicators adapted to the economic model of each of the Group's activities;
- contributing to budget monitoring through general performance reviews in the departments and controlled subsidiaries;
- developing and disseminating financial management methods and processes, contributing to the adoption of a management culture within the Group;
- managing the management cycle processes, summarising them and suggesting decisions to management and subsidiaries;
- developing medium- and long-term financial trajectories.

Accounting:

- preparing EDF's financial statements and the Group's consolidated financial statements;
- ensuring accounting compliance by using Group reference frameworks based on accounting standards and the chart of accounts;
- coordinating the Group's internal accounting and financial control system in accordance with the system presented below.

Taxation:

- ensuring the consistency of tax practices, the requirements of which are listed in the Group's Tax policy. The precise provisions in this area are discussed in section 3.4.2.2 "Contribution to development through taxation" of this document;
- ensuring the proper execution of legal and declarative obligations, notably by monitoring the subject;
- ensuring the accounting follow-up of the deferred tax position and the periodic justification of the accounts;
- identifying and controlling the Group's tax risks.

Finance and Investments:

- coordinating all the actions inherent in the Group's balance sheet and financial result, with the aim in particular of controlling the exposure of the Group's hedging assets, debt and the Group's overall balance sheet to financial risks;
- managing the investments, acquisitions and disposals as well as the listed and unlisted dedicated assets. The Group Risk Department prepares an annual risk mandate and specific working frameworks which define the principles for managing risks and the risk limits that are acceptable for this portfolio;
- appraising the investment projects presented to the CECEG meetings to anticipate impacts and improve the reliability of the financial trajectories relative to the Group's balance sheet and profit and loss accounts, as defined by the Commitments policy;
- contributing to portfolio reviews, and economic and financial optimisation analyses;
- ensuring that the Group is financed in accordance with the Financing, Treasury and Financial Risk Management policy; verifying the proper application of the policy's principles (drafting of work management frameworks, methodology, monitoring of exposures, regular calculation of risk indicators, and controlling compliance with risk limits). The positions of the trading room in charge of cash management are monitored by the Group Risk Department.

The Financing, Treasury and Financial Risk Management policy requires all entities of the Group to continuously and systematically identify financial risks (in particular, liquidity, interest rates, foreign exchange and counterparty). The Group Risk Department exercises second-level control of these risks via:

- verification that the principles of the policy have been properly applied (preparing work management frameworks, methodology, monitoring of exposures, regular calculation of risk indicators and controlling compliance with risk limits);
- controlling the positions of the trading room in charge of cash management. For these activities, a system of indicators and risk limits checked on a daily and a weekly basis is in place. The Markets Committee (a body that brings together the Finance and Investment Department and the Group Risk Department) checks and reviews on a quarterly basis, where applicable, requests for exemptions from the work management framework and requests for investment in new financial products.

The policy on the constitution, management and control of the financial risks involving EDF's Dedicated Assets applies to the portfolio of Dedicated Assets which are managed by the Financial Department. The Group Risk Department prepares an annual risk mandate and specific work management frameworks which define the principles for managing risks and the risk limits that are acceptable for this portfolio.

Reference frameworks

The accounting standards used by the EDF group (the scope of the Group's consolidated financial statements is set out in the appendix to the consolidated financial statements; see section 6 "Financial statements") comply with the international standards published by the International Accounting Standards Board ("IASB") approved by the European Union and applicable as at 31 December 2020. These international standards include the IAS (International Accounting Standards), IFRS (International Financial Reporting Standards) and the SIC and IFRIC interpretations. The accounting rules and methods are specified in the Group's accounting principles manual and summarised in the notes to the consolidated financial statements.

The principles applicable to the preparation and reporting to the Group's Finance Department are defined in the Accounting and Financial Reporting policy. The specific internal control provisions are described in the Group guideline entitled "Internal Accounting and Financial Control", and the control objectives to be implemented in the entities are specified and updated each year in the Group's Internal Control Guide. The Financial Management Directors of the Departments of the Business Lines and Subsidiaries sit on the Management Committee of the entities to which they belong. With the exception of the operators of regulated infrastructure, they are appointed and evaluated jointly by operational management and the management of the Finance function. A network of correspondents from the Operational Departments and subsidiaries facilitates dissemination of the guidelines and harmonised implementation throughout the various Group entities.

Each operational and functional Director of EDF makes a commitment each year with regard to the quality of the Internal Control system in the Accounting and Financial area, the improvement goals for the coming period and the truthfulness and exhaustiveness of the accounting information for which they are responsible by preparing a commitment letter sent to the Group Accounting and Tax Director. In return, each Director receives a letter of evaluation of the accounting and tax quality from the Group's Accounting and Tax Director based on the various elements of the assessment (results of internal controls, indicators of the accounting quality dashboard, letter certifying the compliance of the CSP2C accounts, specific actions) to highlight the progress made and determine the improvements to be made or continued. An indicator reference framework is used within EDF. It makes it possible to measure areas of conformity of the accounting information for each process. With regard to subsidiaries, each legal entity is responsible for the implementation of the Group's Internal Accounting and Financial Control guideline.

Procedures for preparing and auditing the consolidated financial statements

The consolidated financial statements are prepared by the Consolidation Department of the Consolidation Accounting Division based on data entered locally by each entity (parent company entities and subsidiaries) in accordance with Group standards and closing instructions, following a single chart of accounts. The scope of consolidation is closed after identifying all the companies of significance that are controlled, jointly-controlled or under significant influence. The non-significant nature of entities for which EDF holds an interest and which might fall within the scope of consolidation is examined regularly and submitted annually for the assessment of the Statutory Auditors.

The half-year consolidated financial statements are presented to the Audit Committee and then approved by the Board of Directors. The annual consolidated financial statements are reviewed by the Audit Committee, then closed at 31 December of the fiscal year by the Board of Directors and lastly approved by the Shareholders' Meeting.

Each half-yearly and annual closing gives rise to the preparation of instructions specifying the main deliverables expected from each party involved in the publication of the financial statements as well as the preparation of the management report and the Universal Registration Document (URD) for the annual financial statements. Meetings with EDF departments and the subsidiaries facilitate the preparation of these financial statements and make it possible to anticipate changes with regard to certain treatments, thereby increasing the reliability of the accounting and financial information published. An analysis of the conditions concerning completion of the foregoing (compliance with deadlines, quality of information, etc.) after the event allows for regular improvement of the process to prepare and analyse the consolidated financial statements.

Quarterly reporting of information on the EDF group's balance sheet and the profit and loss statement allows for the processing of complex operations to be anticipated and contributes to making the results more reliable.

Forecasts and management are performed using a single reference framework and tools shared between accounting and management. This system contributes to the coherence of Group management and facilitates dialogue at all levels of the organisation, and helps promote the sharing of information between the different parties and the quality of the information produced.

Procedures for preparing and auditing the corporate financial statements

The corporate financial statements are prepared annually and semi-annually by the Parent Company Financial Statements Department of the Accounting Consolidation Division. The annual corporate financial statements are closed on 31 December of the fiscal year, approved by the Board of Directors of EDF and then approved by the Shareholders' Meeting.

The condensed half-year corporate financial statements are closed on 30 June of the fiscal year, then approved by the Board of Directors. EDF's transactional accounting (excluding the Nuclear Fuel Division, the Island Energy Systems Division, the Decommissioning and Waste Projects Division and the Executive Talents Training Managers Department for the payroll accounting aspect) is entrusted to the Shared Accounting and Consulting Services Centre (CSP2C) of the Tertiary Services Department, which also handles the transactional accounting for certain French subsidiaries. The treatment of transactional accounting is organised by process. "Governance pacts" set the respective responsibilities of the operational and functional departments, of the CSP2C or, where applicable, the accounting operators in the operational business lines and the Accounting Consolidation Division.

Meetings are organised on a quarterly basis with EDF's departments to prepare the financial statements and anticipate changes with regard to certain treatments to increase the reliability of the accounting and financial information published.

2.1.3.6 Crisis management and business continuity

Like the Covid pandemic, natural disasters (floods, landslides, earthquakes, etc.), significant climatic variations (droughts, etc.) and any other event the scope of which is difficult to predict (pandemic, a major industrial accident in the world, etc.) could affect the Group's activities; this was the case with the storms Amelie (2019), Alex (2020) in metropolitan France, and Irma (2017) in the West Indies, and with episodes of extreme cold (winter 2017) and heat waves (summer 2019). In the event of an exceptional incident, the measures adopted may generate costs beyond those of repairing the damage caused by the disaster and the loss of earnings from the interruption of the goods and services provided by the Group.

To manage this risk, EDF has defined a Crisis Management and Business Continuity policy that takes into account the Group's territorial presence and the importance of the Group's industrial activities and public service to the economy in terms of business continuity. This policy defines the organisation principles and specifies the entire system that must be implemented. This policy consists in particular of:

- ensuring the existence of structures to manage crises and permanent systems for raising alerts;
- checking the existence and regular updating of relevant crisis management procedures with regard to the risks involved;

(1) Risks that can be transferred to the insurance markets and the alternative markets.

- defining, for periods of crisis, coordination procedures with all stakeholders;
- ensuring feedback from crises and crisis exercises is systematically taken into consideration in order to avoid or reduce the consequences of similar crises, thereby enriching the Business Continuity Plans;
- ensuring the existence and updating of business continuity plans within each entity;
- checking the implementation of professional development actions for all players in the crisis.

A crisis exercise programme allows for the effectiveness and overall consistency of these mechanisms to be tested on a regular basis.

In 2019, the EDF group set up an action plan to increase the entities' preparedness with regard to business continuity issues: in this context, the development of a pandemic crisis exercise, including the revision of the EDF group's pandemic plan, was initiated in the summer of 2019. This work proved to be particularly useful for the management of the Covid crisis in 2020. By relying on operational, prepared and tested mechanisms, the EDF group was able to proactively and with foresight face the health crisis as from the end of January 2020.

Feedback after the summer of 2020 enabled the Group to approach the second lockdown with the lessons learned required to continue its activity.

The year 2021 tested the robustness of the crisis mechanism and its agility in the face of the different phases of lockdown and changing telework conditions during the Covid crisis. Finally, special attention was paid to the components of the supply/demand balance during the winter of 2021/2022, with awareness-raising days both internally and with the French Ministry of Ecological and Solidarity Transition. In addition, an analysis of the Continuity of Information Systems is carried out at the Group level and completed according to specificities in each of the business lines' Business Continuity Plans.

2.1.3.7 Insurance

In order to protect its assets and limit the impact of certain events on its financial position, the EDF group has dedicated insurance programmes that cover its major risks in terms of property damage, civil liability and insurance of persons. Nuclear risks are subject to the specific civil liability regime described below.

Organisation

The Group Insurance Division is responsible, while respecting the management independence of the regulated infrastructure operators, for preparing the insurance policy of the EDF group and organising its implementation throughout the Group in order to continuously optimise the overall costs of its insurable risks⁽¹⁾.

The Insurance Managers of entities and controlled subsidiaries that join the Group's programmes are responsible for:

- ensuring that all risks are insured;
- scheduling prevention inspections and overseeing implementation of the resulting recommendations;
- reviewing cover strategies and amounts declared (risk quantification);
- analysing losses and participating in claims handling.

This work, carried out in close collaboration with the Group Insurance Division, allows for continuous improvement of the quality of information on insurable risks as programmes are renewed and prevention visits are carried out (assessment of maximum possible losses, "MPL"). In connection with prevention actions, the Group Insurance Division establishes and oversees implementation of the site inspection programmes.

Group Insurance Policies

Purpose: the Insurance policy, approved by the Executive Committee in January 2017, specifies the risks that the Group decides to transfer to the market and the general principles for optimising these transfers: mass purchasing through the implementation of Group insurance programmes, sharing between traditional markets and other types of cover (specialised mutual insurance companies, transfer to the financial markets, etc.), individual and Group deductibles (generally, only large-scale risks are transferred) and optimisation of intermediation expenses.



Principles of execution:

Since 2011, a Strategic Insurance Policy Committee ("COSA"), currently chaired by the Finance and Investments Director, provides an opportunity for the business lines and the Finance Department to reflect on changes to and procedures for implementing the Insurance policy, in particular the main characteristics of the programmes.

The Group Insurance Division and the Group Risk Department perform an annual analysis of the risk mapping at the Group level, supplemented by the insurance cover system in place. Based on this shared view, EDF is in a position to improve, and, where applicable, extend the cover of insurable risks in accordance with the principles established by the Group in this area.

The goal of the Group's insurance programmes is to integrate the controlled subsidiaries as broadly as possible in order to homogenise risk cover and streamline its management, on the one hand, and to control the corresponding insurance costs, on the other hand.

Insurance contracts, according to market practice, include exclusions, limits and sub-limits.

Use of captive insurance companies and mutual insurance companies

Like all major French and international groups, EDF uses captive insurance companies and mutual insurance companies to supplement cover provided by the traditional insurance markets.

The EDF group's captive insurance companies are:

- Wagram Insurance Company DAC, an insurance company founded in 2003 in Dublin, which is involved in the majority of the Group's insurance programmes;
- Océane Re, a reinsurance company established in 2003 in Luxembourg, to reinsure EDF's nuclear civil liability.

It should be noted that Framatome also has had a reinsurance company (Tereco) in Luxembourg since 21 December 2018.

Furthermore, EDF is a member of the Oil Insurance Limited (OIL) mutual insurance company in order to deal with the risks of damage (excluding overhead networks) to the property owned by the Group or under concession (EDF and its consolidated subsidiaries). OIL is a mutual insurance company dedicated to the needs of companies in the energy sector, which provides its members with cover for property damage. The scope covered includes *inter alia* nuclear power plants (the conventional portion), fossil fuel-fired power plants, hydropower facilities, network substations, and exploration and production assets.

The Group's damage insurance programmes combine this cover provided by OIL and covers provided by market insurers.

The EDF group is also a member of the European Liability Insurance for the Nuclear Industry (ELINI), the European Mutual Association for Nuclear Insurance (EMANI), the Nuclear Industry Reinsurance Association (NIRA) and Blue Re, which are mutual insurance companies that manage cover in this field for European nuclear power operators.

The captive and mutual insurance companies enable EDF to reduce the total amount of premiums paid and, more generally, the cost of its insurance schemes.

Civil liability insurance (not including nuclear civil liability)

EDF has taken out general civil liability insurance covering EDF, Enedis and their controlled subsidiaries against the financial consequences of civil liability, excluding nuclear damage, that may be incurred by the entities in the course of their activities due to damage caused to third parties. The actions and measures implemented to prevent industrial and environmental risks and limit their effects are described in particular at the beginning of this chapter under the paragraph titled "2nd line of control: risk management and control of activities".

This cover is purchased to the extent of available capacity under acceptable financial terms on the insurance and reinsurance markets. Maximum cover is €1 billion. Under this programme, the share of risk retained by the Group with regard to an insurable accident ("retention"), including the share of Wagram Insurance Company DAC and Océane Re, does not exceed €40 million per insurable accident. Subsidiaries generally opt for lower deductibles that are more consistent with their financial capacity.

Civil liability insurance for corporate officers

EDF holds civil liability insurance covering corporate officers and executives of EDF, Enedis and their controlled subsidiaries against the financial consequences of their civil liability incurred in performing their management functions.

Damage insurance (excluding nuclear assets)

Conventional damage programme

The scope of the conventional damage programme includes virtually all EDF subsidiaries, in particular EDF Energy, Edison, Dalkia and the distribution network operator Enedis.

Wagram Insurance Company DAC, together with other insurers and reinsurers, provide extensions of cover (property damage and business interruption) in addition to the covers provided by OIL, bringing the maximum up to €1 billion. Under this programme, the Group's retention per claim, including the deductible (which varies by subsidiary) and the share of the risk retained by Wagram Insurance Company DAC and by Océane Re, does not exceed €25 million.

This programme provides cover for business interruption for most subsidiaries in the event of property damage, but not for EDF, which does not benefit from this cover. The actions and measures implemented to prevent industrial and environmental risks and limit their effects are described in particular at the beginning of this chapter under the paragraph titled "2nd line of control: risk management and control of activities".

Cover for "construction" risks

EDF has taken out insurance policies covering specific construction risks (construction all-risk and erection/testing all-risk policies). These policies are not included in any Group programme but are purchased on an *ad hoc* basis for major construction projects such as the EPRs of Flamanville and Hinkley Point C, the construction of combined cycle power plants, dams, etc.

Cyber risk cover

Since 1 July 2017, cyber risk cover has been put in place. This cover was renewed on 1 July 2021.

This €75 million guarantee covers EDF and the Group's subsidiaries for the expenses incurred to handle major disruptions caused by a cyberattack on the Group's information systems.

Specific insurance for nuclear facility operations

Civil liability of nuclear facility operators

Several international conventions govern the civil liability of nuclear facility operators, in particular the Paris Convention of 29 July 1960 on Third-Party Liability in the Field of Nuclear Energy and the Brussels Convention of 31 January 1963, which supplements the Paris Convention (hereinafter the "Conventions"). The Paris Convention introduced a special liability system for nuclear damage, which is strict (even in the absence of fault), limited in terms of the amount⁽¹⁾ and duration, and is exclusively focused on the operator of the nuclear facility. These Conventions apply to the signatory countries that have ratified them, including France and the United Kingdom.

Protocols to amend the Paris and Brussels Conventions were signed on 12 February 2004 but have still not entered into force. Ratification and entry into force of the revised Conventions are currently scheduled for 3 January 2022. They require higher amounts of compensation than the original conventions in order to cover a greater number of victims and types of damage that are eligible for indemnification. The State in which the nuclear facility of the operator that is liable for causing the damage is located is liable for amounts above the €700 million for which the operator is liable, up to €1,200 million (provided that said State is a Contracting Party to the Brussels Convention). Over and above this amount, the Member States that are Contracting Parties to the Brussels Convention are liable up to a maximum amount of €1,500 million. In addition, for personal injury only, the time limit to claim compensation has changed from 10 years to 30 years from the date of the incident. The definition of "nuclear damage" is evolving and includes, in addition to damage to persons and property, economic losses, the cost of protective measures, the cost of measures to rehabilitate damaged environments, and certain other losses resulting from damage to the environment.

(1) With the exception of Contracting Parties that have opted for unlimited liability (Germany, Switzerland, Sweden, etc.).

These Conventions also provide that the operator has an obligation to take out insurance or lodge a financial guarantee for the liability amounts established in order to guarantee the availability of funds.

In France, the civil liability obligations imposed on nuclear facility operators were transposed into the French Environmental Code. More specifically, since 2016, Articles L. 597-28 and L. 597-32 of the French Environmental Code provide that the limits on the civil liability of nuclear operators are set at €700 million for nuclear facilities (€70 million for low-risk facilities) and €80 million for risks during transport.

EDF has a "Nuclear Civil Liability Insurance Programme (RCN)" insurance cover obtained following a call for tenders, which enables the Group to meet its obligations while controlling their financial impact. The insurance is shared between the nuclear insurance market (AXA, reinsured by the French nuclear pool Assuratomie), the Group's captive insurance companies, and the nuclear mutual insurance company ELINI.

Framatome joined the Group's insurance system on 18 February 2020. Its insurance programme is equally divided between the nuclear insurance market (AXA, reinsured by Assuratomie), the Group's captives and the ELINI nuclear mutual insurance company.

In the United Kingdom, where EDF Energy operates nuclear power plants, the nuclear operator's civil liability rules are similar to French rules. The UK Parliament approved on 4 May 2016 the "Nuclear Installations Order" (order transposing the above-mentioned amending Protocols of February 2004), which makes substantially the same changes as the French "TSN" Act in 2006 but which, for the most part, will enter into force only in conjunction with the Protocols.

This Order will raise the British operators' obligations from the current limit of £140 million to the equivalent of €700 million, and they will be progressively increased over a five-year period to reach a cap of €1.2 billion.

EDF Energy is currently insured by ELINI and Wagram Insurance Company DAC. The reinsurance company Océane Re shares in this risk under the reinsurance contract it issues for the benefit of Wagram Insurance Company DAC.

In view of the expiry dates of the current insurance policies and the planned entry into force in 2022 of the insurance obligations arising from the revised Paris Convention, tenders and negotiations are underway to set up the necessary insurance.

Civil liability for the transport of nuclear substances

Under the Paris Convention, the operator that is the "shipper" is civilly liable for the transport of nuclear substances (unless stipulated otherwise). Since 18 February 2016, the liability ceiling has been set at €80 million with an unchanged scope of damage, and will subsequently be extended to a broader scope of damage admissible for compensation when the revised Paris Convention comes into force. This liability is as of now covered by the aforementioned nuclear operator civil liability policy.

Cover for damage to nuclear facilities

The cover obtained through EDF's membership in the OIL mutual insurance company provides protection against material damage in cold areas, excluding the consequences of a nuclear accident, of 60% of \$400 million in excess of a deductible of \$15 million, both in France and in the United Kingdom.

Since 1 October 2021, the insurance system covering nuclear facilities is as follows:

- in France, the protection provided by OIL is supplemented, for the consequences of a nuclear accident, including the costs of site decontamination, by insurance cover of up to €80 million in excess of a deductible of up to €20 million using the EMANI nuclear mutual insurance company, Axa and Allianz (reinsured by Assuratomie), and Wagram Insurance Company DAC (reinsured by Océane Re).
- in the United Kingdom, OIL's protection is supplemented for the consequences of a nuclear accident, including the costs of site decontamination, by an insurance programme with capacity defined based on the technology and status of the plants of up to £1 billion provided by the nuclear mutual insurance association EMANI, the British nuclear pool NRI and Northcourt, which consists of British specialist insurers.

Framatome is insured by the mutual insurance association EMANI for damage and consequential operating loss affecting the facilities involved in the manufacture of fuel up to a limit of €650 million, with a deductible not exceeding €5 million for damage and 90 days for operating loss. Furthermore, EDF Inc. is a member of NEIL (Nuclear Electric Insurance Limited) – a mutual nuclear insurance company in the United States.

Premiums

The total amount of Group insurance premiums for all types of cover was €283 million in 2021.



2.2 Risks to which the Group is exposed

The Group operates in a fast-changing environment that entails numerous risks of various kinds: they may be strategic or operational; some are exogenous, others are endogenous and inherent to the Group's business lines. Their consequences may be manifold and may affect the Group's operating results, the Group's financial position and its ability to finance its strategy or development, its internal or external stakeholders or environment, or its reputation.

The Group describes hereinafter the specific risks to which it considers itself exposed. The principle of specificity leads us to describe in this section only those risks for which the specificity of the EDF group is a key factor. For risks that are not specific to the Group, the absence of a risk description in this section does not infer the Group does not take the risk into account.

The risks must be read in their entirety, as some of them may be interdependent.

Risks are divided into five categories, described in sections 2.2.1 to 2.2.5, respectively.

Section 2.2.1 "Market regulation, political and legal risks" describes the risks related to changes in public policy and regulations in the countries and territories where the Group operates, as well as the legal risks to which the Group is exposed.

Section 2.2.2 "Financial and market risks" describes the risks arising from exposure to the energy markets in which the Group operates, as well as risks related to changes in the financial markets and the reliability of related information.

Section 2.2.3 "Group transformation and strategic risks" describes the risks related to the Group's ability to adapt, particularly in terms of strategy and skills, in response to the needs for transformation brought about by climate change, new competition, and technological and societal changes.

Section 2.2.4 "Operational performance related risks" describes the risks related to the control of the Group's operating activities across its various industrial activities and projects, including EPR, services and sales. In particular, this section describes the Group's risk relating to current and/or future EPR projects, which is a major risk.

Section 2.2.5 "Specific risks related to nuclear activities" supplements section 2.2.4 for the Group's nuclear-related activities, which entails additional risk factors and special provisions, particularly in view of the primary requirements of nuclear safety and the very long-term capital-intensive nature of nuclear activity.

The risks are outlined in detail in each of the relevant sections for their respective category. They are numbered to make it easier to connect the table with the graph and the detailed descriptions that follow.

The economic disruptions caused by the Covid health crisis led to a drop in demand for electricity, especially in 2020, and had a significant impact on many of the Group's activities, most notably nuclear production, construction sites (construction of major projects and maintenance of nuclear power plants) and service activities. This health crisis continued to affect the Group's performance in 2021, and may continue to do so in the future. Its impact on the Group's risks is specified in the presentation of each of the risks concerned. The main impacts are as follows:

- disruption of industrial supply chains for products or equipment from countries affected by the epidemic (risk 4B);
- health impacts on the activity of the Group's employees and service providers (risk 4C);
- disruption in the running of the Group's operations, construction sites and major projects in the event of restrictions that could affect business continuity (risk 4A) and the level of production, particularly in the event of an impact on nuclear unit shutdowns (risk 5A);
- Covid-19 effects on demand and the weakening of the economy (unpaid and uncollectable amounts) (3A);
- impact on the price of raw materials and electricity on the wholesale markets, as well as on the level of demand for electricity, and counterparty risks (risks 2C and 2F);

- impact of a disruption in the financial markets through a decrease in the valuation of the portfolio of dedicated assets or pension assets affecting the Group's financial results and the coverage rate of nuclear provisions, and impact of a decrease in interest rates on the calculation of the amount of nuclear provisions and provisions for employee benefits (risks referred to in section 2.2.2 "Financial and market risks").

The Ukrainian conflict and related geopolitical tensions could have consequences of all kinds that could make it necessary to take additional actions in order to achieve the Group's financial objectives. The Group may not even be able to achieve these objectives. At the current stage of the conflict and related geopolitical tensions, the impacts of all kinds are difficult to quantify. To date, without claiming to be exhaustive, this conflict is an aggravating factor for the following risks:

- Energy market risk (Risk 2A): increased volatility, upward pressure on prices and reduced liquidity:
 - the impacts of this risk are aggravated in France due to the uncertainties surrounding the Group's nuclear generation (risk 5A- Non-compliance with operating objectives and/or continued operation of nuclear plants),
 - it may also amplify the adverse effects on the Group of the French government's ⁽¹⁾ decision to increase ARENH volumes exceptionally by asking EDF to sell 20TWh of additional electricity to its competitors (risk 1A "Changes in public policies and in the regulatory framework in France and Europe");
- Operational continuity of supply chains and contractual relationships (Risk 4B): inflationary pressures, disruption of industrial supply chains for products or equipment from countries affected by the conflict, disruption of contracts with companies affected by economic sanctions against Russia. Potential impacts on certain Groups' activities especially in Framatome and Enedis as well as on the planned acquisition of part of GE Steam Power's nuclear business;
- Risk with regard to the fuel cycle (Risk 5D) and the provisions for waste and decommissioning (5B), in particular in the event of the contracts with TENEX (reprocessing of spent uranium) being called into question;
- Financial risks in section 2.2.2 "Financial and market risks": disruption of the financial markets through a fall in the valuation of the portfolio of dedicated assets or pension assets affecting the Group's financial result and the hedge rate of nuclear provisions. Increased risk of interest rate volatility, particularly with regard to the Group's refinancing costs and the discount rate for provisions. Impacts on banks, which are themselves exposed to the Russian financial system, which could accentuate the risks associated with access to liquidity (Risk 2D);
- Damage to assets including cyber-attacks (Risk 4D): increase in cyber threats;
- Endangerment of occupational safety or health (Risk 4C): increased risk for employees and contractors in Ukraine or Russia.

All the risks identified in this document have been selected because they are significant in terms of the materiality of their estimated impact on the Group. In addition, they are prioritised based on a qualitative assessment of their criticality, taking into account simultaneously the significance of the potential impact for the Group, the probability of their occurrence and the level of control, in light of the actions undertaken. This prioritisation produces a three-level scale for all risks: the criticality can be considered strong, intermediate or moderate. The categories are not ordered hierarchically.

The scale and diversity of the risks faced by the Group, particularly in an extremely volatile market environment, accompanied by regulatory measures that have a significant negative impact on the Company, marked by the Ukrainian conflict and associated geopolitical tensions and by the studies and work that the Group must carry out on its French nuclear fleet in connection with the recently identified stress corrosion phenomena, may have consequences of all kinds, including the emergence of new risks or the worsening of the existing ones, which are likely to require further actions in order to achieve the Group's financial objectives. The Group may even not be able to achieve its objectives.

(1) See Announcements of 13 January 2022.

RISK FACTORS AND CONTROL FRAMEWORK

Risks to which the Group is exposed

As a general rule, the scope of exposure is France, Belgium, Italy, the United Kingdom and all countries in which the Group is present. Where the scope of exposure is more restrictive, it is specified in the table and in the risk description.

Exposure to risk may vary according to duration. The potential impact of these risks may produce effects at very different time horizons, ranging from very short term (less than a year), to medium term (up to a few years) to very long term (up to several decades or more, given the nature of the relevant industrial activities which may span centuries).

In order to control risks, measures have been put in place. Some measures apply to all risks: internal control, commitment approval process (see section 2.1 "Risk management and control of activities"); others are specific to each risk.

Additional provisions for taking into account certain risks related to Corporate Social Responsibility are set out in chapter 3. Cross-references shall, where appropriate, be specified in the risk description.

TABLE OF RISKS - NUMBERING, HEADINGS AND CRITICALITIES

Criticality is appreciated in view of the control actions undertaken

Category	Risk	Criticality
1. Market regulation, political and legal risks	1A: Changes in public policies and in the regulatory framework in France and Europe, in particular the ARENH	●●●
	1B: Changes in the legal and regulatory framework for hydraulic concessions	●●
	1C: Changes in the legislative and regulatory framework for electricity distribution concessions	●●
	1D: Ethics or compliance violations.	●
	1E: Litigation risk	●
	1F: Insufficient compensation for missions of general interest	●
2. Financial and market risks	2A: Energy market risk	●●●
	2B: Financial markets risk	●●
	2C: Interest rate risk	●●
	2D: Access to liquidity risk	●●
	2E: Counterparty risk	●●
	2F: Foreign exchange risk	●
3. Group transformation and strategic risks	3A: Transformation capacity in the face of disruptions	●●
	3B: Adaptation to climate change: physical and transition risks	●●
	3C: Adaptation of employees' skills	●●
	3D: Ability to fulfil long-term social commitments	●●
4. Operational performance	4A: Management of large and complex industrial projects (including EPR projects)	●●●
	4B: Operational continuity of supply chains and contractual relationships	●●
	4C: Endangerment of occupational health or safety violations (employees and service providers)	●●
	4D: Attacks against assets, including cyberattacks	●●
	4E: Hydraulic safety violations	●●
	4F: Risk of blackout	●
	4G: Industrial safety violations and impact on environmental assets, including biodiversity	●
5. Specific risks related to nuclear activities	5A: Failure to comply with the objectives in terms of operation and/or in terms of extending the operating life of nuclear power plants (France and United Kingdom)	●●●
	5B: Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments	●●
	5C: Nuclear safety violations during operation resulting in nuclear civil liability	●●
	5D: Control of the fuel cycle	●●

Caption

●●● Strong criticality ●● Intermediate criticality ● Moderate criticality



2.2.1 Market regulation, political and legal risks

1A: Changes in public policies and in the regulatory framework in France and Europe, especially relating to ARENH.

Summary: Public energy policies and market regulation in Europe, France and more generally the countries where the Group operates are likely to change even at short notice and, as a result, the Group faces major regulatory risk. In France, these changes may have an impact on regulated sales tariffs, the ARENH or the Tariffs for Using the Public Transmission and Distribution Networks (TURPE). They may also affect the framework of CO₂ emission certificates or the Group's investment financing mechanisms through the European taxonomy. The consequences might be considerable for the Group, and could slow its development compared to its competitors or hinder its ability to finance its strategy or meet its commitments to climate protection.

In particular,

- the French government announcements of 13 January 2022 requiring EDF to sell to its competitors an additional volume of the ARENH of 20TWh at a price of €46.2 per MWh in 2022 will have significant financial consequences for the Group (estimated to (10.2) billion euros of EBITDA);
- the risk of a lack of comprehensive reform of the regulations applicable to the sale of the Group's nuclear generation in France, or of a reform contrary to EDF's interests, is significant for the Group;
- The Group may not be able to achieve the level of investment level required to meet the objectives set by public policies in the nuclear field.

Criticality: ●●● Strong

a) Context

In France, the context determining the scale of this risk (laws, regulations, policy directions) is as follows:

- **the Energy-Climate Act, enacted on 8 November 2019.** This Act specifies the key points of the energy and ecological transition policy in France and in particular:
 - › the Act changes the **ARENH system** in two ways:
 - 1/ it raises the "ARENH ceiling" from 100 to 150TWh as of 1 January 2020 to allow the French government to increase the maximum overall volume of electricity that EDF transfers to alternative suppliers by decree to 150TWh,
 - 2/ the Act also authorises the Government to review the ARENH price by decree. ⁽¹⁾ See below for additional measures on the ARENH and the TRV – Announcements of 13 January 2022.
 - › **in terms of energy mix**, the Act ratifies the postponement to 2035 of the deadline for reducing the share of nuclear power in electricity generation to 50%. The Act also raises the fossil fuel consumption reduction target from 30% to 40% by 2030 (compared to 2012), and plans to achieve carbon neutrality by 2050 by dividing greenhouse gas emissions by a factor of more than six.
- **the Multi-Year Energy Programme (PPE) adopted by decree of 21 April 2020:**
 - › **ARENH and nuclear regulation:** The Multi-Year Energy Programme (PPE) provides that the Government will propose "details for a new regulation of existing nuclear power ensuring consumer protection (...), while simultaneously affording EDF the financial capacity to ensure the economic sustainability of the production tool".
 - › The negotiations that the French State began in early 2019 with the European Commission on the new regulation for existing nuclear power were unsuccessful in 2021.
 - › **The PPE follows the objective of diversifying the energy mix and reducing nuclear power to 50%** of electricity generation in France by 2035, which would lead to the closure of 14 reactors (including the two at Fessenheim).
- **other critical elements of the political and regulatory context:**
 - › **tariff shield:** On 30 September 2021, the French Prime Minister announced the introduction of a *bouclier tarifaire* ("tariff shield") for 2022 based on the principle of limiting the increase in the regulated sales tariffs (TRV) for residential customers to 4% (including tax). This tariff shield has been implemented and is based on two measures provided for in the 2022 Finance Act:
 - a reduction in the domestic tax on the final consumption of electricity (TICFE) applicable from 1 February 2022 for all consumers, up to the legal minimum amount,

- the possibility for the Government to set the level of tariffs by decree at a lower level than the Energy Regulation Commission's (CRE's) proposal if the latter is still higher than 4% by including the previous lever, with in return a catch-up in 2023 of the losses borne by EDF as well as a compensating mechanism for market offer suppliers. This possibility was used in January 2022 and allows to limit the increase in residential and non-residential blue tariffs to 4%;

- › **additional measures for the ARENH and the TRV :** In the context of an unprecedented rise in electricity prices, the French Government has set up two measures to supplement the tariff shield:

- exceptional increase of 20TWh in the volume of the ARENH to be delivered in 2022 at a price of €46.20/MWh.

The texts (decree and orders) implementing these measures have been published on 11 March. The decree stipulates that, in order to benefit from the additional volumes, eligible suppliers will have to sell to EDF a volume equivalent to the one that will be granted to them by EDF under this additional allocation, at a price equal to the average of wholesale market quotations recorded between 2 and 23 December 2021 of the calendar base product for electricity delivery in mainland France for the year 2022, i.e. 257 €/MWh. CRE will allocate the additional ARENH volumes between suppliers according to the same distribution as for the delivery period that began on 1 January 2022.

- extension of the principle of capping the increase in the regulated sales tariffs (TRV) to an average of 4% (including tax) for non-residential customers who are still eligible for it (mechanism implemented as of 1 February).

These elements are set out in section 1.4.3.2. "Long-term electricity purchase and sale contracts";

- › **emergency supply:** Emergency supply (the taking over by a supplier of the customers of a defaulting supplier) is provided for in Article L. 333-3 of the French Energy Code. It allows the Minister in charge of Energy to launch a tender with the support of the Energy Regulation Commission (CRE). In November 2021, in a context of exceptionally high market prices and the failure of an alternative supplier, the French State designated by decree emergency suppliers on a transitional basis (EDF or ELD, as the case may be). The provision was implemented when two suppliers defaulted in November and December 2021;
- › **the "Fit for 55" Package**, published by the European Commission on 14 July 2021, is one of the flagship schemes of the new European Commission. In particular, it includes an increase in all targets to achieve - 55% net GHG by 2030 compared to 1990 and carbon neutrality by 2050. The main orientations relate to:
 - the revision of the EU Emissions Trading Scheme (EU-ETS) within the EU, including its extension to other sectors,

(1) In its decision of 7 November 2019, the Conseil constitutionnel (the French constitutional council) subjected the legality of such a decree to sufficient consideration of the "economic conditions under which electricity is generated by the nuclear power plants".

- various legislative proposals (energy efficiency, renewable energies, energy taxation), including proposals aimed at regulating the development of hydrogen (with a definition of low-carbon electrolytic hydrogen compatible with the French electricity mix),
- a revision of the Guidelines on State aid for environmental protection and energy (EEAG) adopted on 21 December 2021, applicable from January 2022, which constitute a framework for structuring future EDF group investments;

- › **the legal framework for the European Taxonomy⁽¹⁾ for Sustainable Finance.** The Complementary Delegated Act for nuclear and gas activities was adopted on 2 February 2022 by the European Commission. Subject to the procedure before the Parliament and the Council, it will enter into force as from 2023.

b) Main risks

- **Major impact of the exceptional increase in the volume of the ARENH (government announcement of 13 January 2022):**

The decision requiring EDF to sell to its competitors a supplementary ARENH volume of 20TWh at a price of €46.2/MWh poses several risks:

- › Risk of instability of the regulatory framework, with a major impact on EBITDA.
- › This late decision comes at a time when the ARENH scheme for 2022 was closed and EDF had organised its hedging accordingly. EDF will therefore have to buy electricity to deliver at a much higher price than it will have to sell it to its competitors.

The texts implementing these measures were published on 11 March. They set the price at which EDF will buy back the additional 20 TWh of ARENH that should be provided to suppliers in 2022.

The impact of these regulatory measures on the Group's EBITDA for 2022 had been estimated, for illustrative purposes, at approximately €(8.4) billion based on market prices at 31 December 2021. On the basis of the terms and conditions defined in the Decree published on 12 March 2022, and given the information available to the Group, the estimated impact on the Group's EBITDA for 2022 has been re-evaluated at approximately €(10.2) billion.

- › Legal risks: this situation could lead to legal risks (appeals, litigation, new regulatory instabilities...)
- › Risk that these emergency measures will be extended beyond 2022.

This situation, which embodies a risk that has been raised for several years, carries major risks for the EDF group: financial position, assessment by the rating agencies and ability to finance the strategy.

- **General risks related to the existing ARENH scheme**

Regardless of the corresponding exceptional situation the announcements of 13 January 2022, as long as the Arenh scheme exists, it exposes EDF to the following risks:

- › since the ARENH mechanism is globally optional and free of charge, it gives suppliers opportunities for arbitrage between the ARENH mechanism and the market price, to the detriment of EDF, and exposes EDF to major uncertainties that have a negative impact on the effectiveness of its energy market risk management; as a result, EDF is highly exposed to falls in wholesale electricity market prices when their total level (energy + capacity) is below the ARENH price (currently €42/MWh) for the year of delivery in question. Conversely, the positive impact of wholesale electricity market price increases is limited when their total level (energy + capacity) is above the ARENH price;
- › in addition, there is a risk that the ARENH volume will be increased on a permanent basis without sufficient price changes, since the Energy-Climate Act now offers the French State this possibility. It could result in further reducing EDF's ability to benefit from wholesale market prices for electricity when their total level (energy + capacity) is above the ARENH price;
- › furthermore, the implementation of the mechanism was the subject of disputes in 2020 and 2021, described in note 17 of the appendix to the consolidated financial statements. These disputes relating to the application of force majeure in the context of the Covid-19 health crisis exemplify the

arbitrage carried out by certain alternative suppliers when market prices become lower than the ARENH price, by suspending the performance of the ARENH contract between them and EDF in order to benefit from cheaper supplies on the markets.

- **Risk of no reform of the ARENH in the long term**

The negotiations between the French State and the European Commission on a future regulation were put on hold in the summer of 2021 with no indication of a date on which the discussions will be reopened: the main risks relate to the level of prices, the scope of the regulation, the French State's ability to negotiate sufficient terms of compensation and proportionate consideration with the European Commission. **Thus, there is a major risk of a lack of comprehensive regulatory reform applicable to the sale of the Group's nuclear generation in France or a reform that is not in the interests of EDF, particularly in terms of the Group's ability to finance its strategy.**

- **Other price and tariff risks**

- › **TURPE:** the French Energy Regulation Commission (CRE) deliberations in January 2021 formalised the implementation of TURPE 6 HTB and TURPE 6 HTA/BT as from 1 August 2021. The risk involves whether the level of compensation of network operators is sufficient to enable them to carry out the tasks entrusted to them beyond the TURPE 6 tariff period.

- › **Price of CO₂:** the revision of the EU Emissions Trading Scheme (EU-ETS) could introduce many uncertainties and risks regarding the level and predictability of prices.

- › **Emergency supply:** there is a risk of not being able to recoup the costs incurred in providing emergency supply to customers who can leave EDF's portfolio at any time, subject to prior notice to the companies. This risk exists in both the transitional and permanent arrangements for emergency supply.

- **Risks related to the energy mix**

- › It could therefore be decided to shut down one or more reactors in the EDF fleet prematurely, not as a result of an industrial choice but as a result of the application of orientations reflected in the multi-year energy programme (PPE) or a programming law. Such decisions should lead to EDF being compensated for the harm suffered, as reiterated by the French Conseil constitutionnel (the French constitutional council) in a decision of 13 August 2015. There is a risk that EDF would not be compensated for the entire loss.

- › The closure of controllable production assets (nuclear, coal, fuel oil, etc.) could increase the risk of tensions on the supply-demand balance, particularly during the next few winters.

- › Risk of absence or delay in the formal decision by the State to launch a programme for the construction of new EPR2 or even SMR nuclear reactors, particularly in view of the Energy Programming Act.

- **Risks associated with the European context (Taxonomy)**

- › The Delegated Act published on 2 February 2022 providing for the inclusion of nuclear power in the European taxonomy as "transitional" energy could be rejected by the European Council or by the Parliament (deadline mid-2022). It could also be subject to an annulment action before the European courts. In addition, the classification as transitional energy might insufficiently recognise decarbonised nuclear electricity, with potential consequences for access to financing for new projects. The text does not include the fuel cycle or waste management. Finally, the conditions set out in the Delegated Act for the classification of nuclear energy as an aligned activity may not be fully met.

c) Control actions

Control actions are limited for those risks, which stems from decisions originating outside the Company. Nevertheless, the control actions include the following:

- analysis of the potential consequences of published or still pending texts notably the decree n° 2022-342 and the orders of 11 March in the purpose of identify the impact on the Group, concerning the ARENH and the tariff shield, see in particular the action plan to strengthen the the Group's balance sheet structure (note 23 to the consolidated financial statements consolidated financial statements for the year ended 31 December 2021 in section 6.1 and paragraph Perspectives section 5.5);

(1) Resulting from the European regulation 2020/852 of 4 June 2020 aiming to establish a classification of economic activities according to their contribution to the achievement of environmental objectives, supplemented by a Delegated Act adopted on 4 June 2021 aiming to determine the conditions under which economic activities can be considered as substantially contributing to the climate objectives. On 6 July 2021, the so-called "Article 8" Delegated Act on the content and presentation of the information to be provided was adopted. Finally, on 2 February 2022, the Complementary Delegated Act covering nuclear and gas activities was published and, subject to the procedure before the Parliament and the Council, will enter into force as from 2023.

- monitoring the political, legislative and regulatory context in France, Europe and in the regions where the Group operates;
- dialogue with and lobbying of public authorities (particularly in France and Europe) to share all the potential direct and indirect impacts of the pending texts on EDF and public policy;
- contribution to public consultations on relevant pending texts;
- participation of EDF in the Conseil supérieur de l'énergie (CSE – the French higher council for energy);
- establishment of operational mechanisms for compliance with each new text;
- energy market risk and financial risk control policies.

1B: Changes in the legal and regulatory framework for hydraulic concessions

Summary: The Group carries out its hydropower generation activities mainly in France under concessions, licence or delegation agreements. Therefore, the Group does not always own the assets it operates. In France, changes in the legislative and regulatory framework, particularly for the renewal of concessions (provisions for the most powerful facilities), changes in the economic conditions of concession specifications and the conditions for implementing advertising and competitive bidding procedures could have an impact on the Group's results.

Criticality: ●● Intermediate

a) Main risks

The challenges associated with the renewal of hydraulic concessions in France are specified in section 1.4.1.3.1.4 "Issues relating to hydropower generation". To date, the French State has still not renewed 20 concession titles that expired on 31 December 2020, corresponding to an installed capacity of 2,508MW. On the topic of concessions renewal, discussions are going on between the French State and the European Commission on the resolution of two formal notices dated of 22 October 2015 and 7 March 2019.

There is the risk that the EDF group may not obtain the renewal of each of its concessions in its favour or may obtain the renewal under less favourable economic conditions. In addition, the compensation that should be paid by the State, in particular, in the event of early termination of the operation of a concession, may not fully compensate the loss of revenue borne by the Group. Future regulations could also change in a way that is detrimental to the Group. These factors could have an adverse impact on its activities and financial position.

Depending on the conditions in each country, and mainly in Italy, these concessions may not be continued or may not be renewed in its favour, with changes to the

financial terms and conditions of the concession specifications, which would have an adverse impact on the Group's activities and financial position.

b) Control actions

EDF operates as a responsible concession holder through dialogue and joint construction with all its stakeholders and support for local economic development in the regions.

Close collaboration with the economic, political and associative players in the geographic areas concerned and close dialogue with the people living near the structures are part of the day-to-day consultation process (this is planned for 2022 for the construction of a fish passage structure at the Malausse dam, the Poutès worksite and the renaturation of the Rhine).

In France, anchoring the economy in the regions means maximising local economic benefits by making almost two-thirds of technical purchases (equipment, works, studies, etc.) in the hydraulic regions to support the local industrial fabric (referencing in the supplier panels of more than 1,800 local companies in the specific hydraulic trades).

1C: Changes in the legislative and regulatory framework for electricity distribution concessions

Summary: Enedis conducts its distribution activities under public service concessions and does not own most of the assets it operates. Changes in the legislative framework and in concession specifications could have an impact on the Group's results.

Criticality: ●● Intermediate

a) Context

In France, the law stipulates that Enedis and the Local Distribution Companies (LDC) have, in their respective service areas (as well as EDF for areas not interconnected to the continental metropolitan network), exclusive rights to ensure the public service of public electricity distribution. Similarly, EDF and the LDCs carry out a supply mission in their service areas at regulated tariffs, also under the exclusive rights granted to them by law.

Insofar as the AODE (authority responsible for organising public distribution) competence is entrusted by law to local authorities (municipalities or EPCs, which are inter-municipality cooperation establishments) and that these AODEs are, except for source stations, the owners of the assets constituting the public electricity distribution network, the law requires Enedis to enter into concession contracts with them for a period generally ranging from 25 to 30 years.

Consequently, Enedis carries out its public service missions (maintenance, renewal and development of the network, metering, connections, etc.) both under the law (the French Energy Code designates the operators in charge of the public service of electricity distribution and specifies the missions entrusted to them) and under these concession contracts. Moreover, the purpose of such contracts is, yet again in application of the law, to provide access to the regulated sales tariffs; they are therefore trilateral (they bind the AODEs, the distribution network operators and the regulated tariff supplier).

b) Main risks

Due to the exclusive rights granted to them, Enedis and EDF, when renewing a concession contract, cannot be pitted against other players. The current process of renewing concession contracts with all of the AODEs is based on a new contract template drawn up in December 2017 by the FNCCR (the French national federation of licensing authorities), France Urbaine, Enedis and EDF. Even though two decisions of the French Conseil d'État (council of state) in July and September 2020 confirmed the compatibility of the exclusive rights granted to Enedis and EDF with, on the one hand, European Union law and, on the other hand, the constitutional principle of the free administration of local authorities, the Group cannot, however, exclude the possibility of these provisions being amended by legislation or following an unfavourable court decision. Furthermore, the Group may not obtain the renewal of these contracts under the same financial terms and conditions.

c) Control actions

- Vigilance in the monitoring of texts, whether they are European or national and whether or not they are sector-specific;
- Careful monitoring of any dispute that might call into question the public electricity distribution model (questioning the exclusivity of the rights of the Distribution Network Managers and tariff equalisation).

1D: Ethics or Compliance Violations

Summary: Risks of prohibited and unethical practices in the conduct of business by employees or third parties could put the EDF group at risk of non-compliance with regulations, or even violations of human rights or fundamental freedoms.

Criticality: ● Moderate

a) Main risks

The international nature of the Group's activities and the strengthening of regulatory frameworks that punish unethical business practices, in particular, are likely to expose the Group, its employees or third parties acting on behalf of the Group to breaches of its ethical commitments or non-compliance that could damage its reputation or lead to civil or criminal sanctions or impact the Group's financial performance.

b) Control actions

Thirteen programmes have been set up to prevent risks relating to ethical breaches or non-compliance. These programmes cover the following topics:

- preventing the risk of corruption and influence peddling;
- preventing conflicts of interest;
- fight against fraud;
- compliance with international sanctions programmes;

- prevention of harassment and discrimination;
- prevention of market abuse;
- prevention of the risk of money laundering and financing of terrorism;
- compliance with the European EMIR regulation (European Market Infrastructure Regulation to regulate financial markets);
- compliance with the REMIT (Regulation on Wholesale Energy Market Integrity and Transparency) regulation;
- preventing breaches of competition law;
- personal data protection;
- export control (dual-use goods);
- the duty of vigilance (covering environmental, human rights, and health and safety issues).

These programmes are detailed in section 3.3.2 "Ethics, compliance and human rights".

1E: Litigation risk

Summary: Proceedings or litigation could have a significant financial or reputational impact on the Group.

Criticality: ● Moderate

a) Main risks

In the ordinary course of its business, the EDF group is involved in **litigation, the development or outcome of which could have a material adverse effect on its results or financial position.**

In particular, the EDF group is subject in France to proceedings initiated by its competitors or by administrative authorities owing to its position in certain markets. Claims made against EDF could be considerable and could lead to the payment of compensation or a fine, or even lead to orders being issued that could have an impact on some of EDF's activities. For example, in proceedings before the competition authorities in France or the European Commission, the amount of fines may be as high as 10% of the consolidated revenues of the company concerned (or of the group to which it belongs, as the case may be). The EDF group may also be involved in litigation relating to commercial or fiscal disputes with significant stakes, the outcome of which is inherently unpredictable.

b) Control actions

The EDF group considers that overall, in all the countries in which it operates, it complies with all the specific regulations in force, and mainly those relating to the conditions under which it carries out its nuclear activities, but it cannot anticipate in this respect what the supervisory and administrative or judicial authorities, which are consulted, may decide. These risks are monitored with particular vigilance and give rise to the implementation of prevention policies (contractual policies, compliance policies, etc.). A procedure is in place to provide information to the Group's Legal Department on actual or potential material litigation or other disputes and investigations.

The main proceedings in which the EDF group is involved are described in notes 17.3, 5 and 1.4.1 of the appendix to the consolidated financial statements and in section 7.1.5 "Litigation".

1F: Insufficient compensation for missions of general interest

Summary: EDF is responsible for certain public service missions, the costs of which are covered by compensation mechanisms that may be incomplete or may be called into question.

Criticality: ● Moderate

a) Context

In France, public service missions are assigned to EDF under French law (in particular Articles L. 121-1 *et seq.* of the French Energy Code), which also provides for compensation mechanisms in favour of EDF in respect of the discharge of such missions. The estimated amount of public service energy costs to be offset in France in 2022 for EDF amounts to €7,620 million (decision of the French Energy Regulation Commission of 15 July 2021 on the assessment of public service energy costs for 2022, as amended by the deliberation of 7 October 2021) (it must be noted that the repayment schedule came to an end and that the historical CSPE

receivable was thus entirely reimbursed). The amounts of public service charges are set out in the Finance Act No. 2021-1900 of 30 December 2021 for 2022.

b) Main risks

- The development of renewable energies connected directly to the distribution network may, in certain regions, saturate the reception capacities of the source substations and networks. New investments may be required for network managers in these regions, with the risk that the costs associated therewith may not be taken into account.

- More broadly, the texts provide for EDF to be fully compensated for the public service charges it bears. However, it cannot be completely ruled out that the terms of said compensation may be called into question and that said compensation may not include any new public service obligation allocated to EDF (for example, at the end of the negotiations on the new public service contract).

The occurrence of any of these events may have an adverse impact on EDF's activities, results and financial position. Such situations could also call into question the Group's ability to meet its CSR goals, mainly those aiming at helping fragile populations (see section 3.3.4 "Energy poverty and social innovation").

2.2.2 Financial and market risks

The EDF group, through its varied activities, is exposed to numerous financial and market risks. This section describes these various risks by addressing interest rate risk, financial market risk, energy market risk, foreign exchange risk, counterparty

c) Control actions

EDF maintains a close dialogue with the French State authorities on the issue of financing public energy service obligations in order to implement and secure the compensation mechanism, particularly with respect to working capital requirements, so as to secure payment by the French State at the end of the year and avoid year-on-year arbitrations by the French State.

risk and liquidity risk. All of these risks could affect the Group's ability to finance its investments. Financial and market risks are also discussed in the activity report (see section 5.1.6) and the appendices to the consolidated financial statements.

2A: Energy market risk

Summary: In order to sell its output, the Group is exposed, directly or indirectly, to the prices of the European wholesale energy markets and capacity markets, the levels of which impact its financial position.

In particular, the very high volatility of the energy markets, which are positioned at a very high level at the beginning of 2022, the drop in the Group's French nuclear production, the optionality of the ARENH system and the possible increases in the ceiling (see risk 1A) by the State, as well as the Ukrainian conflict, give rise to considerable uncertainty about the Group's net exposure and represent a major risk for the Group.

Criticality: ●●● Strong

a) Context : In conducting its production and marketing activities, the Group does business in energy markets, primarily in Europe. As such, the Group is exposed to changes in wholesale market prices: electricity – energy prices and prices of capacity guarantees for the countries concerned – gas, coal, petroleum products, CO₂ emission quotas (see section 5.1.2 "Economic environment" for information on recent changes in these prices). A connection exists between these markets: a fall in the prices of gas, coal, petroleum products or CO₂ leads to a fall in electricity prices.

Various factors influence these price levels: commodity prices on world markets, the balance between supply and demand, and also pricing and tax policies or subsidies allocated to certain means of production. As a result, these markets can experience significant and unpredictable price increases and decreases, as well as liquidity crises. For example, the Ukrainian conflict poses significant risks to the liquidity of energy markets.

b) Main risks

This exposure may impact the Group's turnover and all of its financial indicators. In particular, persistently low electricity prices may affect the profitability of the Group's generating units and, more broadly, the value of its assets, as well as the conditions for their maintenance, their life expectancy and any renewal projects.

In France, the degree of exposure to market prices for electricity depends on the level of sales under the ARENH system currently applicable until the end of 2025, which in turn depends on the level of market prices and potential regulatory changes. The risks associated with possible changes to the ARENH system are described in risk 1A "Changes in public policies and in the regulatory framework in France and Europe".

The general framework of the Arenh system, due to its free optional nature, gives suppliers opportunities to arbitrate between the Arenh price and market prices, to EDF's prejudice, and exposes EDF to major uncertainties that negatively impact the efficiency of its energy market risk management: the positive impact of increases in wholesale electricity market prices is limited when their total level (energy + capacity) is above the ARENH price.

In addition, the French government announced on 13 January 2022 that EDF should sell an additional 20TWh of ARENH to its competitors over the period from 1 April to 31 December 2022 at a price of €46.2/MWh. This decision, exposes EDF

to a loss risk between the buy-back price of these volumes as defined by regulation and €46.2/MWh.

Finally, given the production difficulties of the French nuclear fleet following the discovery of stress corrosion phenomena (see risk 5A), EDF will be structurally a minimum buyer in 2022 in a context of low market liquidity and strong upward price pressure.

Thus, the very high prices and highly volatile markets, combined with a significant drop in nuclear production for 2022 and 2023 (see risk 5A below – "Non-compliance with operating and/or activity continuation targets of nuclear plants (France and United Kingdom)") and the government decisions described above concerning the ARENH mechanism represent a major risk in terms of financial impact for the Group. Finally, the Group is exposed to a risk of non-compliance with the EU Regulation on the transparency and integrity of the wholesale energy markets (EU Regulation No. 1227/2011, see section 3.3.2.2.4 "Integrity and transparency of the wholesale energy market (REMIT Regulation)").

c) Control actions

The Group manages its exposure to energy markets through a specific energy market risk policy, which is essentially aimed at gradually reducing uncertainties regarding the level of its financial results in the coming years (see section 5.1.6.2 "Management and control of energy market risks" for more detailed information on the associated principles and organisations). This policy serves to mitigate the impact of price changes but cannot negate it: the Group remains subject to the structural trends of upward or downward movements in these markets (see note 18.6 "Market and counterparty risk management" of the appendix to the consolidated financial statements for the year ended 31 December 2021).

In addition, the hedging of the price risk inherently leads to a higher exposure to volume risk: the risk of having to buy back hedges at a higher price than when they were taken out, in case of lower availability of assets/higher customer sales than expected at the time of setting up these hedges. This risk is even greater given that the delivery prices are high in relation to the prices of the hedges put in place.

In addition, a Group REMIT Directive defines the expectations for ensuring that Group entities comply with the European regulation No. 1227/2011 on the transparency and integrity of wholesale energy markets.

2B: Financial markets risk

Summary: As a result of its activities, the EDF group is exposed to risks related to the financial markets, in particular an equity risk.

Criticality: ●● Intermediate

Main risks

The Group is exposed to equity risk on securities held primarily as dedicated assets constituted to cover the cost of long-term commitments in relation with the nuclear business, in connection with outsourced pension funds, and, to a lesser extent, in connection with its cash assets and investments held directly by the Group.

EDF is exposed to equity risks, interest rate risks and foreign exchange risks regarding its dedicated asset portfolio.

The market value of the listed equities in EDF's dedicated asset portfolio was €14,801 million at 31 December 2021. The volatility of the listed equities at the same date was 10.93% based on 52 weekly performances, compared to 26.6% at 31 December 2020. Applying this volatility to the value of listed equity assets at the same date, the Group estimates the annual volatility of the equities portion of dedicated assets at €1,618 million.

At 31 June 2021, the sensitivity of the listed bonds (€12,560 million) was 5.6, i.e. a uniform 100 base point rise in interest rates would result in a €697 million decline in market value. This sensitivity was 5.5 at 31 December 2020.

2C: Interest rate risk

Summary: The Group is exposed to risks related to changes in interest rates in the various countries in which it operates. These rates depend partly on the decisions of the central banks.

Criticality: ●● Intermediate

a) Risk of falling interest rates

Main risks

Lower interest rate fluctuations could affect the Group's economic indebtedness due to changes in the value of the Group's financial assets and liabilities, as well as its discounted liabilities. The discount rates for pension and other specific employee benefit commitments (see note 16 of the appendix to the consolidated financial statements for the year ended 31 December 2021) and the Group's long-term nuclear commitments (see note 15 of the appendix to the consolidated financial statements for the year ended 31 December 2021) are directly or indirectly linked to interest rates over different time horizons.

For the specific case of nuclear provisions in France, given the decline in rates over the past few years, the discount rate could also be reduced over the next few years. The extent of this decrease, if any, will depend on the future evolution of rates, mainly 20-year sovereign rates.

The Order of 1 July 2020 on securing the financing of nuclear expenses, which amends the initial Order of 21 March 2007, outlines new provisions concerning the regulatory ceiling on the discount rate. This is now expressed as a real value corresponding to the unrounded representative value of the expected long-term actual interest rate used for the calculation published by the European Insurance and Occupational Pensions Authority (EIOPA) of the ultimate forward rate (UFR) applicable on the relevant date, increased by 150 basis points. This ceiling is applicable as from the year 2024. Until 2024, the ceiling is equal to the weighted average of 2.3% and this new ceiling. The weighting assigned to the 2.3% amount is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023.

Furthermore, an increase in nuclear provisions due to a decrease in the discount rate may require allocations to the dedicated assets and may result in an adverse effect on the Group's results, cash flow generation and net debt.

As the case may be, this increase in provisions, including those covered by dedicated assets, does not mean however a mechanical impact on the amount to be allocated to dedicated assets as of the considered dates, as the former depends on:

- the return on dedicated assets and the resulting hedge rate;
- the period within which the allocation is made, as applicable rules provide for the option to set a maximum time period to proceed with the allocation, subject to approval by the Supervisory Authority.

In this respect, the decree of 1 July 2020 relating to securing the financing of nuclear expenses has modified the regulatory framework of the allocation obligation:

- elimination of the obligation, which previously existed under certain conditions, to allocate funds to dedicated assets when the coverage rate is greater than 100%;
- raising the threshold to 120% (from 110% previously), above which it is possible to withdraw funds from dedicated assets;
- increasing to five years (instead of three years previously) the maximum period for allocating funds to dedicated assets in the event of undercoverage, following authorisation by the administrative authority.

Given the changes in the regulatory framework, no additional allocation is expected in respect of 2021, as the rate of coverage of nuclear provisions by dedicated assets is greater than 100%.

Overall, a 0.5% decrease in interest rates would have the following impacts:

- (i) an impact on pre-tax income that could amount to approximately -€1,200 million for nuclear liabilities in France, as a result of the impact of this rate cut on the corresponding discount rate, all other things being equal;
- (ii) an impact on pre-tax income of approximately -€100 million for provisions for employee benefits in France, as a result of the impact of this rate cut on the corresponding discount rate.

In total, the sensitivity of pre-tax income therefore amounts to approximately -€1,300 million for a 0.5% fall in interest rates.

Moreover, an increase in inflation rate expectations, at a given interest rate, would result in a decrease in real interest rates which would have similar effects to a decrease in interest rates on the Group's discounted liabilities, given that the future expenses included in these liabilities are considered to be indexed to inflation rates.

b) Risk of higher interest rates

Main risks

Upward variations in interest rates could affect the Group's ability to obtain financing on optimal terms, or even its ability to refinance itself if the markets were very strained in view of the risk related to changes in flows linked to variable-rate financial assets and liabilities. Financial securities and derivatives held by the Group, as well as debts issued, may pay or receive coupons directly indexed to variable interest rates.



Thus, a 0.5% increase in interest rates would have an effect on the pre-tax income of approximately -€50 million, due to the increase in coupons linked to the debt issued by the Group, at variable or floating rates, offset by the increase in the Group's cash.

Also, these unfavourable impacts related to a rise in interest rates are in principle more than offset by the favourable impacts related to a rise in interest rates in connection with long-term commitments (see previous point).

2D: Access to liquidity risk

Summary: The Group must at all times have sufficient financial resources to finance its day-to-day business activities and the investments necessary for its expansion and the appropriations to the dedicated portfolio of assets covering long-term nuclear commitments, as well as to deal with any exceptional events that may arise. Any downgrading of EDF's⁽¹⁾ financial rating could increase the cost of refinancing existing loans and have a negative impact on the Group's ability to obtain financing. On 31 december 2021, the Group's net financial debt is EUR 42,988 million.

Criticality: ●● Intermediate

a) Main risks

The Group's ability to raise new debt, refinance its existing indebtedness or, more generally, raise funds in financial markets, and the conditions that can be negotiated to this effect depend on numerous factors including the rating of the Group's entities by rating agencies. The Group's debt is periodically rated by independent rating agencies. Any downgrading of EDF's financial rating could increase the cost of refinancing existing loans and have a negative impact on the Group's ability to obtain financing. To meet liquidity needs, the Group issues securities on the market. The Group thus carried out a corporate hybrid bond issue on 26 May 2021 in the amount of €1.25 billion. The Group also issued senior Green Bonds on 23 November 2021 in the amount of €1.75 billion, topped up on 6 December 2021 by €100 million. On 31 december 2021, the Group's net financial debt is EUR 42,988 million.

Nevertheless, the new ARENH volume allocations, the shutdown of nuclear power plants in France and the volatility of the electricity markets, in particular the liquidity calls of the trading activities, put the Group's rating under pressure. This more uncertain financial outlook could lead to a further downgrading of the short- and long-term ratings by the rating agencies and impact the ability to access liquidity and its cost. The risk was made real by the downgrading of the Group's financial ratings, adjusted following the measures announced on 13 January 2022 on changes to regulated electricity tariffs and on nuclear generation in 2022 (section 5.1.5.1.2 "Financial rating"). As a result, the criticality of the risk has been raised from "moderate" to "intermediate".

b) Control actions

The EDF group was able to meet its financing needs by conservative liquidity management and has obtained financing on satisfactory terms.

A range of specific levers are used to manage the Group's liquidity risk:

- the Group's cash pooling system, which centralises cash management for controlled subsidiaries. The subsidiaries' cash balances are made available to EDF in return for interest, so as to optimise the Group's cash management and provide subsidiaries with a system that guarantees them market-equivalent financial terms;
- centralisation of financing for controlled subsidiaries at the level of the Group's Cash Management Department. Changes in subsidiaries' working capital are financed by this Department in the form of stand-by credit lines provided for subsidiaries, which may also be granted revolving credit from the Group. EDF and the investment subsidiary EDF Investissements Groupe (EDF IG), set up in partnership with the bank Natixis Belgique Investissements, also provide medium and long-term financing for EDF group operations outside France, arranged by EDF SA and EDF IG on a totally independent basis: each company sets its own terms, which are the same as the subsidiary would have in an arm's-length market transaction;
- active management and diversification of financing sources used by the Group: the Group has access to short-term resources on various markets through programmes for French commercial paper (*billets de trésorerie*) and US commercial paper. For EDF, the respective ceilings for these programmes are €6 billion for the NeuCP programme and \$10 billion for its US commercial paper;
- the repurchase of bond debt securities with bank counterparties for cash.

2E: Counterparty risk

Summary: Like all economic operators, the Group is exposed to possible default by certain counterparties (partners, subcontractors, service providers, suppliers or customers).

Criticality: ●● Intermediate

a) Main risks

A default by these counterparties may impact the Group financially (loss of receivables, additional costs, in particular if EDF is required to find satisfactory alternatives or take over the relevant activities or pay contractual penalties).

The Covid crisis may lead to a risk of some of the Group's counterparties defaulting. The Group remains vigilant, particularly with regard to industrial counterparties that could be weakened by this downturn in the economic situation. To date, there has not been any discernible material impact on the Group's commercial counterparties.

The energy crisis generated by the Ukrainian conflict has made the counterpart failure rise. In this context, the criticality of the risk has evolved from moderate to intermediate.

b) Control actions

For certain activities, the risk may be hedged by the use of margin calls.

Furthermore, the Group has a counterparty risk management policy which applies to EDF and all operationally controlled subsidiaries. This policy sets out the governance associated with monitoring this type of risk, and the organisation of counterparty risk management and monitoring. The policy also involves quarterly consolidation of the Group's exposures.

At 30 September 2021, 89% of the Group's exposure concerned "investment grade" counterparties, mainly as a result of the predominance of exposures generated by the cash and asset management activity, as most short-term investments concern low-risk assets.

(1) At the date of the Universal Registration Document, EDF's long-term rating is as follows: BBB with a negative outlook (S&P Global Ratings); Baa1 with a negative outlook (Moody's); BBB+ with a negative outlook (Fitch Ratings).

2F: Foreign exchange risk

Summary: Due to the diversity of its activities and geographical locations, the Group is exposed to the risks of exchange rate fluctuations, which may impact currency translation adjustments, balance sheet items and the Group's financial expenses, equity and financial position.

Criticality: ● Moderate

a) Main risks

Due to the diversity of its activities and geographical locations, the Group is exposed to the risks of exchange rate fluctuations, which may impact the translation differences affecting balance sheet items, Group financial expenses, equity, net income and the internal rate of return (IRR) of projects.

As the Group is involved in long-term contracts, an unfavourable currency fluctuation could have consequences on project profitability. In the absence of hedging, currency fluctuations between the euro and the currencies of the various international markets in which the Group operates can therefore significantly affect the Group's results and make it difficult to compare performance levels from year to year. If the euro appreciates (or depreciates) against another currency, the euro value of the assets, liabilities, income and expenses initially recognised in that other currency will decline (or increase). Moreover, insofar as the Group is likely to incur expenses in a currency other than that in which the corresponding sales are made, fluctuations in exchange rates could result in an increase in expenses, expressed as a percentage of turnover, which could affect the Group's profitability and income.

b) Control actions

To limit exposure to foreign exchange risk, the Group has introduced the following management principles:

- local currency financing: to the extent possible given the local financial markets' capacities, each entity finances its activities in its own functional currency. When financing is contracted in other currencies, derivatives may be used to limit the foreign exchange risk;
- matching of assets and liabilities: the net assets of subsidiaries located outside the Euro zone expose the Group to a foreign exchange risk. The foreign exchange risk on the consolidated balance sheet on foreign currency assets is managed by market hedging with debts issued or contracted in foreign currencies or by using derivative financial instruments. Hedging of net assets in foreign currencies complies with risk/return targets, and the hedging ratio varies depending on the currency. If no hedging instruments are available, or if hedging costs are prohibitive, the foreign exchange positions remain open and the risk on such positions is monitored by sensitivity calculations;
- hedging of operating cash flows in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are in the relevant local currencies, with the exception of flows related to fuel purchases which are primarily in US dollars, and certain flows related to purchases of equipment, which concern lower amounts. Under the principles laid down in the "Strategic financial management framework", EDF and the main subsidiaries concerned by foreign exchange risks (EDF Energy, EDF Trading, Edison, EDF Renewables) are required to hedge firm or highly probable commitments related to these future operating cash flows.



2.2.3 Group transformation and strategic risks

3A: Transformation capacity in the face of disruptions

Summary: The Group's development strategy, changes in the scope of activities, and synergies within the Group may not be implemented in accordance with the objectives defined by the Group.

Criticality: ●● Intermediate

a) Context

- Changes in the decarbonisation of the energy sector, emergence of new markets and new players, and changes in the business models of the stakeholders.
- Changes and volatility in energy and commodity prices.
- Changes in the international competitive context: depending on the competitive situation, the Group is faced with different contexts (more or less total opening up of markets, position in relation to competitors, regulation, etc.) and new customer expectations.
- Public policy developments and changes in the regulatory framework, in France and Europe.

In this context, competition is intensifying in all areas: energy generation (nuclear, renewable energies, etc.), supply, services, storage, international tenders.

b) Main risks

In the above context, the main risk is that the Group's strategy will not be successfully implemented. In particular:

- there is a risk that the transformations undertaken to cope with these changes will be insufficient, or that the Group's model will be called into question, with potential consequences in terms of:
 - market share losses, failure to meet decarbonisation targets, failure to gain expected market share or margin losses,
 - decline in upstream/downstream integration, which could lead to a reduced ability to cope with seasonal variations in activity, physical and market uncertainties, and lead to a loss of gross margin,
 - reduced cross-functional synergies deployed within the integrated Group, which could undermine the Group's ability to meet the diverse expectations of its customers and stakeholders, and reduce the efficiency and therefore the competitiveness of low-carbon industrial solutions,
 - decrease in the Group's ability to seize new opportunities (mobility, hydrogen, etc.) and losing the Group's leading position in the energy field;
- nuclear costs and changes in these costs (new nuclear projects, *Grand Carénage*, etc.) and the Group's ability to finance them could force the Group to reconsider the rate at which it deploys its strategy;
- even with a transformation that is well underway and adequate contractual arrangements, the Group cannot ensure that its various low-carbon solutions projects can be implemented according to the planned schedules and under satisfactory economic, financial, regulatory, partnership or legal conditions. It cannot ensure that they will meet the needs expressed by our customers and stakeholders over time with the profitability expected at the outset. All of this could have a negative impact on the Group's financial position, its commitment to the fight against climate change, and its reputation;

- there is a risk that staff will not be sufficiently mobilised individually and collectively due to a deteriorating social climate as a result of the changes associated with the adaptations or transformations underway, be they internal or external;
- there is a risk that all these impacts may be aggravated by the Covid health crisis (weakening of the economy, both externally and internally).

c) Control actions

The following actions are in line with the Group's *raison d'être* and its CSR commitments, responding to the needs of its customers and stakeholders:

- continued development and deployment of low-carbon solutions: supply and services, particularly for energy efficiency and decarbonisation of uses, low-carbon electricity generation, storage solutions, low-carbon hydrogen projects, flexibility solutions, with a view to sustainable development and proximity to customers and regions. This development concerns France, the "core" countries in Europe (United Kingdom, Italy, Belgium) and the other countries

where the Group is present, in accordance with the CAP 2030 strategy. This strategy combines the search for growth drivers with the promotion of existing assets. The strategy and drivers of the Group's transformation are described in section 1.3 "Group strategy and objectives";

- in particular, the Solar Plan, the Electric Storage Plan, the Electric Mobility Plan and the Excell plan are major levers for developing and expanding the range of low-carbon energy solutions offered by the Group in addition to the generation plants already widely available within the Group, particularly wind, solar, hydro and nuclear power (see section 1.4.1.1.1);
- implementation of development, adaptation and transformation programmes and performance plans. These programmes may be complemented by a strategic analysis of assets which may itself lead to a requirement for additional financial agility, giving rise to disposals or acquisitions (see section 1.2.3 "Significant events of the year");
- actions to mobilise work groups through transformation projects, including in particular the "work differently, manage differently" project within EDF.

3B: Adaptation to climate change: physical and transition risks

Summary: The Group is exposed to physical effects of climate change that could have consequences on its own industrial and tertiary facilities and more generally on the Group's financial position. The societal, technological and economic context may not be favourable to the Group's low-carbon solutions.

Criticality: ●● Intermediate

According to the breakdown proposed by the TCFD (Task Force on Climate-Related Financial Disclosures), with which EDF complies (see section 3.1.3.2.1 "The EDF group and the TCFD"), climate change risks are structured into two parts: risks of not adapting to the physical effects of climate change (so-called "physical risks"), and risks induced by the transition to a low-carbon economy (so-called "transition risks").

a) Main physical risks

The EDF group's facilities are closely tied to water, wind and solar resources. The overall reliability of the electricity system depends on the resilience of the generation facilities and network infrastructure to climate change, whether it be chronic effects or an increase in the frequency and intensity of extreme weather events.

Extreme risks can potentially affect the safety and security of facilities and network infrastructure or generation. Chronic risks can potentially have consequences on the generation and the environment as well as on network capacities. These consequences can also lead to risks related to water resources (resource conflicts).

Due to this climate sensitivity and taking into account the many uncertainties associated with the effects of climate change, despite the control actions undertaken, climate change could have an adverse impact on the Group's business continuity, operating performance, balance sheet and financial results.

b) Control actions for physical risks

- Periodic reviews are carried out on nuclear and hydraulic facilities, incorporating both feedback and climate change projections; this is a key cornerstone of the robustness of the facilities.
- As per the Group CSR policy, to address these risks, the operating entities regularly update their climate change adaptation plans, based whenever possible on IPCC scenarios, in order to review the measures taken and to be taken. To this end, a guide to implementing adaptation plans is available to the Group's entities. These adaptation plans are particularly strong for nuclear entities in France and the United Kingdom, and hydraulic and island entities.
- Since the 1990s, the EDF group has been building up specific R&D expertise on climate change issues and invested in collaborative academic research projects to support these actions.

- The Group carries out numerous monitoring and anticipation actions on extreme and chronic effects so as to update its adaptation plans as much as necessary, both for production facilities and infrastructures, as well as to anticipate the consequences on the supply-demand balance.
- The Group coordinates internally and with external stakeholders on water uses.
- In connection with climate change and its potential consequences in terms of external threats (temperature, flooding, storms, etc.), a programme called ADAPT has been set up in France for the Group's nuclear and thermal generation facilities in order to ensure the resilience of these industrial tools over time.
- The Group regularly renews or takes out specific insurance covers, even if this could prove increasingly difficult or expensive due to the impact, frequency and magnitude of natural disasters experienced in recent years.

c) Main transition risks

The Group's long-term strategic directions are in line with the transition to a low-carbon economy. The EDF group's *raison d'être*, adopted in May 2020, centres on the objective of "building a CO₂-neutral energy future". The majority of the Group's investments are directed towards this low-carbon climate strategy (see section 3.1.1.4 "Roadmap for increasing the Group's decarbonised production").

In this seemingly favourable and promising context, there are several significant transition risks.

- this opportunity could be stalled by the external, societal, competitive, social, economic or industrial context. In particular, nuclear energy may not be recognised at the societal level as a key factor in enabling the low-carbon transition. For example:
 - the standards or taxonomies currently being put in place to recognise decarbonised energies could include criteria that would adversely affect nuclear energy, which would constitute a very significant risk for EDF and more generally for the achievement of national and European emission reduction objectives. In this respect, there is still a risk that decarbonised nuclear electricity will not be sufficiently recognised due to its classification as a transitional energy by the European taxonomy, with potential consequences for access to financing for new projects. This topic of European taxonomy is developed in risk No. 1A above "Political and legal risks",

- In France, in connection with the preparation of the 2019-2028 Multi-Year Energy Programme, the French government asked for a review of several scenarios between 2030 and 2050 "ranging from a 100% renewable scenario to one in which nuclear power remains a sustainable source of electricity generation integrated into the mix for reasons of production management and competitiveness";
- achieving the objectives of reducing emissions and, more generally, ensuring the success of the Group's low-carbon strategy depend primarily on the successful shutdown or adaptation of fossil fuel power plants and the accelerated development of renewable generation resources to complement nuclear and hydroelectric generation;
- in addition, new low-carbon energy solutions may induce new societal questions (new intrusive technologies, land rights-of-way, new conflicts related to the use of water or scarce resources, etc.);
- the publication in May 2021 of the International Energy Agency's (IEA) Net Zero scenario sets 2040 as the new target for decarbonising the electricity sector by 100% (or even 2035 for developed countries). This target has been taken up by many players, including Eurelectric, investor coalitions (e.g. IIGCC) and SBTi in its new Net Zero standard published in October 2021, and has led EDF to reexamine its carbon trajectory and its 2020 commitments. This new situation carries risks for the Group: the risk of certain development projects being called into question, the risk of having to make commitments that are more difficult to keep, and the risk to the company's profitability (by giving up profitable activities);
- new legislative or regulatory changes brought about by climate change could also have a negative impact on EDF's business and lead to new legal or compliance risks;
- the Group may also have to deal with the emergence of new technologies or disruptive solutions that are part of the efforts to meet the transition objectives.

Such situations could make it more difficult to carry out these transformations and achieve the desired objectives. They could directly or indirectly affect the Group's business volumes, margins, asset value, financial position, reputation and/or prospects.

d) Control actions to address transition risks

- Carbon trajectory: In 2018, the Group made a commitment to significantly reduce its carbon dioxide emissions, with a target of 30 million tonnes in 2030 instead of 51 million tonnes in 2017 (40% reduction). The EDF group also confirmed this goal in 2020 by joining the "Business Ambition for 1.5 degrees" initiative. The EDF group has made new commitments to contribute to achieve carbon neutrality by 2050, both in direct and indirect emissions (scopes 1, 2 and 3), with milestones set for 2023 and 2030. The SBTi organisation certified this approach in 2020 as going beyond the 2°C set out in the Paris Agreement. Thus, for the first time, the EDF group has set reduction targets for its indirect emissions, covering in particular the emissions associated with the sale of gas to end customers (see section 3.1.1 "Group Carbon trajectory"). These control actions will be reexamined in 2022 in light of the increased requirements to accelerate decarbonisation in the electricity sector.

- Deployment of low-carbon solutions: The Group has been particularly active in the development of renewable energy in France, electric storage and low-carbon electric mobility, which will make it possible to develop and promote the Group's low-carbon energy solutions, particularly for the transport sector, which still emits a very high level of carbon dioxide in France and Europe.
- As a final step in the process of contributing to reach neutrality, the Group favours so-called "negative emission" projects to offset its residual emissions by 2050 (see section 3.1.1.6 "Use of negative emission solutions").
- Control actions for risk No. 1A concerning changes in public policies and the regulatory framework consist of: monitoring the political, legislative and regulatory context; analysis of the potential consequences of texts in preparation; dialogue with and lobbying of the public authorities.

e) Overall control actions - summaries and mapping of climate risks

- In 2019, a summary on climate change and its impacts on EDF, integrating the accumulation of all the knowledge acquired by the EDF group and its scientific partners, was presented to EDF's Scientific Council.
- Since the 1990s, the Group has had significant expertise in climate change, both in its R&D department and in its engineering centres, and this expertise has been maintained over time. The precise resources allocated to this expertise are specified in §3.1.2.4 "An internal climate department, unlike any other major electricity company".
- In 2019, a Group-wide climate risk mapping of all physical and transition risks was also established following the recommendations of the TCFD (Task Force on Climate-Related Financial Disclosures) and submitted to the Audit Committee. Climate risks are now identified, assessed and updated annually in accordance with the Group's general risk mapping methodology (summarised in this risk factor and further detailed in section 3.1.3.2.2 "Identifying climate change risks and opportunities").
- This mapping of climate risks, based in particular on the operational entities' adaptation plans and the report to the Scientific Council, has led since 2020 to a "climate" action plan, included in the Cap 2030 strategic programme, covering actions relating to emissions reduction and resilience. This action plan mobilises the Group both at the corporate level and at the entity level to guide and coordinate the various control actions.
- Numerous actions are carried out internally to raise awareness of climate issues among all employees and to mobilise them in concrete ways. By way of example (these examples are developed in §3.1.3.5.2 "innovation and collective intelligence focused on climate action"), the Group has been deploying the Climate Collage to all its teams since 2020, and aims to make this deployment widespread by 2022; the "Fighting CO₂" programme offers all employees in France the opportunity to become ambassadors for the energy transition by making a private commitment; and the Carbon Neutrality Passport enables employees to assess their carbon footprint and make a commitment to start taking action: obtaining this passport was one of the criteria of the profit-sharing agreement signed for 2020. Over 31,000 passports were obtained in 2021.



3C: Adaptation of employees' skills

Summary: Skill adaptation and development may be insufficient in view of the Group's transformation, business line requirements and changes in organisational and working methods.

Criticality: ●● Intermediate

a) Main risk

In an environment impacted by the energy and digital transitions, the scope of the Group's activities is changing. New business lines are developing and working methods are changing (empowerment, collective intelligence, operating on project platforms, increased teleworking, etc.).

In this context of change, the risk of a skills mismatch will persist for the years to come, both in terms of managing workforce trends and adapting skills. Failure to control this risk could have an impact on the Group's business, financial position and reputation as an employer.

b) Control actions

Risk management is based on matching skills to short-, medium- and long-term needs, on supporting the employability of employees and on managing internal mobility more fluidly. In this respect, the main control actions concern:

- anticipating the future, by analysing projected needs in terms of resources and skills in the short/medium term (GPEC ⁽¹⁾) and the longer term (Prospective);
- pursuing an ambitious approach to skills development through training and the development of professional skills initiatives;

- developing the employability of employees in order to facilitate their career development and changes of profession;
- creating the conditions for internal mobility within the Group;
- implementing an external recruitment policy, targeting the skills of tomorrow that are not available on the internal job market, and developing an inclusive employer approach favouring sourcing *via* work-study and end-of-study internships, with a specific focus in France on candidates from *zones de revitalisation rurale* (ZRR – rural revitalisation zones) and *quartiers politiques de la ville* (QPV – urban political districts);
- enhancing external career paths as a lever for acquiring new skills (EDF: PAME ⁽²⁾, CCE ⁽³⁾) and "win-win-win" career ends (employee, company, territory) through skill mentorship by seniors;
- nurturing a sustained social dialogue in order to ensure that the trade union organisations have a good understanding of the employment and skills orientations.

Obtaining experience may require several years and sufficient coverage is required to ensure the transfer and acquisition of knowledge. In 2020, in the framework of the Excell plan in particular, the Group launched a knowledge management system to facilitate and accelerate the development of skills in the nuclear field as well as in all business lines.

3D: Ability to fulfil long-term social commitments

Summary: The Group may be required to meet significant commitments related to pensions and other employee benefits.

Criticality: ●● Intermediate

a) Main risks

The pension plans applicable in the various countries in which the Group operates involve long-term commitments to pay benefits to the Group's employees (see note 16 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021). In France, in addition to these pension commitments, the Group also owes obligations for post-employment benefits and long-term benefits for employees currently in service. A pension reform in France may have an impact on the Group's commitments.

The amounts of these commitments, the provisions booked, the outsourced funds or pension funds set up and the additional contributions required to make up insufficient funding are calculated based on certain actuarial assumptions, including a discount rate subject to adjustment depending on market conditions and, with regard to employee-related commitments in France, on the rules governing retirement benefits paid out by the general retirement scheme, and amounts owed by the Group. These assumptions and rules may be adjusted in the future, which could increase the Group's current commitments for pensions and

other employee benefits and, therefore, require a corresponding increase in provisions.

Furthermore, if the value of pension funds in the UK proves insufficient to meet the corresponding commitments, primarily due to calculation assumptions or developments in the financial markets, the Group may be obliged to make additional contributions to the relevant funds, which may have an adverse impact on its financial position.

b) Control actions

In order to cover these commitments, the Group has set up pension funds in the United Kingdom, where coverage of commitments is a regulatory obligation, and outsourced funds in France, which provide partial coverage of the commitments. In the United Kingdom, the pension reform in 2021 (from defined benefit to defined contribution) and the merger of the three existing funds (BEGG, EEGS and EEPS) into one fund (EDFG) from 31 December 2021 will limit future risks.

(1) Gestion prévisionnelle des emplois et carrières (job and skill planning).

(2) PAME: Parcours accompagné de mobilité externe (external mobility guidance).

(3) CCE: Congé création d'entreprise (company creation leave).

2.2.4 Operational performance related risks

4A: Management of large and complex industrial projects (including EPR projects: HPC, FLA3, Taishan, etc.)

Summary: The Group carries out very large-scale projects. These projects represent a major risk for the Group in terms of the potential financial impact on its shareholders' equity and implications for its development strategy. In particular, the success of EPR projects depends on specific industrial, regulatory and financial factors.

Criticality: ●●● Strong

a) Context

As part of its activity and in its capacity as project owner or prime contractor, the Group is called upon to carry out projects, such as the EPR Project in Flamanville 3 and Hinkley Point C (HPC) in the United Kingdom, that are very complex, and require significant investments and lengthy procedures for construction and regulatory approvals.

The success of these projects will determine the future of the nuclear industry sector. These projects represent a major risk for the Group.

The Group's other major projects underway are:

- major projects related to the existing nuclear fleet (*Grand Carénage*, see risk 5A below, and decommissioning projects);
- offshore renewable energy projects (off-shore wind power);
- international hydropower projects.

b) Main risks

These projects are exposed to numerous technical and operational risks relating to their industrial implementation, which could result in start-up delays and an increase in associated costs or a possible reconsideration of certain technical choices. This could ultimately lead to a drop in expected profitability or even to asset write-downs. For example, EDF Energy's goodwill in EDF's financial statements is based mainly on the HPC project.

Given their scale, these projects could have a massive impact on the Group's results and balance sheet, mainly on its equity and its financing capacity.

Other economic, regulatory, political, environmental and acceptability risks that could jeopardise project schedules, associated costs and/or profitability, exist.

Risks of technical or operational non-performance,

The technical and operational risks associated with large and complex industrial projects expose the Group to major uncertainties in the implementation and operation of these projects. These risks may have a major impact on the Group's business, results, asset value, financial position, reputation, organisation and outlook.

By way of illustration:

- delays in construction or difficulties in the commercial commissioning of the HPC EPR units beyond 31 October 2033 could result in the loss of the revenue protection afforded to these works *via* the CfD (see section "1.4.5.1.2.5");
- the conclusions of the ongoing investigation into the June 2021 finding of fuel leakage in a reactor at the Taishan plant could impact other EPR projects (see section 1.4.5.3.6.1 "Activities in China", and see below, "Operational control of EPR projects").

In addition to or as a result of these uncertainties, the Group may be in breach of its contractual obligations.

Strategic risks

The Group's strategic goal is to become involved in the construction of new nuclear facilities in France and abroad. The risk with regard to these projects would be that investment decisions might not be made or might be made under poor technical, regulatory or financial conditions.

Risks related to financing and the regulatory framework

New reactor construction projects, particularly in France and the United Kingdom, require considerable investment, a regulatory framework, and adequate and stable financing and pricing conditions. Given the economic or institutional climate or depending on the appropriate progress of the pending projects, obtaining such funding may be delayed or compromised.

In France, the absence of an appropriate regulatory and financing framework, and/or the failure to obtain or delays in obtaining the authorisations required to continue the development of the EPR2 reactor, could have an impact on the Group's financial position, particularly because of the development costs upstream of the decision which might ultimately be borne by EDF. Any event that may delay the launch of the project could lead to disruptions to engineering activities, difficulties in maintaining skills and in mobilising the supply chain, which would be detrimental to the industrial control and performance of the programme.

In the United Kingdom, the new context created by the implementation of Brexit (see section 1.4.5.1.2.4 "Customer business") may lead to changes in the conditions for the implementation and profitability of projects and may not allow sufficient conditions to be met so as to involve investors in the Group's future projects in the United Kingdom. For example:

- as the financing needs of the project exceed the contractual commitment of the shareholders (committed equity), the shareholders will be asked to allocate additional equity (voluntary equity). This could lead the Group to increase its contribution to the financing of the project and to increase its shareholding (currently 66.5%) if its partner decides not to contribute to these additional equity commitments;
- for the Sizewell C project, failure to obtain the right financing framework and appropriate regulation could significantly affect the project and lead the Group to not make the decision to invest.

In addition, the classification as transitional energy under the Taxonomy Regulation (see risk 1A) could insufficiently recognise decarbonised nuclear electricity, with potential consequences for access to financing for new projects. The text does not include the fuel cycle or waste management. Finally, the conditions set out in the Delegated Act for the classification of nuclear energy as an aligned activity may not be fully met. These elements could influence the Group's ability to finance future major nuclear projects (see risk 1A "Changes in public policies and in the regulatory framework in France and Europe").

External risks – political and geopolitical, administrative procedures

All these projects are large-scale and long-duration projects. They involve numerous industrial partners. There may also be difficulties in terms of relationships with the partners involved with EDF in these projects.

For example, trade tensions between the United States and China could have an impact on the conduct of some of these projects given the technologies and partnerships implemented (see risk 4B). In the United Kingdom, as EDF and CGN are partners in the HPC, Sizewell C and Bradwell projects, these projects could be impacted by worsening diplomatic relations between the United Kingdom, France, the United States and China.

These projects require, among other things, administrative authorisations, licences or permits which may be subject to disputes, withdrawals or delays in obtaining them.



Risks related to CSR issues

A very large number of stakeholders are involved in these projects, which may, for example, need to be associated with territorial development projects or suffer from difficulties related to local acceptance.

Cyclical risks

Inflationary pressures could also lead to higher project costs (see in particular risk 4B "Operational continuity of supply chains and contractual relationships").

The health crisis has affected the deployment of these major projects and could, if it were to worsen, lead to further delays or additional costs.

In addition, the health crisis may have weakened the financial strength of some partners.

Other issues and risks specific to nuclear activities, whether in terms of nuclear safety, control of operations and maintenance activities, long-term commitments or the fuel cycle, are specified in section 2.2.5 "Specific risks related to nuclear activities".

c) Control actions

c1) Cross-cutting control actions

- As part of a continuous improvement approach to project management, the Group has a project management policy and a Commitments policy which require an analysis of risks and associated security measures. Regular project reviews are carried out and the Group set up a Major Project Control unit at the end of 2020. The Group has been implementing the Excell plan since December 2019, which will enable the French nuclear industry to return to a high level of rigour and quality in order to succeed in the major projects underway and to be carried out in France, the United Kingdom and elsewhere in the world (see section 1.4.1.1.1 "The Excell plan").
- This project management takes into account, in accordance with EDF's vigilance plan, the potential impacts of projects on human rights, the environment, health and safety, as well as the CSR issues of dialogue and consultation with stakeholders, territorial development, development of industrial sectors, ethics, and responsible land management (see sections 3.2, 3.3, 3.4 and 3.9).

c2) Control of committed EPR projects

1. EPR Flamanville 3 (France)

In particular, meeting the timetable and cost objectives as announced ⁽¹⁾, is still dependent on (see section 1.4.1.1.3.1 "Flamanville 3 EPR project"):

- actions relating to the implementation of the rupture exclusion principle (main secondary circuit -MSC- and main primary circuit -MPC-). The most complex welding operations on the reactor building penetrations were carried out. The upgrading of all the MSC welds and the implementation of the solution accepted by the French Nuclear Safety Authority (ASN) for the treatment of the significant event relating to the three MPC connections have yet to be completed;
- the successful completion of a new facility qualification test campaign prior to the loading of fuel into the reactor;
- the integration of feedback from the technical hazard encountered on the Taishan 1 reactor, to be discussed with the French Nuclear Safety Authority;
- the remainder of the examination of the last technical issues in conjunction with the French Nuclear Safety Authority (ASN) with a view to obtaining the administrative authorisations;
- the completion of the facility's finishings and the provision of all the necessary documentation for operation;
- control of the consequences of ageing of equipment and materials due to the duration of the project work;
- the possible emergence of new technical issues, particularly in the context of further work. For example, a problem with the filtration of the reactor building sumps, which are used during recirculation operation of the safety injection and enclosure spray, was identified in the summer of 2021. A solution is currently being examined by the French Nuclear Safety Authority (ASN) and the French Institute for Radiological Protection and Nuclear Safety (IRSN).

A decree of 25 March 2020 extended the maximum time limit for commissioning the reactor to April 2024.

In addition to the activities still to be carried out before the fuel is loaded into the reactor vessel and the overall start-up tests are carried out, the project could also face other potentially significant additional costs and delays in the event of a new hazard. Schedule and cost to completion risks remain high; the project has no margins on either schedule or cost to completion.

2. EPR Taishan (China)

In China, the Group has a 30% stake in TNPJVC (Taishan Nuclear Power Joint Venture Company Limited) alongside its Chinese partner CGN and Guangdong Energy Group (19%). Taishan 1 was the first EPR reactor to be coupled to the grid on 29 June 2018. It was commercially operational on 13 December 2018. The Taishan 2 reactor became commercially operational on 7 September 2019 (see section 1.4.1.1.3.2 "Other New Nuclear projects").

The EPR No. 1 reactor at the Taishan power plant started its second cycle after partial refuelling at the end of September 2020. The monitoring of the reactor gradually revealed an atypical evolution of the radiochemical parameters leading to the suspicion that the fuel rods constituting the fuel assemblies had started to leak.

According to the results of the inspection of the fuel assemblies and the reactor vessel, the loss of sealing of the assembly rods would be due to a deterioration of the rod cladding owing to a mechanical wear phenomenon, located in the lower part of the rod. This mechanical wear would be the result of the rupture of small rod hold-down systems in the assemblies ⁽²⁾. In addition, a phenomenon occurring between the assemblies and a component enclosing the core has been identified, which would be linked to hydraulic stresses. Studies are underway on these phenomena and their potential impacts.

The file for the restart of the Taishan No. 1 reactor is currently being examined. In this context, there is a risk that the restart of the reactor may be delayed. Unit 2 underwent a scheduled visit, including refuelling, which was completed in June 2021.

Furthermore, the profitability of the asset is linked to the feed-in tariff for electricity produced by Taishan and could be affected if tariff decisions are not favourable. A temporary tariff was set at RMB 435/MWh until the end of 2021, for a guaranteed annual volume of generation offtake equivalent to 7,500 hours of full power operation. Any surplus above this volume is sold at the market price. As with any scalable generation facility, the actual call-up of the Taishan plant is decided by the Guangdong provincial power grid operator. The Chinese authorities have initiated consultations with the parties concerned to define the tariff conditions applicable from 2022 onwards to China's third generation nuclear power plants, in particular the Taishan plant. A decision had not yet been taken by the authorities at the beginning of 2022. The profitability of the asset is also subject to the risk of changes in the volume of sales at this tariff, against a background of development in the electricity market.

The financing arrangements put in place by TNPJVC include provisions to secure the repayment of the joint venture's financial liabilities. In certain situations, these provisions may temporarily limit the payment of dividends. If the company were to fail to generate a positive cumulative net result or a sufficient level of cash flow, the amount of dividends expected by EDF would be revised downwards which could result in the need for an impairment of the asset. ⁽³⁾

3. Hinkley Point C - EPR (United Kingdom)

Control of the design and bringing the manufacturing and the major milestones of the Hinkley Point C (HPC) construction site under control will determine the profitability of the project and the financing of any future projects in the United Kingdom.

Construction passed a number of milestones in 2021 (see section 1.4.5.1.2.5 "United Kingdom – New Nuclear Division"), however the project was marked by:

- lower than expected civil engineering performance;
- delays related to the continuing impacts of the health crisis;
- tensions in the global building materials market;
- and the impact of Brexit.

(1) Press release of 11 January 2022.

(2) See the EDF press release dated 12 January 2022: "Update on the Flamanville EPR".

(3) The value of the share of TNPJVC's equity at the end of 2020 in EDF's accounts is €1,123 million – see note 12 of the appendix to the consolidated financial statements at 31 December 2021.

There is a risk that these factors will continue to impact construction progress and the supply chain. Action plans are underway to address delays and improve the performance of civil engineering and electromechanical assembly. Compliance with the schedule and cost to completion (see section 1.4.5.1.2.5 "United Kingdom – New Nuclear Division") requires that these actions produce the expected results. However, in this context, risks to the schedule and costs to completion increased in 2021. They are now very high.

The IRR of the HPC project is sensitive to:

- inflation and changes in electricity market prices beyond the term of the CFD. 0.1% inflation has a 0.1% impact on HPC's IRR. A change in the electricity price of £₂₀₁₅10/MWh following the CFD has an impact of 0.1% on HPC's IRR;
- impacts of the agreements between EDF and CGN, which include a mechanism for compensation between the two shareholders in case of a deviation from the initial cost budget or delays. Given the current schedule and the forecasted cost to completion, this mechanism is applicable and will be triggered at the appropriate time;
- the risk of CGN not contributing Voluntary Equity;
- the exchange rate between the British Pound and the Euro. A hedging strategy for this risk is in place at the HPC project and Group levels.

Due to the difficulties encountered by the project, notably on civil performance and marine works, and the increase in risks such as the Ukrainian conflict, Brexit, COVID, supply chain disruption and inflation, a new comprehensive review to update the costs and schedule estimates announced in January 2021⁽¹⁾ is underway and is expected to be finalised by summer 2022.

c3) Control of future projects

1. Renewal of the nuclear fleet in France - EPR2 (see section 1.4.1.1.3.2 "Other projects - New Nuclear")

On 25 January 2019, the French government published the main guidelines of the Multi-year Energy Programme adopted by a decree of 21 April 2020. The sector contract signed on 28 January 2019 by the French government and the French Nuclear Sector Strategic Committee (CSFN) includes a section on the preparation of the industrial capacity necessary for the execution of a construction programme for new reactors in France.

In accordance with these orientations, the government has asked EDF to prepare a comprehensive file with the nuclear industry by mid-2021 relating to a programme for the renewal of nuclear facilities in France. EDF, along with the nuclear industry, submitted to the French State, in May 2021, a dossier of economic and industrial proposals for the launch of a new reactor programme in France. This dossier, based on EPR2 technology, details what the regulatory and financing framework for such a programme could be. It is based on the implementation of a programme of three pairs of EPR 2 successively at Penly, Gravelines and a third riverside site in the Auvergne Rhône Alpes region (Bugey or Tricastin), while continuing the feasibility analysis on other nuclear sites.

This offer was subject to an audit in the summer of 2021 commissioned by the French General Directorate for Energy and Climate (DGEC), which validated the methodology used to estimate the schedule and costs.

In addition, on 25 October 2021, RTE made public its study "Futurs énergétiques 2050" (Energy Future 2050), which analyses possible changes in electricity consumption in France and lays out six electricity mix scenarios to achieve carbon neutrality by 2050. The study clearly indicates that an electricity mix with a significant nuclear base is preferable to other scenarios.

The main challenge now is therefore to ensure that the conditions for a decision to launch the programme and its transposition into the legal and financial framework necessary for its implementation are brought about as soon as possible.

This requires three main prior actions:

- structuring of the programme, in particular the financing, regulation and governance scheme to which the State and EDF would commit;
- notification of the programme's structuring arrangements to the European Commission with regard to state aid regulations;

- public consultation on the programme and on the site for the first buildings. The conclusions of this consultation must be taken into account as part of the application for "authorisation to create" (DAC) that the nuclear operator must submit to the administrative authorities in order to launch the construction of a new nuclear facility.

In order to bring about the conditions for a commitment decision, EDF is now working with the public authorities on several points, in particular:

- preparation of future public consultations, in particular the consultation to be held on the site where the first buildings will be constructed. Taking into account the conclusions of this consultation is an important element of the dossier for the application for authorisation to create (DAC), which must be submitted to the administrative authorities in the government before the construction of a new nuclear facility is launched;
- the structuring required to implement such a programme is essential for EDF. Several organisational, regulatory and financial schemes are currently being discussed with the French State; the State's involvement in financing the programme must also be approved by the European Commission.

2. Sizewell C (United Kingdom)

A description of the Sizewell C project development in 2021 is provided in section 1.4.5.1.2.5. EDF's ability to make the final investment decision alongside other investors and to contribute to the financing of the construction phase is contingent on, *inter alia*:

- sufficient funds to finance development costs until the final investment decision is made;
- a regulatory framework, a risk-sharing mechanism and a government support package (GSP) allowing private investors (debt and equity) to invest;
- an appropriate financing structure for the construction and operation phase with a sufficient number of investors willing to invest in the project. This would be the first time in the United Kingdom that a nuclear asset would be brought to market under a regulated asset base, and obtaining an investment grade credit rating from the rating agencies is a pre-requisite;
- an agreement with suppliers on major construction and operating contracts;
- obtaining the required approvals and authorisations, including planning permission (DCO), the nuclear site licence and environmental permits;
- the ability to deconsolidate in the Group's financial statements (including in the calculation of economic debt by rating agencies) after the final investment decision.

Thus, the project is pursuing its strategy of replicating the HPC design as widely as possible, especially with suppliers, and of using the lessons learned from HPC.

Failure to bring about these conditions could result in the Group not making a final investment decision.

The main control actions to create favourable conditions for the decision include:

- ongoing discussions with the UK Government to define the project's financing conditions and to obtain financial support before the investment decision;
- working with supply chain operators to develop an appropriate contractual strategy, in particular including the replication strategy;
- a detailed review of the cost and schedule;
- completion of studies to obtain the necessary planning permissions, licences and permits.

3. Jaitapur (India)

EDF and its partners submitted a comprehensive conditional non-binding bid to NPCIL at the end of 2018; in this offer, the EDF group and its partners undertake to supply all the studies and equipment for the nuclear island, the conventional island, the auxiliary systems, as well as the heat sinks and galleries of the EPR technology.

EDF does not plan to invest in the project, and the NPCIL client will be the overall project manager and integrator in the implementation phase (bearing in particular the risks of licensing, construction, assembly and overall integration). In April 2021, a binding technical and commercial offer was transmitted and discussions are ongoing. (See section 1.4.1.1.3.2 "Other New Nuclear projects" and section 1.4.5.3.6.2 "Southeast and Southern Asia").

(1) See EDF's press release on 27 January 2021 "Hinkley Point C project update".

The project has the risk profile of a supplier of engineering services and equipment supplies; its value therefore lies in the realisation of the margin included in the price of the services sold. Like all large complex industrial projects, this project presents technical, industrial and cost control risks for the scope under the responsibility of EDF and its partners, as well as a risk relating to compliance with pre-defined milestones, particularly with regard to the expected revenue model. In addition to the country risk, which includes a substantial tax dimension, the conditions related to the nuclear liability framework in India and the securing of the project's financing plan must be resolved before the final contracts are signed.

C4) Control actions specific to Framatome

Framatome can expose the Group through its activities in France and abroad, for nuclear operators other than EDF or other customers.

The Group's exposure may be financial or reputational in nature. Framatome's industrial performance is strategic for EDF as a nuclear operator in France and the UK.

The success of EPR projects, the competitiveness of the nuclear industry in France and the Group's successful international development all depend on the quality and compliance with contractual clauses in the production of studies, components and services by Framatome.

4B: Operational continuity of supply chains and contractual relationships

Summary: The Group is exposed to the operational continuity of supply chains and contractual relationships with its suppliers as well as to fluctuations in the price and availability of materials, equipment and services it purchases in the course of its business activities. These risks may be aggravated by conflicts between nations or blocs of nations, when the territories concerned contain important sources of raw materials or means of production that are essential to the continuity of supply for the Group or its industrial partners.

Criticality: ●● Intermediate

a) Main risks

Access to materials or products that are critical for the Group

The Group's needs may arise in markets with a reduced area or in markets subject to growing pressure, due in particular to the structure and evolution of the industrial offer or to increased competition from new uses. This pressure is attributable in particular to the growing needs of information systems and the needs of energy actors, especially those related to climate transition. These market pressures may increase the cost of supplying certain critical products or services and lead to a reduction in supply by some suppliers in response to a contraction in their margins. Fluctuations in the price and availability of certain raw materials or products that play a key role in setting the price of electricity and energy services may affect the Group's supply capacity and results. This risk is currently heightened due to inflationary pressures on the price of raw materials and components needed for operations.

The Group uses technologies, mainly in the fields of nuclear, hydraulic and renewable energy generation, electrical storage and mobility, that require materials and elements that may be highly sensitive in terms of access⁽¹⁾. The scarcity of or conditions of access to certain raw materials may be critical for the Group due to geological, geopolitical, industrial, regulatory or competitive limitations, particularly in a context of energy transition. Certain crisis situations, such as the Covid health crisis, may also accentuate or generate difficulties regarding access to certain products, materials or services required for the Group's activities and may make performing certain services particularly complex or delay their completion. The development of uses, particularly related to storage, the growth of renewable energies and the penetration of low-carbon electricity, could pose problems regarding access to certain materials: lithium for batteries, ferromagnetic rare earths for wind power, indium or selenium for solar energy. These difficulties could limit the Group's ability to achieve its development objectives. In addition, control of the conditions under which raw or semi-finished materials are extracted, processed, packaged or made available for the Group's needs may be subject to provisions calling for greater control of regulatory requirements and the duty of vigilance.

Supplier panels

The Group currently depends on a limited number of industrial players with specific skills and the required experience. This situation reduces competition in markets where EDF is a buyer and exposes the Group to the risk of default of one or more of these specialised suppliers or service providers. Restructuring observed at the level of major groups (GE, ABB, ENGIE, Rolls-Royce, Bilfinger, etc.), some of which are under pressure from activist minority funds, may also have an impact on the quality and operational continuity of contracts in progress, or the cost of services rendered and products delivered. But apart from the large groups, it is the small and medium-

sized French companies that represent the essential part of the industrial fabric of suppliers. These companies have so far weathered the Covid crisis relatively well. Those companies that were the most affected suffered from their exposure to the aeronautics, oil and automotive sectors rather than the nuclear sector, as the nuclear sector continued to ensure sustained activity thanks to the major maintenance projects underway in France in particular. However, the trend of financial fragility observed over the last ten years or so continues, although bankruptcies, which are limited in number, generally end in a takeover and provide an opportunity for revitalisation.

Contractual relations and partnerships

There may also be difficulties in terms of relationships with the partners involved with EDF in completing these projects. Trade tensions between the United States and China could have an impact on the conduct of some of these projects given the technologies and partnerships implemented.

In this respect, decisions were made in October 2018 by the US Department of Energy ("US DoE") relating to civil nuclear cooperation with China with regard to CGN, and in August 2019 by the US Department of Commerce ("US DoC") placing 4 CGN Group entities on the restricted entity list (entity list). These decisions concern in particular the transfer of American goods and technologies, in particular dual-use goods and technologies, to CGN, EDF's partner, notably in its new nuclear projects in the United Kingdom. As a result of these decisions, the transfer of goods and technology to the entities in question for the technical scope covering them under the decisions, must be specifically authorised in advance by the competent US authorities, with the presumption that such authorisation will be refused.

In June 2020, the US Department of Defense also published a list of entities, including CGN, presumed to belong to or be affiliated with the Chinese army. This geopolitical risk also exists in the United Kingdom.

As a result of these measures, the People's Republic of China enacted its first integrated law on the control of exports of sensitive goods and technologies (December 2020), as well as "a blocking law" against decisions, particularly those of the United States, that are extraterritorial in scope (January 2021).

These risks may be exacerbated by conflicts between nations or blocs of nations, and in particular, to date, the Ukrainian conflict, when in the concerned territories are located important sources of raw materials or means of production essential for the continuity of supply of the Group or its industrial partners.

b) Control actions

In 2021, the Group adopted a new Suppliers policy which aims to secure the performance objectives of projects by ensuring that they can rely on panels of suppliers that meet their needs and by mitigating situations of supplier failure, quality crisis or contractual blockage.

(1) The issue of uranium supply is not considered here. It is dealt with in Risk 5D Control of the fuel cycle.

Furthermore, the Excell plan launched in 2020 (see section 1.4.1.1.1 "The Excell plan") aims to meet these challenges, in particular: strengthening the sector's skills (welding plan and actions in connection with professional and educational structures), improving supplier selection and qualification processes, taking into account the "Ethics and human rights" and the "Territorial development" CSR issues (see sections 3.3.2 and 3.4.2), as well as increasing the number of more partnership-based contractual terms and conditions. In 2021, in this context, the Group set up a "Supplier policy panel" for the nuclear sector intended to coordinate the actions of the entities involved in the relationship with suppliers. GIFEN ⁽¹⁾ is also a key player as a relay for the Group's industrial policy.

Regarding contracts entered into between the Group and suppliers of equipment or services, improved contracting processes and management of the contracts that have been entered into, in particular through the implementation of vigilance

actions at each stage, is a major issue in terms of controlling operations, deadlines and associated costs.

The Contract Management function, led by the Contract Management Department, itself reporting to the General Secretary, aims to improve risk management and create opportunities in the management of contracts. This function calls on the involvement of Contract Managers from the departments throughout the contractual process. It is an additional line of defence in the management of contracts, along with Group top managers and the departments.

In response to the American and Chinese newly-adopted regulations and laws, and in order to ensure its compliance with these laws and decisions, the EDF group (EDF, NNB, Framatome, etc.) has taken precautionary measures in connection with the organisation of its nuclear projects, particularly in the United Kingdom.

4C: Endangerment of occupational health or safety violations (employees and service providers)

Summary: The Group is exposed to health and safety risks in the workplace, both in terms of its employees and those of its service providers.

Criticality: ●● Intermediate

a) Main risks

Human resources and their related skills are a major concern for the Group and its service providers. The industrial nature and diversity of the Group's activities reinforce the crucial importance of complying with the rules and taking into account the various risks that may affect people working in the Group's industrial facilities in order to protect health and safety in the workplace.

The risk of work-related accidents or occupational illnesses cannot be excluded in all of the Group's areas of activity. The occurrence of such events may lead to lawsuits against the Group and may result in the payment of damages, which could be significant.

b) Control actions

The Group has for many years taken the steps necessary to comply with the health and safety laws and regulations in the various countries in which it operates, and considers that it has taken the measures required to ensure the health and safety of its employees and those of its subcontractors'.

Each Group entity has action plans aimed at continuously improving health and safety at work. Actions are also carried out at the Group level as a whole: definition and promotion of the vital rules and the BEST reference framework for health and safety management, one-day shutdown on 7 October 2021 to reflect collectively on the persistence of fatal accidents (see section 3.3.1.3 "Health and safety of employees and subcontractors").

4D: Attacks against assets, including cyberattacks

Summary: The Group is exposed to risks of failure of or damage to its tangible and intangible assets, including its information system. In particular, these risks may arise from malicious actions, including cybercrime.

Criticality: ●● Intermediate

a) Impact on assets

Main risks

The Group's assets consist of its staff and its tangible and intangible assets. The facilities or assets operated by the Group or its employees may be the target of malicious acts of any kind. These acts could have negative consequences on the Group's operational activity, financial position, legal situation, assets and/or reputation.

The Group would also be forced to make additional investments or incur additional costs if laws and regulations relating to the protection of sensitive sites and critical infrastructures became more stringent.

Control actions

The EDF group has defined an Asset Security policy for malicious acts to prevent this risk and limit its impact in the event of an attack. This policy is supplemented by procedures for the protection of people, property assets and intangible assets, and instructions and an IT tool for collecting security incidents. This policy and the procedure were updated in 2021 to take into account the changing threat environment. These policies and procedures are supported by a network of Asset Security Managers (RSP) who are members of the entity Codirs.

The main actions undertaken in 2021 regarding the protection of assets are:

- coordination of the RSP network, training of new RSPs, letters (DSIE@EDF), support on request (e.g. security of premises, projects abroad and security, etc.)

and presentations on current topics (IGI 1300 and secrecy protection, new tool for collecting security incidents, etc.);

- drafting of a new version of the Group's Asset Security policy to fight malicious acts and proposal to the Executive Committee of a list of 10 pieces of information that are Group confidential;
- production of an e-learning course on the Asset Security policy to fight malicious acts;
- updating of EDF's procedures for implementing the Group's Asset Security policy, in particular in the Classification and Protection of Information memoranda and the procedure for reporting security incidents. Implementation of the new security incident collection application. Numerous tools and meetings for change management from existing to new tools;
- participating in steering the implementation of the NIS directives and the French Military Programming Act (LPM) in conjunction with ANSSI, DSIG and the entities involved;
- contributing to the implementation of the obligations associated with the new version of the IGI 1300, an instruction involving significant changes for the Group:
 - participating in the finalisation of the IGI 1300 ministerial memoranda with the MTE and other relevant operators,
 - drafting IGI internal application memoranda,
 - assisting entities in the implementation of this instruction by ensuring that all regulatory obligations are properly implemented;

(1) The Groupement des industriels français de l'énergie nucléaire (French nuclear energy industry group), created in June 2018, aims to bring together all the parties involved in the French nuclear industry to ensure the attractiveness of the sector and maintain its skills.

- setting up a training course with the DGSI and the DRHG on radicalisation and religious issues in companies for HRDs, managers and lawyers (a webinar is being prepared);
- helping to take into account Asset Security files during the development of IS applications, etc.;
- contributing to the preparation of compliance files.

b) Information systems failure including cyberattacks

Main risks

The Group operates multiple, interconnected and complex information systems (databases, servers, networks, applications, etc.) that are essential to the conduct of its commercial and industrial activity, the preservation of its human, industrial and commercial assets, and the protection of personal data (of customers and employees) and that must adapt to a rapidly changing context (digital transition, development of teleworking, new ways to share work in extended companies with suppliers, changes in regulations, etc.).

The facilities and assets used by the Group or its employees may be the target of external attacks or malicious acts of any kind. An attack or malicious act committed on these facilities could have consequences such as injury to persons and/or damage to property, the Group being held liable on the grounds of measures judged to be inadequate, and interruptions in operations. The Group would also be forced to make additional investments or incur additional costs if laws and regulations relating to the protection of sensitive sites and critical infrastructures became more stringent.

The frequency and sophistication of information system hacking and data corruption incidents are increasing worldwide. The impact of a malicious attack – or any other failure resulting in the unavailability of information systems – may have a negative impact on the Group's operating activity, financial, legal and asset situation, or reputation.

Control actions

The EDF group has defined an Asset Security policy for malicious acts and an Information System Security policy to prevent this risk and limit its impact in the event of an attack. These policies are supplemented by guidelines on the protection of personal data.

A charter regarding the use of IT resources is annexed to the Company's internal regulations. IS security training and awareness-raising courses adapted to different profiles (users, project managers, IS security managers, etc.) are offered on a regular basis to employees. The Executive Committee and the Audit Committee of the Board of Directors receive reports on cybersecurity risk management. Several dozen security audits are carried out each year by external PASSI qualified IS security audit companies (IS security audit providers) by the ANSSI (the National Cybersecurity Agency of France), both on IT infrastructures and on business information systems. In addition, the EDF group SOC (Security Operational Center) reports on IS security incidents on a monthly basis. The Group SOC has moreover carried out a qualification process with the ANSSI, which issued a favourable opinion in August 2021 (https://www.ssi.gouv.fr/uploads/2021_2047_np.pdf).

In 2021, the main actions deployed in the areas of cybersecurity, protection of intangible assets and, more generally, the Company's resilience to the risks of damage to information systems were:

- setting cybersecurity targets for Group entities;
- deploying "Cybersecurity Passport" e-learning accessible to all (including subsidiaries) and which has been made compulsory for all Group executives and managers in France;
- deploying phishing campaigns within the Group's entities (more than 60,000 people targeted in 2021);
- strengthening the operational cybersecurity function: strengthening the CERT (Computer Emergency Response Team), setting up a new SOC (Security Operations Center) model, professionalising the Cyber Support Teams within the departments and subsidiaries, who contribute to the CERT's activities and implement the actions requested;
- Group monitoring of the remediation of the most critical IT security flaws;
- continuing the deployment and evaluation within the entities of a security reference framework based on the rules of the Agence nationale de la sécurité des systèmes d'information (the French national cybersecurity agency);
- periodic publication of a dashboard for the Executive Committee indicating the Group's level of cybersecurity.

In addition, IS crisis and cybersecurity drills are regularly carried out to test the various measures put in place.

4E: Hydraulic safety violations

Summary: The hydroelectric facilities operated by the Group present risks with potentially serious consequences for people, property and the environment that could have a financial and reputational impact on the Group.

Criticality: ●● Intermediate

Hydropower safety comprises all the measures taken when designing and operating plants to reduce risks and hazards to people and property associated with water and the presence or operation of facilities.

a) Main risks

The Group's hydraulic structures present specific risks with potentially very serious consequences: breakage, overflow during floods, operating manoeuvres.

b) Control actions

Hydropower safety is the major and permanent concern of the producer. It falls under the purview of the Group's CSR "nuclear safety, health and security" issue (see section 3.3.1 "Health & Safety"). It involves three main activities:

- measures to address the major risk associated with dam or reservoir failures, through the regular monitoring and maintenance of facilities under the supervision of public authorities, mainly the French regional environment, land use and housing authorities (*Directions régionales de l'environnement, de l'aménagement et du logement – DREAL*). Of the largest dams, 67 are subject to a special administrative procedure implemented by the competent prefect;

- the management of facilities during periods of exceptionally high water levels in order to ensure safety at the facilities and for the surrounding communities;
- control of operational risks: changes in the level of the water bodies or the flow of watercourses downstream of the works.

EDF regularly monitors and maintains its dams, including through continuous monitoring. The real-time readings and analysis at each site of multiple data (settlement, pressure, leakage measurements, combined with the visual inspection of the concrete and an inspection of the mechanical parts, etc.) enable EDF to conduct a regular assessment on the state of its dams. In Grenoble and Toulouse, EDF teams can analyse the largest dams or those dams that are the hardest to access remotely and in real time, using a series of sensors.

Furthermore, for each of the large dams, a danger study, including a complete examination, is conducted every ten or fifteen years (for one class A dam and one class B dam respectively). This examination requires draining or an inspection of the submerged parts with sub-aquatic equipment. These operations are carried out under the strict control of the French State authorities (Service de contrôle et de sécurité des ouvrages hydrauliques (Hydraulic Works Control and Safety Department) within each DREAL (French regional environment, land use and housing authority)).

At the organisational level, the Hydro Safety Inspector prepares an annual report for the Chairman & Chief Executive Officer of EDF, to which he or she reports directly, as well as to those involved in hydropower safety (see section 1.4.1.3.1.3 "Hydropower Safety"). Issued after analyses, inspections and assessments carried

out by the Hydro Safety Inspector, this report aims to give an opinion on the level of hydropower safety of the Group's facilities and provide a basis for reflection and progress to ensure its improvement and consolidation. This report is made public on the Group's website.

4F: Risk of blackout

Summary: Repeated customer power supply interruptions, or a blackout, or a widespread power grid incident, in a territory served by the Group could have consequences for the Group's activities, financial position and reputation, particularly if they were partly attributable to the Group.

Criticality: ● Moderate

a) Main risks

The Group may be faced with repeated power outages or even a blackout, a widespread network incident of considerable scale, or be involved in it, even if the triggering incident occurred on a network not operated by EDF or was attributable to another operator.

The causes of power outages can be diverse: local or regional imbalance between electricity generation and consumption, accidental power supply or transmission failure, cascade failures, interconnection problems, delays in investment and the necessary network conversions to meet the needs of energy and ecological transition, difficulty in coordinating players, particularly in a market with insufficient or evolving regulation. An external crisis, such as the Covid health crisis, can, through the disruptions it generates, constitute an aggravating risk factor.

The initial impact of such power failures could be repair costs incurred to re-establish power or restore the network. Power failures may also generate capital expenditures if it were decided, for example, to install additional generation or network capacity. This could also cause a decline in the Group's turnover. Finally, they could have a negative impact on the Group's financial position or reputation

with its customers and all its stakeholders, particularly if the power outage were to be partly attributable to it.

b) Control actions

Controlling this risk is at the heart of RTE's mission, as it is responsible 24 hours a day for managing the French electricity system and balancing electricity supply and demand in France. The resources implemented by RTE fall within the framework defined by the public authorities and comply with the policies common to European TSOs and established within the framework of ENTSOE (European Network of Transmission System Operators for Electricity).

EDF's contribution to risk management, over and above its regulatory obligations and in accordance with the public service contract and its responsibility as a balance manager, lies in its commitment to:

- respond to RTE's calls for tenders for the constitution of reserves;
- contract with RTE to enable coordinated planning of generation unit shutdowns and network interventions;
- contribute to the proper functioning of the capacity mechanism.

4G: Industrial safety violations and impact on environmental assets, including biodiversity

Summary: The Group operates facilities for which accidents could, in the event of a failure in industrial safety, have serious consequences on the human or natural environment, particularly in terms of biodiversity and environmental capital (air, soils and water).

Criticality: ● Moderate

a) Main risks

The Group operates or has operated facilities which, as part of their day-to-day operations, can be, may be or may have been the cause of incidents or industrial accidents having environmental (air, soil and waters pollution risks) and health impacts.

Furthermore, all the Group's facilities and projects are concerned with biodiversity issues and, more generally ecosystems, in particular with regard to the issues of temperature and water abstraction in connection with climate change, especially in France where EDF is a major landowner and natural resource manager.

The stakes are all the higher as the energy transition introduces new or enhanced requirements in terms of biodiversity protection, pollution control and control of impacts on the environment as a whole.

The Group's facilities may be located in industrial areas where other activities subject to similar risks exist, which means that the Group's own facilities may be impacted by accidents occurring at neighbouring facilities owned by other operators and not under the Group's control.

The Group owns 40 facilities classified as Seveso under the European Directive for the prevention and management of major industrial risks. These are essentially storage or warehousing facilities for oil, gas or chemicals.

Measures taken for industrial safety and the control of these risks may not be fully effective, which could have consequences for people, property and immediate surroundings. The Group may be held liable.

In case of a major accident, insurance policies for civil liability and damage taken out by the Group could prove to be inadequate, and the Group cannot guarantee that it will be able in the long run to maintain a level of cover at least equal to current cover levels.

Risks specific to nuclear facilities are further developed in section 2.2.5 "Specific risks related to nuclear activities". Risks specific to hydraulic facilities are set out in 4E above.

An industrial safety failure may have a negative impact on the Group's operational activity, its financial or legal position regarding its duty of vigilance, environmental assets, or its reputation, and may affect the Group's ability to achieve its Corporate Responsibility objective with respect to biodiversity (see section 3.5.2.1.).

b) Control actions

The risk management studies carried out on each industrial site integrate potential health or environmental impacts and avoidance measures: compliance with regulations, monitoring, prevention and protection of soil, water, air and potential health effects. In addition, they include avoidance measures for accident situations. In this respect, feedback from the fire that occurred on 26 September 2019 at the "Seveso" Lubrizol plant in Rouen will be included in the analyses. The Group's French Seveso sites all implement the regulatory requirements applicable to this type of facility. In addition, they all responded to the requests of the prefects following the fire at the Lubrizol plant. The additional post-Lubrizol decrees on the storage of flammable liquids and toxic materials are applicable and therefore integrated into the Group's ICPE (facilities that are classified for the protection of the environment) industrial facilities.

The industrial and natural risks (RIN) network within EDF ensures that the new requirements are monitored, appropriated and integrated on the sites.

Furthermore, the Group is committed to biodiversity through its corporate social responsibility concerns relating to the preservation of the planet's resources (see section 3.2).

2.2.5 Specific risks related to nuclear activities

5A: Failure to comply with the objectives in terms of operation and/or in terms of extending the operating life of nuclear power plants (France and United Kingdom)

Summary: The Group may not meet its nuclear power plants' operating objectives in terms of safety and availability, notably in the case where controls or defect detection would lead to modifications on the nuclear French fleet. It may also not continue operating its reactors beyond the current planned expiry date, or even be authorised to operate them until that date in both France and the United Kingdom. In addition, the Group may not be able to control costs and deadlines for upgrading its operating fleet (*Grand Carénage* in France), which represents a major risk for the Group.

Criticality: ●●● Strong

a) Context

The fleet of nuclear reactors that the Group currently operates in France is highly standardised (see section 1.4.1.1.2.1 "EDF's nuclear fleet in France"). This enables the Group, in particular, to achieve economies of scale, to apply improvements made to its newest reactors to all reactors and, in the event of a reactor malfunction, to anticipate the measures to be taken with the other reactors. The Group has been aiming for several years to continue operating its nuclear power plants in France longer than 40 years.

On 15 December 2021, EDF has announced the phenomena known as "stress corrosion" near welds in the safety injection system (RIS) pipes as part of the ten-year inspection of reactor No. 1 at the Civaux plant. Similar defects have been detected in other plants. These phenomena lead to unplanned shutdowns and inspections and have a significant impact on nuclear generation, the medium-term consequences of which are difficult to assess.

During the periodic reviews carried out during the ten-yearly inspections (VD) and following the Fukushima accident in Japan, the Group drew up a major work programme, called *Grand Carénage*, the principle of which was approved by the Board of Directors (see section 1.4.1.1.2.2 "Nuclear power generation in France").

Following the French State's decision to shut down the Fessenheim nuclear power plant early, the two reactors were definitively shut down in 2020.

In the United Kingdom, the currently planned operating period for the reactors in EDF Energy's existing nuclear fleet ranges from 41 to 47 calendar years for advanced gas reactors (AGRs) and is 40 years for the Sizewell B pressurised water reactor (PWR). Since EDF Energy acquired them, the operating lifespan of the AGR power plants has been extended by 8 years on average and the objective is to increase the operating life of the PWR power plant by 20 years after the currently planned 40 years (see section 1.4.5.1.2.2 "Nuclear generation"). The two reactors at Dungeness were permanently shut down on 7 June 2021 and those at Hunterston B on 26 November 2021 and 7 January 2022 respectively.

b) Main risks

Nuclear fleet in France

- This standardisation of the fleet has a potential parallel risk of the dysfunction being common to several reactors or to a generation or series of reactors (see section 1.4.1.1.2.1 "EDF's nuclear fleet in France and its operation").
- The Group may be required to make significant or costly repairs or modifications to all or some of its plants. Events may occur that could have an impact on the operation of the fleet or on its output, which could lead to a temporary shutdown or closure of all or part of the fleet.

In particular, the detection of the above-mentioned phenomena known as "stress corrosion" led to the shutdown of the other N4 range reactors. The preventive inspections carried out revealed similar evidence in other reactors. The completion

of inspections, some of which were destructive, the examination of technical solutions and their deployment led EDF to draw up in February 2022, in consultation with the ASN, a prioritised list of reactors on which inspections will be resumed with optimised resources and taking into account feedback.

The list of pipes potentially affected by these phenomena has not yet been finalised. Thus, the programme of inspections and repairs on the pipes potentially affected by the stress corrosion phenomenon constitutes a major risk in terms of nuclear generation. It has led the Group to revise its nuclear generation estimate for 2022 and 2023 ⁽¹⁾. To date, the Group is not in a position to analyse the impacts beyond 2023.

Checks could be further extended within the nuclear fleet in close consultation with the ASN. They could result in new investigations and potentially long and costly repairs.

- During the periodic reviews, the ASN decides on the measures taken by the operator and may give additional instructions for each reactor. Solutions are being studied to demonstrate the capacity of non-replaceable equipment, such as the containment building and reactor vessels, to ensure their operation up to 60 years. These studies, which are based on data available in France but also internationally ⁽²⁾, make it possible to confirm the safety margins available for the operating periods under examination but may also lead to the need to adopt additional protective measures, if necessary, for the existing fleet, which could have consequences on its performance.
- In its decision of 23 February 2021 on the conditions for continued operation of EDF's 900MWe reactors beyond their fourth periodic review, the ASN found that the measures planned by EDF, supplemented by the responses to the requirements formulated by the ASN, will make it possible to achieve the objectives of the review and that these safety improvements open up the prospect of continued operation of the 900MWe reactors for a period of ten years beyond their fourth periodic review, subject to the implementation of additional measures. These new requirements lead to an increase in investments and an additional industrial load of around 25% compared to the already very ambitious initial programme, increasing the risk on the ability of industrialists to make the necessary investments within the stipulated deadlines.
- In accordance with the French Environmental Code, the provisions proposed by EDF during reviews after the 35th year of operation will be submitted reactor by reactor to the ASN for authorisation, after a public enquiry. For Tricastin 1, whose VD4 (head of series) ended with recoupling on 23 December 2019, the periodic review conclusion report (RCR) was transmitted in February 2020, and will be the subject of a public enquiry from 13 January to 14 February 2022, after publication of the ASN's generic opinion on the VD4. The ASN's opinion on the Tricastin 1 RCR is expected to be issued at the end of 2022. At the end of 2021, the VD4s of the Tricastin 1, Bugey 2, Bugey 4 and Tricastin 2 reactors were completed and the VD4s of Dampierre 1, Bugey 5 and Gravelines 1 were underway. Each ASN opinion may include site-specific requirements in addition to the requirements of the generic opinion, impacting industrial load and costs.

(1) See EDF press releases of 7 February 2022 and 11 February 2022.

(2) Four reactors in the United States have been licensed to operate for up to 80 years. For six others, the licence application is currently being processed: *The Nuclear Regulatory Commission (NRC) staff has defined subsequent license renewal (SLR) to be the period of extended operation from 60 years to 80 years* (www.nrc.gov/reactors/operating/licensing/renewal/subsequent-license-renewal.html).

- In 2016, the Board of Directors approved the extension in the consolidated financial statements of the depreciation period for 900MW PWR plants, except Fessenheim, from 40 years to 50 years, without anticipating the decisions of the ASN on the provisions proposed by EDF on a reactor-by-reactor basis after each 10-year inspection. It cannot be ruled out that the extension of the operating life of certain 900MW reactors may not be authorised, but an important step has been taken with the generic opinion issued by the ASN on 23 February 2021.
- The continuing operation of the other series of France's nuclear fleet (1,300MW and 1,450MW), which are more recent, remains an industrial objective for the Group. In 2021, the Board of Directors approved extending the depreciation period of the 1,300MW PWR plants from 40 years to 50 years in the consolidated financial statements. This accounting estimate is not indicative of the decisions to authorise continued operation, which will be given unit by unit by the Safety Authority after each ten-year inspection, as required by law.
- The potential risks of the *Grand Carénage* programme include a possible delay in the appraisal of the authorisations required to start operations, in particular as regards the authorisations expected from the French Nuclear Safety Authority (ASN). Such uncertainties may also concern the manufacture and delivery on site of new equipment or work carried out on-site in a situation where a large number of industrial operations are being carried out at the same time. Any delays caused by the health crisis may also mean that the work will not be able to be completed within the stipulated timeframe. Furthermore, the Group may not receive the expected operating lifespan extension from the competent authorities. Such extensions could also be obtained under certain conditions, the financial impact of which, in particular in terms of investments, could affect the Group's strategy with respect to extending the operating life of its reactors or the Group's ability to pursue its global investment strategy. These events could have a significant negative impact on the Group's financial position.
- Finally, should the health crisis worsen or last, it could affect the achievement of operating targets and the success of maintenance projects, including the *Grand Carénage* projects.

Nuclear facilities in the United Kingdom

- Given the nuclear safety rules applicable in the United Kingdom and AGR reactor technology in particular, EDF Energy may not obtain the necessary authorisations from the ONR when the time comes to operate its existing nuclear reactors until the currently planned (AGR) or potential (Sizewell B) end of operation date, or may obtain such authorisations under conditions involving significant expenditure or investment by the Group.
- The ongoing analysis of graphite ageing in the AGR (Advanced Gas Reactor) may lead to prolonged unavailability or early shutdown of the reactors. The cracking of graphite subjected to irradiation must be carefully monitored, with inspections carried out regularly, and controlled by the Office for Nuclear Regulation (ONR), to ensure that there is sufficient knowledge of the core to justify continued operation. Following decisions taken in August 2020 and November 2020, Hunterston B was permanently shut down on 7 January 2022 while Hinkley Point B will permanently cease production by July 2022. Following a life review of the AGRs in December 2021, the projected final shutdown dates for Heysham 2 and Torness have been brought forward from 2030 to March 2028.
- An accelerated fuel withdrawal strategy would be implemented in the event of any risk of an early shutdown of the other AGR plants. If this strategy were to be adopted, a reexamination of the value of the assets may be required.
- Given the ageing of the British fleet and the many technical difficulties encountered, the future level of output of the AGRs currently in service is very uncertain.

Other nuclear facilities

- For nuclear reactors where EDF is not in charge of operation but has financial interests (Belgium, China), the Group is also financially exposed to some risks. The Group may need to contribute up to the amount of its share to costly repairs or modifications to be carried out on these units or to events that may have an impact on their operating lifespan, production or availability. As in France and the United Kingdom, the nuclear safety authorities in these

countries may take decisions that require additional work or controls, in particular as regards exploiting feedback from international experience and anticipating potentially precursory events. The Group is also exposed in terms of the value of its assets.

Other risks

- Furthermore, despite the quality of operations and the changes made by the Group to its nuclear facilities, it cannot be ruled out that some of these facilities will be subject to special operating conditions to reinforce the operating safety margins at the initiative of the nuclear operator responsible for nuclear safety or at the request of the Nuclear Safety Agency.
- Finally, a potential serious nuclear accident not involving the Group but with widespread consequences worldwide could lead the safety authorities to require new reactor upgrades, applicable to the Group's reactors, and to those in which the Group has a stake.

c) Control actions

These action plans for this risk are carried out by all the operational engineering and operating teams of the nuclear fleet, particularly in the context of the Start 2025 and *Grand Carénage* projects (see section 1.4.1.1.2.1).

During the ten-year inspections, the safety assessment makes it possible to increase the level of safety by taking into account, on the one hand, international best practices and, on the other hand, the condition of the facilities, the experience acquired during operation and the evolution of the knowledge and rules applicable to similar facilities.

The increase in the number of VD4s carried out each year (1 in 2019, 1 in 2020, 4 in 2021, and 5 in 2022) and the increase in the load on the industrial fabric is the subject of an approach involving the main suppliers of the fleet in operation in order to have a multiannual vision of the load and to enable the entire nuclear industry to take the necessary measures (in terms of resources, contractual terms, standardisation, etc.) to secure the success of the industrial programme for the fleet in operation.

Since December 2019, the Group has been implementing the Excell plan, which aims to enable the French nuclear industry to return to the highest level of rigour, quality and excellence in order to keep up with major projects and meet the needs of existing nuclear power plants in France and the United Kingdom (see section 1.4.1.1.1 "The Excell plan").

With regard to stress corrosion phenomena, EDF is continuing to define a plan for inspections throughout the nuclear fleet, with the aim of carrying them out by the end of 2022, during scheduled maintenance and fuel renewal outages for several 1,300MW and 900MW reactors, particularly those undergoing 10-yearly inspections. EDF is continuing its studies to complete its knowledge of the phenomenon and has initiated the development of new ultrasonic inspection methods capable of measuring the cracks depth. EDF plans to check some of its reactors with these new methods from September 2022 until the end of 2023.

Controls may be further extended within the nuclear fleet, in close consultation with the ASN, and result in an action plan in addition to the already scheduled maintenance actions.

In the United Kingdom, risk control is also based on:

- ongoing interactions with the regulator on safety cases relating to the life cycle of facilities, assessment by the regulator and requirements for licences;
- the graphite management and ageing monitoring programme on the AGR fleet, with frequent graphite inspections, in particular at Heysham 2 and Torness;
- Sizewell B's long-term operating programme to manage the production of the business case in support of the decision on the investment programme required for the extension of the operating life;
- reviews, as appropriate, of the life cycle of the AGRs and actions to prepare for fuel retirement in the event of early closure;
- strategies for preventive monitoring and maintenance of facilities to enable consideration at an early stage of problems that could lead to loss of generation.



5B: Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments

Summary: The provisions set aside by the Group for the decommissioning of nuclear facilities and for the treatment and ultimate disposal of radioactive waste, including long-lived waste from spent fuel treatment and decommissioning, may prove to be insufficient. In particular, decommissioning existing nuclear facilities may present currently unforeseen difficulties or be much costlier than anticipated. In addition, these operations must address the CSR challenge of waste management and the circular economy.

The amount of dedicated assets in France set up by the Group to cover the costs of its long-term nuclear commitments (radioactive waste and decommissioning) could prove insufficient in the event of an upward revision of the associated provisions or in the event of a decline in the value of the dedicated assets. In such a case, this amount would have to be topped up, which would have a negative impact on the Group's cash flow, results and perspectives.

Criticality: ●● Intermediate

a) Decommissioning

The decommissioning operations underway in France (see section 1.4.1.1.2.3 "The issues relating to the nuclear activity") concern plants that were built and operated and are now permanently shut down, including the Superphenix plant and the Fessenheim plant permanently shut down in 2020. These operations cover four different reactor technologies: heavy water reactor (Brennilis), sodium-cooled fast reactor (Superphenix at Creys-Malville), graphite-moderated and gas-cooled reactor (NUGG reactors at Chinon, Saint Laurent and Bugey) and the pressurised water reactor ("PWR") at Chooz A and Fessenheim.

In the United Kingdom, the two reactors at Dungeness were permanently shut down on 7 June 2021, those at Hunterston B on 26 November 2021 and 7 January 2022, respectively. Under the agreements concluded in connection with the restructuring of British Energy, the costs of decommissioning EDF Energy Nuclear Generation Group Ltd.'s existing nuclear power plants will be paid by the Nuclear Liabilities Fund (NLF). If the assets of this Fund prove insufficient, these costs will be borne by the UK Government (see section 1.4.5.1.2.2 "Nuclear generation"). In 2019, EDF Energy and the UK Government (BEIS) began discussions with a view to clarifying the conditions for implementing the above-mentioned agreements, in particular as regards determining the decommissioning costs to be recovered by EDF Energy from the Nuclear Liabilities Fund and the conditions under which the British authorities may exercise their option to acquire the nuclear power plants at the end of the defueling phase. In June 2021, an agreement was reached with the government, which specifies EDF Energy's role in the fuel disposal phase, how and when costs will be recovered, and the terms under which the plants will be transferred to the government. This agreement updates the Nuclear Liabilities Fund Agreement (NLFA).

Main risks

- The dismantling operations underway in France are a first for EDF, and, apart from the PWR, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists.
- Neither EDF, nor any other operator, has yet undertaken a decommissioning programme on a scale comparable to that of the Group's current PWR fleet, and the cost estimates therefore involve risks that are associated in particular with this scale effect.
- The timing and cost of the work are dependent on administrative authorisations and the availability, at the necessary time, of radioactive waste storage centres or other facilities necessary for the conditioning, treatment and storage of waste containers.
- These technical, industrial and administrative uncertainties and contingencies which might affect decommissioning projects and waste management could have an impact on the amount of provisions currently set aside. Indeed, the assessment of the amount of these provisions is sensitive to the assumptions used for costs, planning, inflation rates and long-term discount rates, and to any change in the regulations, in particular those relating to the scope of expenses to be covered. The amount of these provisions, in accordance with the French Environmental Code, is subject to control by the administrative authority, which verifies in particular the adequacy of the provisioned expenses and imposes a cap on the discount rate for the provisions.

These uncertainties and contingencies could lead to a significant revision of the amounts provided for, and the provisions made may not cover the costs actually incurred in due course. Failure to control the amount of expenditure, timing of completion and financial provisions relating to the decommissioning of nuclear facilities for which the Group is responsible would have a negative impact on the Group's financial position and reputation (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021).

- In the United Kingdom, the agreements in force provide that the expenses related to the unloading and evacuation of the fuel, to be covered by the NLF, must be justified by EDF Energy and approved by the French government; failing this, they would remain the responsibility of EDF Energy.
- For nuclear power plants which EDF does not operate, but has financial interests in (China and Belgium), the Group is exposed financially in proportion to its contribution to future decommissioning costs.

Control actions

- The feedback from the PWR at Chooz A will enable consolidation, as far as possible, of the studies and estimates on the future costs of decommissioning the nuclear fleet currently in operation and Fessenheim ("second-generation" power plants).
- The Group regularly conducts an update of the key assumptions underlying the provisions (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021).
- The 2020-2021 DGEC audit of facilities shut down at the end of 2019 concluded that, "The costing and annual review process is robust and allows good traceability of the assumptions used and the original data. The provisions are consistent with the baseline scenarios of the projects and cover the full scope of the expenses of the audited scope."
- Governance in terms of securing the financing of nuclear expenses has been strengthened through the development of a Group policy, validated by the Board of Directors on 30 June 2021, and the creation in 2021 of a Nuclear Expense Assessment Control Function, in accordance with Decree 2020-830 of 1 July 2020.
- In the United Kingdom, the risk of decommissioning cost recovery has been significantly reduced by the agreement with the government. Additional risk control actions are:
 - maintaining the quality of relations with the government and the NDA (Nuclear Decommissioning Authority);
 - strengthening monitoring and contractual compliance arrangements, as well as reporting and performance management.

b) Waste management

In France, EDF is responsible for all radioactive waste produced during:

- the operation of the nuclear facilities operated by the Group;
- processing operations for spent fuel from reactors operated by EDF;
- decommissioning operations at the nuclear facilities operated by the Group (see section 1.4.1.1.2.3 "The issues relating to the nuclear activity – storing conditioned ultimate waste").

In this regard, EDF has allocated provisions for the long-term management of such waste. For each category of waste (high, medium, low or very low activity), a specific management channel is identified.

Most of the provision for the long-term management of waste concerns high-level waste (HLW) and intermediate-level long-lived waste (LLW). It is based on the assumption of geological disposal, which is the international benchmark for the ultimate disposal of high-level long-lived radioactive waste, and on the work carried out in 2006 with ANDRA, the public authorities and other producers of radioactive waste (see note 15.1 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021 and see section 1.4.1.1.2.3 "The issues relating to the nuclear activity").

French Act no. 2006-739 dated 28 June 2006 provided for a dedicated storage centre for Low-Level Long-Lived waste (LLW-LL), such as graphite. The overall industrial scheme for the management of all LLW-LL is being defined within the framework of the PNGMDR (see section 1.4.1.1.2.3 "Issues relating to the nuclear activity").

In the United Kingdom, under the terms of agreements entered into with the authorities (see section 1.4.5.1.2.2 "Nuclear generation"), the liability and certain costs associated with the management of certain radioactive waste are transferred to the UK Government. The supplementary agreement entered into with the government in 2021 clarifies how the costs associated with waste management will be recovered.

Main risks

- As a nuclear operator or producer of radioactive waste, within the meaning of the legislation applicable to waste, the Group could be held liable, in particular in the event of an accident involving damage to third parties or to the environment in connection with spent fuel or waste. The Group may be held liable even if these products are handled, transported, held, stored or warehoused by parties other than the Group, in particular, in France, by the Orano Group and the French national agency for radioactive waste (ANDRA).
- All of the Group's High-Level and Intermediate-Level Long-Lived waste may not constitute "ultimate radioactive waste" within the meaning of Article L. 542-1-1 of the French Environmental Code. In this case, it may not be possible to store this waste directly in a deep geological repository, especially since the Nuclear Order of 10 February 2016 issued pursuant to French Act no. 2015-992 relating to the energy transition for green growth allows for the reclassification of radioactive materials as radioactive waste and vice-versa by the administrative authority. Moreover, the Group has no control over the time taken by the public authorities to issue permits for such ultimate storage, nor over the technical guidelines that are set forth. This may create uncertainties regarding the fate of the waste, the liability and the resulting costs for EDF.
- The reservations that remain and the supplementary investigation being carried out by ANDRA to obtain approval for the construction of the geological storage area starting in 2022 could lead to a revision of the provisions for long-term radioactive waste management.
- The provisions may need to be updated in the light of the findings of the studies conducted under the French National Plan for the Management of Radioactive Materials and Waste (PNGMDR) on the storage of low-level long-lived waste.
- Pursuant to the restructuring agreements of British Energy, EDF Energy Nuclear Generation Ltd. remains financially, technically and legally liable for the management, storage and processing of waste that does not come within the scope of the aforementioned agreements.
- Failure to control the costs and time-frames for completion with respect to the solutions for the treatment and ultimate storage of waste for which the Group is liable would have a negative impact on the Group's financial position and reputation.
- For nuclear power plants which EDF does not operate, but in which it has financial interests (Belgium, China), the Group is exposed financially in proportion to its shareholding to contributing to future expenditures related to the management of spent fuel and waste.

Control actions

- The control strategy consists in developing and securing radioactive waste treatment channels to meet the present and future needs of the Group's nuclear facility decommissioning and operating projects. To this end, the structuring of the Cyclife subsidiaries has in particular been consolidated in order to offer a range of appropriate waste treatment solutions.
- For CIGEO (the geological disposal centre project developed by ANDRA for high-level waste and intermediate-level long-lived waste), the control strategy

consists in securing the project by proposing to ANDRA technical optimisations and supporting the development strategy and implementation of the disposal, in order to meet the target cost of €25 billion ⁽¹⁾ (see section 1.4.1.1.2.3 "The issues relating to the nuclear activity"). To this end, a cooperation agreement was signed at the end of 2020 between EDF and ANDRA.

- The Group participates, as a producer, in the various working groups on the storage of graphite waste. In addition, EDF is very actively involved in the PNGMDR steering committee.
- In the United Kingdom, arrangements are in place for the management of spent fuel from AGR and PWR reactors:
 - in accordance with its safety and sustainable development policies, EDF Energy implements actions to continuously improve and minimise the quantities of spent fuel and waste generated;
 - the arrangements for the management of spent fuel from the AGRs were defined at the time of the restructuring of British Energy. Spent fuel from AGRs is disposed of at the Sellafield reprocessing site for long-term storage. EDF Energy finances this storage (as well as the reprocessing carried out in previous years);
 - the Sizewell B PWR spent fuel is stored on site in a dedicated dry storage facility. This facility will provide safe storage for all spent fuel produced during the lifetime of Sizewell B. At the end of this long-term surface storage, the Sizewell B PWR spent fuel will be transferred to the future British geological disposal facility. This strategy is approved by the NDA and financed by the Nuclear Liabilities Fund.

c) Provisions and management of dedicated assets

Context

Note 15.1 "Nuclear provisions in France" of the appendix to the consolidated financial statements as at 31 December 2021 sets out the amounts of expenses under the economic conditions at the end of 2021 as well as the corresponding provisions relating to:

- the decommissioning of France's nuclear power generation fleet;
- the last cores;
- the long-term management of waste, and the recovery and packaging of waste.

This note also provides sensitivity analyses of the Group's provisions and income regarding a change in the discount rate for the various categories of provisions. All these provisions represent several tens of billions of euros.

Note 17.1 "Other provisions for decommissioning" of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021 presents the same items for Framatome and Cyclife France (formerly SOCODEI) and their basic nuclear facilities in France.

Note 15.1.2.4 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021 presents the market value of EDF's portfolio of dedicated assets to cover the costs of long-term nuclear commitments (radioactive waste and decommissioning) at 31 December 2021.

In the United Kingdom, the funds for nuclear liabilities are managed by a body independent of EDF set up by the UK Government (Nuclear Liabilities – NLF) for the existing nuclear fleet. For HPC-related liabilities, the funds will be managed by FundCo, a body (Trust) independent of HPC's shareholders (EDF Energy and CGN) and the UK Government. Operators therefore have no assets to manage for this purpose (see section 1.4.5.1.2.2 "Nuclear generation").

Main risks

- All of the contingencies and uncertainties regarding these provisions may have a material adverse impact on the Group's financial position (see note 15.1 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021).
- In the event of a significant change in the provisions determining the reference base of the dedicated assets, it might prove necessary to make additional allocations to adjust the value of these assets, which could have a material adverse impact on EDF's financial position. Moreover, stricter regulations at the

(1) Economic cost 2011 (see note 28.2 to the financial statements for the year ended 31 December 2021).

national level (in particular those that might impact the base for determining the dedicated assets to be constituted by EDF ⁽¹⁾) or European level may lead to more stringent requirements regarding the constitution of dedicated assets and have a significant impact on EDF's financial position.

- Although these assets are constituted and managed in accordance with strict prudential rules, price fluctuations in the financial markets or changes in valuation may have a material adverse impact on the value of these assets (see section 5.1.6.1.6 "Management of financial risk of EDF's dedicated asset portfolio" for a sensitivity analysis), which could require EDF to allocate additional amounts to restore the value of these assets. Such events could have a material adverse effect on the Group's financial position.

- The unavailability or insufficient amount of the dedicated assets to hedge the expenditure schedules of the Group's long-term commitments could have a negative impact on the Group's financial position and reputation.

Governance arrangements

In order to ensure the control of provisions and the management of dedicated assets, the Group has put in place specific governance arrangements:

- the Nuclear Load Assessment Control Function, in accordance with Decree 2020-830 of 1 July 2020;
- the Dedicated Asset Portfolio Operational Management Committee;
- the Nuclear Commitments Monitoring Committee (CSEN) of the Board of Directors.

5C: Nuclear safety violations during operation resulting in nuclear civil liability

Summary: In addition to controlling industrial performance, and given the importance of nuclear generation within the EDF group, the way EDF exercise its responsibility as a nuclear operator – with nuclear safety being the number one priority – determines the Group's overall performance. As a result of its nuclear activities, the Group is exposed to nuclear civil liability risks.

Criticality: ●● Intermediate

a) Context

The primary responsibility for nuclear safety lies with the nuclear operator throughout the operating cycle of nuclear reactors. This principle along with the principle of control are reaffirmed in the EDF group's nuclear safety policy. Liability as a nuclear operator falls under the "nuclear safety, health and security" aspect of the Group's CSR policy (section 3.3.1 "Health & Safety"). The Chairman & Chief Executive Officer delegates this responsibility to the Group Senior Executive Vice-President, Nuclear and Thermal and the Group Senior Executive Vice-President, New Nuclear Projects and Engineering, who then sub-delegate it to the Directors of the Divisions involved, who in turn sub-delegate it to the Unit Managers.

b) Main risks

Control of nuclear safety

The top priority is nuclear safety, as defined in the Group's Nuclear Safety Policy, and this is a factor in the industrial performance of the nuclear business as a whole. Nuclear safety takes into account the design by the nuclear operator and the operation by the designer. Failure to control operating safety could have major or even vital consequences on the value of the Group's industrial assets, its financial position and its development outlook or even on the continuation of its industrial activity.

Any serious event related to the Group's nuclear activities, with a potential or proven impact on the population, the environment or a territory, could lead to a significant increase in the operating constraints of the Group's industrial sites, or even the partial or total interruption of the Group's nuclear activities. Such an event could have a significant negative impact on the Group's activities, financial position, strategy and reputation.

Nuclear civil liability

The nuclear civil liability scheme that applies to nuclear facility operators of States parties to the Paris Convention, and the insurance applicable thereto, are described in section 2.1.3.7 ("Insurance"). This scheme is based on the principle of the operator's strict liability. Accordingly, if an event occurs that causes nuclear damage, the Group would be automatically liable up to a monetary maximum set by the law applicable in the country, regardless of the source of the event that caused the damage and any safety measures that may have been taken.

In countries where the Group operates nuclear facilities, statutory liability limits may be increased or repealed. For example, the protocols amending the Paris Convention and the Brussels Convention, in force since 1 January 2022, provide for these maximum amounts to be increased and a substantial expansion of the damage to be covered. The operator's liability in France amounts to €700 million in the event of a nuclear accident in a facility and €80 million in the event of a nuclear accident during transport. The entry into force of the other changes laid out in these protocols is likely to increase yet again the cost of insurance, and such insurance covering this liability may not always be available or maintained. Insurance coverage for the Group's nuclear operator's civil liability and for the transport of nuclear substances is described in section 2.1.3.7 "Insurance".

Property damage to EDF's nuclear facilities is covered by insurance programmes (see section 2.1.3.7 "Insurance"). Despite this cover, any event that may cause significant damage to a nuclear facility of the Group could have an adverse impact on the Group's business and financial position.

Lastly, the Group cannot guarantee that the insurers that cover both its liability as a nuclear plant operator and property damage to its facilities will always have available capacity or that the costs of cover will not significantly increase, particularly in light of the impacts on the insurance market of events such as the nuclear accident in Japan that occurred in March 2011.

c) Control actions

In view of these risks, and pursuant to the Group's policy, each Group company operating nuclear facilities acts within the framework of legal and regulatory requirements specific to the country in which it operates and is obliged to comply with them. Each one ensures the nuclear safety of its facilities and constantly improves the level of this safety based on its methods, skills and values. The Group develops common principles aiming to obtain the best level of prevention of incidents and protection of workers, the public and the environment. These principles apply to all stages of the activity, both for new projects and for the existing fleets or sites being decommissioned. The Group closely involves its industrial partners in the achievement of these objectives.

Each company is responsible for the proper conduct of its nuclear activities and sets the appropriate delegations at each decision and action level. The Group guarantees the allocation of the necessary resources for nuclear safety.

(1) The French Cour des comptes' report to the Senate Finance Committee on the decommissioning and dismantling of nuclear power plants, published on 4 March 2020, recommends that the costs of all decommissioning preparation operations, post-operational expenses and the cost of taxes, levies and insurance premiums directly attributable to decommissioning sites should gradually be included in the long-term expense categories.

An internal entity in charge of an independent safety evaluation is put in place at the level of each site, each company and the Group. Each one reports to the manager concerned, independently of other managerial functions; furthermore, each one has the duty to alert the superior hierarchical level if the reaction of the level directly involved is not what is expected.

The Group's nuclear operating companies regularly receive international evaluation teams (WANO⁽¹⁾ Peer Review and OSART from the IAEA⁽²⁾).

Clear and honest information communication on the events and their possible impacts are promoted within the Group. This high-quality dialogue is sought and maintained with the salaried personnel and its representatives, subcontractors, the

supervisory authorities (Nuclear Safety Authority in France, Office for Nuclear Regulation in the United Kingdom), local communities and all other nuclear safety stakeholders.

The Nuclear Safety Council, which the Chairman & Chief Executive Officer of EDF chairs, meets several times a year and periodically reviews the annual assessment of the EDF group's nuclear safety. A General Inspector for nuclear safety and radiation protection (IGSNR) is appointed by the Chairman & Chief Executive Officer to whom he or she reports. He or she carries out inspection assignments regarding all of the nuclear activities of the EDF group. Each year, he or she issues an opinion on safety within EDF. His or her report is presented to and discussed by the Nuclear Safety Council. It is then made public (see section 1.4.1.1.4.3).

5D: Control of the fuel cycle

Summary: In addition to the control of nuclear safety (risk 5C), the operation of existing nuclear facilities (risk 5A) and new nuclear projects (risk 4A), the Group is exposed, in the context of nuclear activities, to the control of the nuclear fuel cycle.

Criticality: ●● Intermediate

a) Context

The Group's operating costs include nuclear fuel purchases.

EDF is supplied with uranium, conversion and enrichment services, fuel assembly supplies and spent fuel reprocessing operations for its nuclear fleet in France and the United Kingdom.

In France, EDF has booked provisions for spent nuclear fuel management operations (transport, processing, conditioning for recycling) (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2021) based on the price and volume conditions of the master agreement signed with Orano in December 2008 and broken down in the successive implementation agreements (see section 1.4.1.1.2.3 "The issues relating to the nuclear activity"). These provisions amount to approximately €10 billion.

Note 15.1.1.5 "Inflation rate, discount rate and analyses of sensitivity" and note 15.1 "Nuclear provisions and dedicated assets in France" of the appendix to the consolidated financial statements ended 31 December 2021 show the connection between "costs based on year-end economic conditions", which represent estimated amounts as at 31 December 2021, and "provisions made at present value".

b) Main risks

Nuclear fuel supply

Prices and volumes are subject to fluctuations that depend on factors beyond the Group's control, including political and economic factors (in particular, profitability outlook for mining investments, supply/demand imbalance or a tension on the supply side, associated, for example, with the occurrence of an operating incident in a uranium mine or cycle plant, a delay in the commissioning of a new mine or an event leading to institutional instability in a producing country, or restrictions/sanctions/embargos).

Nuclear fuel logistics

The storage and transport of new or spent nuclear fuel is an industrial activity that requires specific safety and security measures. These requirements could become more stringent, generating additional difficulties and costs for the Group.

In the event of the collapse of this industrial logistics system, the Group could reduce or even interrupt all or part of the electricity generation at the affected sites, either due to the non-delivery of new assemblies or to the saturation of storage facilities, which could have a negative impact on the Group's financial position (see section 1.4.1.1.2.3 "Issues relating to the nuclear activity").

Transport of nuclear materials continues to be highly constrained, particularly with regard to the increase in security and regulatory requirements; in line with the management of the "yellow vests" (*gilets jaunes*) crisis, the Covid-19 pandemic was well anticipated and did not disrupt transport, but reminded us that the situation remains precarious.

Given the saturation of the existing storage pools and the risk of the impossibility, in the long term, of implementing multi-recycling in its third generation pressurised water reactors or recycling in fourth generation "GEN IV" reactors (abandonment of the ASTRID fast neutron reactor project), the fuel cycle could be called into question. This could have both operational and financial consequences.

Provisions for spent fuel disposal

The amount of provisions currently booked to cover the period not covered by the current agreement with Orano should be reassessed if the terms under which this agreement is renewed prove more costly than those currently applicable.

The contracts entered into in France and abroad may not sufficiently protect the Group from sudden or significant price increases. When these contracts expire, the Group may not be able to renew them, in particular at an equivalent price. This could have an adverse impact on the Group's financial position.

c) Control actions

The supply risk management strategy consists of progressively securing the portfolio through competitive long-term contracts in line with the objectives for covering requirements presented to the Board of Directors. Fixed price contracts are preferred, or contracts including a limited market price component, the latter systematically including ceilings/floors to reduce exposure to the market.

In the field of transport, the control actions implemented by EDF include strengthening the unpredictability of transport and ties to the authorities (HFDS/IRSN/ASN), the prevention and reduction of potential impacts on the fleet, as well as the development of alternative levers (anticipation of deliveries, inter-unit transfer, etc.).

The control of spent fuel storage capacity is essential to preserve the balance of the closed cycle. A new large capacity spent fuel storage pool will be commissioned by EDF in 2034 at the Orano site in The Hague (see section 1.4.1.1.2.3 "Issues relating to the nuclear activity"). In the meantime, Orano plans to densify its existing pools on the site and is developing a dry storage solution for spent fuel.

Finally, EDF's strategy for the fuel cycle is to maintain the long-term perspective of a closed cycle based on GEN IV reactors.

(1) WANO : World Association of Nuclear Operators

(2) OSART : Operational Safety Analysis Review Team ; AIEA: Agence Internationale de l'énergie Atomique - International Agency of Atomic Energy

48gCO₂/kWh

GROUP CARBON
INTENSITY ⁽¹⁾

67%

ACHIEVEMENT RATE IN
"ACT4NATURE
INTERNATIONAL" ⁽²⁾

29.8%

OF WOMEN IN GROUP
MANAGEMENT
COMMITTEES ⁽³⁾

22 to 26%

OF PROCUREMENT FROM
SMES IN FRANCE

(1) See section 3.1.1.1.3.

(2) Group biodiversity commitments (see section 3.2.1).

(3) Management Committees.





3 NON-FINANCIAL PERFORMANCE

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Corporate social responsibility issues and commitments

In line with its *raison d'être*, strategy, business model and related risk factors ⁽¹⁾, the EDF group presents in this chapter 3 its non-financial performance issues, commitments, policies, actions and results.

16 priority CSR issues

The EDF group's high-priority CSR issues guide its actions in terms of Environmental, Social & Governance (ESG) performance ⁽²⁾. They are seen as key non-financial issues, *i.e.* ones that involve risks and/or opportunities for the Group and its stakeholders. EDF has used a dual materiality analysis to map them over the last six years. This included enabling identification, selection and ranking of the main non-financial issues by combining the points of view of both external stakeholders (customers, investors, non-financial rating agencies, public authorities, etc.), and the Group itself.

Against a changing backdrop, the initial dual materiality analysis carried out in 2014 was updated in 2018. The analysis was prepared with the support of a specialist firm and underpinned by international standards based on documentary studies, interviews and workshops conducted with about one hundred people forming a representative cross-section of the Group's stakeholders ⁽³⁾. External stakeholders included internationally-recognised qualified individuals as well as representatives of the Group's main stakeholders (authorities, administrations, shareholders, banks, customers, partners, subcontractors, suppliers, NGOs, etc.). Internally, members of the Executive Committee participated in the development process, as did managers from the Group's main departments and subsidiaries. The conclusions were approved by the Group Senior Executive Vice-President for Innovation, Corporate Responsibility & Strategy. In 2019, the Sustainable

Development Council ⁽⁴⁾, met to examine the Group's materiality analysis and based on current best practice, recommended reducing the number of issues.

On 7 May 2020, the EDF group established its *raison d'être*, which was adopted by 99.99% of the Shareholders' Meeting and added to its articles of association: "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development". More than 4,000 employees contributed to developing this statement ⁽⁵⁾. In accordance with the EDF Sustainable Development Council, these 16 high-priority CSR issues have been ranked and categorised into four key issues in line with EDF's *raison d'être*:

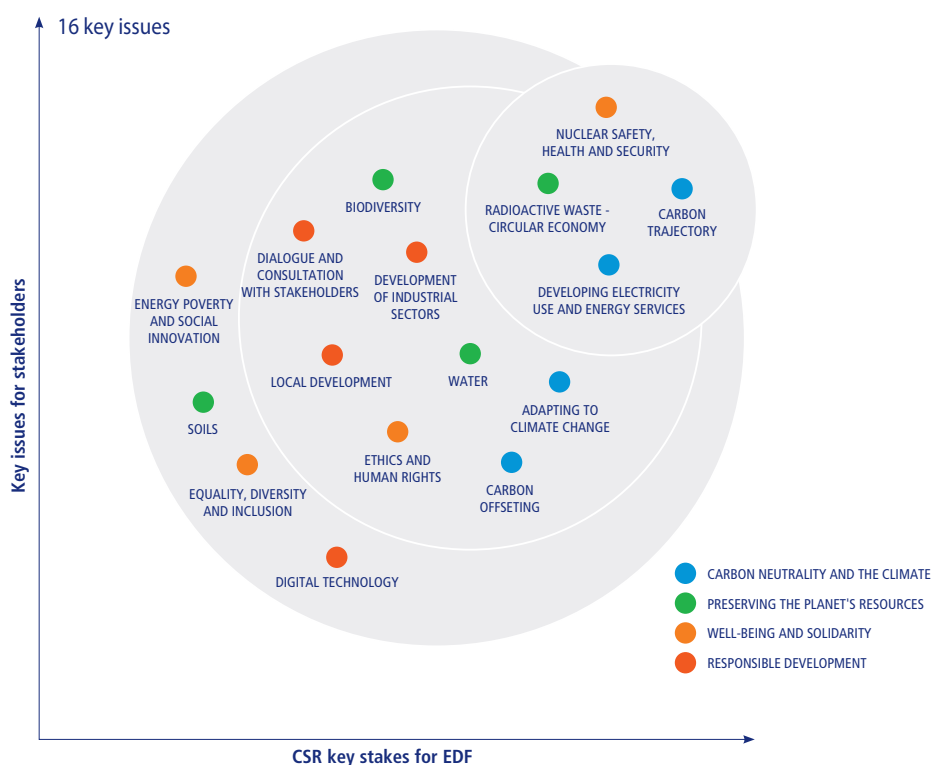
Carbon neutrality and the climate

Preserving the planet's resources

Well-being and solidarity

Responsible development

EDF group's dual materiality matrix has remained unchanged since 2020, with the priority CSR challenges mapped out as follows:



(1) For details of the EDF group's *raison d'être*: see the introduction to the URD; for details of the EDF group's strategy, see section 1.3 "Group strategy and goals"; for details of the EDF group's business model: see section 1.1 and section 1.4; for details of the EDF group's risk factors: see chapter 2 "Risk factors and control framework".

(2) Measuring a company's Environmental, Social & Governance (ESG) performance consists of assessing the extent to which ESG impacts are taken into account in its strategy and management. This process is based on environmental, social and governance criteria that structure the Company's non-financial performance analysis.

(3) For a detailed description of the various methodological stages in its preparation, see section 3.6 "Methodology".

(4) Known as the EDF group Stakeholder Advisory Panel (*Conseil des parties prenantes*) since 2021; see section 3.4.1.1.1 "EDF – a pioneer in the implementation of stakeholder panels". The materiality matrix remained unchanged in 2021.

(5) Through the "Let's talk about energy" dialogues, cf. section 3.4.1.1.2 "An open dialogue with all, involving all of the Group's businesses and subsidiaries".

Given the importance of the issues related to nuclear and hydraulic safety and radioactive waste, which are key business issues for the Group, detailed descriptions of these issues can be found mainly in Chapters 1 "The Group, its strategy and activities" and 2 "Risk factors and control framework" in the following sections: 1.4.1.2.2 "Environment, nuclear safety, radiation protection", 1.4.1.1.2.3 "The issues relating to the nuclear activity", section 2.2 risk 5B "Control of radioactive waste treatment and decommissioning of nuclear facilities, and the ability to meet related commitment", 5C "Nuclear safety violation during operation resulting in nuclear civil liability"; 4E "Hydraulic safety violation".

16 CSR commitments

For each of the 16 high-priority CSR issues, the Group drew up a corresponding CSR commitment in the form of operational policies and actions designed, from an environmental, social and societal point of view, to minimise the negative impacts and maximise the positive impacts of each of these issues.

The following mapping lists these 16 CSR commitments and states for each of them the corresponding non-financial risk as described in the Group major risk mapping,

its contribution to the UN Sustainable Development Goals, and related performance measurements ⁽¹⁾.

Summary of EDF group's 16 CSR commitments and associated performance indicators

The Group's non-financial performance is a component of the Group's performance, designed to facilitate a just, inclusive energy transition.

For a just and inclusive energy transition

EDF's *raison d'être* is based on four key areas which, taken together, aim at ensuring that the Group's engagement in the energy transition is fair and inclusive.

For a detailed description, see the publication Just Transition commitments, " from strategy to action " on the edf.fr website ⁽²⁾.

Methodology and links with other public documents

The methodology for the key indicators cited in the Statement of Non-Financial Performance (DPEF) is set out in section 3.6 "Methodology".

The Pack ESG, a public document recognised at the Finance Transformation Awards, sets out all the EDF group's non-financial indicators ⁽³⁾. The EDF group's Impact

report ⁽⁴⁾ is a public document that draws inspiration from the guiding principles of the Impact Management Project (IMP), and details how the Group aims to maximise its positive impacts to facilitate the energy transition and minimise its negative impacts.


















































(1) For the methodology used for these indicators, see section 3.6 "Methodology".

(2) <https://www.edf.fr/en/the-edf-group/taking-action-as-a-responsible-company/corporate-social-responsibility/just-transition>

(3) www.edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/indicateurs-extra-financiers/indicateurs-esg

(4) www.edf.fr/sites/default/files/contrib/groupe-edf/engagements/2021/impact/edfgroup_impact2021-rapport_vf.pdf

Summary of the EDF Group's 16 CSR commitments and associated performance indicators

Major non-financial risks resulting from the Group's risk mapping	CSR commitments	Contribution to the SDGs
CARBON NEUTRALITY AND CLIMATE		
Adaptation to climate change - transition risks (3B)	Ambitious carbon trajectory	 
Adaptation to climate change - transition risks (3B)	Carbon offset solutions	 
Adaptation to climate change - physical risks (3B)	Adapting to climate change	 
Transformation capacity in the face of disruptions - Downstream transformation (3A)	Developing electricity use and energy services	 
PRESERVATION OF THE PLANET'S RESOURCES		
Industrial safety risk and impact on environmental assets and biodiversity (4G)	Biodiversity	   
Management of large industrial projects - risk of conflict in the use of land (4A) / Industrial safety risk and impact on environmental assets and biodiversity - risk of soil pollution (4G)	Responsible land management	 
Industrial safety risk and impact on environmental assets and biodiversity - risk of water pollution (4G) / Risk relating to adapting to climate change - Risk of conflict in the use of resources (3B)	Integrated and sustainable water management	     
Risk relating to control of radioactive waste treatment and decommissioning of nuclear facilities (5B)	Waste and circular economy	   
WELLBEING AND SOLIDARITY		
Nuclear safety risks during operation (5C) / Risk relating to hydro power safety (4E) / Risk relating to occupational health or safety (employees and service providers) (4C)	Health and safety for all	  
Ethics and compliance risk (1E) / Risk relating to the duty of care : Risks related to supply chains (4B) and management of large industrial projects (4A)	Ethics, compliance and human rights	   
Risk related to the development of employees' skills - professionalisation action and inclusive employer approach (3C)	Equality, diversity and inclusion	 
Risk related to insufficient compensation for missions of general interest (1H)	Energy poverty and social innovation	 
RESPONSIBLE DEVELOPMENT		
Risks related to the management of large industrial projects - consultation of stakeholders and acceptability aspect (4A)	Dialogue and consultation with stakeholders	 
Risks related to the operational continuity of supply chains and contractual relations - responsible procurement approach (4B) / Risk related to the management of large industrial projects - local development of projects (4A)	Responsible regional development	     
Risk relating to management of large industrial projects (4A) - Risk related to the development of employees' skills - professionalisation action and inclusive employer approach (3C) / Risks relating to skills of the nuclear industry and associated reinforcement actions (4B)	Development of industrial sectors	 
Risk related to attacks against assets, including cyberattacks (4D)	Sustainable and inclusive digitalization	 

* Indicator calculated on the basis of an average over the last five years.

** Changes in the methodology for calculating the indicator.

√ 2021 figures subject to reasonable assurance audit by Deloitte & Associés.

NON-FINANCIAL PERFORMANCE

Corporate social responsibility issues and commitments

Policy, actions, results	Key performance indicator	Scope	Unit	Target	2019	2020	2021
Section 3.1.1	Carbon intensity: specific CO ₂ emissions from electricity generation and heat √	Group	gCO ₂ /TWh	35 by 2030	55	51	48
Section 3.1.1.5	Deployment rate of the framework guidelines on carbon offset solutions	Group	%	100 by 2023	-	-	50
Section 3.1.3	Deployment rate of new climate change adaptation plans within concerned entities	Group	%	100 by 2022	-	-	47
Section 3.1.4	Avoided CO ₂ emissions thanks to our sales of innovative goods and services	EDF and Dalkia	Mt	> 15 by 2030	-	-	4.4
Section 3.2.1	Achievement rate of "Act4nature international" commitments	Group	%	100 by 2022	-	44	67
Section 3.2.2	Implementation rate of innovative solutions encouraging multifunctional land use	Group	%	100 by 2026	-	-	20
Section 3.2.3	Water intensity: water consumed / electricity generated by fleet √	Group	l/kWh	< 0.95 *	0.87	0.87	0.86
Section 3.2.4	Annual rate of conventional waste directed towards a waste recovery industry	Group	%	> 90	92.4	91.9	92.7
Section 3.3.1	Global LTIR	Group	Ind	< 1.8 by 2023	2.4	1.9	2.1
Section 3.3.2	Proportion of executives who have completed the anti-corruption training programme	Group	%	100 by 2021	61.8	62.5	71.8
Section 3.3.3	Gender balance index: percentage of women in the Management Committees of the Group's entities	Group	%	33 by 2026	27.3	28.7	29.8
Section 3.3.4	Individual guidance provided every year to our clients as part of the "Energy Support" framework	EDF	Nb	600,000 - 1,000,000	894,260	905,017	642,482
Section 3.4.1	Annual rate of projects for which a dialogue and consultation procedure is engaged**	Group	%	100	-	-	100
Section 3.4.2	Annual rate of procurement from SMEs in France	EDF and Enedis	%	22 - 26	22.5	23.4	24.9
Section 3.4.3	Achievement rate of supporting actions backed by EDF, encouraging relocation and maintaining nuclear industry skills ("France Relance" Programme)	EDF	%	100 by 2023	-	-	28.6
Section 3.4.4	Achievement rate of EDF commitments towards French Responsible Digitalization Institute (INR)	EDF	%	100 by 2024	-	-	18.8



3.1 Carbon neutrality and the climate

Group accountability and commitment to cut CO₂ emissions

In the first section of its sixth assessment report published in August 2021 ⁽¹⁾, the Intergovernmental Panel on Climate Change (IPCC) established that the warming of the atmosphere, oceans, and land observed since 1750 is “unequivocally” caused by human activities. Confirming the conclusions of the 2018 special report on global warming of 1.5°C ⁽²⁾, the IPCC calls for a swift, durable, significant reduction in CO₂ and other greenhouse gas emissions and achievement of net zero anthropogenic CO₂ emissions to stabilise the human-caused increase in global temperatures.

The EDF group recognises that taking action against climate change is a matter of urgency.

It has aligned its ambitions with the Paris Climate Agreement, the aim of which is to keep global warming well below 2°C, preferably at 1.5°C, compared to pre-industrial levels.

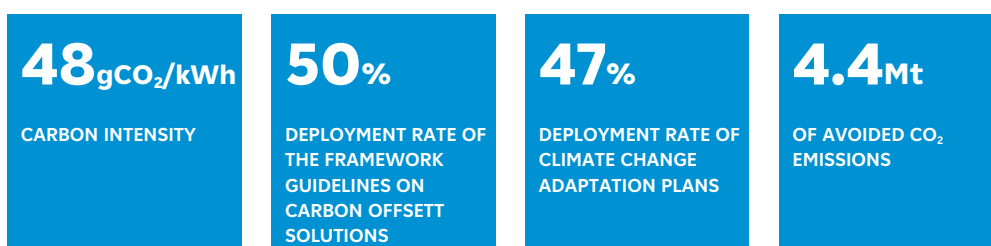
The Group’s trajectory to reduce CO₂ emissions has been validated by Science Based Targets. The EDF group has set up dedicated governance, in accordance with best practices as recommended by the Taskforce on Climate related Financial Disclosure (TCFD) ⁽³⁾.

The Group’s climate strategy, which is in line with CAP 2030, features four CSR commitments: an ambitious carbon trajectory, carbon offsetting solutions, adaptation to climate change, and development of electricity uses and innovative energy services, which together form the EDF group’s Climate Change Plan.

(1) *Climate change 2021: scientific components. Contribution of Working Group I to the sixth assessment report of the French Intergovernmental Panel on Climate Change (IPCC), August 2021.*

(2) *Impacts of global warming of +1,5°C and related global greenhouse gas emission trajectories, special report by the French Intergovernmental Panel on Climate Change (IPCC), October 2018.*

(3) *See also the EDF group press release of 10 December 2020.*



3.1.1 Group carbon trajectory

EDF, the world’s number one producer of direct CO₂ emissions-free electricity

The EDF group is now the world’s number one producer of electricity without direct CO₂ emissions, and as such is a major contributor to the energy transition in the regions where it operates. An Enerdata ⁽¹⁾ study shows that EDF produces more nuclear, hydro, wind, solar and geothermal power than any other electricity supplier in the world. These are all sources of electricity that the IPCC recognises as causing zero direct CO₂ emissions during power production ⁽²⁾.

3.1.1.1 Group commitments and policy

3.1.1.1.1 Achieving carbon neutrality by 2050

The EDF group was one of the first companies, way back in 2018, to set itself the goal of contributing to achieving carbon neutrality by 2050. This commitment was strengthened and clarified in March 2020. This involves in practical terms:

Carbon neutrality by 2050	Group direct greenhouse gas emissions: reducing direct greenhouse gas emissions to zero or virtually zero by 2050.
	Group indirect greenhouse gas emissions: reducing indirect emissions as much as possible within the framework of national policies.
	Group residual emissions: implementing negative-emission projects to offset the Group’s residual emissions by 2050.

(1) power-producers-ranking.enerdata.net/

(2) *i.e. zero CO₂ emissions for electricity produced and delivered to the grid; does not include emissions relating to the fuel supply chain and the life cycle of other components of the production system.*

Group	This commitment covers emissions of all greenhouse gases for all scopes (1, 2 and 3) and for all operations of the Group across the globe.
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Business Ambition for 1.5 degrees	<p>In February 2020, the EDF group signed up for the “Business Ambition for 1.5 degrees: our only future” initiative launched by the United Nations Global Compact, We Mean Business and Science Based Target Initiative. This coalition has now been joined by more than 300 companies committed to achieving carbon neutrality by 2050, in order to limit the rise in global temperatures to 1.5°C with respect to pre-industrial temperatures.</p> <p>Through this commitment, the EDF group is also part of the United Nations “Race To Zero” initiative and has joined the “Climate Ambition Alliance” ⁽¹⁾ alongside more than 120 countries, 450 cities, 45 investors and 1,000 companies.</p>
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3.1.1.1.2 2030 targets recognised by the SBTi initiative

In 2020, the EDF group set new targets to cut its greenhouse gas emissions by 2030, covering both its direct emissions (Scope 1) and its indirect emissions (Scopes 2 and 3). On 7 December 2020, the Science Based Targets initiative ⁽²⁾ confirmed based on its recently-published methodology specially developed for the electrical sector ⁽³⁾ that these goals are in line with the “Well Below 2°C” trajectory.

The EDF group thus committed to the following 2030 targets:

2030 targets recognised by the SBTi	50% reduction, compared with 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (i.e. not generated by it) to be sold to end customers.
	28% reduction, compared with 2019 levels, of emissions from combustion of gas sold to end customers (Scope 3).

Section 3.1.1.2.3 “Summary of the Group Greenhouse gas (GHG) report” and section 3.6 “Methodology” provide detailed explanations of how these goals were set.

In keeping with these targets validated by the SBTi, the EDF group has decided to set the following additional targets for 2030:

Additional 2030 targets	25MtCO ₂ e for Group Scope 1 emissions in 2030.
	28% reduction, from 2019 levels of all Scope 3 emissions by 2030.

With these goals, the EDF group is aiming to maintain its leading position among the world’s lowest-carbon electricity companies. In order to reach these targets, a greenhouse gas emissions reduction trajectory has been developed for the three Scopes of the EDF group. This trajectory contains a 2023 milestone with the following interim targets:

2023 interim targets	28 to 30MtCO ₂ e for the Group’s Scope 1 emissions by 2023 (this range factors in the uncertain post-health crisis scenarios).
	23% reduction with respect to 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (i.e. not generated by it) to be sold to end customers.
	10% reduction with respect to 2019 levels for emissions associated with the combustion of gas sold to end customers and 8% reduction for the entire Scope 3 of the Group.

These 2023 and 2030 Group direct and indirect emissions targets were used to determine emission trajectories for all the Group’s business lines and entities (see section 3.1.3 “EDF climate governance”).

3.1.1.1.3 Objectives in line with the SNBC strategy

The National Low Carbon Strategy (*Stratégie nationale bas carbone*, SNBC) is France’s roadmap to combatting climate change. The SNBC was introduced by the Energy Transition for Green Growth Act (*Loi de transition énergétique pour la croissance verte*, LTECV) in 2015, and comes up for review once every five years. It was revised in 2019 with a view to achieving carbon neutrality nationally by 2050.

This section summarises the analysis of EDF group’s carbon trajectory in view of the National Low Carbon Strategy, in accordance with the French Order of 2 November 2021 adopted under Article 66 of the French 2020 Amended Budget Act no. 2020-935 of 30 July 2020.

	2023	2030	2050
SNBC target - France not including LULUCF *	-13%	-32%	-86%
SNBC target - Energy industries	-23%	-34%	-96%
SNBC scenario – Electricity production	-32%	-37%	-100%
Projected change in the EDF group’s direct emissions in France	-34%	-45%	-100% (near-zero emissions)

* LULUCF: Land Use, Land-Use Change, and Forestry.

(1) Alliance created in September 2019 during the Climate Action Summit of the United Nations General Secretariat by the President of Chile Sebastián Piñera.

(2) Initiative launched by the following four organisations in the wake of the 2015 Paris Agreement: CDP, UN Global Compact, World Resources Institute and World Wide Fund for Nature.

(3) Setting 1.5°C-aligned Science-based Targets: Quick Start Guide for Electric Utilities, CDP, June 2020.

3.1.1.2 The Group's results

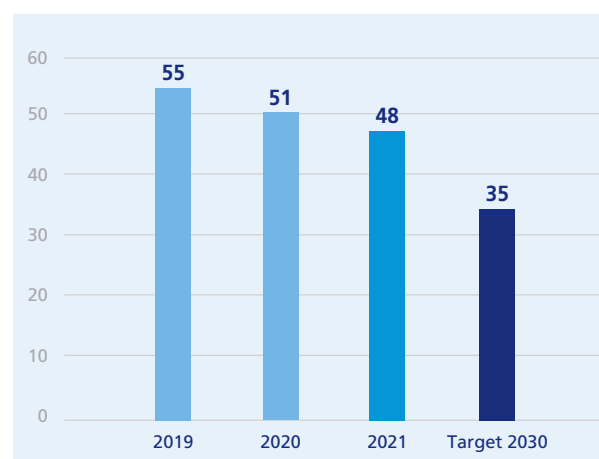
3.1.1.2.1 Carbon performance for the climate

Carbon intensity

The Group's carbon intensity is a key indicator of performance with respect to its carbon trajectory. For the methodology used with for this indicator, see section 3.6 "Methodology".

2021 Performance	The carbon intensity of the electricity and heat produced by the EDF group continued to decrease in 2021, falling below 50gCO ₂ /kWh and reaching a historic low of 48gCO ₂ /kWh. This means that the Group's carbon intensity has been halved since the CAP 2030 strategy was implemented in 2015.
	The carbon intensity of the electricity and heat produced by the EDF group is around five times lower than the European average (231gCO ₂ /kWh ⁽¹⁾) and more than nine times lower than the global average (450gCO ₂ /kWh ⁽²⁾).

Carbon intensity: specific CO₂ emissions from electricity generation and heat (gCO₂/kWh) [√]



[√] 2021 indicator subject to reasonable assurance check by Deloitte & Associés.

If this performance is compared with average carbon intensity in Europe (including France), taking into account direct and indirect emissions, EDF group's electricity generation worldwide in 2021 resulted in 118MtCO₂ avoided.

3.1.1.2.2 Climate performance for integrated performance

EDF promotes integrated performance, combining financial and CSR performance. The Company's value creation is expressed by a combination of financial and CSR indicators.

Emissions to turnover ratio

EDF believes that this indicator accurately reflects integrated performance only if all direct and indirect emissions are taken into account (Scopes 1, 2, and 3). In the space of two years, this ratio has decreased by 28% amid a 15% increase in turnover. In 2021, the figure stood at 1,533tCO₂e per million euros of turnover.

Emissions to turnover	Unit	2019	2020	2021
Scopes 1,2,3	tCO ₂ e	152,743,114	134,661,021	129,474,942
Turnover	M€	71,317	69,031	84,461
Scopes 1,2,3/Sales	tCO ₂ e/M€	2,142	1,951	1,533

3.1.1.2.3 Summary of the Group greenhouse gas (GHG) report

The following table presents trends in the Group's GHG reports between 2019 and 2021.

EDF group greenhouse gas report (MtCO ₂ e)	2019	2020	2021
Scope 1 emissions	33	28	27
Scope 2 emissions	0.3	0.3	0.3
Scope 3 emissions	119	107	102

The following table presents the 3 most significant Scope 3 items:

Significant Scope 3 items (MtCO ₂ e)	2019	2020	2021
Emissions from electricity purchases to be sold on to end customers (not including upstream emissions)	19	18	17
Emissions from combustion of gas sold to end customers (use of sold products)	60	50	45
Emissions from Scopes 1 and 2 of equity accounted assets (investments)	10	10	10

Details on the methodology used to produce this information are explained in section 3.6 "Methodology". The EDF group's detailed GHG report is published on the EDF website [edf.fr](https://www.edf.fr) ⁽³⁾.

(1) 2020 estimation, EU-27, Agence Européenne de l'Environnement, Greenhouse gas emission intensity of electricity generation by country, Oct. 2021

(2) 2019 data, International Energy Agency, Emission Factors 2021, Sept. 2021.

(3) edf.fr/sites/default/files/contrib/groupe-edf/engagements/rapports-et-indicateurs/

The EDF group's carbon footprint (all scopes) continued to decrease in 2021, and was down 4% compared to 2020.

The decrease in the EDF group's direct emissions (Scope 1) in 2021 (down 1% compared to 2020) was smaller than expected due to the exceptional use of EDF's thermal generation fleet at the end of 2021. This exceptional use was due to a combination of low wind power generation, the concomitant unavailability of several nuclear reactors, and high electricity prices throughout Europe. However,

the Group's initial direct emissions target of 28-30 MtCO₂e by 2023 has been met, two years ahead of schedule. Going forward, the Group is considering reviewing its 2030 emissions target.

The decrease in the EDF group's indirect emissions (Scope 3) continued in 2021 (down 5% compared to 2020). This decrease was due in particular to the emissions reduction strategy implemented by the Group in North America for its gas purchase and sale business.

3.1.1.2.4 SBTi indicators

The following table shows progress on the EDF group's trajectory towards achieving its 2030 targets, as validated by SBTi:

SBTi Indicators	2020	2021	2030 target validated by SBTi
Rate of reduction in emissions relating to the sale of electricity (emissions in Scopes 1 and 2, also including emissions from non-consolidated assets and emissions relating to electricity purchased for sale to end customers, baseline year = 2017)	-26%	-28%	-50%
Rate of reduction in emissions relating to the sale of gas (emissions from the combustion of gas sold to end customers, baseline year = 2019)	-17%	-24%	-28%

The EDF group's emissions reduction trajectory (direct and indirect emissions) is on target to achieve the 2030 targets validated by SBTi in December 2020.

3.1.1.3 Roadmap for reducing the Group's direct GHG emissions

To achieve the greenhouse gas emission reduction goals it set itself (see section 3.1.1.1 "Group commitments and policy"), the EDF group implements an action plan in line with its CAP 2030 strategy ⁽¹⁾. This action plan is coordinated by the EDF group Carbon Neutrality Strategy project (see description of climate governance in section 3.1.3.1 "Governance bodies").

By 2030, and in line with the CAP 2030 projects, the main actions enabling the EDF group to achieve these emission targets covering all three scopes are as follows ⁽²⁾:

THE GROUP'S DIRECT GHG EMISSIONS REDUCTION ROADMAP			
Topic	Action	URD Sections	Impact on the low-carbon trajectory *
Coal-fired closures	No more coal power generation by 2030.	3.1.1.3.1	~-60%
Replacement of fuel oil in island regions	Replacement of fuel oil in existing fossil-fuel fired facilities with lower carbon fuels (liquid biomass and possibly gas) as part of their Multi-Year Energy Programme (<i>Programmation pluriannuelle de l'énergie</i> , PPE).	3.1.1.3.2	~-15%
Greener heating networks	Greening of Group-managed heat networks: biomass, waste heat recovery, geothermal and ocean thermal energy conversion	3.1.1.3.3	~-10-15%
Limiting fossil fuel emissions	Application of strict criteria to the development of any new combined cycle gas turbine project by the Group, and reducing the use of existing resources following the increase in renewables.	3.1.1.3.5	~-5-10%
Emissions of SF ₆ and HFCs	Measures to manage and reduce uncontained SF ₆ emissions from electrical transmission and distribution systems as well as uncontained HFC emissions from air-conditioning units	3.1.1.3.6	< 1%
Consumption by the Group's facilities	Managing Group facility energy use	3.1.1.3.7	< 1%
The Group's vehicle fleet	Fully electrifying the EDF group's light vehicle fleet in accordance with the EV100 commitment	3.1.1.3.8	< 1%

* Contribution to the 25MtCO₂e decrease between 2017 and 2030 (50% reduction in Scope 1 emissions).

3.1.1.3.1 Coal-fired power generation, currently representing 0.7% of the total power generation, to be reduced to 0 by 2030

The EDF group is implementing its commitments by closing down coal-fired electricity generating plants.

For some twenty years now, the EDF group has been implementing and supporting the closure of as many units powered by coal and heavy fuel oil across Europe as possible. Since 2017, the EDF group has been engaged in the Powering Past Coal Alliance ⁽³⁾, which promotes the phasing out of coal in EU countries by 2030 and in the rest of the world by 2050 in the wake of the Paris Agreement. The EDF group supports the Global Coal to Clean Power Transition Statement ⁽⁴⁾ that was recently signed at COP26.

(1) See section 1.3. "Group Strategy".

(2) It should be noted that Enedis is also experimenting with Local Zero Emission Generating Sets (GE ZE), an alternative solution to conventional generating sets. The diesel engine is replaced with a battery or a hydrogen fuel cell, the use of which locally emits no noise, CO₂, or pollutants. These GE ZEs will supply customers during outages for works on the public electricity distribution network, while reducing the impact on the environment and maintaining the collection of local renewable energies connected to the network. They will contribute to the zero carbon objective.

(3) poweringpastcoal.org/members

(4) ukcop26.org/global-coal-to-clean-power-transition-statement/

Commitment

In 2019, the EDF group set itself the goal to stop coal-fired power generation by 2030 in all geographical areas.

Unit closure schedule

Cottam (4 units, 2,000MWe, United Kingdom)	September 2019
Le Havre (580MWe, France)	April 2021
West Burton A (units 3 and 4, 1,000MWe, United Kingdom)	September 2021
West Burton A (units 1 and 2, 1,000MWe, United Kingdom)	September 2022

Results of the coal phase-out policy

Number of coal-fired carbon units shut down since 1995	33
Number of heavy fuel oil units shut down since 1995	15
Coal-based electricity production capacity withdrawn since 1995 (GWe)	10.8
Heavy fuel oil-based electricity production capacity withdrawn since 1995 (GWe)	6.8
Estimated reduction in annual emissions (MtCO ₂ e) *	40
Coal-based electricity and heat production capacity, 2021 (GWe)	2.9
Coal-based electricity and heat production capacity, 2022 (GWe)	1.9
Ratio of coal-based electricity and heat production to total production, 2021 (%)	0.8

* Conservative estimate, assuming an average load factor of 40% for coal-fired power plants and 10% for heavy fuel oil-fired power plants.

Details	40Mt reduction in CO ₂ e emissions	This coal (and oil) phase-out policy resulted in an estimated reduction of the European electrical sector's annual greenhouse gas emissions by more than 40MtCO ₂ e.
	Very limited operation	In 2020, coal-fired heat and electricity generation accounted for 0.8% of the EDF group's total in 2021 output. These production assets are actually used only during "peak" periods. As a result, their operation and subsequent emissions are very limited.
	Pending closures of coal-fired units operated by EDF	As of September 2022, the EDF group will be operating only two coal-fired units in Europe, located at the Cordemais power plant in the Loire-Atlantique region. Pursuant to the French Energy and Climate Act of 2019, operation of these two units will be limited from 1 January 2022 onwards by an annual emissions cap; operation is to halt by no later than the end of 2026, depending on transmission network operator RTE's requirements. See section 1.4.1.2.2 "Issues relating to thermal generation".
	Support during closures	All of these closures are accompanied by employee redeployment measures and initiatives within the Group to develop new local economic activities. See section 3.4.3.3.1 "Power plant closures: greater solidarity".

3.1.1.3.2 Energy transition in island regions

Corsica and the French overseas territories, as Non-Interconnected Zones (NIZ) in terms of the mainland power grid, are covered by specific Multi-Year Energy Programme (PPE), which set ambitious low-carbon and energy independence goals for them (energy independence of overseas territories by 2030 and Corsica by 2050).

Fossil fuel-fired facilities, mainly oil or diesel generators and combustion turbines (CT), have historically played a major role in these zones. They can handle highly-seasonal electricity use, guarantee a secure supply and mitigate intermittent renewable energy input into electrical systems that cannot be switched to imports in case of peak demand or production issues.

To achieve low-carbon electrical production in the Non-Interconnected Zones (NIZ), the EDF group has put the following actions in place:

Replacement of fuel oil	Gradual replacement of fuel oil with liquid biomass between 2023 and 2028 in existing EDF SEI and EDF PEI engine power plants, in line with the PPE for various territories.
Shutdown of the oldest combustion turbines (TAC) and generators	Shutdown of the oldest oil-fired combustion turbines (TAC) and generators as and when new generation resources with lower emissions become available. As a result, the future Larivot plant in Guyana designed by EDF PEI will be powered with liquid biomass, replacing the Dégrad-des-Cannes fuel plant, which is set for shutdown by the end of 2023 ⁽¹⁾ . Operation of the new power plant with liquid biomass was included in the French Guiana PPE in August 2021.
Energy management systems	Voluntary implementation of an energy management system (ISO 50001 certification) at 7 of the 8 most important SEI fossil fuel-fired generation sites and output optimisation work and energy efficiency initiatives on EDF PEI facilities.
100% renewable projects	The development of 100% renewable energy projects for isolated microgrids (e.g. in French Guiana's interior municipalities).

Section 1.4.4.3 "Island Energy Systems" provides a fuller description of the actions taken by EDF in the islands in question, such as measures to manage energy (e.g. solar water heaters), plans to increase the production capacity of active hydroelectric facilities, development of networks compatible with the integration of renewable energy (e.g. batteries, synchronous condensers, Energy Management Systems, etc.).

(1) In French Order no. 2100957 of 27 July 2021, the urgent applications judge of the French Guiana administrative tribunal suspended execution of the Order of 22 October 2020 granting the environmental authorisation for operation of the EDF-PEI power plant. These legal proceedings are ongoing.

3.1.1.3.3 Greener heating networks

The EDF group, through its subsidiary Dalkia, manages over 330 urban heating and cooling networks. It is France's number one energy service provider. Dalkia has set itself the goal of achieving 65% renewable and recovered energy (R&RE) in its heating networks in France by 2026, and achieved 57.7% in 2020⁽¹⁾.

This commitment has led to development of the use of biomass, recovery of waste heat, and geothermal and oceanic thermal energy conversion. For more details, see section 3.1.4.3 "Developing efficient, low-energy, innovative energy services".

Globally, coal accounted for 2.62% of 2021 heat production by Dalkia, which has committed to no longer use this fuel for its heating activities in France, in line with the provisions of the Multi-Year Energy Programme.

Use of renewable energies and energy efficiency services enabled Dalkia to reduce its customers' greenhouse gas emissions and allowed 4 million tonnes of CO₂e to be avoided in 2021 (see section 1.4.6.1.1 "Dalkia").

3.1.1.3.4 Use of Power Purchase Agreements (PPA)

See section 3.1.4.2.3 "Low-carbon electricity at an affordable price".

3.1.1.3.5 Low-carbon thermal energy

Gas activities account for a significant share of the EDF group's GHG report, particularly through three activities: production of electricity from natural gas, production of heat from natural gas, and sale of natural gas to end customers (residential customers, businesses, and local authorities).

The **CAP 2030 Decarbonised Thermal Project** launched in March 2021 aims to propose for each of the Group's thermal assets:

- a decarbonisation strategy for existing assets and a development strategy for new decarbonised assets;
- a roadmap to guarantee the availability of such decarbonised thermal generation means at the appropriate time, and therefore the mastery of the related technologies and skills.

Within this framework, a "Decarbonised Thermal" programme has been drawn up to anticipate the needs of the roadmap as far as possible: to have proven "Decarbonised Thermal" technology available as soon as possible by 2030 and to enable the identification of the necessary resources.

The EDF group has defined a set of internal criteria promoting low-carbon thermal energy in order to align its gas business with its climate-related commitments:

Multidisciplinary criteria

All the EDF group's gas activities fit into the carbon trajectories (covering both direct and indirect emissions) set for each of the Group's entities in line with the Group's 2030 goals. All development projects must demonstrate a contribution to the energy transition of the relevant regions and their business plan must ensure compliance with the Group's 2050 carbon neutral target.

Additional electricity production criteria

No development of new gas projects (Combined Cycle Gas, CCG), unless the project contributes to reducing the carbon intensity of the country's electrical system or further secures its supply. When technically and economically feasible, the project uses solutions enabling reduction of its direct emissions, such as green gas, hydrogen or CO₂ capture and storage.

Additional criteria for gas sales

The EDF group helps its gas customers to shift to energy savings, energy efficiency and a reduction in their emissions through its products and services, expertise and specialised subsidiaries. It develops and encourages alternative solutions to fossil fuels whenever available (electricity, heat pumps, renewable gas, renewable heat etc.).

The EDF group supports the development of the biogas sector whenever a project's business model is viable in the long term. It does so mainly through its subsidiary Dalkia, which operates in biogas production, processing and recovery activities, both for cogeneration and direct reinjection into the natural gas distribution network.

Finally, the EDF group is constantly working to optimise the energy and environmental performance of its fossil fuel-fired fleet in order to reduce its CO₂ emissions, as well as to provide more services to the electricity system.

3.1.1.3.6 Reduction of SF₆ and HFC emissions

Fluorinated gases such as sulphur hexafluoride (SF₆) and hydrofluorocarbons (HFC), used as refrigerating fluids, are powerful greenhouse gases. Their emissions in 2021 were estimated for the entire EDF group at a total of 148ktonnes of CO₂e, i.e. approximately 0.5% of EDF group direct emissions (Scope 1). Emissions are produced by leaks during both the production process and lifecycle. Wherever technologically and economically possible, the EDF group uses alternative technologies to SF₆. All EDF group business lines are working to cut the carbon impact of HFCs wherever technologically possible.

Reduction of SF₆ emissions

Existing nuclear fleet

Based on a proactive policy, the Nuclear Generation Division in France managed to reduce its SF₆ emissions by 85% between 2008 and 2020 and since 2019 has set up a plan of specific actions designed to restore all its facilities to their initial leakage rate, i.e. 1% per year. The overall rate in 2020 was 1.83%; in 2021, it should be less than 1.5%, despite an isolated incident at one site during the year (a leak of approximately 210kg). The average rate of leakage from sites located on river banks is less than 0.4%, even though coastal sites contribute considerably to emissions due to corrosion of equipment.

Investments made by EDF over the past three years have halved emissions from nuclear fleet overall. EDF is deploying a range of technological innovations to achieve this, including alternative coatings to protect against corrosion and innovative solutions for SF₆ recovery and leak plugging. EDF's procedure in this respect forms part of an As Low As Reasonably Achievable (ALARA) policy that is appropriate in view of unit safety issues and network security.

New Nuclear Projects and Engineering

The air insulation technology adopted for the EPR2 project's Energy Removal Platform⁽²⁾ means that equipment liable to contain SF₆ can be kept to a minimum. The technology adopted for switchgear will depend on the developments and apparatus available on the market at the time that contracts are drawn up.

For the Flamanville EPR, it has been decided to locate the equipment in question indoors in order to protect it from sea wind corrosion. EDF has also committed to an R&D programme (Project Zero SF₆) to monitor and test alternatives to SF₆ for its installations.

Distribution

SF₆ emissions by distribution network operator Enedis amounted to approximately 400kg in 2021. The action plan implemented by Enedis to reduce these emissions has focused in particular on the deployment, since July 2021, of a new technical series of high-voltage vacuum breakers (with no SF₆) for new high-voltage switchgear fitted in primary medium- and high-voltage substations. In 2021, 120 vacuum breakers were installed in 6 source substations. In 2022, approximately 1,000 vacuum breakers are due to be installed. Over 90% of SF₆ from obsolete breakers is recovered and regenerated, thus avoiding the need to produce new gas. Following on from this initial success, Enedis is entering into partnerships with suppliers to evaluate alternative solutions based on entirely non-toxic natural gases for secondary substations.

Reducing HFC emissions

HFCs are used as refrigerating fluid in industrial refrigeration units and air conditioning in the service sector. Their use expanded worldwide from the 1980s onwards, as an alternative to chlorofluorocarbons (CFCs) and HFCs whose use was prohibited by the Montreal Protocol (1987) due to their destructive effects on the stratospheric ozone layer. Atmospheric emissions of HFC are the result of leaks that may occur during the lifecycle of these products.

(1) 2020 data. 2021 data were not available at the time of publication of this document.

(2) See section 1.4.1.1.3.2 "Other 'New Nuclear' projects".

The main method of reducing these greenhouse gas emissions is to use refrigerating fluids that have a lower Global Warming Potential (GWP), in line with the goals of EU legislation seeking to reduce the quantities of HFCs (expressed in CO₂e) on the market by 79% compared to 2015 levels by 2030.

Presently, the most-used refrigerating fluid in EDF's production fleet (almost 95%) has a GWP of 1,430. EDF has commissioned studies to evaluate the possibility of converting existing refrigerating units to operate with refrigerating fluid with a lower GWP (< 600).

3.1.1.3.7 Consumption of EDF group's own installations

See section 3.2.4.3.3 "Optimisation of internal consumption".

3.1.1.3.8 EDF group light vehicle fleet

See section 3.1.4.3.6 "Decarbonisation solutions for transport".

3.1.1.3.9 Employee travel

See section 3.2.4.3.3 "Optimisation of internal consumption".

3.1.1.4 Roadmap for increasing the Group's decarbonised production

To achieve the low-carbon power production goals it has set itself (see section 3.1.1.1 "Group commitments and policy"), the EDF group is implementing an action plan in line with its CAP 2030 strategy ⁽¹⁾. This action plan is coordinated by the EDF group Carbon Neutrality Strategy project (see the description of climate governance in section 3.1.3.1 "Governance bodies").

EDF, Europe's biggest investor in low-carbon energy

The EDF group is investing massively to prepare for the future and build a CO₂-neutral energy future. The Group's electricity generation mix in 2021 was 78.2% nuclear, 8.8% hydro, 4.0% other renewable energies, 7.3% gas, 1.0% fuel oil and 0.7% coal ⁽²⁾ (see section 1.1 "Key figures").

By 2030, and in line with the CAP 2030 projects, the main actions enabling the EDF group to achieve its targets relating to decarbonised generation are as follows:

ROADMAP FOR INCREASING THE EDF GROUP'S LOW-CARBON POWER PRODUCTION		
Topics	Actions	URD Sections
Grand carénage programme	Grand Carénage programme to extend operation of the French nuclear fleet beyond 40 years	3.1.1.4.2
EPR	Commissioning of 5 EPRs by 2030 (FA3, HPC and TSH), commitment to new EPR2 and SMR reactors	3.1.1.4.3
Development of renewable energies	Doubling installed renewable energy capacity (including hydropower) between 2015 and 2030 to achieve 60GW net by 2030	3.1.1.4.4
Management of intermittence and flexibility	Development of electricity storage to improve system flexibility and manage the intermittence of non-controllable renewable energies	3.1.4.1.5

3.1.1.4.1 Low-carbon investments

The Group is by far the biggest investor in the energy transition in Europe, accounting on its own for more than 25% of industrial investments in the electrical sector ⁽³⁾.

In 2021, nearly 94% of Group investments were in line with the Group's net-zero trajectory (94% in 2020), with 50% of investments concerning the nuclear sector (51% in 2020). 40% of the Group's investments are aligned with the European sustainable taxonomy in effect since 31 December 2021 (43% at 31 December 2020 applying the method based on the March 2020 TEG). This notably covered investments in networks, renewable energy production (hydropower, solar power, wind power) and certain energy services (see note 20.4 to the 2021 consolidated statements and section 3.8.3 "Details on the taxonomy").

3.1.1.4.2 Grand Carénage programme

See section 1.4.1.1.2.1 "EDF's nuclear fleet in France and its operation".

3.1.1.4.3 New Nuclear projects

See section 1.4.1.1.3 "New Nuclear projects".

3.1.1.4.4 Doubling of installed renewable energy capacities between 2014 and 2030

The EDF group is today the biggest renewable energy producer in Europe ⁽⁴⁾, with global production in 2021 of 67.1TWh of electricity and 7.3TWh of renewable heat through hydroelectricity, wind turbines, photovoltaic solar power and other renewable energies.

In accordance with its CAP 2030 strategy, it set itself the goal of more than doubling its installed net renewable capacity between 2014 and 2030, increasing it to 60GWe by 2030. In 2021, the Group's net installed renewable capacity was 34.8GWe.

	2030 Targets	2019	2020	2021
Net installed renewable capacity (in GWe)	60	32	33	35

The EDF group was ranked as one of the top 10 "green" companies in the world and one of the five most dynamic European companies in terms of renewable energy development ⁽⁵⁾ (see in particular section 1.4.1.3.3 "EDF Renewables activities").

(1) See section 1.3. "Group strategy".

(2) In consolidated data.

(3) 7th European energy company financial ratings "Watt's Next Conseil", June 2021 (wattsnext.fr).

(4) Climate Change and Electricity, European carbon factor, Benchmarking of CO₂ emissions by Europe's largest electricity utilities, PWC, October 2021.

(5) Energy Intelligence, Green utilities report, 2019 (www.energyintel.com/).

3.1.1.4.5 Management of intermittence and flexibility

See section 3.1.4.2.2 "Better management of intermittence, flexibility and storage development".

3.1.1.5 Roadmap for reducing the Group's indirect GHG emissions

Topic	Action	URD Sections	Impact on the low-carbon trajectory *
Emissions from the purchase of electricity for resale to end consumers	Greening (use of renewable energy PPAs) of purchases of electricity for sale to end customers in countries where electricity has a high carbon intensity	3.1.4.2.3	~-15%
Emissions from gas combustion sold to end consumers (use of products sold)	Support to gas consumers in their transition towards energy sobriety, energy efficiency, and the reduction of their emissions via Group offers, expertise, and subsidiaries, in particular by promoting alternative solutions to fossil fuels	3.1.4	~-60%
Employee travel	Reducing emissions from employee travel, particularly in view of the new Group Travel Policy	3.2.4.3.3	< 1%
Investments	Divestment from non-controlled carbon production assets		~-25%

* Contribution to achieving the goal of reducing Scope 3 emissions by 20% between 2019 and 2030.

3.1.1.6 Use of negative emissions solutions

3.1.1.6.1 Policy

For the EDF group, use of carbon offsetting is the final stage of a process to achieve neutrality, based on the "Avoid-Reduce-Compensate" approach. Carbon offsetting must not under any circumstances take the place of a strategy designed to drastically reduce the Group's emissions, whether direct or indirect.

The EDF group is focusing on the use of "negative emissions" projects to offset its residual emissions by 2050, compared to "avoided emissions" projects. This can include technological solutions, such as Bio-Energy with CO₂ Capture and Storage (BECCS), or natural solutions, such as carbon sequestration in forests and soil.

In accordance with current carbon compatibility rules ⁽¹⁾, emission credits from carbon offsetting are not deducted from the EDF group greenhouse gas report and are accounted for separately.

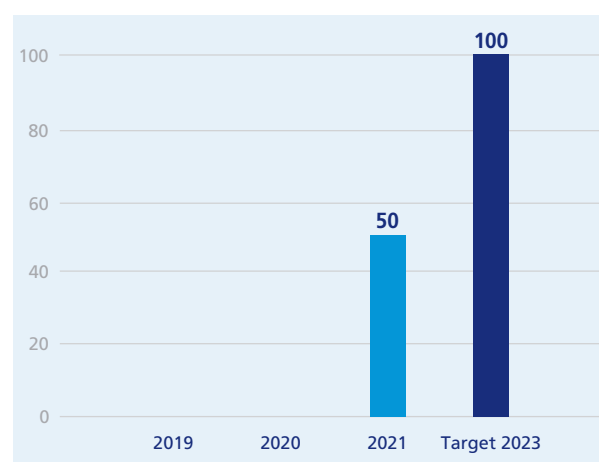
3.1.1.6.2 Group key performance indicator

EDF is working with SBTi on methodology to align the performance indicator with SB methodology.

In the meantime, the Sustainable Development Department has finalised a memorandum of application for all Group entities with the aim of establishing EDF group governance principles for carbon offsetting, more specifically carbon credit redemption. It also establishes reporting methods for entities using offsetting practices (reporting on Sustainable Development Committee ⁽²⁾).

The Group has decided to use a "transitional KPI" between the end of 2021 and the end of 2022: the rollout rate for the guidance on carbon offsetting solutions within Group entities ⁽³⁾. For the methodology used for this indicator, see section 3.6 "Methodology".

Deployment rate of the framework guidelines on carbon offset solutions (%)



(1) GHG Protocol Corporate Accounting and reporting Standard, WRI-WBCSD, 2015.

(2) See section 3.5.2 "CSR governance bodies".

(3) For the methodology used for this indicator, see section 3.6 "Methodology".

3.1.1.6.3 Research and development

The EDF group R&D Division is implementing the Group's strategy to achieve carbon neutrality by 2050 by actively monitoring negative emissions technologies and more specifically exploring the following solutions:

CO₂ capture and storage (CCS)

The EDF group has solid skills in this area, having participated in several international research projects and created a capture demonstrator at its Le Havre site. This €22 million demonstrator (25% co-funded by ADEME, *i.e.* the French Environmental & Energy Management Agency) has captured 1,900 tonnes of CO₂ and was used to determine the technical and economic feasibility of several processes. An alternative to storage is to reuse carbon dioxide captured in a different chemical form (fuels, materials). Applied to bioenergy (considered to be CO₂-neutral), CCS is becoming a way to generate negative CO₂ emissions (BECCS) and could play a major role by 2050. The EDF group's R&D Division has undertaken action to adapt these capture technologies to industrial processes in other sectors.

Direct Air Capture

Atmospheric CO₂ capture technologies (Direct Air Capture, DAC) are still at the experimental stage. In November 2020, EDF in the United Kingdom published a call for expressions of interest to set up a direct air CO₂ capture demonstrator on the site of the Sizewell C nuclear power plant project.

Solutions based on nature

These practices, like afforestation, reforestation, or proper management of pastures and wetlands now appear among the most promising potential ways to increase carbon sequestration in soil and forests, and accordingly generate negative emissions. The EDF group is the third biggest land manager in France, with more than 40,000 hectares of land featuring not only production sites but extensive countryside (including 7,000 hectares of forests).

The EDF group's R&D Division is working to assess the potential of the Group's land to store carbon, the temporal, additional reality of offsetting actions, and the synergies and potential contradictions of carbon offsetting with respect to other ecosystem services, including preservation and biodiversity.

3.1.2 Adapting to climate change

The climate change we are witnessing is unprecedented on such a short timescale. The average temperature of the planet has already increased by 1.1°C since 1750 ⁽¹⁾. This global warming triggers the rise of sea levels and an increase (to varying degrees in different regions of the world) in the frequency and magnitude of natural disasters; it also contributes to an erosion of biodiversity worldwide. Climate risk is already a tangible reality, the effects of which will become more pronounced in the coming years.

EDF's facilities have a technical lifespan potentially exceeding 40 years, making EDF one of the major firms, among non-nationalised companies, that is most exposed to the physical effects of climate change. This is why the EDF group identified climate risk as a priority in 2018.

Adapting to climate change refers to a procedure to adjust to the current climate, its changes, and its consequences. This means mitigating the harmful effects of climate change to nurture the resilience of the system in question and making the most of any beneficial effects and resulting opportunities.

3.1.2.1 Policy

The Paris Climate Agreement assigns the same level of importance to the goal of adapting to climate change as to mitigation. However, it must be acknowledged that given the lack of simple, shared indicators, the regulatory framework for adapting to climate change is still considerably less developed than that for mitigation. The National Adaptation Plan for Climate Change ⁽²⁾ makes France one of the most advanced countries in the world in terms of planning for adaptation to climate change. France aims to effectively adapt to a regional climate in Metropolitan France and overseas territories by the middle of the 21st century

consistent with a temperature increase of 1.5-2°C worldwide compared to 19th century temperatures. However, this plan does not establish any regulatory requirements that are directly applicable to businesses.

The EDF group has therefore taken a responsible, proactive approach by establishing a set of integrated commitments in the Group's Corporate Social Responsibility (CSR) policy.

Pursuant to this policy, the EDF group undertakes to:

EDF group commitments

- evaluate the impacts of climate change on future and existing activities;
- adapt existing installations to make them less sensitive to climatic conditions and more resilient to extreme weather events;
- incorporate climate change scenarios in the design of new installations;
- adapt the Group's solutions, internal operations and know-how in light of climate change;
- take into account the eco-systemic dimension of climate change.

In particular, this policy states that entities most exposed to the physical consequences of climate change should draw up a climate change adaptation plan and update it every five years.

It is important to note that adaptation and mitigation actions are both vital and complementary: unquestionably, the EDF group's foremost climate change adaptation action consists in striving to produce electricity and heat without emitting greenhouse gases.

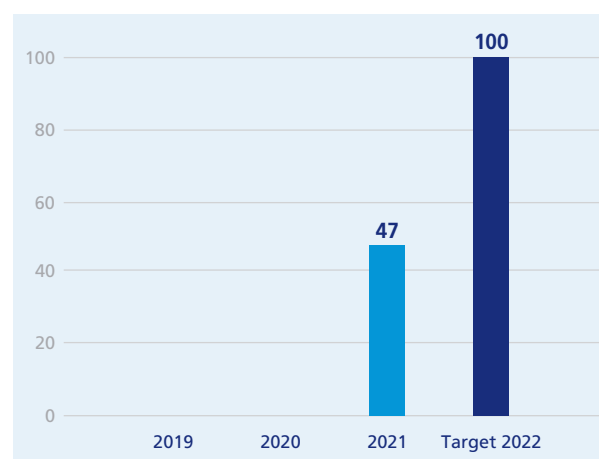
(1) Climate change 2021: scientific components. Contribution of Working Group I to the sixth assessment report of the Intergovernmental Panel on Climate Change, August 2021.

(2) National Adaptation Plan for Climate Change (*Plan national d'adaptation au changement climatique*) for 2018-2022, known as PNACC-2.

3.1.2.2 Key performance indicator

In addition to the priority actions which have long been undertaken by the Group, the rollout rate for new climate change adaptation plans aims to ensure the structuring, prioritisation, and industrialisation of actions undertaken in Group entities exposed to the physical risks of climate change, in compliance with TCFD requirements. Depending on the entities concerned ⁽¹⁾, this involves producing an adaptation plan by a qualitative and/or quantitative approach, to be integrated into the environmental management system by the end of 2022. For the methodology used for this key performance indicator, see section 3.6 "Methodology".

Deployment rate of new climate change adaptation plans within concerned entities (%)



3.1.2.3 From climate disaster plan to global resilience strategy

By 1999, the storms Lothar and Martin had already led EDF to work on mitigating the physical impact of climate change on its activities. The EDF group developed a climate disaster plan in 2004, followed by a climate change adaptation strategy in 2010.

The EDF group adaptation strategy covers first and foremost production facilities with a lifespan of over 40 years, such as nuclear power plants and hydroelectric dams. All EDF group entities are required to take account of climate risks (including both physical risks and "transition" risks) when mapping their risks ⁽²⁾.

3.1.2.4 An internal Climate Department, unlike any other major electricity company

Immediately after the publication of the IPCC's first report in 1990, the EDF group resolved to develop internal skills focusing on climate issues, in collaboration with key organisations such as MétéoFrance (i.e. the French meteorological office).

EDF R&D's Climate Department acts as an interface between scientific knowledge about the climate and the EDF group's business lines. It provides the Group's different business lines with climate data that can be used to quantify climate-change-related risks and develop appropriate adaptation plans. EDF systematically takes the IPCC's worst-case scenario (currently, RCP 8.5) into account in its impact and design studies.

The EDF group has a team of some fifteen permanent researchers investigating the consequences of climate change on its existing and future production fleets for nuclear, hydro, wind, and solar power, etc., changes in production potential from renewable energy and trends in energy demand. The Group has developed an operational unit to monitor meteorological phenomena and forecast their impact on water catchment sources.

3.1.2.5 The ADAPT project of the Nuclear and Thermal Park Directorate (DPNT)

The aim of the ADAPT programme conducted by EDF's Nuclear & Thermal Fleet Division (DPNT) is to perform a thorough analysis of the existing nuclear fleet's level of adaptation to climate change. This involves identifying potential weaknesses and suggesting appropriate action plans. Over and above engineering works, the analysis also considers the systemic and changing nature of the consequences of climate change.

Chooz 2050

The ADAPT programme has launched Chooz 2050 on the basis of a detailed study of a site chosen specifically for its lifespan (2050) and water-related issues. This study allows a life-size analysis of all aspects of the project, from industrial installations to binding and non-binding ecosystems. ADAPT examines issues relating to the inhabitability of the planet, water, temperature, energy, farming, transportation, and industry in a complex ecosystem. Chooz 2050 will publish a "climate monograph" to offer decision support in preparing regional adaptation strategies.

(1) DPN, EDF Hydro, SEI, EDF UK, Dalkia, Luminus, Edison, Framatome, DIPNN, EDF-R, DTEO.

(2) See section 3.1.3.2.2 "Identifying climate change risks and opportunities".

3.1.2.6 Extreme events and summer transition

Lessons learned from the 2003 crisis

In 2003, some power plants had to reduce output so as not to further heat river water, leading to a production loss of 5.5TWh, equivalent to 1% of EDF's production that year. The aim of the adaptation actions launched by EDF, has been to increase the safety margin and maintain production levels during such periods.

The "Heatwaves" plan and dimensioning of power plants

The *Grands Chauds* ("Heatwaves") plan launched in 2008 resulted in EDF making improvements to cold water source cooling efficiency for some of its power plants,

and hardening reactor building electronics so that they can withstand temperatures in excess of 50°C. All EDF group power plants currently under construction (including Flammanville 3 and Hinkley Point C) have been designed taking into account the most recent climate scenarios; in particular, this has involved revising the rise in sea levels upwards.

Results

Given summer temperatures and rainfall, watercourse flow was sufficient in 2021. There was no loss of production to comply with regulations on temperature or river warming, or to adhere to minimum river flows.

3.1.2.7 Adaptation of hydroelectric facilities

In order to reinforce resilience to extreme climate events and risks relating to the massive inflow of water into reservoirs, the EDF group is implementing the following actions:

Reassessment of extreme flooding	Regular reassessment of extreme flooding to ensure the capacity of flood evacuation infrastructure is maintained.
"Piano Key Weir" Technology	Development and installation in 9 of EDF's hydroelectric facilities of an innovative technology known as a Piano Key Weir (PKWeir), allowing a far greater quantity of water to flow through without increasing the dimensions of the dam.
Adaptation works	<ul style="list-style-type: none"> Resizing the evaluation of overflow at the Lanoux dam (Pyrénées-Orientales). Raising the top of the Riète dam in the Aston Valley (Ariège). Spillway recalibration works on the La Palisse sur la Loire dams (Ardèche), raising the abutments and reinforcing downstream scour protection; Work to raise the Les Bois reservoir water intake in the Mont Blanc massif by several metres, thus taking into account and anticipating the shrinkage of France's largest glacier, the Mer de Glace.

3.1.2.8 Adjustment of distribution networks

Enedis is working to reduce the vulnerability of its networks, experimenting with local zero emission generators, and has set up an Electricity Rapid Intervention Force (FIRE).

Reducing network vulnerability	Enedis is also working on reducing the vulnerability of its 1.4 million kilometres of networks. This mainly consists in burying high-voltage overhead lines to avoid risks of falling trees, wind, snow and frost, beginning with the most exposed facilities. In 2021, 2,341km of high voltage overhead lines and 3,588km of low voltage overhead lines were removed. In the island regions, 95% of new networks are built underground.
Electricity Rapid Intervention Force (Force d'intervention rapide électricité, FIRE)	<p>Enedis set up ⁽¹⁾ the Electricity Rapid Intervention Force (<i>Force d'intervention rapide électricité</i>, FIRE), enabling resources and staff to be redeployed nationwide to restore power as quickly as possible. FIRE is one of the EDF group's key measures to respond to extreme weather risks. FIRE currently has 2,500 technicians trained for crisis situations and 11 logistics storage facilities across the country, allowing the deployment of 1,800 high-power generators (> 60kVA) and 1,000 low-power generators (10kVA), meeting the power needs of low voltage networks during significant climate incidents</p> <p>2021 was impacted by Storm Aurore in addition to several storms and snow episodes which were quickly brought under control. In 2021, FIRE intervened on 5 occasions.</p>

3.1.3 EDF climate governance

3.1.3.1 Governance bodies

The EDF group's climate strategy governance forms part of its sustainable development governance (see section 3.5.2 "CSR governance bodies"). This is supervised, in accordance with the independent management of the network's infrastructure managers, at the top Group level.

3.1.3.1.1 Governance reinforced recently

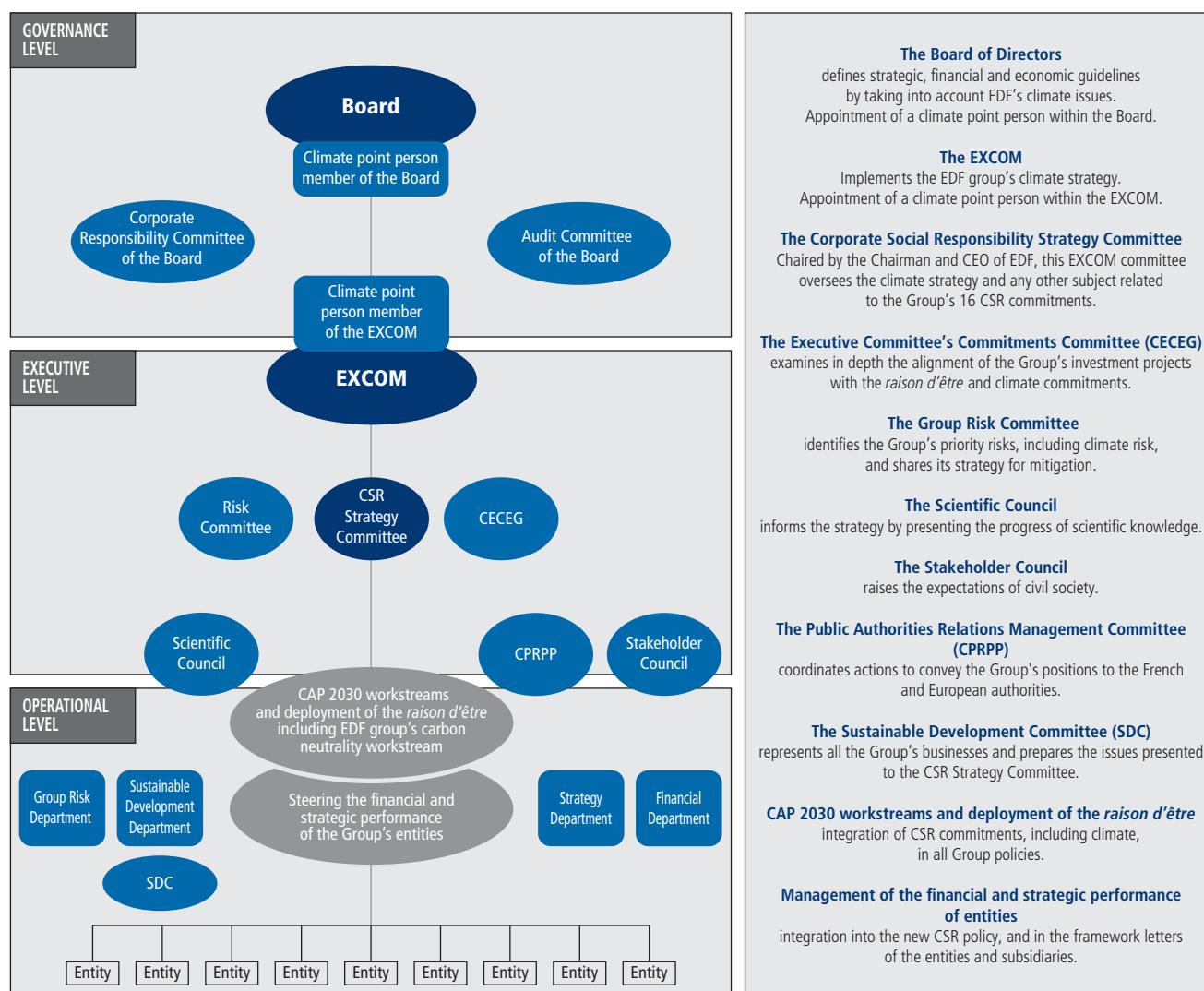
At the end of 2020, to bolster its climate governance, and in line with the highest TCFD standards, the EDF group appointed Climate point persons within its Executive Committee and its Board of Directors ⁽²⁾:

COMEX Climate Point person	The Group Senior Executive Vice-President in charge of Innovation, Corporate Social Responsibility & Strategy is the Climate point person within the Group Executive Committee. In this capacity, he presents the Group's carbon-neutrality ambition to the Board's Corporate Social Responsibility Committee and the Board itself.
Board of Directors Climate Point person	The Chairwoman of the Corporate Responsibility Committee is the Climate point person within the Board. She ensures, in liaison with the Chairman of the Board of Directors and the Executive Committee's Climate point person, that the Board identifies all impacts of climate change for the Group and that the work undertaken by the Board as well as the strategy it defines include considerations pertaining to climate change.

(1) In the continuity of the 1999 storms.

(2) See also the EDF group press release of 10 December 2020.

3.1.3.1.2 Climate governance map



3.1.3.2 Implementation of Taskforce on Climate-related Financial Disclosures (TCFD) recommendations

3.1.3.2.1 The EDF group and the TCFD

TCFD Supporter

The TCFD (Taskforce on Climate-related Financial Disclosures) is a G20 Financial Stability Board (FSB) working group set up after the 2015 COP 21 conference with a view to improving companies' financial transparency in climate-related matters. The EDF group was one of the world's first organisations to support this approach and is officially listed as a "TCFD supporter" ⁽¹⁾.

TCFD reporting

The TCFD ⁽²⁾ recommendations set out the climate reporting components that companies are expected to provide in their Universal Registration Documents, in four broad areas: governance, strategy, risk management, and indicators.

Alignment of the EDF group

The EDF group is in line with TCFD recommendations, as detailed in the report "Implementing the Recommendations of the Taskforce on Climate-related Financial Disclosures", TCFD, June 2017:

(1) fsb-tcfd.org/tcfd-supporters.

(2) Recommendations of the Taskforce on Climate-related Financial Disclosures, TCFD, June 2017.

	URD Sections
Governance	
a) Role of the Board of Directors in oversight of climate-related issues within the organisation	Section 3.1.3.1.1
b) Role of Management in oversight of climate-related issues within the organisation	Section 3.1.3.1.1
Strategy	
a) Climate-related risks and opportunities over the short, medium, and long term	Sections 3.1.3.2.2 and 2.2.3
b) Impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	Section 3.1
c) Evaluation of the resilience of the organisation's strategy, taking into consideration different climate-related scenarios	Section 3.1.3.2.3
Risk management	
a) Processes for identifying and assessing climate-related risks	Section 3.1.3.2.2 Sections 2.1 and 2.2.3
b) Processes for managing climate-related risks	Sections 3.1.2 and 3.1.3.2 Sections 2.1 and 2.2.3
c) Integration into the organisation's overall risk management processes	Section 2.1
Indicators and goals	
a) Financial and non-financial metrics used by the organisation for its climate-related strategy	Section 3.1.3.3 Section 3.6
b) reporting of Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions	Section 3.1.1.2.4
c) Climate-related targets used by the organisation and performance against targets	Sections 3.1.1.1 and 3.1.1.2 Sections 3.1.2.1 and 3.2.2.2

Non-financial rating

The EDF group responds every year to questionnaires from non-financial rating agencies specialised in analysing corporate strategies to combat climate change. Section 3.7 "Non-financial rating" features all the EDF group's 2021 reporting results.

3.1.3.2.2 Identifying climate change risks and opportunities

The EDF group identified climate risk as a priority in 2018, addressing it in a report from the Group's Scientific Council in March 2019, as well as in the detailed analysis presented to the EDF group's Executive Committee and the Board of Directors Audit Committee in October 2019.

In its analysis of climate risks, the EDF group has adopted the classification put forward by the TCFD, which draws a distinction between physical risks and transition risks⁽¹⁾.

EDF group physical risks

Risk category	Description	Potential impact for the EDF group
Risks related to extreme events	Increase of heatwaves and droughts	Production: drop in nuclear production due to heat sink, low water flow for dams in southern countries, accelerated wearing of materials. Transmission and Distribution: drop in network capacity, fire risk. All business lines: rise in the cost of insurance, deterioration of working conditions for employees and service providers.
	Increase of strong wind events, storms, tornados and floods	Production: slow-down or potential temporary halt of production facilities, impacts of higher flood waters. Transmission and Distribution: Power outages.
Risks related to chronic events	Increase of average temperatures/Increase of sea levels	Production: change and drop in hydropower production, decreased yield of nuclear and thermal power facilities, risk of submersion of infrastructures on seacoasts (particularly island regions), proliferation of organisms that plug water intake, risk of microbial growth in cooling circuits. Transmission and Distribution: diminished capacity of transmission lines. Marketing: drop in heating demand, increase in air-conditioning demand.

(1) These risks are also listed in section 2.2.3 "Group transformation and strategic risks", risk factor 3B, "Adapting to climate change: physical and transition risks".

Transition risks and opportunities for the EDF group

Risk category	Description	Potential impact for the EDF group
Legal risks	Climate-related litigation	Risk of cancellation of licences, risk of litigation following exceptional climatic events, risk of litigation related to EDF group publications, particularly as regards the duty of vigilance.
Political and regulatory risks	Tension over uses of water	Risk involved in the sharing of water resources due to multiple uses and multiple stakeholders in a context of increasing water scarcity.
	Tension over access to land and use of soils	Risk involved in the necessary land resources for renewable energy due to regulation (biodiversity, agricultural lands) and the legitimacy of sharing with numerous stakeholders.
	Political difficulties to achieve the objectives of the Paris Agreement	Opportunity: as a low-carbon leader, the EDF group is called on to play a key role in decarbonisation of the European economy.
Customer – market risks	Change in customer expectations	Opportunity: increased demands of own consumption, energy efficiency, electric mobility, green deals and low carbon.
	Change in uses of electricity	Opportunity: decarbonised electricity is recognised as an indispensable means to decarbonise the economy.
Technological risks	Stability and security of electricity networks	Risk/Opportunity: risk of instability to the system in case of a high penetration rate of renewable energies, key role of nuclear energy usable together with renewable energies to ensure stability of the network.
	Transition technologies	Risk/Opportunity: potential emergence of technologies such as CCSU, thermal solar, small modular reactors, storage or in the area of negative emissions.
Financial risks	Access to competitive financing	Risk/Opportunity: risk of non-alignment of investors with the 1.5°C criteria. Opportunity to provide the EDF group with sustainable financing (Green Bonds, positive incentive loans).
	Stranded assets	Risk of stranded thermal assets after regulatory changes or carbon price increases.



3.1.3.2.3 Scenario-based approach to verify corporate resilience

Transition risk scenarios

The International Energy Agency has shown that achieving carbon neutrality at the global level requires an increase in the electrification of uses, combined with an acceleration in the decarbonisation of electricity. In all scenarios compatible with the Paris Climate Agreement ⁽¹⁾, the share of electricity in end energy use will have at least doubled by 2050 (20% in 2020) and become by far the leading form of energy worldwide. The IEA anticipates that end electrical energy use worldwide will have doubled by 2050, at a time when end energy demand is falling due to the development of energy efficiency and behavioural changes.

An atypical profile

The EDF group has an atypical profile of exposure to transition risks compared to most other energy companies worldwide. Given the EDF group's position as the world's leading producer of electricity without direct CO₂ emissions, the bolstering of policies seeking to work towards achieving carbon neutrality and the increase in European greenhouse gas market prices constitute major opportunities for the Group to showcase its strengths.

Use of scenarios

Medium- and long-term scenarios, national and European scope	To assess transition risks (legal, technological, market, reputation), the EDF group uses medium-term scenarios (2030-2050), on national scopes. Examples include the French National Low Carbon Strategy (2020) and RTE's provisional "Energy Futures 2050" report (2021).
	The Group also uses European-level scenarios, such as the European Union's long-term strategy (2018) and the 'Decarbonisation Pathways' sector study coordinated by Eurelectric.
	These scenarios are consistent with the goals of the Paris Agreement, and take into account the following key variables as input data: gross domestic product, the price of raw materials (coal, gas, fuel oil), electricity demand, the price of CO ₂ , electrical interconnection between countries, the discounted cost of energy from different technologies (renewables, nuclear, gas, CCUS), the development of electric mobility, and hydrogen.

Strategic decisions to cover transition risks

Analysis of the risks of transition towards a carbon-neutral economy has led the EDF group to take strategic decisions to maintain and develop its leadership as a low-carbon electricity supplier: achieving net zero emissions by 2050 for all greenhouse

gas emission scopes, withdrawing from carbon-based electricity production by 2030, the goal of 60GW for renewables by 2030, the *Grand Carénage* programme to extend the lifespan of existing nuclear power plants, the launch of the Group's solar power plan, storage plan, and electric mobility plan, the creation of EDF Pulse Croissance, the creation of Hynamics, etc.

(1) Sustainable Development Scenarios (SDS) and Net Zero 2050 (NZE), AIE World Energy Outlook 2021.

3.1.3.2.4 Use of carbon price to guide investments

The EDF group's investment projects were analysed based on the CAP 2030 strategy and its commitment to achieve carbon neutrality for all its direct and indirect emissions by 2050.

For all countries covered by the EU-ETS (European greenhouse gas emissions trading system), through which the majority of EDF group investments are made, the sensitivity of the profitability of projects in terms of production is also assessed based on medium- to long-term scenarios using different 2050 emissions price trajectory forecasts.

These scenarios and the related carbon price trajectories are developed taking account of various parameters, particularly GDP growth, raw material prices, technology costs, and climate and energy regulations. In its response to the 2021 CDP questionnaire, EDF stated, for example, that the carbon price range currently taken into account in its scenarios was €47/tCO₂ in 2020 to €150/tCO₂ by 2040.

By enabling identification of project risks and opportunities and testing their climate change resilience, this analysis, based on scenarios integrating different carbon price trajectories, contributes to guiding the Group's investments.

3.1.3.3 Financing to promote decarbonisation

3.1.3.3.1 Alignment with European taxonomy

For full details, see section 3.8.3 "Details on the taxonomy" and 3.1.1.2.2 "Climate performance for integrated performance".

3.1.3.3.2 Issue of Green Bonds

For full details on Green Bonds, see chapter 6.7 of the URD.

3.1.3.3.3 More than €9 billion of lines of credit indexed on the Group's ESG indicators

72% of credit lines are indexed on ESG indicators *i.e.* a total of €9.3 billion out of €13 billion at 31 December 2021.

3.1.3.4 Commitment to ambitious climate policies

The EDF group promotes public policies that encourage actual carbon reduction in the economy.

3.1.3.4.1 On a national level

The EDF group strives to hasten the French energy transition and halt the use of fossil fuels. In particular, EDF is a member of the French Electricity Union (Union française de l'électricité, UFE). In its white paper ⁽¹⁾ "Energy transition to benefit the French", it presents a series of reforms to prepare the future of the energy system with a view to "zero emissions", for instance through the introduction in investment decisions (calls for tenders) of criteria pertaining to carbon footprints and location.

EDF is not a member of the MEDEF (*Mouvement des entreprises de France*), but in August 2019 it joined MEDEF's "French Business Climate Pledge" ⁽²⁾ initiative.

EDF supports the implementation of an ambitious national legal and regulatory framework to see France become carbon-neutral by 2050. EDF has followed the work of the French Citizens' Convention on the Climate and was pleased to see many of their proposals taken into account in the French Climate and Resilience Act of 22 August 2021.

EDF is involved in work to develop the French Energy-Climate Strategy (*Stratégie française sur l'énergie et le climat*, SFEC), begun in 2021 and due to be completed in the first half of 2024. The SFEC includes a review of France's National Low Carbon Strategy and National Plan for Adaptation to Climate Change, constituting France's roadmap to achieve carbon neutrality by 2050 and ensuring that our society can adjust to the impacts of climate change.

3.1.3.4.2 On a European level

The EDF group is particularly active in the EU

The EDF group participates both in its own name (through its permanent office in Brussels) and through Eurelectric, the association representing the common interests of the electricity industry in Europe. The EDF group's commitment to a robust EU greenhouse gas trading system and to an ambitious long-term climate and energy strategy led by the European Commission is recognised by all stakeholders, including NGOs such as InfluenceMap ⁽³⁾ which has repeatedly ranked EDF as one of the companies most actively promoting climate issues in EU negotiations ⁽⁴⁾. EDF engages in transparent, responsible lobbying (see section 3.3.2 "Ethics, compliance, and human rights").

The EDF group fully supports the European "Green Deal"

Jean-Bernard Lévy, Chairman and Chief Executive Officer of EDF, was elected Chairman of Eurelectric in May 2021. During his Chairmanship, Jean-Bernard Lévy intends to structure his term of office around four pillars: promoting the Green Deal as a social, industrial, and strategic opportunity for all Europeans; adopting an affordable, low-carbon electric lifestyle whilst combatting discriminatory energy taxation; ensuring that a full range of technology with low-carbon emissions contributes to profitable decarbonisation, encouraging the deployment of renewable energies, smart grids, and the use of electrolytic hydrogen; demonstrating the resilience and flexibility of electricity as a key asset for the Green Deal, whilst promoting smart integration and highlighting the benefits of digitalisation.

EDF joins InfluenceMap's A-list

InfluenceMap is a partner NGO of the Climate Action 100+ initiative, representing responsible investors with assets under management totalling over \$55,000 billion, which aims to ensure companies invest in combatting climate change. On 15 October 2021, InfluenceMap published a list of fifteen leaders in lobbying to promote climate action, out of a total of 350 companies. The EDF group has been included on this A-list, being recognised in particular for its "high level of commitment to a range of key policy areas".

(1) ufe-electricite.fr/transition-energetique-au-service-des-francais/

(2) medef.com/fr/communique-de-presse/article/french-business-climate-pledge-les-entreprises-francaises-engagees-pour-le-climat

(3) influencemap.org.

(4) The EDF European Business Affairs Department's business reports are available online: www.edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/rapports.

3.1.3.4.3 On an international level

As the world's leading producer of electricity without direct CO₂ emissions, the EDF group is one of the leading non-state actors in international discussions on climate change.

Race To Zero	In February 2020, EDF group joined the "Business Ambition for 1.5 degrees: our only future" initiative, thereby joining the United Nations Race To Zero ⁽¹⁾ movement, the broadest alliance ever created, which seeks to achieve net zero carbon emissions by 2050 at the latest (see section 3.1.1.1.1 "Achieving carbon neutrality by 2050").
Open letter to G20 leaders	The EDF group is part of the coalition ⁽²⁾ of 778 companies led by We Mean Business; on the occasion of the G20 leaders' summit in Rome in October 2021, the coalition called for them to raise their climate-related ambitions through the following actions: aligning their nationally determined contributions (NDCs) pursuant to the Paris Agreement with the goal of reducing emissions by at least 50% by 2030; ending subsidies to fossil fuels by 2025; supporting the electrification of transportation; aligning stimulus spending with a trajectory of 1.5°C.
Promoting the coal phase-out	Since 2017, the EDF group has been engaged in the Powering Past Coal Alliance ⁽³⁾ , which promotes the phasing out of coal in EU countries by 2030 and in the rest of the world by 2050 in the wake of the Paris Agreement. In 2021, EDF group lent its support to the Global Coal to Clean Power Transition Statement ⁽⁴⁾ launched during the UK presidency of the COP26 summit; this statement has already been signed by 23 countries.
Promoting fair carbon pricing	EDF supports the Carbon Pricing Leadership Group (CPLG) initiative that brings together businesses, governments, academics, and NGOs to promote carbon pricing as a means of achieving a low-carbon world economy. At the Climate Action Summit organised by the Secretary General of the United Nations in September 2019, the EDF group signed the CPLC's appeal recommending a price per tonne of carbon of \$40-\$80 by 2020 and \$50-\$100 by 2030, in line with the 2017 Stern-Stiglitz report, in order to enable countries to abide by the Paris Agreement.
EDF at the COP26	Held in Glasgow from 1 to 13 November 2021, the COP26 summit was a major event in the international climate calendar; the parties to the Paris Agreement were invited to revise the NDCs they submitted in 2015. The EDF group was able to monitor negotiations on site, and took part in a dozen or so events organised in the accreditation-only Blue Zone, in particular on the contribution of innovations in nuclear power to further complementarity with renewable energies and achieve the Paris Agreement goals, the contribution of companies to achieving global carbon neutrality, the mobilisation of individuals and employees in the ecological transition, electric mobility, and access to energy.



3.1.3.4.4 Acting in a consistent manner with external stakeholders

The EDF group set up specific governance to ensure the consistency of the positions promoted by the Group, and makes sure not to support initiatives promoting positions not in line with its own aims in terms of combatting climate change. EDF ceased to be a member of Business Europe on 1 November 2020.

Development and validation of Group positions	All EDF group key positions on climate issues are approved by the Public Authorities Relations Management Committee. This Committee, co-chaired by the General Secretary and the Group Senior Executive Vice-President in charge of Innovation, Corporate Social Responsibility and Strategy, meets every week and features, among others, the Public Affairs Division, the European Affairs Division, the Regulation Division, and the Legal Affairs Division.
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3.1.3.4.5 Raising awareness and providing information to the general public

See section 3.5.4.8 "Responsible communication".

3.1.3.5 Involvement of employees and executive officers in carbon neutrality

The EDF group implements actions to enable all its employees and corporate officers to adopt the Group's *raison d'être* and climate commitments. These actions involve employee training ⁽⁵⁾, remuneration and collective intelligence.

3.1.3.5.1 Remuneration linked to combatting climate change

Executive officer bonuses for 2021	The chosen climate criterion is the carbon intensity ⁽⁶⁾ of the Group's heat and electricity production, corresponding to 30% of the Group share ⁽⁷⁾ . See section 3.5.4.6 "CSR and remuneration policy for group executives".
Employee profit-sharing agreement	The 2020 profit-sharing agreement signed by EDF's management and its social partners includes, in addition to business and health & safety criteria, one climate-based criterion relating to electrifying the EDF's vehicle fleet in accordance with the EV 100 commitment. See section 3.3.3.7 "Remuneration".

(1) [racetozero.unfccc.int/](https://www.racetozero.unfccc.int/)

(2) wemeanbusinesscoalition.org/g20-2021-french/

(3) poweringpastcoal.org/members

(4) ukcop26.org/global-coal-to-clean-power-transition-statement/

(5) See section 3.3.3.6.5 "Skills development in the area of sustainable development".

(6) See section 3.1.1.2.1 "Carbon performance for the climate".

(7) Including EDF, Edison, EDF in the UK and Luminus.

3.1.3.5.2 Innovation and collective intelligence focused on climate action

EDF is implementing initiatives directly focused on combating global warming.

The “Carbon neutrality passport”

Launched at the end of 2020 as part of the “Combating CO₂, it starts with us!” programme, the “carbon neutrality passport” was intended to test knowledge on climate change, assess the carbon footprint, and take action based on challenges in the fields of energy use, housing, power supply, transport and digital technology.

Carbon neutrality passports	2021
Number of passports obtained	33,992
Number of challenges taken up	68,773

The “Climate Collage”

The EDF group committed to raise awareness among its 165,000 employees on climate issues through the “Climate Collage”, a collective intelligence-based tool that makes it easy to understand the key conclusions of the Intergovernmental Panel on Climate Change (IPCC) report⁽¹⁾. Due to the health crisis, most of the initial

deployment took place digitally, following which face-to-face sessions gradually resumed as the various waves of the crisis allowed. Feedback indicates that participants were very much in favour of the latter format. Seeking to be attentive to its employees, the Group has therefore decided to focus on face-to-face sessions and adjust the pace of the roll-out accordingly.

Climate Collage	Target	2020	2021
Number of employees who participated to the Climate Collage	167,157 *	3,200	22,000
Number of employees who animated the Climate Collage		170	780
Number of sessions		330	3,500

* Group workforce at the end of 2021; see section 3.3.3.9 “Detailed information on the Group’s workforce”.

2021 highlights	On 16 March, the Chief Executive Officer took part in a Climate Collage workshop alongside 7 employees from EDF group and its subsidiaries.
	A workshop for the Board of Directors was held on 19 November 2021.
	<i>24 heures de la Fresque</i> : some 1,000 participants contributed to a 24-hour Climate Collage held between 8am on 17 June 2021 and 8am on 18 June 2021. Workshops were held throughout the Group (New Caledonia, China, Cambodia, India, United Arab Emirates, Mayotte, Reunion Island, Europe, Morocco, Cameroon, French Guiana, Guadeloupe, Chile, USA) so that the event was held continuously, either remotely or face-to-face, in French, English, Spanish, and Portuguese.

Eco2 conferences

Eco2 in 2021	In 2021, the Group launched its “Eco2 conferences”. This series of scientific talks focuses on the issues surrounding a carbon-neutral economy. Around 20 volunteers from among EDF employees, together with members of the Alumni for the Planet* network, are following all of these events. The aim is to produce a formal, practical description of a multi-stakeholder economic system promoting climate issues, welfare, and development; this may result in a publication.
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* Alumni for the Planet is a network of higher education graduates who have committed to actions in favour of the climate and the environment: alumnifortheplanet.org

“Employer sustainable mobility plans” developed by employees

Sites concerned	Through the France-wide EDF group agreement on sustainable mobility unanimously signed in November 2019, a commitment was made to develop an “Employer sustainable mobility plan” for sites with more than 100 employees. As of the end of 2021, 65 employer mobility plans had been finalised across the EDF group in France.
Involvement of employees	Employees are involved in producing and implementing these employer mobility plans.
Schemes to develop sustainable employee mobility	Encouraging the use of low-carbon transportation: trialling electric bikes and cars, a “sustainable mobility allowance” for ride-sharers, negotiated discounts for the purchase of electric vehicles. Adapting infrastructures to new travel modes: installation of charging stations, creation or extension of bike parks, reserved parking places for ride-sharing.

(1) This tool, developed in 2015 by Cédric Ringenbach, has already raised awareness among over 230,000 people worldwide.

3.1.3.6 R&D for the energy transition

At end 2021, EDF's R&D employed 1,784 people in France representing 30 nationalities. Among electricity suppliers, it has one of the largest R&D budgets, mostly devoted to energy and climate transition.

Breakdown of R&D investments by technology

99% of EDF R&D's operating budget in France is dedicated to decarbonation and the energy systems transition. In particular, expenditures covered energy efficiency, uses of electricity as a substitute for fossil fuels, renewable energies and their insertion into the grid, energy production and storage, low-carbon hydrogen and its applications for decarbonising the economy, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of disturbances. Nuclear power accounts for 43% of EDF R&D; renewable energies account for 14%.

Example: work on LCAs (LifeCycle Analyses)

To identify solutions with the smallest environmental impacts, EDF R&D teams are performing lifecycle analyses of the various processes used to produce electricity and hydrogen, and uses of kWh (electric mobility, buildings, batteries).

According to the IPCC ⁽¹⁾, greenhouse gas emissions based on a lifecycle approach for one electrical kWh produced by a nuclear facility are 12g/kWh, compared to wind turbine (on-shore) and photovoltaic solar segments which respectively have a carbon footprint of 11g/kWh and 44g/kWh (see section 1.5 "Research and development, patents and permits").

This has resulted in the most recent reference study of the LCA for each kWh produced by the French nuclear fleet (4gCO₂eq/kWh, determined in 2000) being revised to incorporate changes in methods and the new data available (work in progress).

3.1.3.7 Innovation supporting the energy transition

The energy transition involves exploring innovative solutions. This is the aim of the EDF Pulse ecosystem (see section 3.3.3.6.6 "Developing a culture of innovation: the EDF Pulse ecosystem").

3.1.4 Developing sobriety in electricity uses and innovative energy services

A key source of leverage for decarbonisation	With largely low-carbon electricity, the development of uses of low-energy, innovative electricity uses and services is a key vector for work to combat global warming.
Developing appropriate offerings	The EDF group is contributing to this goal by means of offers tailored to various markets, including promoting the use of heat pumps, electric mobility, and energy efficiency solutions. See section 3.1.4.3 "Developing efficient, low-energy, innovative energy services".
Establishing the conditions for the development of effective, low-energy uses	Electrifying sectors that produce the most CO ₂ entails having conditions that are favourable to this development. See section 3.1.4.2 "Setting the conditions for the efficient development of electricity uses".

3.1.4.1 Commitment to supporting customer decarbonisation

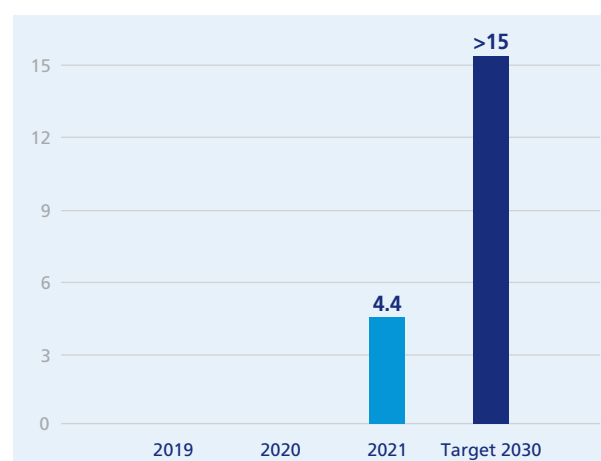
One of the key indicators in combatting global warming is the quantity of CO₂ emissions avoided.

To date, there is no recognised external reference that can be used to determine the amount of emissions avoided by customers thanks to the products and services EDF sells. However, EDF can follow principles for such calculations according to the most frequently observed practices in this respect. At the same time, EDF is engaged in French and international research seeking to develop this type of benchmarking method.

In 2021, EDF calculated emissions avoided by the following products and services sold by EDF and Dalkia: developing renewable energies in heat networks, energy efficiency at thermal facilities, photovoltaic production (installations sold to customers and self-consumption, not including EDF installations reinjecting their production into the network), electric mobility, residential heat pumps. The indicator corresponds to the gap in emissions from the product or service sold and emissions in a baseline scenario established for each product or service. For the methods used for this indicator, see section 3.6 "Methodology". Extension to other EDF group entities (UK, Italy, and Belgium) and, potentially, other products and services, is being examined.

The 2021 results cover only some of the products and services marketed by EDF. The figures should increase in the coming years, subject to possible changes in method in order to remain in line with third-party practices.

Avoided CO₂ emissions thanks to sales of innovative goods and services (MtCO₂)



(1) IPCC Assessment report 5, 2014, Working Group III Mitigation of Climate Change, Annex III, Table A.III.2 (Emissions of selected electricity supply), medium values.

3.1.4.2 Setting the conditions for the efficient development of electricity uses

3.1.4.2.1 A more robust, intelligent and flexible network

The energy transition and digital revolution are profoundly transforming management of the electricity distribution network ⁽¹⁾, making it more robust, smarter, and more flexible.

More robust

Thanks to renewal programmes, scheduled renovation and use of underground lines in high-risk climate zones, the frequency of power outages has lowered, leading to a reduction in the average outage time per customer.

	2019	2020	2021
SAIDI (min.) *	79	52	56
CAIDI (min.)	115	76	92.5
SAIFI (min.)	0.69	0.68	0.61

* SAIDI: System Average Interruption Duration Index; CAIDI: Customer Average Interruption Duration Index; SAIFI: System Average Interruption Frequency Index.

In 2021, the mean power outage time (excluding transport incidents and exceptional incidents) of 56 minutes was one of the best in the past 15 years. The quality of service provided is also reflected by maintaining steady voltage levels, kept as close as possible to the level set by regulations, and by minimising the number of outages.

More intelligent ("Smart")

In terms of "smart grid" technology, the 20kV high-voltage network is already smart since it is supervised and equipped with automated resupplying. For the low-voltage network, the deployment of smart metres now enables us to have a real-time vision of the characteristics of the electricity at the individual customer level. In areas not interconnected with continental Metropolitan France, and outside Europe, Enedis and EDF are continuing to install connected electricity meters, allowing consumers to monitor their electricity consumption.

As of the end of 2021, 37.6 million meters had been installed, including almost 35 million in France (equipping approximately 90% of all customers) as well as in the UK and India.

	2019	2020	2021
Number of smart meters installed (in millions of units) *	26	32	37.6

* For the methodology used for this indicator, see section 3.6 "Methodology".

More flexible

Roadmap	In 2020, Enedis, in its capacity as distribution network manager, published its roadmap for the transformation of network scaling methods and integration of flexibilities.
Flexibility contracts	At the end of 2020, Enedis signed its first 2 flexibility contracts, anticipating the transposition into French law of the energy market Directive known as the "Clean Energy Package".
'Smart Connection' offer	Going forward, Enedis will be offering an alternative connection offer with power modulation, also known as the Smart Connection Offer, to all high-voltage producers on request.
Regional plans for the grid connection of renewable energies	Enedis is testing a new method for the scaling of renewable energy Regional Network Connection Plans in real-life conditions at 8 source substations in the Landes and Somme regions, the immediate effect of which has been to free up over 200MW of connection capacity as a result of greater flexibility (ReFlex Project).
Enedis ranked no. 1 in the global Smart Grid Index	Each year, the international Smart Grid Index (SGI) benchmark assesses how smart electricity grids are across the world *. Out of 80 network operators, Enedis topped the world rankings in 2021.

* <https://www.spgroup.com.sg/sp-powergrid/overview/smart-grid-index>

3.1.4.2.2 Better management of intermittence, flexibility and storage development

Innovative solutions for load balancing

Capacity Commitment electricity contracts	Customers supplied with high-voltage electricity that have load-shedding capacity in excess of 300kW are being invited to take out a Capacity Commitment electricity contract. Customers trigger load shedding on the basis of a range of formats, and receive compensation in return.
Custom offers	Agregio is a subsidiary of the Group which serves electricity producers with renewable generation capacities and companies with load-shedding capacities, which they can reuse on electricity markets in the best possible manner. For electricity producers, Agregio offers tailored solutions to optimise and sell their production on the markets. Agregio is also aimed at industrial and tertiary consumers, who are willing to reduce or shift their consumption in exchange for compensation.

(1) For full details of the activities of Enedis, a subsidiary managed in compliance with the rules of management independence, see section 1.4.4.2 "Distribution: Enedis".

Innovative solutions for self-consumption and storage

Storage plan	The storage development strategy launched in 2018 has led to approximately 1.1GW of projects being secured or completed by the end of 2021. In 2021, the EDF group commissioned 145MW of battery installations in Non-Interconnected Zones (NIZs), the UK, and the USA, and diversified the development areas for new projects (South Africa, Peru, and China). EDF group storage projects involve pumped-storage hydropower plants (STEPS), hybridisation of batteries with renewable energies, batteries directly connected to the network, and storage with customers.
EDF Store & Forecast	EDF Store & Forecast develops and markets a software solution for energy optimisation of local electricity systems through energy forecasting and storage. It also offers turnkey electricity storage systems.
Dalkia Smart Building	France's first dual heat and electricity smart grid in the Nanterre Cœur Université ecodistrict is a smart network linking the various buildings and pooling occupant needs. This innovative energy mix combining geothermal, aerothermal, biomass and free heat recovery supplies heat, hot water and air-conditioning using 60% renewable energy. The electricity necessary for its own functioning is produced through self-produced energy photovoltaics and cogeneration ⁽¹⁾ .
DREEV	DREEV is a new subsidiary of EDF leveraging the charging flexibility and storage potential offered by electric vehicles. It is a leader in France and across Europe in the deployment of the Vehicle-To-Grid (V2G) technology for businesses (company and bus fleets, etc.); this allows terminals to dispatch power to a building or the grid for various services ⁽²⁾ . In 2021, DREEV became the first French company to be accredited by RTE to provide system services to the network using electric vehicles (Vehicle-to-Grid). It is part of the EVVE project, the largest European project to deploy V2G terminals (800 terminals to be installed by 2025).

Using artificial intelligence and the blockchain to enhance flexibility

Dalkia Analytics	Dalkia Analytics provides an energy and environmental performance coordination service for industrial facilities. Deployed on over 100 sites, the service captures new sources of energy savings by using AI to analyse production and consumption data. It can also be used to support ISO 50001 and decarbonisation certification procedures.
Enerbrain	EDF Pulse Holding has taken out a stake in Enerbrain, an Italian startup specialising in smart building solutions. It has developed a solution to optimise energy efficiency in service sector buildings, based on IoT technology incorporating artificial intelligence.
Metroscope	Developed by R&D researchers, Metroscope is based on an unrivalled combination of a Digital Twin and Artificial Intelligence. It can diagnose the performance losses in an industrial installation in real time. Metroscope is currently being rolled out across the nuclear fleet, and is destined to be marketed to EDF's industrial customers.
O-One	In Belgium, an algorithm capable of providing detailed forecasts of network congestion ("O-One", developed by ORES) was trialled on a Luminus wind farm between 2019 and 2020. This active network management solution makes it easier to anticipate risks and go beyond the dispatch limits imposed on wind turbines, thereby increasing the wind farm's average output.



3.1.4.2.3 Low-carbon electricity at an affordable price

One of EDF's goals is to supply sustainable electricity at a reasonable price. Based on its strong public service values, EDF considers that electricity, as an essential asset, must be accessible to all and in all areas.

In France, 23 million homes and 1.5 million businesses have chosen to adopt the regulated sales tariff (*tarif réglementé de vente*, TRV). In an increasingly competitive market in which over 1,200,000 domestic customers have already opted for EDF market offers, the Group has diversified its range to address demand.

Prices below the European average

As of the end of 2021, the average sale price of electricity excluding VAT at the TRV regulated sales tariff (used as a benchmark for the entire domestic customer market inasmuch as most alternative suppliers position their price in respect of this tariff) was €128.6/MWh for domestic customers. On average, every month, a residential customer who signed a "6kVA Base" contract (monthly use of 200kWh) spends €28.8 excl. VAT (€42.60 incl. VAT) on their electricity bill. A residential customer, with a "9kVA peak/off-peak" contract (monthly use of 600kWh, and 57% consumption within peak hours), spends €74 excl. VAT (€112.80 incl. VAT) on their electricity. In terms of the total price paid by consumers, households using the TRV regulated sales tariff use an average of 4.9MWh of electricity per year, with an average annual bill of €943. In the first half of 2021, the price of electricity per megawatt-hour in France was 22% lower for French households and 26% lower for professionals located in France compared to other countries in the Eurozone. In 2021, the average sale price (excl. VAT) of TRV regulated sales tariff electricity to non-domestic customers ⁽³⁾ was €132.5/MWh.

(1) [Dalkiasmartbuilding.fr/double-smart-grid-ecoquartier-nanterre-coeur-universite](https://dalkiasmartbuilding.fr/double-smart-grid-ecoquartier-nanterre-coeur-universite)
(2) Through Izivia.
(3) Business market customers at Regulated Sales Rates with LV connection ≤ 36kVA.

Contractual and financial innovations

Contractual and financial innovations ⁽¹⁾ help leverage the affordability of electricity. They include:

Fixed-rate electricity contracts	EDF Entreprises offers customers a single contract and invoice for the entirety of their sites. This "fixed-rate electricity contract" is directed at companies.
Power Purchase Agreement (PPA)	<p>A PPA is an agreement between an electricity purchaser and a renewable-origin electricity producer at a price agreed for the entire duration of the contract. This form of contract encourages the development of renewable energies, and represents an additional commitment on the part of customers to the development of renewable energies alongside Renewable Energy Guarantee of Origin certification.</p> <p>For instance, EDF is making 203GWh of renewable electricity available to Bouygues Telecom between 2022 and 2024 (the equivalent of the electricity output of six wind farms operated by its subsidiary EDF Renewables) for the telecom operator to use. Established for a three-year period, the supply contract thus guarantees that these wind farms will continue to operate after the purchase commitment ends. Agregio, the EDF group subsidiary specialising in the optimisation of renewable energy production, will be responsible for supply via a PPA as part of the overall Bouygues Telecom supply contract.</p>
Financial support	EDF Entreprises' "Energy Savings Bonus" (<i>Prime économies d'énergie</i>) can help fund renovation and energy efficiency works for equipment and buildings.

3.1.4.2.4 Earning trust through quality of service

The practice of conducting customer satisfaction surveys has been extended to all departments and relevant subsidiaries. This practice serves as a tool for designing and managing offers, and inspires action plans with the goal of continuously improving customer service.

Customer relations

EDF's customer service quality is acclaimed. More than 9 out of 10 customers are satisfied with their contact with EDF advisers ⁽²⁾. According to the most recent French National Energy Ombudsman reports, EDF had the lowest rate of disputes of any energy supplier in France ⁽³⁾. In 2021, EDF became the first energy supplier to obtain *Relation Client France* certification, awarded to French companies that decide to locate all of their customer service facilities in France. See section 3.4.2.1.4 "Focus on customer service lines of business".

Digital accessibility

EDF & Me: The EDF & Me application is viewed as one of the best on the energy supplier market, with over 16.6 million downloads. In 2021, EDF & Me was nominated for a Webby Award. The app is regularly the highest-ranked of all apps made available by energy suppliers.

Turning consumers into engaged stakeholders: The EDF group's action to develop digital resources has provided greater access to information. The rapid rise in the number of consultations of online energy use monitoring platforms illustrates the cultural change underway.

On the basis of detailed statistics for the past year, almost 6.2 million customers logged on to these solutions at least once during the year. Over 800,000 of them are "hyperactive" users in the sense that they have logged on at least 6 times over the past 6 months. On average, users connected a little over 11 times. Visits are relatively seasonal in nature: consultation spikes are mainly observed in the winter, during periods of cold weather. They are more frequent at the start of the week, between Monday and Wednesday. 64% of visits are via a mobile terminal, 31% are from a computer, and 5% from a tablet. During each visit, users view 12 pages on average, for an average period of 2.5 minutes (nearly 4 minutes when using a computer and 2 minutes when using a mobile phone).

3.1.4.2.5 The RE 2020 regulation supports the development of electricity uses

At the end of 2020, the French government announced its initial decisions in respect of the new RE 2020 Environmental regulation for new homes. Being fully persuaded of the urgent need to electrify consumer habits, EDF took part in the related consultation. The application legislation for RE 2020 was published on 31 July 2021 for homes, offices, and educational establishments. The new legislation will come into effect on 1 January 2022 for new residential houses and apartments, as well as for office buildings and educational establishments, followed one year later by other service sector buildings.

The carbon footprint of construction products and equipment will be aggressively reduced between now and 2031, calculated using the dynamic LCA method.

	2019	2020	2021
Number of customer visits on digital consumption monitoring platforms (millions) *	47	73	74.3

* For the methodology used with this indicator, see section 3.6 "Methodology".

3.1.4.3 Developing efficient, low-energy, innovative energy services

The development of different uses of electricity and their expansion constitute a major source of leverage to assist customers towards carbon neutrality. With this in

mind, the EDF group has committed to developing a broad range of offers suitable for different markets.

(1) See also section 1.4.2.2 "Activities of the Customer Division".

(2) Spontaneous satisfaction following contact by phone.

(3) French National Energy Ombudsman (*Médiateur national de l'énergie*), 2018, 2019, and 2020 annual reports; proportion of disputes received pertaining to electricity or gas contracts with residential customers of national suppliers with more than 100,000 customers within the Enedis/GRDF area.

3.1.4.3.1 Decarbonisation solutions for housing

The EDF group develops and markets decarbonisation solutions for customers in houses and apartments: these include insulation, heat pumps, thermodynamic and

solar-powered water heaters, and water consumption and energy management solutions. These offers are managed by EDF and its subsidiaries ⁽¹⁾:

Energy renovation	IZI by EDF is constantly expanding its high-performance energy renovation offering, supporting consumers and retailers in the energy transition. In 2021, IZI by EDF tripled sales of air/water heat pumps and home charging terminals for electric vehicles. Offers in its new range now include externally mounted wall insulation, air/heat pumps, etc.
Maintenance, repairs, and installation	The CHAM group operates nationwide in France, providing maintenance, repairs, and installation of boilers and heat pumps. CHAM is redirecting its aim towards becoming the leading specialist in heating and hot water solutions ⁽²⁾ .
Number one in self-consumption in France	The EDF ENR subsidiary enables customers to use the energy generated by their own solar panels and store some of it for use when needed. The solution enables customers to maximise their self-produced energy rate, monitor their energy use online in real time, meaning they can control their energy spending (see section 1.4.1.3.3 "EDF Renewables activities"). With 30% of all solar power installations on the residential market, EDF ENR is the leader in solar power self-consumption in France.

3.1.4.3.2 Decarbonisation solutions for industry

Decarbonisation consultancy

The EDF group assists industrial players in identifying and implementing sector-related solutions allowing them to cut their carbon footprint. The France Relance stimulus plan has earmarked €1.2 billion for the decarbonisation of industry, with

the launch of several requests for proposals. The EDF group is supporting and carrying out a large number of selected projects.

Process electrification

The priority for the decarbonisation of industry involves switching from fossil-fuelled heating to mature electrical solutions. EDF is deploying high temperature and very high temperature industrial heat pumps for its customers, as well as resistance

furnaces, conduction furnaces, infrared furnaces, induction and arc furnaces (to replace fuel oil or gas), and mechanical steam compression.

High-temperature heat pumps	In collaboration with heat pump manufacturers, EDF R&D has developed new technologies allowing the waste energy contained in low-temperature liquid effluent to be recycled by restoring it to temperatures of up to 140°C. Thermal recycling of industrial emissions achieves considerable reductions in energy use and CO ₂ emissions. With the assistance of EDF R&D, EDF Enterprises is supporting five of its industrial customers in the installation of high-temperature heat pumps.
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Low-carbon heat

Backed by its biomass supply line, Dalkia is a leading player in low-carbon heat. The EDF group was the successful bidder for a number of boiler projects to replace natural gas or coal with biomass as part of the French post-pandemic recovery plan.

Waste heat	Dalkia teams have installed 1.2MW of new refrigeration equipment for Thales Alenia Space, supplementing this industrial company's existing refrigeration units. Heat exchangers have been installed to recover "waste" heat and use it to heat the factory's hot water loop, according to the principle of the circular economy. This provides 80% of the company's heating requirements and achieves energy savings of 45%.
Biomass boilers	Solvay: installation of a 30MW biomass boiler, replacing natural gas, for a factory employing 300 people, with 400tCO ₂ /year avoided.

Full-scope support

Stellantis	As the energy supplier for over 150 PSA sites, EDF is helping the carmaker identify sources of energy savings, in particular by implementing an energy performance plan. EDF subsidiaries are assisting PSA as it improves its energy performance and decarbonises its practices: <ul style="list-style-type: none"> • Dalkia: in Charleville-Mézières, Dalkia is recovering waste heat from PSA factory furnaces and reinjecting it into the urban heat network. Dalkia is providing support to six PSA sites as they address issues relating to the supply and recovery of heat and connection to local heat networks, as well as providing a variety of other technical services; • Perfesco: identifying every possible avenue for energy optimisation, ranging from lighting to process equipment, for a number of PSA sites and projects in France and elsewhere. This redesigning is generating energy savings of over 10GWh per year; • Izivia: PSA has selected Izivia's charging station network for the electrification of its internal fleet. The carmaker's industrial and office sites will be using the charging stations in eight countries throughout Europe.
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(1) See also the "My sustainable heating" (Mon chauffage durable) offer in section 3.3.4.2 "Fight against energy poverty".

(2) See also the "Solution Dépannage Confiance" (Reliable Repair Solution) offer in section 1.4.2.2.1.1 "Residential customers", more especially "Features and services".

3.1.4.3.3 Decarbonisation solutions for agriculture

To support the sector as it combats climate change, the EDF group has introduced offers such as the installation of solar panels, the production of electricity and heat using biogas, the improvement of agricultural equipment energy efficiency, the heating of environmentally-friendly greenhouses by recycling household waste, and

the use of a hydrogen fuel cell to power milking machines. On 8 September 2021, EDF announced the publication of a White Paper to promote the energy transition for agriculture and support the agriculture of tomorrow as it transitions towards carbon neutrality.

3.1.4.3.4 Decarbonisation solutions for the tertiary sector

The EDF group offers customised services to companies and professionals that wish to optimise their energy flows to improve their economic performance and reduce their environmental footprint:

Support (Futuroscope)	Dalkia is supporting Poitiers' Futuroscope theme park as it implements its environmental programme. In particular, this includes the creation of a heating and air conditioning network that will reduce greenhouse gas emissions by 40% and achieve 70% energy self-consumption by 2025.
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3.1.4.3.5 Decarbonisation solutions for local authorities

The EDF group is extensively engaged in the energy transition as it applies to cities and local authorities.

Seawater thermal energy (Sète Town Council)	Together with Dalkia, the town of Sète is accelerating its ecological transition with a private seawater thermal energy conversion network. Designed to provide heating and air conditioning for homes, 73% of the supply for the future network will come from the Mediterranean Sea. Ultimately, 4,600 tonnes of CO ₂ emissions will be avoided each year. This is expected to result in a decrease in the annual energy bill of approximately 5%.
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3.1.4.3.6 Decarbonisation solutions for transport

The Electric Mobility Plan

Objectives	With the electric mobility plan launched in October 2018, EDF is aiming for a 30% market share in the supply of electricity to electric vehicles in the Group's four major markets (France, the United Kingdom, Italy and Belgium), the deployment of 400,000 charging points and the operation of 20,000 smart charging points by 2023. By the end of 2021, the EDF group had deployed 200,000 charging points, including over 150,000 in the UK and almost 20,000 in France, as well as 10,000 smart charging points.
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Development of recharging infrastructure

As part of the electric mobility plan, the EDF group provides a full-scope range of offers for every type of use: residential customers in houses and flats, companies, and local authorities.

IZIVIA Networks	Izivia, a French market leader, is one of the leading operators of charging stations network. Izivia currently has several major projects bolstering fast charging services in urban and suburban environments, such as: <ul style="list-style-type: none"> the ongoing deployment in 59 towns around Lyon of an interoperable network of 170 stations featuring 641 charging points; deployment of over 80 new charging points operated with all user services for the Métropole Aix-Marseille-Provence urban district will be completed by 2022.
Services supporting the advanced management of charging devices	EDF, the Occitanie region, ADDOC and ADEME (i.e. the French Environmental & Energy Management Agency) launched the "Flexitanie" project with the aim of carrying out large-scale testing of a V2G two-way charging station management service. Installed by Izivia and supported by technology from the DREEV subsidiary, these terminals will be capable of powering a fleet of up to 100 electric cars.
Solar power and charging stations	EDF, ENR, and Izivia invite companies and local authorities to install solar canopies fitted with charging stations.
IZI by EDF	EDF's local services platform IZI by EDF provides charging solutions for homes and small business premises.
United Kingdom	The acquisition in February 2020 ⁽¹⁾ of UK-based Pod Point, one of the largest electric vehicle charging companies in the UK, will help to achieve these goals.
United States	The September 2019 acquisition of PowerFlex Systems (PowerFlex), a pioneering company in the field of electric vehicle charging technologies, based in Los Altos in California, enables the creation of a unique decentralised energy ecosystem combining smart charging solutions for electric vehicles or building energy charging solutions, as well as solar energy production and storage systems.

(1) See EDF press release of 14 February 2020.

Partnerships

Since 2018, a number of partnerships have been developed with stakeholders in the sector (manufacturers, equipment manufacturers, leasers, leasing companies, charging station manufacturers) to propose custom electric mobility solutions. The new partnerships entered into in 2021 were:

Volkswagen, Toyota, Vinfast	The EDF group entered into partnership agreements with the carmakers Volkswagen, Toyota, and Vinfast to help transition their customers to electric powertrains. These agreements include promoting attractive EDF electricity supply offers to vehicle purchasers in line with expectations on the part of consumers (<i>Vert électrique Auto</i> , <i>Vert Électrique Régional</i>) and companies (<i>Contrat flexible</i>), as well as Group charging solutions.
BMW group	In Belgium, Luminus entered into a strategic partnership with BMW group Belux to develop offers for dealerships, companies, and consumers over a period of three years, spanning charging infrastructures and fleet consumption monitoring.

EDF's commitment for its vehicle fleet (EV 100)

The EDF group is the first French group to sign the "EV 100", which aims at having a fleet of 100% electric light vehicles by 2030. This project covers almost 45,000 vehicles and charging infrastructures on almost 2,000 sites worldwide, around half of which had already been equipped by the end of 2021.

In the UK, EDF is applying its EV 100 commitment by introducing a catalogue of very low emission vehicles, alongside an electrification rate for its fleet of 10.7%. As of the end of 2021, the electrification rate of the Luminus car fleet stood at 40%.

EV 100 commitment	2030 target	2020	2021
Proportion of electric vehicles in the EDF group's light vehicle fleet	100%	12.2%	17.3%

3.1.4.3.7 Focus on hydrogen solutions ⁽¹⁾

The use of renewable hydrogen and low-carbon electrolytic hydrogen offers attractive solutions to decarbonise sectors for which direct electrification is not possible. These include refining, chemicals, and heavy-duty transport.

Hynamics	In 2019, EDF decided to set up Hynamics, a new fully-owned subsidiary, with the aim of becoming a leading producer of low-carbon hydrogen through electrolysis of water. Hynamics aims to achieve a low-carbon economy by targeting segments of industry and transport that emit large quantities of CO ₂ and are hard to serve with low-carbon electricity (refineries, chemical and cement production facilities, buses, trains, sea and river shuttles, aeronautics, etc.). Based on its investor and operator/maintainer model, it offers turnkey solutions to its customers in France and more generally in Europe.
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Hydrogen in France

In partnership with the cement group Vicat, the Hynovi project is aiming to create France's first decarbonised methanol production system using captured CO₂ combined with hydrogen produced by water electrolysis, totalling over 330MW. Located in Isère on the Montalieu site, the French government has pre-notified the European Commission of the project in respect of IPCIE-H2 (Important Project of Common European Interest for Hydrogen). With production of 200,000 tonnes of synthetic methanol per year, equivalent to one quarter of national consumption, and commissioning planned for 2026, the project aims to avoid almost 500,000 tonnes of CO₂ emissions per year.

Hynamics also successfully bid on mobility-related ADEME (French Environmental & Energy Management Agency) calls for projects to supply energy for buses for the Auxerrois and Grand Belfort Urban Districts. As a result, Hynamics and Transdev have launched the largest renewable hydrogen production and distribution site in France, in Auxerre. Dubbed AuxHYGen, the facility has a capacity of 1MW and can produce up to 400kg of green hydrogen per day via water electrolysis. This first achievement will avoid 2,200 tonnes of CO₂ emissions every year. It powers five hydrogen buses (20% of the fleet) operated by Transdev Auxerrois on the urban transport network. The aim is to extend the production capacities of these installations from 1 to 3MW by 2025 to support the deployment of all types of hydrogen use, notably the hydrogen-powered trains ordered from Alstom by the Bourgogne Franche Comté Region.

In Belfort, the urban district council has signed a first agreement with Hynamics for the sale of hydrogen via a hydrogen production and distribution station with the capacity to power 7 buses by 2023. An order for 20 additional buses is already planned by the public transport operator, bringing the total number of zero-emission buses on the road to 27 (50% of the fleet). The station will also allow local industries to be powered by decarbonised hydrogen.

Hydrogen in Germany

In August 2020, the Westküste100 joint venture, in which Hynamics is a 24% shareholder, was awarded €15 million to install a 30MW electrolyser, one of Europe's biggest, on the Heide refinery site in Schleswig Holstein as part of the German Reallabor programme. Extension of the project, known as Hyscale100, involves deploying almost 2GW of electrolysis capacity by 2030 to address the hydrogen needs of the refinery, as well as to produce synthetic fuels. The German government has pre-notified the European Commission of the project in respect of IPCIE-H2 (Important Project of Common European Interest for Hydrogen).

Hydrogen in Belgium

In 2020, with the support of Hynamics, Luminus positioned itself on several projects to develop, finance, construct, and operate hydrogen production facilities in Belgium. As early as November 2019, Luminus had already entered into an agreement with Terranova as part of the European Commission's "Green Octopus" programme. The aim is to make the port of Ghent one of the suppliers of green hydrogen in Belgium, in order to achieve decarbonisation of industrial uses, heavy-duty mobility, and the supply chain. The project involves connecting Luminus wind turbines and Terranova's solar power plants to an electrolyser to produce green hydrogen starting in 2022-2023. Detailed studies are underway for the planned construction of a 1MW electrolyser on the Terranova site. The second phase of the project could reach up to 5MW. Two other partnerships have been entered into at Mouscron and in Picardy Wallonia.

⁽¹⁾ Currently, 95% of hydrogen is manufactured using fossil fuels; since this process generates CO₂, it is referred to as "grey" hydrogen. Hydrogen (H₂) can either be created from methane by means of steam reforming, or by splitting a water molecule (H₂O) by electrolysis, i.e. by means of an electric current. Hydrogen is considered to be "green" if the electrolysis in question is produced by renewable energy, or low-carbon energy if it is produced using nuclear electricity. "Green" or "low-carbon" H₂ is thus an attractive way of decarbonising sectors in which direct electrification is not possible. Such sectors include refining, chemicals, and heavy-duty transport.

3.2 Preserving the planet's resources

EDF is committed to limiting its environmental footprint throughout the life cycle of its facilities and activities by optimising the use of natural resources. The four main CSR commitments identified in this set of issues concern biodiversity, responsible land management, integrated and sustainable water management, the circular economy and waste management.



3.2.1 Biodiversity

3.2.1.1 EDF group commitment and policy

A renewed commitment

Via its long-standing commitment based on a dedicated policy, the EDF group systematically aims to minimise the impact of its activities on biodiversity. Currently, it aims to achieve this goal via its commitment to two schemes.

2020-2022 biodiversity commitments	<p>In France: the "EEN" (<i>Entreprises Engagées pour la Nature</i>, i.e. companies committed to nature) initiative organised by the OFB (Office français de la biodiversité, i.e. French biodiversity office).</p> <p>Internationally: act4nature International initiative set up by the French non-profit EpE (<i>Entreprises pour l'Environnement</i>, i.e. Enterprises for the Environment).</p>	<ul style="list-style-type: none"> ● SMART commitments (Specific, Measurable, Additional, Realistic, Time-bound). ● Commitment themes: Reducing its activities' contribution to IPBES⁽¹⁾ pressure factors, improving and sharing scientific knowledge; raising awareness and governance.
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Scope : Group	These commitments cover all Group business lines, all geographical regions, and the scope of operational activities with biodiversity issues.
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Assessment of biodiversity issues	<p>In 2021 the Group organised an assessment of biodiversity issues along the full value chain, including mapping issues upstream and downstream from its activities (scope 3).</p> <p>This biodiversity risk assessment, carried out using the double materiality method on dependencies and impacts, was based on the ENCORE database (Exploring Natural Capital Opportunities, Risks and Exposure). It appears that the main issues concern not only direct operations but also activities upstream from the EDF group value chain. Some of these upstream activities, particularly fuel and material supply operations, feature dependency issues relating to nature (resources, regulation services) and pressures (e.g. on ecosystems and water resources). It appears from the risk materiality assessment – i.e. assessment carried out on seven types of risks (resource, operational, vulnerability, reputational, financing, regulatory or market risks) – that risks are generally correctly identified and covered with some room for improvement.</p>
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TNFD Initiative	In 2021, EDF attended the Taskforce on Nature-related Financial Disclosure (TNFD) Forum, contributing the Group's skills, but also, where appropriate, taking part in pilot projects.
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Biodiversity footprint	Methods testing	EDF contributes to protecting the planet's natural resources and makes sure to use credible and recognised biodiversity footprint tools. In 2021, EDF tested two methods on nuclear and thermal sites: the Global Biodiversity Score (GBS) and the Product Biodiversity Footprint (PBF).
	SBT for Nature	EDF is mindful to use a science-based action methodology and, along with a collective of French businesses, is testing the first stages of the SBT for Nature method. A report on these works will be published by the collective in 2022.

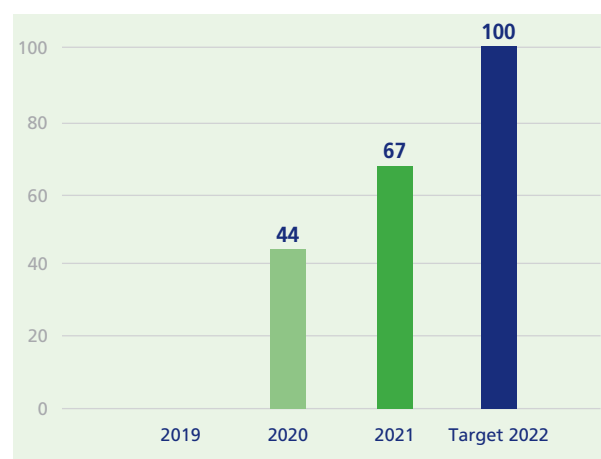
(1) IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

3.2.1.2 The results in 2021

The key indicator for the Group is based on the fulfilment of actions taken in accordance with Act4nature international. This fulfilment rate focuses on six of these actions, meeting commitments to reduce the contribution of activities to major pressure factors; further improving and sharing knowledge; enhancing governance of biodiversity issues and raising employee awareness.

Further details of the methodology for this indicator are provided in section 3.6 "Methodology".

Achievement rate of "Act4nature international" commitments (%)



3.2.1.3 Group action

3.2.1.3.1 Reducing the activities' contribution to major pressure factors

Most of the pressures applied to biodiversity are strictly governed by regulations. The IPBES report in 2019 identifies five major pressure factors: changing use of land and sea, overexploitation of resources, climate change, pollution and invasive alien species. EDF has developed its action programme to limit its impact on each of these factors.

Changing land and sea uses

All segments included

Hierarchy	The Group applies the principles of the mitigation hierarchy ⁽¹⁾ or the regulations of the country where it is located, if these are more stringent (particularly in Europe). Group companies apply the PMO (Prevent, Minimize, Offset) hierarchy for all projects and facilities in operation ⁽²⁾ .
Projects	For new projects the Group is optimising its site coverage and, in case of decommissioning of its facilities, works to restore the natural environment. Regarding investment decisions, 100% of the projects presented to the CECEG ⁽³⁾ are screened for risks related to biodiversity.
Structures currently in operation	Impacts of structures currently in operation, in particular nuclear structures, on the environment and biodiversity are the subject of monitoring conducted by EDF teams and scientific organisations such as IFREMER or IRSN.
Offsetting proposal	The Company conducted an experiment in the Isère department on the offsetting proposals with the "Initiative Biodiversité Combe-Madame" non-profit organisation and key community players. The experiment came to an end with the presentation of the project to the stakeholders in 2021. Dialogue on the actions that could be jointly carried out in the future on this site of both ecological and scientific interest is continuing.

Wind and Solar sector

Wind and solar power plants contribute to the fight against global warming and the protection of the environment, even if their construction and operation have an impact on biodiversity. All the Group renewable activities are thus part of a proactive approach aimed at limiting and controlling impacts, and seeking and implementing the best technical and technological solutions to preserve the environment.

Guidelines	The EDF group, the IUCN (International Union for Conservation of Nature), EDP and Shell worked together to develop guidelines ⁽⁴⁾ to prioritise mitigation measures and the best available measures to reduce impacts on biodiversity from onshore and offshore wind projects and photovoltaic projects.
EDF Renewables	EDF Renewables is committed to implementing an environmental management plan in France for all its ground-mounted photovoltaic power plants with biodiversity implications. In 2021, 100% of parks with biodiversity implications have this plant management plan in place.

(1) Principles based on Performance Standard 6 of the International Finance Corporation (IFC, a World Bank organisation) dedicated to Biodiversity Conservation and Sustainable Management of Living Natural Resources.

(2) The French biodiversity law of 2016 requires companies to implement "offsetting measures designed to avoid a net loss, and, preferably, even make a net gain in biodiversity".

(3) Group Executive Committee Commitments Committee (CECEG).

(4) portals.iucn.org/library/node/49283

Hydropower sector

Hydraulic generating facilities can affect ecological continuity in aquatic environments. The Group has implemented over 200 schemes to facilitate fish migration on sites with ecological implications (specifically on listed waterways).

This involves dam crossing equipment (such as "fish ladders") and the dismantling of weirs in rivers.

Poutès	This project allows access to spawning grounds upstream from the structure that are home to 47% of the Allier basin's spawning salmon, i.e. the majority of the Loire basin's spawning pool.
Romanche-Gavet	This project significantly improves the state of the Romanche valley's natural and aquatic environments. It consists of replacing six old power plants and five old dams with a new dam and a new, more efficient underground power plant. The new dam is equipped with an upstream and downstream fish and sediment ladder. From 2021 to 2024, the project is continuing with the decommissioning of the dams to allow fish to move freely, taking account of the river's specific hydromorphological characteristics. In 2024, all the old structures will have been decommissioned. As a result, 4 hectares of industrial land will have been returned to the natural environment, including 1 hectare to the river.
Vezins and La Roche Qui Boit	On the River Sélune, EDF launched the Roche Qui Boit dam decommissioning phase. These actions should lead to the full restoration of the river's natural functions, opening it up to the return of diadromous migratory fish (salmon, eels, shad, lamprey).
Belgium	Luminus and its partners (University of Liege and Namur, Profish, EDF R&D) have continued a programme to model the behaviour of migrating fish and reduce their mortality during the passage of hydroelectric facilities. The "Life4Fish" programme (2017-2023) is supported by the European Commission thanks to €1,913,000 in funding as part of the "Life" programme and with an overall budget of €4 million.

Nuclear and traditional thermal sector

To meet its industrial needs, EDF must have access to land without increasing soil artificialisation. This is why its land tenure strategy is driven by the overriding principle of sobriety. See section 3.2.2 "Responsible land management".

Within this framework of a land sobriety approach ⁽¹⁾, EDF is committed to monitoring the level of soil waterproofing during the conversion of former continental thermal sites in order to limit it in the long term.

In 2020, a first assessment of waterproofed land was carried out based on waterproofing rate data from the Corine Land Cover database ⁽²⁾. Approximately 20% of this land is estimated to have a waterproofing rate of over 50%.

In 2021, works continued to compare options to assess land takes on thermal land undergoing conversion. Studies were carried out on different decommissioning activities at old thermal plants to identify operations liable to have a positive impact on the level of soil waterproofing (removal of coverings, backfilling). Exploratory R&D works were begun in partnership with BRGM to carry out an initial assessment on a site of soil functions after rehabilitation (rehabilitation based on a management plan approved by the administrative authorities).

Removal of waterproofing	Three sites can be considered to have had their waterproofing freshly removed in 2022: <ul style="list-style-type: none"> temporarily, 8ha of the old coal storage yard at Vitry sur Seine power plant (Seine-et-Marne); permanently, nearly 10ha of the old Ambès thermal power plant (Gironde) reconverted into a photovoltaic plant; approximately 4ha at the old Artix thermal power plant (Pyrénées-Atlantiques) reconverted into a photovoltaic plant.
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Electricity grids

In the areas operated by Enedis ⁽³⁾, new HV lines were completed underground or unobtrusively for low voltage (LV).

Service sector

Several EDF buildings have received "BiodiverCity®" certification, a streamlined approach for players involved in sustainable construction ⁽⁴⁾, such as the Grande Halle in Lyon.

Overexploitation of resources and biodiversity

EDF's activity is partially dependent on the availability of fresh water. EDF has worked for years to reduce its water footprint. See section 3.2.3.1.2 "Optimisation

of water use and reducing pressure on environments". The same applies to raw materials and rare-earth metals. See section 3.2.4 "Waste and circular economy".

Forest resources	In terms of forest resources, EDF reviewed its Group-wide biomass policy, including new biodiversity commitments, particularly specifying that neither direct nor indirect deforestation were permitted to meet EDF's biomass-energy needs.
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Climate change and biodiversity

To enable the Group to achieve carbon neutrality by 2050, EDF R&D began work focused on carbon offsetting. The challenge was to favour solutions that promote

CO₂ sequestration in natural ecosystems. The Group's initial initiatives are described in section 3.1.1.6 "Use of negative emissions solutions".

(1) See also section 3.2.2 "Responsible land management".

(2) Biophysical inventory of changing land cover in 44 classes.

(3) GRI G4 EN 13 – Disclosure 304-4.

(4) cibi-biodiversity.com/biodiversity/

Pollution and biodiversity

Pollution	For a full overview of the pollution theme, see sections 3.2.4 "Waste and circular economy", 3.2.3.1.2 "Optimisation of water use and reducing pressure on environments" and 3.3.1.5 "Air quality".
Light pollution	<p>Light pollution: to reduce light pollution, the EDF group is mobilising its R&D.</p> <p>R&D: EDF group R&D is developing a methodology assessing and comparing night-time lighting and biodiversity on EDF sites that was tested in 2021 on its "Les Renardières" R&D site.</p> <p>Partnership: EDF and MNHN (<i>Muséum national d'histoire naturelle</i>, i.e. French National Museum of Natural History) work together to define the approach and protocols to be applied to identify the groups of species or habitats sensitive to light pollution on the sites, identify pollution and monitor the impact of the actions implemented.</p> <p>Street lighting: under the terms of the Copenhagen street lighting renovation, optimisation, operation and maintenance contract, Citelum carries out works taking account of the capital's "respect for biodiversity" goals, particularly with a view to minimising as much as possible the city's light pollution, especially in "vulnerable" and nature preservation zones.</p>

Invasive alien species

Invasive alien species are usually detected during surveys carried out on sites. The use of local plants when re-naturalising sites can be a resilience factor limiting the future development of invasive alien species.

EDF IES and EDF IEP	In Corsica and French overseas departments and territories, where the issue is particularly important, EDF IES and EDF IEP are intensifying the fight against invasive alien species on their projects. In 2021, all EDF IES investment files going through the Commitment Committee were screened, including, if necessary, requests for a diagnosis of invasive alien species and, if necessary, the fight against invasive alien species. Ten invasive alien species assessments were carried out in 2021, covering major areas or distances ⁽¹⁾ . Other assessments are scheduled for 2022-2023 based on project timetables. Three eradication measures were taken by EDF IES on highly-invasive species (Mauritius hemp on La Réunion or <i>Acacia mangium</i> on Guyana) in conjunction with competent local structures. Biosecurity protocols were also put in place by EDF IES to prevent the risks of colonisation during and after on-site work.
"Local Plants"	EDF, which has long been a partner of the OFB's ⁽²⁾ <i>Végétal local</i> (i.e. local plants) programme with CBN (<i>Conservatoires botaniques nationaux</i> , i.e. French National Botanical Conservation Bodies), is committed to the preferential use of locally sourced wild plants in all of the Group's projects. On new projects, local plants were used to renaturalise sites in Romanche-Gavet, covering more than 10 hectares, or to plant a line of hedges at the Beurepaire photovoltaic power plant. Local plants are also used after on-site work or to restore old industrial sites such as the old Bouchain power plant.

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3.2.1.3.2 Recreating spaces and conditions conducive to biodiversity

Environmental preservation and restoration

Positive ecological management

The Company manages natural sites belonging to the land it owns in partnership with local associations. EDF employs positive ecological management practices such as late mowing or eco-grazing. Part of the land owned is allocated to spaces

dedicated to the protection or recreation of biodiversity, via management plans tailored to the site's issues.

Kembs	In Kembs (Alsace), on an old agricultural corn monoculture plot (100ha) EDF carried out large-scale ecological rehabilitation work over a 5-year period. The restoration of a branch of a river stretching more than 7 kilometres and recreation of all the natural, wet and dry environments enabled the return of a range of species of insects, amphibians, birds and mammals, which now form a richly biodiverse environment. A full ecological assessment of this renaturalisation project was submitted to the concession's Environmental Ecological Monitoring Committee to be shared with partners. Currently, the site is jointly managed with the "Petite Camargue Alsacienne" national nature reserve.
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To anchor the approach, EDF focuses on several factors:

Standards	Applying for standards either partially or fully covering sites, e.g. LPO (Ligue pour la protection des oiseaux, i.e. League for the Protection of Birds) refuge standard in Brennilis.
Real Environmental Obligations	The signing of Real Environmental Obligations, e.g. on the old Ambès site (approximately 42ha).

(1) 9 for EDF IES and 1 for EDF IEP.

(2) OFB: *Office français de la biodiversité* (French Biodiversity Office).

Extending consideration of biodiversity to third parties

For years, EDF has been committed to an approach to sustainably manage land and respect its biodiversity. The Company takes account of issues specific to natural environments and the animal and plant species present, and since 2020 has more

systematically included these in its conceded land agreements (with local owners, municipalities, non-profits, etc.).

Conceded land agreements	An article dedicated to consideration of biodiversity was included in 70% of new conceded land agreements in 2021. An educational booklet explaining the ecological interest of the measures proposed is currently being prepared with the FCEN (Fédération des conservatoires d'espaces naturels, i.e. Federation of Natural Site Conservation Bodies).
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Specific programme on nuclear sites

The French and English nuclear sites are engaged in a programme to preserve and restore environments in partnership with local stakeholders:

Saint-Alban	EDF made a commitment with the CEN (Conservatoire des espaces naturels, i.e. Conservatory of Natural Areas) of the Isère department to restore and manage the Malessard wetland (20 hectares).
Cruas	Under the terms of the partnership with the Drôme-Ardèche LPO (Ligue pour la Protection des Oiseaux, i.e. League for the Protection of Birds), an educational trail and pond were created on a plot of land on the site along the ViaRhôna cycling route.
United Kingdom	Each site has a Biodiversity Action Plan including performance indicators that are reviewed annually. Following analysis of the results, recommendations or alternatives are put forward. Since 2016, more than 80% of indicator targets were achieved (except in 2020, due to the sanitary crisis).

Protected areas and endangered species

Europe	Several EDF sites contribute to achieving the preservation objectives in the Natura 2000 areas and to implementing the Natura 2000 contracts. The Group takes action via multiple programmes dedicated to preserving biodiversity (e.g. Life+). EDF Hydro has been committed to protecting the Pyrenean desman since 2010 (currently via the 2021-2030 National Action Plan), Luminus migratory fish, and Enedis bearded vultures (Life Gypconnect 2015-2021). EDF also contributes to developing regional versions of these plans (dragonflies, otters, etc.).
Asia	In Laos, NTPC is maintaining its policy of protecting biodiversity in the river basin in conjunction with the Nakai-Nam Theun National Park (formerly WMPA), the authority managing it. The EDF subsidiary is committed to having Nakai Nam Theun National Park put on the IUCN ⁽¹⁾ Green List of Protected Areas by the end of 2023. The park's candidacy to be added to the Green List was officially announced at the IUCN Congress in Marseille in September 2021.

3.2.1.3.3 Improving and sharing knowledge

Research and biodiversity

For over 50 years, EDF has equipped itself with dedicated R&D and Engineering Departments working on the environment, in partnership with external bodies.

BIODIV Project	This project covers most of EDF's research actions in favour of biodiversity; the related commitment is worth €21 million over 4 years and led to the launch of 8 theses, 5 post-doctoral projects, and 43 publications. In 2021, the new Renewables Environment and Sustainability (REES) project was launched. Coordinated by EDF Renewables and executed by R&D, it studies the impacts of wind turbines (both on- and offshore) and solar power on biodiversity.
HYNES team	Since 2009, EDF's R&D and INRAE ⁽²⁾ have set up the joint HYNES team in order to collaborate on the development of ecological approaches to aquatic environments. Renewed in 2019, the themes of the HYNES team have been extended to land environments.
Using data to protect biodiversity	In partnership with the MNHN ⁽³⁾ , INRAE and its other research partners, EDF contributes to the development of knowledge and decision support tools such as the "Biodiversity Toolbox" (BOB) and "Ecoval" (ecological equivalence evaluation). Monitoring surface water: Since the end of the 1990s, EDF has been conducting studies to understand the influence of water temperature on aquatic organisms in the context of climate change. Since 2020, EDF has produced seven publications on this programme. A summary of the programme was drawn up in 2021 as agreed in the public commitment. Sentinel lakes: contribution to the long-term scheme to monitor high-altitude lakes in the face of global change. Offshore wind power: pursuant to the Dunkirk offshore wind project, EDF Renewables is committed to conducting a data acquisition programme on the conservation status of species, environmental quality and ecosystem services in the Strait of Dover.

(1) International Union for the Conservation of Nature.

(2) inrae.fr

(3) MNHN: Muséum national d'histoire naturelle (i.e. French National Natural History Museum).

Awareness of the ecological quality of land

The Company integrates biodiversity as one decision-making criterion in its industrial choices. The vast majority of EDF production sites are located close to protected sites and remarkable natural areas.

Ecosystems	At the very least, ecosystems surrounding group infrastructure are studied <i>via</i> environmental and societal impact assessments (ESIA) completed prior to projects, following best practice (current regulations or IFC Performance Standards).
Industrial sites	Mandated by the Company, UNEP – WCMC carried out a vast study to assess the ecological sensitivity of places where the Group's 1,000 industrial sites are located ⁽¹⁾ .
Land inventories	EDF has a clear overview of the ecological status of its land, <i>via</i> a dedicated database, populated <i>via</i> both regulatory and voluntary inventories (contribution to the biodiversity Atlas since 2015). EDF has also contributed to developing and implementing the MNHN (Museum national d'histoire naturelle, <i>i.e.</i> French National Museum of Natural History) Ecological Quality Index and Ecological Potential Index. In the field, a number of sites have prepared and regularly updated an inventory of the ecological quality of the land on which they are located. Management records are drawn up to assess and compare biodiversity issues and prospective land uses (project, decommissioning, rehabilitation).
Voluntary contribution to the INPN	In France, EDF voluntarily transmitted to the INPN ⁽²⁾ some of its data from inventories collected, <i>i.e.</i> approximately 50,000 occurrence data, in addition to the 15,000 occurrence data stemming from EDF's mandatory contribution.

3.2.1.4 Biodiversity governance

In 2021, the Group reinforced biodiversity governance and dialogue with relevant stakeholders.

3.2.1.4.1 Reinforcing the governance

General governance

The Group's biodiversity governance is similar to climate governance (See section 3.1.3 "EDF climate governance").

EDF's attendance of the Taskforce on Nature-related Financial Disclosures (TNFD) Forum

In 2021, EDF's attended the Taskforce on Nature-related Financial Disclosures (TNFD) Forum. The TNFD's goal is to provide better information enabling financial institutions and businesses to take account of nature-related risks and opportunities in their strategic planning, risk management and asset allocation decisions.

Other managerial initiatives and standards

Biodiversity governance has been expanded to include several new biodiversity management initiatives, recently put in place at various entities, in accordance with the new AFNOR NFX 32-001 standard: Biodiversity – Strategic and operational approach – Requirements and guidelines, published in January 2021, relating to biodiversity management, or positive biodiversity standards.

AFNOR NFX 32-001	EDF La Réunion is AFNOR-certified for all its in-situ activities, except for post-operating activities.
"Positive biodiversity project" standard	The Saint Romain en Gal photovoltaic project (Rhône) was certified as a "Positive biodiversity project" <i>via</i> the Rives du Rhône (<i>i.e.</i> banks of the River Rhône) SCOT (<i>Schéma de Cohérence Territoriale, i.e.</i> territorial coherence plan).

(1) Analysis carried out in September 2018 by the World Conservation Monitoring Center (WCMC) for EDF, EDF Renewables, EDF in the UK, Edison, EDF China and the International Division (Luminus, MECO, Nachtigal, EDF Norte Fluminense, NTPC, SLOE, and SNOP).

(2) INPN = Inventaire national du patrimoine naturel (*i.e.* French National Inventory of Natural Heritage).

3.2.1.4.2 Enhancing dialogue with stakeholders

Dialogue with biodiversity stakeholders is based on setting up partnerships and taking part in relevant think tanks. This is supplemented with in-field dialogue with local bodies.

Partnerships

Partnerships make up a significant share of the actions carried out in favour of biodiversity.

France Nationwide	<p>The Group prioritises the Company's historic partners and major players in the sector: MNHN (Muséum national d'histoire naturelle, <i>i.e.</i> National Natural History Museum), LPO (Ligue pour la protection des oiseaux, <i>i.e.</i> League for the Protection of Birds), French Committee of the IUCN (International Union for Conservation of Nature), FCBN (Fédération des conservatoires botaniques nationaux, <i>i.e.</i> Federation of National Botanical Conservation Bodies), FCEN (Fédération des conservatoires d'espaces naturels, <i>i.e.</i> Federation of Natural Site Conservation Bodies), INRAE (Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture, <i>i.e.</i> National Institute for Scientific and Technological Research for the Environment and Agriculture) and IFREMER (Institut français de recherche pour l'exploitation de la mer, <i>i.e.</i> French Research Institute for Exploitation of the Sea).</p> <p>Overall, there are more than 100 partnerships agreed with non-profit or research bodies.</p> <p>In preparation for the "Entreprises engagées pour la nature" (<i>i.e.</i> Committed companies for nature) commitment, 70 representatives of EDF biodiversity partners were invited to a two-day seminar to review the implementation of the EDF biodiversity roadmap.</p>
France At the local level	<p>Locally, numerous partnerships aim to help sites in their approach conducted in favour of biodiversity. The partnership with the FNPF (Fédération nationale de la pêche en France, <i>i.e.</i> National Federation of Fishing in France) continues through the financing and management of actions in favour of aquatic environments (one framework agreement and nearly 50 local agreements with departmental federations). Numerous actions are also carried out within the nuclear fleet in partnership with local players.</p>
United Kingdom	<p>EDF is one of the 5 companies to have met the Wildlife Trusts' Biodiversity Benchmark. EDF has been collaborating for more than 20 years with the Suffolk Wildlife Trust in Sizewell, the Lancashire Wildlife Trust in Heysham, the Wildfowl & Wetlands Trust in Hinkley Point C and with the Romney Marsh Countryside Partnership in Dungeness.</p>

Think tanks

Think tanks	EDF has regular discussions with think tanks like OREE ⁽¹⁾ , EpE ⁽²⁾ , CILB ⁽³⁾ and the working group of CDC Biodiversité ⁽⁴⁾ for the definition of the global biodiversity score.
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Local governing bodies

Local governing bodies	The EDF group is involved in local biodiversity governing bodies, such as: River Basin Committees, River Committees and Regional Biodiversity Committees in France. It develops a policy for cooperation with non-profits, scientific organisations, and institutions.
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3.2.1.4.3 Training and awareness raising

Employees

The EDF group is setting up an awareness and training programme for its employees to improve its business practices in light of biodiversity issues. Each company manages its own training and awareness-raising activities, which are often in partnership with naturalist associations. Eight business line-specific guides have been produced. They describe the biodiversity issues specific to their

operational activity, highlight regulatory changes, explain the terms and conditions of partnerships agreed by the businesses, and give examples of actions worth repeating.

Based on a concept similar to the "Climate Collage" (see section 3.1.3.5.2 "Innovation and collective intelligence focused on climate action"), the "Biodiversity Collage" raises awareness of the causes of biodiversity erosion. The goal of providing training for or raising awareness among 1,000 employees on the theme of biodiversity by the end of 2022 ⁽⁵⁾ was achieved as early as 2021.

Employees made aware of/trained about biodiversity	2020	2021
Number of employees made aware of/trained about biodiversity (total)	467	1,046

General public

Via its Foundation or business lines, the Group supports biodiversity-related philanthropic actions.

	2019	2020	2021
Number of biodiversity projects	-	22	44
Amount of funding (in euros)	-	327,500	687,150

EDF Norte Fluminense is continuing its work with the *Mico Leao Dourado* non-profit organisation to reforest the watershed, *Leontopithecus rosali* habitat (golden lion tamarin). The Company has recently extended its partnership to take action on

agroforestry. Since the start of the project, nearly 10 hectares of forest and agroforestry systems have been reforested with the direct support of EDF.

(1) oree.org/objectifs-et-missions.html

(2) epe-asso.org/

(3) cilb.fr

(4) cdc-biodiversite.fr

(5) Taken with Act4NatureInternational.

3.2.2 Responsible land management

The Group attaches the utmost importance to land sobriety and wants to act responsibly with regard to the land it owns or uses under concession. Accordingly, the Group's entities make sure they limit land take and soil sealing, and optimise and use land in accordance with regulations, particularly by implementing innovative solutions in favour of multiuse of land. The entities attach the utmost importance to preventing pollution risks.

3.2.2.1 Land sobriety

3.2.2.1.1 Limiting and optimising rights of way

New industrial developments are preferentially positioned on existing man-made sites. Appraisal and site restoration operations are carried out by EDF's internal engineering entities with the assistance of external service providers.

In the field of centralised production systems

Assessments	A mapping and zoning of land areas for industrial use is systematically carried out.
Man-made sites	In the context of the post-Fukushima works, the built-up areas for the 56 buildings housing the emergency diesel generators are located on existing land take. The EPR under construction in Flamanville stands alongside the pre-existing Flamanville 1-2 facilities.
Conversion of old thermal sites	The land strategy put in place at the DPNT (Nuclear & Thermal Fleet Department) assists with the conversion of old thermal sites for new industrial uses. In 2021, two old thermal power plant sites were converted into EDF Renewables photovoltaic plants: the zone of the old plant block of the former Ambès plant (Gironde) and a damaged area of the old Artix plant (Pyrénées-Atlantiques).

In the field of new renewable energies

Focus on Group properties and derelict sites

When it comes to new renewable energies, the plants prioritise the Group's properties as well as derelict sites. Photovoltaic panels are installed on plant new-builds, car park roofs or sun shades (in 2021, total photovoltaic modules: 14,402, total power: 6.2MW).

EDF Renewables prioritises derelict sites and develops all its projects based on the "Prevent Minimize Offset" (PMO) hierarchy plus systematic impact assessments.

However, to achieve the goals set by the Multi-year energy programme in France, derelict sites will not be sufficient. On specific sites presenting biodiversity issues, environmental management plans and accompanying measures will be implemented, which will meet the requirements to protect species and biodiversity and promote positive impacts (differentiated management, late mowing, etc.)⁽¹⁾.

Other facilities

Compatibility with crop or livestock farming activities	The French "climate and resilience" act of 22 August 2021 ⁽²⁾ states that natural or agricultural spaces occupied by a photovoltaic park do not count as land take if the ecological functions of the soil are not lastingly affected and if the facility remains compatible with a crop or livestock farming activity ⁽³⁾ . For EDF Renewables projects, the feasibility of grazing is systematically assessed based on the type of site, biodiversity issues, or the presence of interested farmers. The same compatibility rule is applied by Luminus in Belgium: the Ath solar park set up on the Hoganasva industrial site will be equipped with a planted screen featuring more than 900 indigenous melliferous plants and the green spaces near the panels will be maintained by Ouessant sheep.
Agri-PV	With regard to the development of ground-based photovoltaic projects involving agricultural land within the territories, EDF Renewables, the French Chambers of Agriculture and the FNSEA signed a charter of best practices on 19 January 2021, focusing on responsible and coordinated land use.
Floating photovoltaic plants	The aim of this technology is to set up a power plant on a lake or dam, as floating solar power plants enjoy maximum sunshine and the coolness of the water to cool the panels, optimising their yield. Several EDF Hydro entities are currently working on initiatives and bidding on invitations to tender.

(1) In addition to not using phytosanitary products on all the parks it manages.

(2) French Act 2021-1104 of 22 August 2021 combating climate imbalance and increasing resilience faced with its effects (JORF (i.e. Official Journal of the French Republic) number 0196 of 24 August 2021).

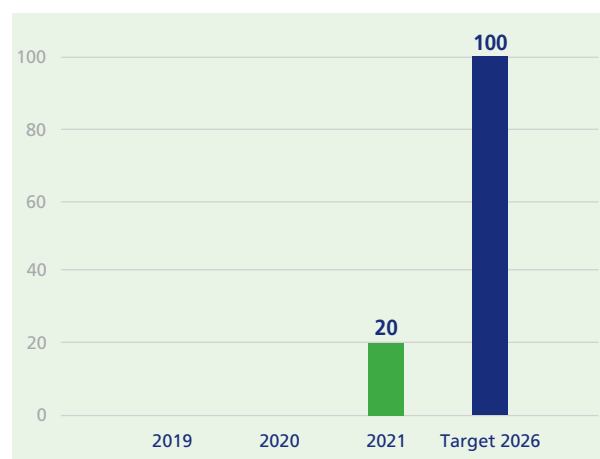
(3) A decree is pending to specify the terms of the Act.

3.2.2.1.2 The Group's commitment

The key performance indicator selected for the commitment to responsible land management relates to the installation of solutions in favour of multiuse of land. This indicator more specifically focuses on the issue of reconciling agriculture and the development of carbon-free power generation, as well as setting up floating photovoltaic parks. The methodology associated with this indicator is described in section 3.6 "Methodology".

In collaboration with EDF Renewables, EDF R&D commissioned a first agrivoltaic demonstrator on the Renardières site, yielding encouraging results: lucerne production under the panels was twelve times higher than on the control plot.

Implementation rate of innovative solutions encouraging multifunctional land use (%)



3.2.2.2 Soil and underground management

Pollution of soil and groundwater is one of the potential environmental impacts of the Group's industrial activities. The environmental policies of the Group entities aim to optimise the use of land and protect these environments against any impacts. Land use and subterranean water use is monitored as part of groundwater monitoring (see 3.2.3.1 "Sustainability of water use") and biodiversity actions (see section 3.2.1 "Biodiversity").

3.2.2.2.1 Prevention of soil and subterranean water impacts

An "in-depth defence" approach	The prevention of impacts relies on an "in-depth defence" approach, including several levels of security built into the protection methods in place at all industrial sites.
Protection methods in place	Maintaining the integrity of protection methods; control of effluent and waste management operations; maintaining and inspecting ultimate structures such as retention systems; ensuring that the soil surface remains free from radiological and chemical contamination; reinforcing safeguard measures when transporting fuel or waste; ensuring the availability of emergency kits and carrying out the corresponding drills.
Physicochemical and radiological monitoring	EDF also carries out physicochemical and radiological monitoring of the quality of subterranean water at sites by means of a dense network of piezometers. See section 3.2.3.1.2 "Optimisation of water use and reducing pressure on environments – Quality of water and effluents".

3.2.2.2.2 Management plans

Proactive and organised approach

For years, EDF has adopted a proactive approach to checking the quality of soil, sub-soil and subterranean water on different production fleet sites (thermal and nuclear).

Actions taken	Recording of activities liable to have an influence on the quality of soil and subterranean water; setup of regular monitoring of the quality of subterranean water where appropriate; implementation of management measures.
Methodology applied for the full facility lifecycle	Checks on activities conducted and carrying out of investigations in case of acquisition of new land; prior characterisation of soil upstream from a project for rational and optimised use; definition of the state of soil and management of any markings during operation; rehabilitation actions following shutdown of activities to minimize impacts.
Organisation and dedicated tools	Taking part in works by the French Environment Ministry and standards commissions; centralised technical support for different Group entities (soil and subterranean water) (Ingeum): training courses organised every year on soil management and subterranean water samples; research and development actions with institutional partners (concrete management, soil data use, etc.).

In the field of phytosanitary products ⁽¹⁾

Industrial centralised production sites	EDF's Real Estate Department aimed to abandon all phytosanitary products by 2022 for all areas on continental industrial sites that are not sensitive to safety and security issues. Other entities no longer use these products ⁽²⁾ . To date, 62% of industrial centralised production sites are committed to a zero phytosanitary product approach to meet these goals.
Source substations	Ahead of its goals, and from July 2022, Enedis will no longer use phytosanitary products to maintain Source Substations, except for zones where treatment is necessary for security reasons (HVB zones). For new Source Substations, experiments are ongoing in the Aude, Aveyron and Drôme with a view to building Source Substations using Zero Phytosanitary products.

3.2.3 Integrated and sustainable water management

As a manager of dams and reservoirs, and a major user of water resources, the EDF group works towards integrated and responsible water management. Dams

operated by EDF in mainland France are used to store over 7 billion cubic metres of water, i.e. 70% of the volume of water artificially stored in France.

Commitments	The Group is committed to protecting and managing water in an integrated and sustainable manner, both in terms of quantity and quality (see section 3.2.3.1 below), as well as sharing water within the territories in which it operates while fully taking into account the local water situation (multi-uses of water under growing climate constraints) (see section 3.2.3.2 below).
Ocean	The Ocean, after the Climate and Biodiversity, has become the 3rd major environmental and international theme due to related strategic, geopolitical and economic issues, particularly regarding its resources. The EDF group has built a historic link with major stakeholders linked to marine issues, particularly with the construction of the Rance tidal power plant in the 1960s, with coastal thermal and nuclear production facilities, and more recently development of offshore wind turbines or reduction of the carbon impact of ports. In 2021, the EXCOM named an EDF group "Offshore Coordinator" to define a strategy and coordinate the Group's different entities on this theme.
International works	EDF participates in several international works on water (IHA Board of Directors, Board of Directors of the <i>Partenariat français de l'eau</i> (French Water Partnership), member of the World Water Council, etc.), and is also directly involved, as UFE representative to Eurelectric, in working groups on the Water Framework Directive.
R&D	Every year, several million euros are spent on R&D in the water sector.
CDP Water	Since 2020, CDP Water, the flagship international non-financial rating firm for water, has rated the Group among the leading utility companies in this sector (see section 3.7 "Non-financial rating").



3.2.3.1 Sustainability of water use

3.2.3.1.1 Excellent results in terms of water intensity

Almost 99% of water withdrawn is returned to the environment. Most of the water withdrawal from its facilities is carried out in France (81%) and the UK (17%) in areas where there is no permanent water stress. Many nuclear and thermal facilities are established in coastal locations and therefore do not use fresh water.

Exposure to water stress

Thermal generation

Assessment of exposure to water stress	The exposure to water stress of the Group's production resources was assessed by 4 different international tools (Blue Water Scarcity from WFN, Aqeduct ⁽³⁾ , from WRI, AWARE from the WULCA project and WEI+ from the EEA). These tools do not identify freshwater withdrawals from stressed areas in France, with the exception of Aqeduct.
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The results of this evaluation show that:

BWS ⁽⁴⁾ > 80%	Four nuclear power plants are located in an area of extreme water stress, but are not exposed to water-related risks because they use seawater as a cold source and therefore do not draw freshwater.
40% < BWS < 80%	Five nuclear power plants face a medium to high risk for which specific measures have been taken either at the design stage or during operation (infrastructure, water management with local stakeholders, etc.) They are therefore not faced with water scarcity risks. Thus, the Lunax reservoir was constructed from the outset upstream of the Golfech nuclear plant to prevent a possible shortage of water from the Garonne used for cooling in periods of serious drought.
BWS < 20%	Three flame-thermal sites are located in a water-stressed zone for which appropriate water-saving measures have been taken with no impact on output, which is low during the summer period (in practice, drought-related prefectural decrees are issued every year during the summer).

EDF has a hydro-meteorological centre that records local data in real time for all its power plants in order to have greater accuracy with respect to time and space in measuring water stress, which is at best a monthly average for the 4 tools mentioned above, used to assess exposure to water stress.

(1) This is an Act4Nature commitment.

(2) Cyclife, Edison, Luminus, EDF Norte Fluminense, EDF Hydro; ES no longer uses any glyphosate-based products.

(3) WRI Aqeduct, developed by the World Resources Institute, is a mapping tool for determining the risk associated with water resources on a global scale. Aqeduct researchers calculated 12 indicators including access to water, water stress, drought, pressure on groundwater, etc.

(4) BWS: The Baseline Water Stress – BWS is calculated as the ratio between annual water withdrawal and average annual water availability during the 1950-2010 period for 215 sub-basins in France.

Hydropower generation

Reassessment of generation	The reservoirs are located upstream from basins experiencing water stress, meaning they are regularly required to provide back-up in case of lower water levels. Every 5 years, EDF Hydro reassesses its sites' generation, taking account of changing hydrology and temperatures due to climate change.
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Investment criteria

Criteria	Changes in water stress is one of the criteria used to evaluate any new project presented to the investment Committee (CECEG, i.e. Executive Committee's Commitments Committee).
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Water withdrawn

Variation in water withdrawals	Group water withdrawals are up 3% compared to 2020, but remain 5% below the average of the last five years.
Cooling water	69% of the water withdrawn for cooling purposes by the Group comes from marine or estuary environments, where resource availability is not an issue. This percentage is almost 63% in France, over 99% in the United Kingdom and close to 85% in Italy.
Subterranean water	The quantity of freshwater sourced from groundwater is marginal and amounts to 2hm ³ , about 0.01% of the freshwater taken from the surface. Mains water is not used for cooling systems but only for various forms of water process for a share lower than 0.1%.

Returning water to the natural environment

99% of withdrawn water is returned	At the Group level, around 43 billion cubic metres of water are used for cooling thermal power facilities, of which 99% is reusable and returned virtually instantaneously to the natural environment. As such, EDF is a significant user, but negligible consumer, of water.
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Group key performance indicator

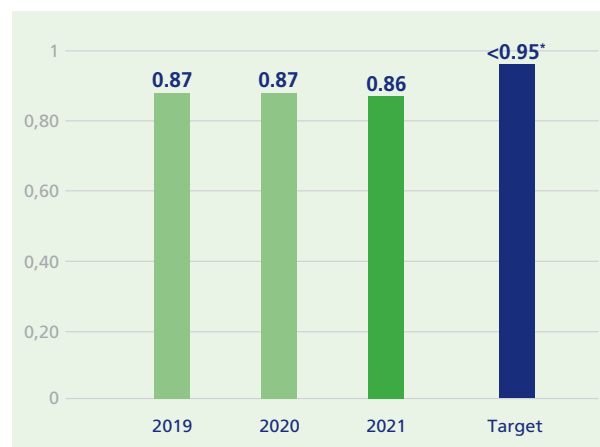
Water intensity is the specific consumption of evaporated water per kilowatt hour of electricity generated.

The stated aim is to remain below the target of 0.95l/kWh on average over the five past years, by progressively reducing specific water consumption by 2030 (the benchmark being the 2015 level at 0.96l/kWh).

This threshold would serve to put an exceptional climatic year into perspective. Taking account of the expected variation in generation resources and actions taken to optimise water, total Group-wide freshwater withdrawal and consumption should fall in the coming years.

Water intensity over 2021 alone is down compared to 2020 (0.82l/kWh). In fact, the volume of evaporated water ⁽¹⁾ in absolute value (427hm³) is down by 2% despite the increase in thermal production and related water withdrawals. Most of this volume is in France (96%).

Water intensity (l/kWh) √



* On average over the past five years

√ 2021 indicator subject to reasonable assurance check by Deloitte & Associés.

(1) Of which 99.5% fresh water.

3.2.3.1.2 Optimisation of water use and reducing pressure on environments

The optimisation of water used in EDF's generation activities serves to ensure management of water resources and to honour the Group's commitment to guarantee multipurpose water resources (drinking water, water for irrigation, tourism, etc.) and to meet the needs of local authorities. The EDF group is working on several factors to optimise its water use and reduce pressure on the environment, by reducing its water consumption, reusing and/or recycling it, and using seawater desalination processes.

Water quality and effluents

Monitoring around industrial sites	EDF monitors land and aquatic ecosystem quality parameters, including subterranean groundwater around its industrial sites, particularly by measuring, controlling and analysis effluents on all sites. Monitoring the temperature of water upstream and downstream from thermal power plants is an important parameter with regard to biodiversity. The pH of water, its conductivity, chemical oxygen demand (COD), biochemical oxygen demand (BOD5), nitrogen and phosphorus are also controlled and measured according to a regulatory environmental monitoring plan. In terms of subterranean water, piezometers set up around industrial facilities are used to monitor and control water quality <i>via</i> withdrawals specified in a regulatory control plan. The information collected is used to ensure the quality of subterranean water is preserved. These environmental monitoring programmes, combined with impact and incidence assessments carried out at each facility, are used to guarantee that surface and subterranean water resources are lastingly preserved.
Specific monitoring for nuclear power plants	Each nuclear power plant has a specific authorisation defining, based on its characteristics and its environment, the water withdrawal conditions, and chemical, thermal and radioactive effluent discharge limits (mainly tritium and carbon-14). All these effluents are collected, treated, then transported to storage tanks where they are analysed, before being disposed of, in accordance with regulations to prevent any potential impact on aquatic ecosystems. Annually, more than 10,000 control analyses are carried out at each nuclear power plant, by both EDF and non-EDF laboratories. The results of this monitoring are provided to the relevant local authorities and used in documents available to the public.

There were no significant water-related environmental events or fines in 2021.

Water consumption reduction and withdrawal limitation measures

Experimentation

Golfech	In 2021, the Golfech nuclear power plant closed a trial with a local EMS to reduce its water withdrawals (95,000m ³ /year) from the Garonne river, as well as use of chemicals (acids and sodium) to produce demineralised water (89,000kg/year).
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Dry air cooling systems

Overseas department	EDF R&D teams have designed "dry air cooling" systems for engine cooling, which reduce water withdrawal. EDF IPE's new plants are now no longer cooled with seawater, and the same will be true for the Larivot plant.
Brazil	A plan for a second combined cycle power plant after Norte Fluminense is under consideration, featuring an air- rather than water-based cooling system from the design phase.

Dry cleaning of photovoltaic panels

EDF Renewables	At photovoltaic power plants operated by EDF Renewables in France, rain is generally sufficient to clean the panels. However, the level of dirt and grime that builds up over the years on panels can require cleaning. Cleaning frequency may vary from plant to plant, but panels always require cleaning easily more than once a year. In these cases, no products are added to the water used. Dry cleaning solutions are available and can be considered for use in cleaning panels in overseas zones facing water stress.
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Modernising the demineralisation chain

Belgium	In Angleur (Belgium), demineralised water, extracted from the River Ourthe, is used to both reduce NO _x emissions and increase turbine output. By modernising the demineralisation process, the site's water intensity has been reduced by approximately 20%.
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Reducing process water needs

Chile	In Chile, following a long drought that caused the water table to fall by 1m in less than a year, specific measures were taken for the combined cycle power plant in Nueva Renca, enabling halving of process water, which plummeted from 12t/h to 6t/h.
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Water reuse and recycling

The recycling of process and cooling water is implemented throughout the Group, where appropriate.

Design of new nuclear reactors	In order to reduce the impact on freshwater withdrawal, the possibilities of using water from WWTPs and rainwater as a source of complementary water are studied as early as the design stage of new nuclear reactors.
Cordemais and Martigues	EDF's thermal power plants in Cordemais and Martigues recover rainwater or recycle their effluents.
West Burton	At the West Burton A Nuclear Power Plant (United Kingdom), effluent from the wastewater treatment plant is no longer returned to the river but is sent to the plant's basins for reuse in the cooling towers. Each year 100,000m ³ of water is no longer removed from the Trent River.
Fuzhou	In China, the Ultra-supercritical power plant of Fuzhou reuses all its process water sequentially and depending on the quality of water (from cooling to watering ash to gardens).
Dalkia	In Dalkia's large biomass combustion facilities, process wastewater is used to cool bottom ash to limit the volume of liquid effluent to be treated.

Desalinating sea water

EDF is carrying out several desalination trials on its sites:

Flamanville 1, 2 and 3	A desalination unit has been in operation since 2016 to produce demineralised water.
Jarry Sud	In Guadeloupe, the power plant in Jarry Sud has a sea water desalination facility, which has made it possible to stop using tap water and save around 50,000m ³ of fresh water per year.
Simeri-Crichi	The plant in Simeri Crichi (Italy) is equipped with sea water desalination systems to replace freshwater withdrawals for industrial water needs.

3.2.3.2 Integrated and shared water management

The last nine years rank among the "top 10" hottest years ever recorded on Earth, and 2021 stands in sixth place, thereby increasing the importance of good water management ⁽¹⁾.

3.2.3.2.1 Impact of climatic conditions on electricity generation

In France, several heatwaves without intense temperatures or severe low water levels (except the Garonne) generated historically low production losses on the nuclear fleet (5GWh compared to 3,000GWh in 2020).

3.2.3.2.2 EDF met its commitments to stakeholders thanks to good management

Water stored by EDF in its dams is mainly dedicated to supplying hydraulic power plants. Water resources are also used to cool thermal or nuclear power plants, which return it at a temperature close to the natural environment from which it was withdrawn. But in addition to the EDF group's industrial activities, water is also

shared and redistributed for several uses: drinking water for towns and cities irrigation for farmers; white-water sports facilities.

Resource availability varies according to hydrological conditions (snowfall, rainfall). Shared water management requires collaboration between different stakeholders, particularly local authorities and the six water authorities.

Management of water resources

Water authorities	EDF is represented by the UFE ⁽²⁾ at meetings of each of the river basin water governing authorities ⁽³⁾ . In spring 2021, the French Ministries of Agriculture and the Ecological Transition launched a dialogue process ⁽⁴⁾ designed to reconcile adaptation to the consequences of climate change and preservation of a strong agricultural sector. Via the UFE, EDF contributed to this process and highlighted the essential role of hydropower, and EDF in particular, to provide back-up in case of low water levels.
Water coordination	Since 2003, EDF has had an internal water coordination body, chaired by the Group Senior Executive Vice-President, Renewable Energies. The operational management of water is ensured at the national level by the Water Management Group (GGE) responsible for ensuring the regular, weekly or daily monitoring, if necessary, of water stocks in order to coordinate various production constraints and the management of the multiple uses of water. In 2021, 458hm ³ were removed from storage, to meet the various needs of water-users in the context of the specifications of hydropower concessions or agreements to share water. The River Rhône required back-up in the autumn, due to low natural flow rate and the low level of Lake Geneva, and this led to the use of 83hm ³ of water from Arves and 51hm ³ from the Vouglans reservoir.

(1) [noaa.gov/news/2021-was-worlds-6th-warmest-year-on-record](https://www.noaa.gov/news/2021-was-worlds-6th-warmest-year-on-record)

(2) Union française de l'électricité (i.e. French electricity union).

(3) [lesagencesdeleau.fr/](https://www.lesagencesdeleau.fr/)

(4) "Varennes agricole de l'eau et de l'adaptation au changement climatique", i.e. French national agricultural forum on water and adapting to climate change.

Keeping commitments

Water balance and back-up in case of low water levels	All the commitments with the different stakeholders were kept in 2021. The South-West was the only territory where the situation was particularly strained, though emergency requisitioning of hydroelectric reservoirs for drinking water on the River Aude was ultimately not required. The CGEDD-CGAAER appraisers recognised (during the <i>Varenne de l'Eau</i>) EDF's important role in the water balance of the Adour-Garonne basin and concluded on the need to preserve potential hydroelectric flexibility.
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Sharing water on projects

Cameroon	The Nachtigal hydropower project is designed to improve access to water for inhabitants of the project zone. An invitation to tender was recently launched to renovate existing boreholes and drill new ones in zones where access to clean water is an issue for local people. This initiative is part of the programmes to support local infrastructure, and was developed in conjunction with the local population and authorities in charge of community development.
Chile	The "Good energy to improve the quality of life of the Los Burros Sur cove" initiative won first prize in the "Good practices for a more sustainable electricity future" competition organised by Generadoras de Chile. This initiative is organised by EDF and Latin American Power in collaboration with a selection of local stakeholders in the municipality of Freirina. The project features more than ten actions, including installing solar power generation systems, supplying drinking water, and supporting diversified production in the zone, such as diving lessons for fishermen and women or delivery of appropriate equipment. The community received funding to build a desalination plant (with expert technical support from both businesses), as well as additional funding to increase water production.

On the theme of integrated and shared water management, please also refer to section 1.4.1.3.1.4 "Issues relating to Hydropower generation" and particularly "water management and access".

3.2.4 Waste and circular economy

Optimising the use of the natural resources consumed by the Group's value chain is an essential component of the Group's corporate responsibility.

Commitments	<p>The Group undertakes to:</p> <ul style="list-style-type: none"> ● assume its responsibilities with regard to radioactive waste. ● promote a circular economy approach; ● avoid the production of conventional waste ⁽¹⁾ and promote the reuse, recycling and recovery of products/materials throughout the value chain; ● use our waste by reallocating uses internally within the Company in case of new developments, or via certified recovery centres.
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3.2.4.1 Assuming its responsibility for radioactive waste ⁽²⁾

Nuclear power plants generate radioactive waste from the operation of power plants, recycling of spent fuel, or decommissioning of permanently shut-down plants.

In France, EDF is responsible for what happens to its spent fuel and how it is processed and for the related waste, without any possibility of transfer of responsibility or limitation in time. Orano is responsible for processing spent fuel and ANDRA for the storage of final waste, in accordance with the Article L. 542-12 of the French Environmental Code. In order to meet the significant challenge of radioactive waste, the Group has developed a strategy of control and development of radioactive waste management sector, enabling as of today to ensure that they are taken care of, in operational industrial sectors. Associate fundings enable to answer the present and future needs of dismantling sites and the operation of the Group's nuclear facilities are subject to dedicated provisions (see section 2.2.5 - Risk 5B "Control of radioactive waste treatment and decommissioning of nuclear facilities, and securing the associated commitments commitments").

"Short-lived" waste and "long-lived" waste

95% of the volume of radioactive waste produced by EDF is "short-lived" waste (period less than or equal to thirty-one years). It mainly comes from filtration systems, and maintenance and servicing operations. The majority of radioactive waste from plant decommissioning works is also short-lived waste.

"Long-lived" waste (period greater than thirty-one years) is generated by processing spent nuclear fuel, disposing of certain metal parts from reactors, and waste from decommissioning of metal parts close to the core, as well as graphite from natural uranium graphite gas nuclear reactors. This "long-lived" waste

accounts for approximately 5% of the volume of radioactive waste eventually produced by EDF.

France

For HLW a,d ILW-LL (see glossary), the Group is involved alongside ANDRA (the French national agency for radioactive waste management) in the CIGEO project, the ANDRA's geological disposal. To this end, a cooperation agreement was signed at the end of 2020 between EDF and ANDRA. For the storage of graphite waste the Group participates, as a producer, in the various working groups of the National Plan for the Management of Radioactive Materials and Waste (PNGMDR).

In addition, the organisation of the Cyclife subsidiaries has been completed in order to widen a range of waste treatment solutions, enabling an optimization of the volumes stored.

With regard to the management of spent fuel, EDF's current strategy, in agreement with the State, in terms of the fuel cycle is to practice the treatment of spent fuel, recycling the separated plutonium in the form of MOX fuel (Mixture of plutonium and uranium OXides) and the recycling of reprocessed uranium. The quantities processed by Orano Recyclage at EDF's request, i.e. approximately 1,100 tonnes per year, are determined according to the quantity of plutonium that can be recycled in the reactors authorised to load MOX fuel.

In 2018, the Board of Directors approved the relaunch of the reprocessed uranium recycling process (suspended in 2013 pending the availability of a new industrial scheme), with the first assemblies to be loaded by 2023, subject to the completion of the technical modifications and obtaining the necessary authorisations from the safety authority. The objective is to proceed to recycling in some 900MWe units and then in some 1300MWe units.

On the other hand, spent fuel storage is a key issue for the back-end cycle. Forecasts for the filling of spent fuel storage facilities from EDF's production facilities at the Orano site in La Hague suggest that the La Hague pools will be saturated by 2030.

(1) With regard to food waste, EDF does not consider this information as being material. With respect to its materiality analysis, EDF does not consider information related to the amendments to Article L. 225-102-1 of the French Commercial Code on food shortages, respect for animal welfare and a responsible, fair and sustainable food supply as being material.

(2) See section 1.4.1.1.2.3 "Issues relating to the nuclear activity" - "The nuclear fuel cycle".

In this perspective, the construction of a centralised storage pool, which will be piloted and operated by EDF and which is scheduled to be commissioned in 2034, will make it possible to increase the volume of long-term storage of spent fuel and thus avoid saturation, in conjunction with the measures below. While waiting for the centralised storage pool, studies on transitional solutions have been launched by Orano and EDF in 2019, in conjunction with the ASN. The preferred solution is to densify the existing pools at the ORANO site in La Hague site. A complementary solution would be to deploy a dry storage facility for plutonium (MOX) and reprocessed uranium (URE) fuels.

Concerning the long-term storage of currently non-recyclable spent fuel in existing or under construction industrial facilities, namely plutonium fuel (MOX) or uranium issued from treatment, EDF is considering the construction of a centralised underwater storage facility at the La Hague site. This project, which was presented during the public debate on the National Plan for Radioactive Materials and Waste Management Plan (PNGMDR) in 2019-2020, is the subject of a specific public consultation under the supervision of the National Public Debate Commission (CNDDP), which began on 22 November 2021. It was suspended on 3 February 2022 to give itself time to reinforce the concerting modalities to better cover the territory of La Manche and the raised issues, and will go on from 20 June 2022 to 8 July 2022 (for more details see note 15.1.1. Nuclear provision in France to the consolidated financial statements 31 December 2021 - section 6.1). See section 1.4.1.1.2.3 « The issues relating to the nuclear activity » : A - « Downstream », « Processing of spent fuel from EDF's nuclear power stations », - « Storing conditioned final radioactive waste », et C - « Issues related to the dismantling of power stations ».

United Kingdom

In the UK, radioactive waste is classified into four categories:

- Low Level Waste (LLW), for which a disposal route exists – including the LLW near-surface Repository at Drigg West Cumbria;

- Intermediate Level Waste (ILW), for which no disposal route is currently available in the UK;

- High Level Waste (HLW) is defined as radioactive waste in which the temperature may rise significantly as a result of the radioactivity, so this factor has to be taken into account in the design of storage and disposal facilities;

- Higher Activity Waste (HAW) – this is effectively HLW, ILW and any LLW that are unsuitable for near-surface disposal.

EDF Energy nuclear generation's strategy for LLW and HAW reflects that the UK and Scottish Governments are focused on application of the waste hierarchy (reduce, reuse, recycle, recover). The use of a range of waste recycling and disposal routes will help to make the best use of the UK's Low Level Waste Repository (LLWR) in Cumbria. Only a disposal route for LLW currently exists in the UK. HAW is stored for the medium-term in safe, purpose-built facilities at EDF Energy's stations while longer term national solutions are being established within England and Scotland.

Spent fuel from the AGRs is transported to Sellafield nuclear reprocessing site (owned by Sellafield Limited, a subsidiary of the NDA) for long term storage. PWR spent fuel from Sizewell B is stored on site in a purpose-built spent fuel dry storage facility which will safely store all of the spent fuel that will be generated over Sizewell B's life. Following long-term surface storage, the Sizewell B PWR spent fuel will be disposed to a future UK geological disposal facility.

The AGR spent fuel arrangements were agreed at the time of the restructuring of British Energy and through them EDF Energy pays for long term storage (and in previous years reprocessing) of spent nuclear fuel. Sizewell B's fuel storage strategy is approved by the NDA as it is funded by the Nuclear Liabilities Fund. EDF Energy has policies to continually improve and minimise the spent fuel and waste arising through the company's wider safety, sustainability and environmental policies (see section 1.4.5.1.2.2 "Nuclear generation" : "Radioactive waste management and decommissioning").

Radioactive waste indicators

Solid radioactive waste indicator	2019	2020	2021
France: volume of long-lived high and intermediate level solid radioactive waste (m^3)	304	283	287
United Kingdom: volume of low-level solid radioactive waste disposed of (m^3)	444	352	471

In France, the confirmation of the decrease in HLW and ILW-LL radioactive waste production volumes was correlated with the decrease in fuel consumption over the year 2020 and part of 2021 due to reduced electricity generation. In the United Kingdom, the return to the level of volumes of VLLW was the result of the return to normal business, particularly in the decommissioning field. In addition to the previous indicators, the generating plants in operation in France are concerned by

very-low level solid radioactive waste (VLLW) and short-lived high-level and intermediate-level solid radioactive waste (LILW-SL).

The volume of very-low level waste in 2021 is 3,273m³, compared to 2,597m³ in 2020 and 3,101m³ in 2019. The volume of short-lived low-level and intermediate-level waste in 2021 is 6,329m³ compared to 5,429m³ in 2020 and 5,734m³ in 2019. Within the Group's scope in the United Kingdom, the intermediate-level radioactive waste generated is 161m³, stable compared to 2020 and 2019.

Radioactive waste and decommissioning

Waste resulting from the decommissioning of power plants and associated industrial activities is identified in France using the indicators of very-low level solid radioactive decommissioning and industrial waste (VLLW) and low-level and intermediate-level (LILW) radioactive waste. For the Group in France, the volume of very-low-level waste is 2,707m³ in 2021, compared to 2,007m³ in 2020. The volume of low-level and intermediate-level waste is 622m³ in 2021, compared to 251m³ in 2020.

Waste from Framatome's industrial activities in Belgium and the USA is identified by the class A radioactive waste indicators. In the USA, the volume of class-A waste is 215m³ in 2021, compared to 378m³ in 2020. In Belgium, decommissioning activities at the Dessel site are being completed and did not produce Class A waste in 2021, as in 2020. For further methodological details on this data, see section 3.6 "Methodology".

3.2.4.2 Eco-design

The circular economy approach is integrated right from the engineering phase for new construction projects or major changes to processes. Several measures have been taken ⁽¹⁾:

At every stage of the process	The design of facilities by engineering entities is based on an eco-design approach taking account of their environmental footprint, production management and waste recovery throughout their entire lifecycle.
Organisational innovations	Implementation of dedicated requirements in specifications or internal procedures simplifying forward thinking on construction sites; classification of industrial processes limiting waste production.
Technical innovations and solutions	Water/oil separation of hydrocarbon effluents, asbestos removal, energy recovery. The Dampierre power station, for example, uses its hot water to supply nearby agricultural greenhouses.
Raising awareness among stakeholders	Awareness-raising activities for staff and providers, for example in the form of e-learning or competitions.

3.2.4.3 Optimisation of resources

The Group's entities and companies are committed to a process of continuous improvement according to the principle that the "best waste" is waste that is not produced.

Entity action plans	The entities have action plans aimed at limiting the generation of waste integrated in the environment and management systems' action programmes with associated indicators (quantity of waste prevention, savings made on waste management, quantity of equipment reused, etc.).
"Waste and Circular Economy" Group	This is integrated into EDF's EMS and is tasked with carrying out prevention, optimisation and recycling actions with a view to preventing waste generation.

3.2.4.3.1 Optimisation of fuels and raw materials

For generating electricity and energy services, the Group uses raw materials, including a significant share of fuels: uranium, gas, coal, fuel oil and biomass. Consumption of different fuels varied to differing degrees in 2021: coal (+59%), heavy fuel oil (+10%), natural and industrial gas (-7%). In France, EDF coal consumption saw an upward trend over 2021 due to tensions on the electricity

market. EDF's gas consumption fell by 7% due to reduced gas-powered energy generation. In terms of electricity consumption on industrial sites, electricity consumption for generation resource auxiliaries (approximately 20TWh/year) is mainly self-produced electricity ⁽²⁾.

To optimise fuels and raw materials, the Group focuses on several factors:

Variation in its generation mix	The development of renewable energies, commissioning of high-efficiency combined gas cycle power plants (Edison's Maghera Levante project is targeting the European efficiency record of 63%), use of biomass by Dalkia, modernisation of the island systems' thermal fleet with liquid or solid biomass.
Optimisation of existing facilities	Improving energy efficiency or output (IES, Dalkia, EDF in the UK) through maintenance measures, modifications, fuel quality rules and more rigorous monitoring of efficiency levels or cogeneration (e-monitoring).
Real-time selection of the most effective generation resources	These optimisations, made based on load curve and according to energy efficiency, are backed up with ISO 50001 certification of 7 thermal sites on island territories. Dalkia uses an energy management tool to optimise energy facility fuel use and is increasing its renewable energy use rate, replacing fossil fuels.
Implementation of a natural uranium savings strategy	EDF's control of each stage of the fuel cycle, the design of high-efficiency fuel and suitable management of that fuel within nuclear units all contribute to optimising natural uranium needs (see section 1.4.1.1.4 "The nuclear fuel cycle and related issues"). Recycling of spent fuel currently generates a saving of approximately 10% natural uranium via the use of MOX fuel (for a balanced cycle), and ultimately up to 25% by relaunching the RPU (reprocessed uranium) sector.
Life-cycle assessments	EDF Renewables, which uses raw materials to manufacture equipment, carried out life-cycle assessments on its technologies (onshore wind turbines, photovoltaic solar, battery storage) to identify the main environmental impacts, and the life-cycle phases making the biggest contributions, and to study the technical & economic feasibility of possible improvements.
Development of zinc-air batteries	Zinium is a Group subsidiary dedicated to the development of zinc-air batteries. This technology uses easily accessible and non-polluting materials (for information on rare-earth metals, see also section 3.2.4.3.3 "Recycling in the field of new renewable energies").

(1) See also section 3.2.4.3.2 "Optimisation of materials".

(2) Net electrical generation takes account of this self-produced energy.

3.2.4.3.2 Optimisation of materials

The use of recycled materials (aggregates, earth, concrete, etc.) is encouraged during major projects related to networks (ÉS, Enedis) and hydraulic, nuclear and thermal investments and the materials used are recovered. Many large-scale projects under the Grand Carénage programme recover a large amount of equipment and spare parts that can still be used.

EDF Reutiliz	Digital platform for the reuse of professional equipment: EDF started "EDF Reutiliz", a digital platform to help equipment to be reused, with a view to reducing the consumption of resources and limiting the production of new goods. Its deployment began in 2021 with the operational implementation phase, ramping up the reuse operations already deployed to the production fleet, and to the management of the property and IT fleet. EDF R&D estimated that the carbon impact of reuse not only contributed to reducing its own carbon footprint (scope 3), but also contributes to reducing the emissions of its stakeholders that reuse EDF equipment. The quantification of this carbon impact on part of the industrial scope, on property and IT is ongoing.
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3.2.4.3.3 Optimisation of internal consumption

The Group is always looking to optimise its own consumption for service sector use.

Electricity consumption on service sector sites	To achieve energy sobriety, EDF aimed to reduce electricity consumption on all its service sector sites by 2% per year, between 2018 and 2021. The 2021 result is in line with the targeted goal of 146kWh/m².
Other service sector consumption	A wide-ranging travel limitation programme has been implemented by many Group entities. Resource saving awareness campaigns (energy, water, plastic) are regularly organised Group-wide.

The Group's employees are increasingly aware of these issues, particularly as a result of networks set up by staff, for staff.

3.2.4.4 Conventional waste management and recovery

So-called conventional waste includes waste passed on to a certified external centre during the year. Waste stored on-site, waste awaiting disposal, materials reused on-site (e.g. spoil and rubble ⁽¹⁾) and equipment that could be reused (sold or gifted) are not taken into account. They do not include radioactive waste. Combustion fly

ash and gypsum from the process are reviewed specifically ⁽²⁾. Construction and decommissioning waste is included in this report, if its management falls under the responsibility of the EDF group.

3.2.4.4.1 Recovery of conventional waste

Group policy and commitment

The Group CSR policy aims to improve the use of waste that is generated.

Reuse	Developing the reuse of parts and materials, particularly in the decommissioning phase.
On-site pre-treatment	Implementing on-site pre-treatment of various waste items, in order to limit the volume of waste produced and promote the recovery of the remaining portion (e.g.: concentration of hydrocarbons).
Partnerships	Developing partnerships with recycling firms (RECYLUM for Citelum, Veolia and Suez for conventional waste, Ateliers du Bocage for printer cartridges).
Certified centres	Recovery of waste by certified centres; e.g. spoil or sediment from hydropower dams, then recovered as aggregate for civil engineering or used in public works.
Sorting and dedicated centres	Efficient sorting of waste, sent to energy or materials recovery centres (e.g.: EDF Renewables Soren and First Solar agreements which take panels back at the end of their useful life ⁽³⁾).

(1) In the context of construction or deconstruction sites, EDF reuses the spoil as backfill for new developments.

(2) In view of the quantities produced and the outlets through which they can be exploited (mainly in the cement sector).

(3) DSP (Shared Services Division).

Key performance indicator

The Group's annual target for conventional waste recovery is at least 90%. The methodology associated with this indicator is described in section 3.6 "Methodology".

The 2021 result for recovery of conventional waste sent to recovery centres is above the annual target.

Regarding waste volumes, year-to-year changes in tonnage are strongly influenced by investments and decommissioning programmes as well as, regarding the hydropower sector, the cleaning work for dams. Accordingly in 2021, a number of draining and cleaning sites caused a significant increase in the production of sediment and gravel from dams in France, totalling 710,000 tonnes, compared to a total volume of conventional waste produced by the EDF group of 1.07 million tonnes.

In 2021, hazardous waste production totals 73,000 tonnes Group-wide. This mainly consists of mixtures of water and hydrocarbons, sludge from flue gas treatment from the operation of facilities, and one-off production of waste hydrocarbons in the United Kingdom. In France, with the optimisation of the operating process, hazardous waste production has fallen by 35% in five years. New tools have recently been put in place to further optimise the management of production of hazardous waste from industrial sector operations (including a dedicated quarterly indicator).

Annual rate of conventional waste directed towards a waste recovery industry (%)



3.2.4.4.2 Recovery of combustion products

Use of ashes

Resulting from the combustion of coal to generate electricity, coal ashes have properties that enable them to be used in various applications (in particular cement and concrete). In 2021, EDF produced 91,188 tonnes of coal ash and used 39,342 tonnes, i.e. a use rate of 43%.

Research works

As part of its continuous improvement approach, EDF conducted research works to improve the use of ashes, sediment and sludge, particularly via works by the non-profit RECORD⁽¹⁾.

3.2.4.4.3 Recycling in the field of new renewable energies

Recycling of wind turbines

98% recyclable	Almost all the components of a wind turbine can be recycled, with the exception of the blades and permanent magnets. Composed essentially of concrete, steel/cast iron, copper and aluminium, the structure of a wind turbine is 90% recyclable. Including concrete foundations, this figure rises to 98%.
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The hard-to-recycle components are the composite material blades. They represent about 10% of the weight of a wind turbine (2% when including the foundations). The most mature treatment solution for the moment is energy recovery.

Blades

Support for the call to ban dumping	In 2021, EDF Renewables, as a member of WindEurope, supported the Europe-wide call to ban dumping of used wind turbine blades by 2025. The European wind turbine industry is actively committed to reusing, recycling or recovering 100% of used blades.
R&D	Wind turbine blades and components that are not currently recycled are the subject of a variety of experiments and pilot projects on which EDF Renewables is working, in conjunction with EDF R&D: recovery of fibre-glass blades and transformation into granules for integration into concrete or wood aggregate; reuse for street furniture.
A 100%-recyclable wind turbine by 2030	EDF Renewables is particularly working with Siemens Gamesa with the goal of deploying several sets of recyclable blades on a future offshore project. Using this technology, the materials contained in the blade can be separated at the end of its useful life, meaning it can be fully recycled.

(1) There were many examples, including the free supply of warm water from the Gravelines power plant to the Aquanord fish farm, where by installing pipes to draw warm water from the drains, the fish farm collects 10m³ per second, without a water heating system (see the EDF "Circular economy and regions" guide).

Rare-earth elements ⁽¹⁾

Issue	Rare-earth elements pose a challenge for wind power, and only for technologies using permanent magnets, i.e. "PMG" (Permanent Magnet Generator) wind turbines. These may contain several rare-earth elements: neodymium, dysprosium, praseodymium, or sometimes terbium in their permanent magnets. Magnets represent on average 600 to 700kg/MW in Direct Drive (mainly used for offshore wind turbines), and 80 to 160kg/MW in Gearbox (mainly used onshore).
Recycling of permanent magnets	Due to the low volumes, there is not yet an industrial process for recycling permanent magnets in order to reuse rare-earth elements. The recycling of permanent magnets is under study and the first projects are emerging. Manufacturers are working on creating permanent magnet wind turbines without rare-earth elements.

Recycling of photovoltaic panels

In Europe, the recycling of photovoltaic panels is governed by the European "WEEE" (Waste Electrical and Electronic Equipment) Directive. Suppliers are responsible for handling their end-of-life products.

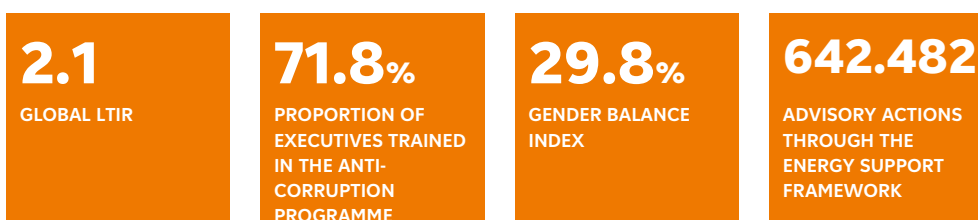
95% recyclable	More than 95% of the components are recyclable Rare-earth elements are not used in the manufacture of photovoltaic panels.
Collection, reuse and recycling	In France, Soren provides end-of-life collection (the average eco-participation in the purchase of equipment is €0.70 per panel) and the first PV recycling plant was opened in Rousset in the Bouches-du-Rhône, recycling "crystalline silicon" panels. The materials are separated and redirected to various industrial sectors: silicon to precious metal sectors, the aluminium frame to aluminium refineries, junction boxes and cables are crushed and sold as copper shot. Outside the EU, EDF's task is to contribute to the creation of recycling centres in the countries where the Group operates.

(1) "Rare-earth elements" are one of the categories of rare metals, a group of 17 metals whose chemical properties are necessary for the manufacture of high-tech devices. Other metals are considered "rare" or "critical" but are not "rare earths", for example cobalt or lithium.

3.3 Well-being and solidarity



Personal well-being (including nuclear and hydraulic safety) and solidarity development are key issues of EDF's *raison d'être*. It concerns its employees as well as all its stakeholders. The four main CSR commitments identified in this respect are the health and safety of all individuals, ethics and human rights, the promotion of equality, diversity and inclusion and the prevention of energy poverty and promotion of social innovation.



Nuclear safety: a priority stake

EDF, in its capacity as a nuclear operator, takes responsibility for nuclear safety and, in a rapidly-changing context (market competition, environmental issues, European connection, etc.), reaffirms as its absolute priority the protection of the human and environmental health, among other things, through the prevention of accidents and the limiting of their consequences as regards nuclear safety. The implementation of the French nuclear power programme led EDF to establish a safety procedure that:

- takes into account, from the design stage, the risks that might arise during the operation of the power plants, whether relating to the actual operation of the facilities or to internal or external attacks;
- is based both on the application of strict rules of operation, and on the cautious and inquiring attitude of the technical teams thanks to the establishment of a true safety culture;
- is based on the cumulative experience of a standardised fleet;
- incorporates and fosters a continuous improvement approach that is notably embodied by the process of reactors periodical review that happens every 10 years and is monitored by the ASN to authorize the ongoing reactor operation;

- benefits from integrated nuclear engineering and Research & Development within the Group in order to anticipate the occurrence of failures, maintain the facilities in good working order, develop equipment on an ongoing basis, reassess safety margins and monitor technology advances, as well as the implementation of more effective new technologies and the management of sites being decommissioned;

- has a system of emergency preparation, through regular exercises and the implementation of dedicated systems such as the FARN;

- relies strongly on the development of skills. With this objective in mind, each nuclear generation site is equipped with a simulator used for training to cope with any type of situation.

Any serious event related to the Group's nuclear activities would have potential or proven consequences on the population and/or the environment of a territory. These elements make it a major extra-financial issue for the Group (see section 2.2.5 Risk 5C - Nuclear safety violations during operation resulting in nuclear civil liability).



3.3.1 Health and safety for all

EDF is committed to protecting the health and safety of all individuals. As part of this, the Group develops the highest standards in terms of nuclear and hydropower safety, health policies for its employees and subcontractors (reducing the number of accidents, eradicating fatal accidents, developing the management of psychosocial risks, adapting work organisation methods, guaranteeing a high level of social welfare etc.), sales offerings related to comfort and well-being, improvement of air quality and reductions in noise, visual or light pollution.

3.3.1.1 Nuclear safety

The operational safety of nuclear facilities is taken into consideration from the initial design stage, and is regularly monitored, together with the implementation of an employee motivation policy and large-scale investment programmes. The Group's nuclear safety policy is incorporated into training for both EDF employees and subcontractors. Nuclear safety is subject to internal controls (annual reviews, internal control plans and nuclear inspection audits in France) and external controls (peer reviews between corporate members of WANO ⁽¹⁾ and OSART ⁽²⁾ audits conducted by experts from the International Atomic Energy Agency (IAEA)).

In France, the safety of nuclear facilities is controlled by the ASN. In the UK, the Office for Nuclear regulation (ONR) is the independent safety regulator in the civil nuclear sector. It monitors compliance with safety rules, including for the transport of radioactive materials. The "EDF group Nuclear Safety" policy was redefined in 2021⁽³⁾ (see section 1.4.1.1.2.2 "Environment, nuclear safety, radiation protection").

Given the importance of the nuclear safety issue, clear and transparent information and communication on events and their possible impacts are promoted within the Group. This quality dialogue is sought and maintained with employees and their representatives, subcontractors, regulatory bodies (ASN and ONR), local authorities and all other stakeholders in nuclear safety.

The Nuclear Safety Council, chaired by EDF's Chairman and CEO, meets several times a year and periodically examines the annual nuclear safety report of the EDF Group. A General Inspector for Nuclear Safety and Radiation Protection (IGSNR) is appointed by the Chairman and CEO to whom he reports. He carries out inspection missions in all the EDF Group's nuclear activities. Each year, it issues an opinion on safety within EDF. Its report is presented and discussed by the Nuclear Safety Council. It is then made public (see section 1.4.1.1.4.3).

For developments in nuclear safety, see in particular sections 1.4.1.1.2.2 "Environment, nuclear safety, radiation protection", 1.4.5.1.2 "Activities of EDF Energy" and 2.2.5 "Specific risks related to nuclear activities".

The methodology associated with this indicator is described in section 3.6 "Methodology".

INES Indicator

	2019	2020	2021
Significant level-2 events on the INES scale ⁽⁴⁾ (nb)	3	1	1

(1) World Association of Nuclear Operators.

(2) Operational Safety Review Team.

(3) See section 1.4.1.1.2.2 « Environment, nuclear safety radiation protection » in France, and for UK see section 1.4.5.1.2.2 « Nuclear generation ».

(4) International Nuclear Event Scale.

3.3.1.2 Hydropower safety

Hydropower safety aims to limit risks of structural failure, risks relating to the operation of facilities during times of flooding, as well as watercourse flow variations during operation. The hydropower safety policy aims for a high level of safety and continuous improvement. For developments related to hydraulic safety, refer to Section 1.4.1.3.1.3 "Hydropower safety".

3.3.1.3 Health and safety of employees and subcontractors

In an environment that is undergoing rapid, far reaching changes, the human aspect is a core component of the CAP 2030 strategic plan. To tackle the industrial and commercial challenges it faces, the Group must remain a socially responsible and committed employer and a benchmark in terms of health.

The Group's objective is to sustainably transform the way it works and manages its activities, in order to provide the best possible conditions for employee involvement, with a view to increasing their well-being, performance and team mobilisation.

A pioneering system for listening to employees and gathering expectations: "MyEDF group"

MyEDF group	The annual employee engagement survey "MyEDF group" is sent to all Group employees to gather their opinions on their work life and their perception of the Company at both the local and Group levels. Areas of satisfaction and areas for improvement are identified, and the results of this survey are examined by the Executive Committee and the various Management Committees. They help guide priorities and feed action plans within the teams.
2021 Survey	The 2021 survey took place over 4 weeks. It is conducted by IPSOS, which strictly guarantees the anonymity and confidentiality of responses. Participation rose again, to 79%. The engagement index remained at a good level (69%) identical to last year. The leadership results (leadership index ⁽¹⁾) are integrated into the variable compensation of senior executives (see section 3.5.4.6 "CSR and remuneration policy for group executives").

3.3.1.3.1 Health and safety policy

The Group's health and safety policy, adopted in April 2018, was updated in April 2021.

Ambition	The Group strives to set an example in the area of Health and Safety.
Raised to the highest level of the Group	The policy is based on a commitment signed jointly by the Chairman and Chief Executive Officer and all members of the Executive Committee.
Consistent framework	The policy defines a consistent framework and all policies and action plans of the Group's different subsidiaries must comply with the policy.
Scope	This Group policy applies to all the companies controlled by the EDF group, in all the countries in which EDF operates. It concerns both its employees and its subcontractors.
Priorities and objectives	The priorities of the policy are primarily to eradicate serious and fatal accidents, and secondarily to reduce the number of accidents and to fight against absenteeism. The policy aims to anchor throughout the Group the foundation formed by the Group's key rules and the BEST health and safety management reference framework, enhanced with new practices. This policy is accompanied by a roadmap that mobilises the Group's entities to achieve the objectives set.
Review	The Executive Committee reviews health and safety figures and monitors action plans regularly. A strategic Committee steers the deployment of the policy.

3.3.1.3.2 Health and safety management

The basis of health and safety management

The 10 key rules	In 2021, the Group focused its commitment on the 10 key rules, identified on the basis of an analysis of the fatal accidents that have struck the EDF group over the past 30 years.
BEST reference framework	The review organised in February 2021 by the Health and Safety Strategic Committee showed that 100% of the Group's scope had carried out a self-assessment of its health and safety management system according to the BEST reference framework.

ISO 45 001 and MASE certifications

Coverage rate	At the end of 2021, 35.2% of EDF group employees were covered by an external health and safety certification.
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"Safety Stop"

NoGo	When safety conditions related to key rules are not met, a "NoGo" must be activated to correct the situation before starting. In the same way, when unforeseen circumstances no longer allow the safety rules to be respected, a "safety STOP" should be marked.
2021	A pause was observed throughout the Group in October 2021 for each work team to discuss how to adapt the new policy to their own situation and ensure its adoption.

(1) The leadership index is a descriptive and factual "managerial dynamics index" which, when used in a macro way, makes it possible to measure the quality of management throughout the entity.

Sharing the analysis of “High Potential Events” (HPE)

Continuous improvement loop	In order to ensure the continuous improvement loop, and to maintain risk awareness, High-Potential Events (HPE) are collected, analysed, and shared throughout the Group. Nearly 70% of these HPEs are near-misses or dangerous situations. Particular emphasis is placed on those related to the Group's 10 key rules.
2021 profit-sharing	In 2021, the safety criterion of EDF's profit-sharing agreement focused on reducing the number of injuries from HPEs and developing analyses of these events.

Health & Safety audits

Site visits	Audits are carried out each year throughout the Group, in particular in the form of site visits. These visits are written up in a site visit report shared with the audited teams.
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See also section 3.9.1 “The Group's framework relating to its commitments and requirements with respect to the environment, human rights, and health and safety”.

3.3.1.3.3 Occupational accidents

EDF is committed to improving the physical and mental health of its employees and subcontractors. The top priority is to protect them and, most importantly, to eradicate serious and fatal accidents.

Eradicate serious and fatal accidents

There were four fatal accidents directly related to work in 2021. These four tragic events involved employees of outside companies.

Collective requirement	In line with the steps taken within the Group to eradicate serious and fatal accidents, the new policy aims to develop a collective safety requirement supported by both Group and subcontractor employees.
Steps toward progress with providers	The updated policy reinforces the progress made with our providers. Four action sheets or “assets” have been developed for this purpose.

Reducing work-related accidents

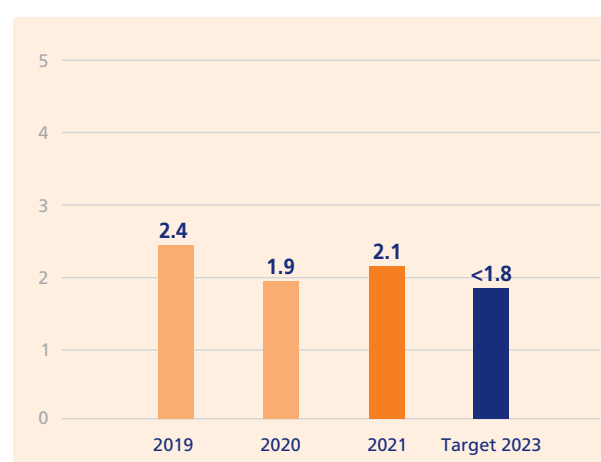
In order to have comparable data between Group entities and measure accident rates directly related to the performance of activities, the EDF group set up a new “LTIR” (Lost Time Injury Rate) indicator corresponding to the calculation of the frequency rate according to Anglo-Saxon standards.

The Group's key performance indicator: Global LTIR

Under the health and safety policy, the targets for the end of 2023 are 1.4 for Group employees and 1.8 for all contractors combined. The methodology associated with this indicator is described in section 3.6 “Methodology”.

The 2021 results are a slight improvement over 2019. The year 2020 is special, because the effects of the pandemic led to a sharp decrease in accidents, especially on the ground, which naturally reduced the LTIR results.

Global LTIR



Further details on work-related accidents and occupational illnesses ⁽¹⁾

	2019	2020	2021
Employees			
LTIR Group employees	1.8	1.4	1.7
Employee work-related accidents with at least one lost day	433	351	432
Accident severity rate	0.14	0.13	0.16
Occupational illnesses	63	41	40
Suppliers			
Supplier LTIR	3.4	2.6	2.6
Supplier work-related accidents with at least one lost day	635	483	513

The drop in occupational illnesses over the past few years follows a drop in the number of reported asbestos-related illnesses, confirming the success of the prevention and protection measures implemented.

(1) The methodology associated with these indicators is described in section 3.6 “Methodology”.

3.3.1.3.4 Well-being and psychosocial risks

Combating absenteeism, preventing psychosocial risks and improving well-being at work

Prevention of anxiety- and depression-related disorders, stress and musculoskeletal disorders (MSD), the three main causes of absenteeism, are regularly targeted by prevention initiatives.

The development of team empowerment projects also led to a significant drop in absenteeism among the employees of the teams involved, due to the positive health impacts of the improved quality of life in the groups and the increased levels of commitment and meaningfulness of work.

	2019	2020	2021
Number of days of absence per employee per year	9.1	8.8	9

Health in the workplace and general health issues

The EDF group employs personnel who specialise in occupational health, as well as doctors who are experts in environmental health and public health. In addition to medical monitoring of employees, these healthcare workers are involved in setting up primary prevention programmes and are stakeholders on all the social dialogue bodies in the field of health at work.

The EDF group is also committed to public health issues such as addiction and cardiovascular risk prevention.

3.3.1.3.5 Well-being, organisation of work and working hours

Worktime	For companies based in France, the duration of the working week is 35 hours, with shifts spanning a minimum of 5 days. In order to meet the needs relating to each company's business and particularly to ensure continuous operation, the Group's employees may be required to provide a continuous service or be on call outside of regular working hours. These arrangements are according to the changing circumstances at each company, legislation and new authorised work organisation practices.
Fixed numbers of working days	By implementing <i>forfaits jours</i> agreements (which provide managers a fixed number of working days and have proved overwhelmingly popular among them) in most of the Group's companies, the Group has sought to modernise how working hours are structured in order to promote agility and employee empowerment.

The pandemic has accelerated the evolution of our methods for organising work, with a significant impact in terms of simplification, empowerment, and performance. The main changes were as follows:

TAMA Agreement for EDF	For EDF, a <i>Travailler Autrement, Manager Autrement</i> ("Work Differently, Manage Differently") agreement was signed on 15 November 2021. This global agreement includes a process of team empowerment, new working methods (updating the consistent framework for teleworking, new options for flexible working hours, working directly on-site) and will be implemented through the co-construction of a team project to determine how the team's operations will change.
Telework agreements at Group companies	The practice of teleworking has massively expanded, leading several Group companies to introduce or review their telework agreements (Enedis, EDF Renewables, Electricité de Strasbourg, Framatome, etc.) or develop such arrangements (Luminus, EDF UK, etc.)
Digitalisation and collaborative tools	Significant digitalisation and automation of certain tasks and massive development of the use of remote collaborative tools (electronic signatures, Microsoft Teams, etc.).

3.3.1.3.6 Well-being and social welfare

Long-term social welfare policy

The Group's employee benefits policy is based on three main principles: a principle of responsibility, a principle of balance between competitiveness and sustainability, and a principle of appropriation by beneficiaries.

A specific social welfare scheme

EGI (Electricity and Gas industry) Status	In France, the majority of the Group's workforce are employed by companies descended from "historic operators" (EDF, Enedis ⁽¹⁾ , PEI) which have electricity and gas industry or "EGI" status. This status carries an entitlement to special social security schemes, including special sickness, disability and pension schemes. If employees with EGI status are unfit for work (sickness/maternity/disability), they thus benefit from a customised level of cover. In terms of healthcare costs, in addition to the basic scheme, their special scheme includes an additional mandatory part, which also covers retired employees. Employees with EGI status and EGI pensioners have access to centralised social activities, financed by the companies in the professional branch and managed independently by the unions. In addition to these schemes, there is a benefit in kind historically based on a company decision which covers gas and electricity supplied by historic operators to employees and which is maintained for retired employees.
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(1) A distribution operator managed in accordance with the rules of managerial independence.

Significant changes over the last decade

EDF's IPO and the application of international accounting standards required the valuation and provisioning of commitments to retired employees. The maintaining of the industry's special welfare plans faced with this requirement was supported by the overhaul of their financing: affiliation with standard mandatory plans for pensions and strengthening of affiliation between current and retired employee plans for complementary health insurance cover.

Special pension plan	<p>The special pension plan has, like other public sector special pension plans, been increasingly affected by efforts to reform mandatory pension plans launched by successive governments. Except for the pension calculation method (specific rate, applied to a salary at the end of career, with a reduced base), the main parameters (retirement age, required contribution period, etc.) tend to be in line with the standard compulsory plan. The definition of active service, enabling earlier retirements, has been revised and the way it is taken into account has been significantly overhauled for newly-hired employees, <i>via</i> the creation of a Retirement Days Savings Account.</p> <p>A bill introducing a universal pension system for all employees affected by the reform, regardless of their pension scheme, including the EGI scheme, was examined by the National Assembly in February 2020, before being suspended on account of the Covid health crisis.</p> <p>If a new pension reform bill, whatever its nature, were to be re-launched in the near future, the major issues for the EDF group would remain threefold:</p> <ul style="list-style-type: none"> ● social: the special pension scheme is one of the pillars of the EGI status; ● financial: the special EGI pension scheme represents an additional financial burden of several hundred million euros per year, and some twenty billion euros in commitments; ● transformation: particularly with regard to the fluidity of mobility within and outside the Group (as differences between pension schemes constitute one of the main barriers).
Health, disability, and death	<p>The level of employee health, disability and life cover appeared to need updating to meet that offered by other major groups, which led to a complementary cover in these three areas, in the form of an agreement at branch level.</p> <p>An agreement on family rights was signed in 2017 at the level of the EGI branch with the trade union organisations, to modernise the social system.</p> <p>In terms of health insurance, 2021 saw the culmination of an in-depth consultation between the social partners of the EGIs and the government concerning a rebalancing of the accounts of CAMIEG (health insurance fund for the electricity and gas industry), which have carried a surplus since its creation in 2007.</p> <p>The rebalancing is specifically based on a reduction in employer and employee complementary health insurance contributions, a reduction in the solidarity contribution paid by the working population for the non-working population and an improvement in optical benefits. These provisions have opened the way to a broader rethinking of how to monitor CAMIEG's balance of accounts and how to potentially increase responsiveness in order to recalibrate rates to the observed reality of financial balances.</p> <p>In practice, these measures will benefit the employees of the EGIs. These measures have a positive financial impact on their pay in 2021 and 2022: the rate of employee complementary health insurance contributions is 25% less than in 2020 and, from 2023 onwards, this rate reduction will remain 5% less than the 2020 rate of employee contributions. The solidarity contribution paid by the working population for the non-working population has been permanently reduced by 17%, from January 2021.</p>

Social protection for non-statutory employees

The Group's other employees in France are covered by several collective bargaining agreements and can have fringe benefits provided by their own employer. Each employer must ensure that the benefits provided are consistent with the Group policy. For Group companies outside France, even if the regulatory context specific to each country must be taken into account, each entity is required to ensure that the capital paid out in the event of a death under death benefit contracts covers one year's salary at the very least.



3.3.1.4 Consumer health and safety

In addition to its long-standing commitment to the safe use of electricity ⁽¹⁾, the EDF group is also committed to consumer health. In the upstream branch of its activity, it has a positive impact on air quality because of its low-carbon production method. Downstream, with regard to the uses of electricity and its applications, it authorises the development of best practices in terms of mobility, cold chains, and home comfort.

The EDF group's policy allows it to cover a wide range of activities to serve consumer health ⁽²⁾.

Health and environment	For several years now, environmental issues have been linked to health issues out of a sense of limiting risk, anticipating future risks such as the health impacts of climate change, and promoting innovative services.
Detection of emerging issues	In order to detect emerging issues as early as possible, a meeting is held every quarter with all the environmental health correspondents of all the Company's departments. In 2021, EDF studied the implications of the French government's new national environmental health plan for 2021-2025 and the European Commission's draft "Zero pollution action plan" published on 12 May 2021. EDF is also anticipating the revision of the Reach regulation.
Noise pollution	Regarding noise pollution, acoustic studies are conducted from the initial design stage and are included in environmental impact studies. Acoustic measurement campaigns are run in the area surrounding nuclear power plants, at a rate of two sites per year. EDF Renewables performs acoustic studies from the initial development phase of the wind turbines and the noise levels of turbines form part of the selection criteria for machinery. The same level of attention is given to noise pollution in the Group's international and French subsidiaries. All new transformers purchased by Enedis now use low-noise air coolers.
Light pollution	With regard to the action taken to prevent light pollution, Citelum has implemented a system of sensors to adjust the intensity of lighting on the road network based on traffic density and driving speeds, which also improves car safety.

3.3.1.5 Air quality

3.3.1.5.1 Improving air quality by transforming the generation fleet

Modernisation of the thermal fleet	The EDF group is continuing its process of modernising and improving the environmental performance of its thermal fleet, until it meets the best available techniques in Europe. Regarding island systems, actions are taken to reduce NO _x emissions, on a case-by-case basis: optimising exhaust gas processing, or reducing the number of hours of operation for certain turbines. In Brazil, the emission levels of the Combined Gas Cycle power plant in Norte Fluminense are below NO _x limit of 25ppm, mainly due to the high level of equipment maintenance. Using its future exhaust gas processing system, the Edison CGC project in Italy, Marghera Levante (780MW with 63% efficiency), which should be commissioned in 2022, will emit a quantity of NO _x equivalent to 30% of the current facility's limit. EDF is continuing to test biofuels, low-sulphur fuels to replace fossil fuels and is also developing an alternative fuel made from wood waste ⁽³⁾ . At the same time, EDF is developing non-NO _x and SO ₂ emitting technologies and proposes, in the island systems, isolated 100% renewable energy systems.
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CHANGE IN SO₂, NO_x AND DUST EMISSIONS AT THE GROUP LEVEL:

SO ₂ and NO _x emissions due to heat and electricity generation (kt) *	2019			2020			2021		
	SO ₂	NO _x	Dust	SO ₂	NO _x	Dust	SO ₂	NO _x	Dust
EDF group	18	36	3	17	30	3	18	31	3
EDF	4	10	0.4	3	9	0.2	4	10	0.2

* The methodology associated with this indicator is described in section 3.6 "Methodology".

(1) Various schemes have been set up in all relevant Group structures in France, Italy, the United Kingdom, etc. For example, EDF systematically sends a safety instruction booklet to all customers who take out a natural gas subscription. These instructions can be accessed on the edf.fr website. Enedis also develops partnerships with organisations representing the main high-risk groups to raise awareness of the risks of fishing near power lines, or to boost cooperation in the prevention of risks relating to firefighting work near power grids. Overseas, EDF in the UK informs its customers of the potential dangers of electricity in newsletters or on the back of bills. EDF in the UK also has a toll-free number to inform its customers about safety practices. Specific action is taken regarding the most vulnerable customers to promote their health, particularly during the winter period.

(2) Health is understood here in the sense of the WHO as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

(3) As part of the Ecocombust project.

3.3.1.5.2 Improving air quality by supporting public initiatives in this area

France's "Climate and Resilience" Act strengthens outdoor and indoor air quality standards (mobility, heating, building renovation). As a responsible energy company, EDF has developed unique skills in this field over many years, and works with partners to propose solutions to improve air quality.

EDF ⁽¹⁾ has historical know-how on the understanding and modelling of atmospheric emissions and air-conditioning systems of buildings.

Scientific contribution	With CEREAs (a laboratory created by a French engineering school, doing research on air pollution), EDF R&D participates in the scientific effort by developing open source models ⁽²⁾ .
Fleet equipped with air quality sensors	In Paris, Lille and the department of Haute Savoie, the vehicles used by Enedis - the French distribution network operator - are equipped with a network of air quality sensors called Pollutrack: 300 Enedis vehicles in Paris are equipped with laser sensors measuring PM 2.5 fine particles and transfer approximately two million daily readings to Airparif, which displays them on a map and marks the hotspots.
Mobility and air pollution	Airparif is one of Citelum's partners in Asnières-sur-Seine, part of the AIRLAB platform ⁽³⁾ . Installation of cameras and sensors on urban infrastructure makes it possible to measure mobility flows and atmospheric variations in sources of pollution in real time.
Prevention of health impacts	EDF contributes to preventive and research initiatives on the health impact of air pollution engaging in the Association for Prevention of Air Pollution (Association pour la prévention de la pollution atmosphérique, or APPA) and the Inter-professional Technical Centre for Studies on Air Pollution (Centre interprofessionnel technique d'études de la pollution atmosphérique, or CITEPA), and being an active member of the French Society for Health and Environment (Société française de santé environnement, or SFSE).

3.3.1.5.3 Improving the indoor air quality of buildings

EDF provides a range of innovative solutions to improve the indoor air quality of buildings.

Demonstrator in Villiers-sur-Marne	EDF and the town of Villiers-sur-Marne has joined forces to implement urban renewal and construction projects to improve and control indoor and outdoor air quality "from the street to the room". The deployment of a scientific approach carried by CEREAs has resulted in the creation of a first digital demonstrator of air quality in a show flat.
ERP support offer	Dalkia is assisting healthcare facilities with operating blocks to comply with indoor air quality regulations, as well as operators of public buildings. It has broadened its range by offering air network balancing, duct cleaning, room reclassification and health risk advice services.
NemoPool	To develop solutions takes innovation and team work. Dalkia developed NemoPool with the startup ETHERA to make both swimmers and pool staff more comfortable. This tool regulates the level of trichloramines by controlling ventilation systems.
Air Quality Challenge	Covivio and EDF have joined forces with the Impulse Partners incubator to launch the Air Quality Challenge. This is a European call for projects aimed at startups, SMEs, laboratories, associations and large companies. The goal is to propose new innovative solutions in the field of monitoring and measuring indoor air quality, while positively impacting the energy consumption of buildings.



3.3.2 Ethics, compliance and human rights

The EDF group, while respecting the management independence of the regulated infrastructure operators, promotes a culture of integrity and applies a zero tolerance policy towards fraud and corruption. Ethical conduct in accordance with the law is the absolute rule for all Group employees, at all levels of the organisation, and without exception. The EDF group is committed to respecting and ensuring respect for human rights in all its activities and wherever it operates.

3.3.2.1 Organisation of ethics and compliance at the EDF group

3.3.2.1.1 Governance

The EDF Executive Committee is responsible for determining the orientations and priorities of the ethics and compliance programme, allocating the necessary resources and ensuring the monitoring and control of its implementation. The Board of Directors of EDF, through its Corporate and Social Responsibility Committee, oversees the Company's incorporation of ethical and compliance considerations into its works. Every year, the Executive Committee and the Governance & Corporate Responsibility Committee also receive an activity report drawn up by the Group Ethics and Compliance Department.

3.3.2.1.2 The Group Ethics and Compliance Department and its ethics and compliance network

Group Ethics and Compliance Department. (DECG)	Reporting to the General Secretary, the Group Ethics and Compliance Department manages and coordinates, in liaison with the departments concerned, the implementation of the Group's ethics and compliance programme.
Ethics and Compliance Officers (REC)	A network of around 50 Ethics and Compliance Officers within its entities and subsidiaries, both in France and internationally share and deploy the Group's Ethics and Compliance Policy. The RECs participate in the Management Committees and report directly to the entities' senior management.
Associations and non-profits	EDF is a member of several anti-corruption groups and non-profits. In 2016, it joined Transparency International France, in which it participates in the Forum of Engaged Companies (<i>Forum des Entreprises Engagées</i> , or FEE), which promotes the highest standards of transparency and integrity.

(1) More specifically, it involves the MFEED Department of EDF R&D.

(2) Free access to source code.

(3) Airparif's laboratory of innovative air quality solutions.

3.3.2.1.3 Group Ethics Charter and its values

Respect, Solidarity and Accountability	The Group Ethics Charter sets out the values shared by all EDF staff, places ethical requirements at the heart of corporate responsibility and, in accordance with the Chairman's commitment, promotes ethical behaviour in all professional activities. Updated in 2019, the Group Ethics Charter now focuses on the Group's three values "Respect, Solidarity and Responsibility", each featuring 4 requirements. It is available in French and English on the EDF group website and in eleven other languages in which the Group works.
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3.3.2.1.4 Group Ethics and Compliance Policy (PECG)

13 compliance programmes	The Group Ethics and Compliance Policy (PECG), which identifies the Company's compliance programmes as well as the main rules that Executive Directors should know, observe and enforce within their entities, strictly aligned with the risks of these entities, was updated and approved during an Executive Committee in January 2020. The PECG includes thirteen compliance programmes: preventing the risk of corruption and influence peddling; preventing conflicts of interest; fight against fraud; compliance with international sanctions programmes; prevention of harassment and discrimination; prevention of market abuse; prevention of the risk of money laundering and financing of terrorism; compliance with the EMIR regulation; compliance with the REMIT (regulation on Wholesale Energy Market Integrity and Transparency) regulation; preventing breaches of competition law; personal data protection; export control (dual-use goods); and the duty of vigilance (covering environmental, human rights and health and safety issues).
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3.3.2.2 Anti-corruption and other compliance programmes

3.3.2.2.1 Anti-corruption programme

In accordance with the French Act of 9 December 2016 on transparency, the fight against corruption and the modernisation of the economy, known as the "Sapin II" Act, EDF set up an anti-corruption compliance programme taking account of legal requirements:

An ethics & compliance code of conduct included with the internal rules of procedure and a disciplinary mechanism	This code of conduct, which was reviewed in July 2021, defines and illustrates, through practical cases, the different types of behaviour employees are likely to face as a result of the Company's business activities and organisation, and which should be prohibited given that they may constitute acts of corruption or influence peddling. It sets rules for all the themes identified during the corruption risk mapping process. It prohibits facilitating payments, and restricts gifts and invitations. Breach of any of its rules may result in disciplinary sanctions. It can be viewed by third parties on EDF's site in French and English ⁽¹⁾ .
Whistleblowing system	See section 3.3.2.4 "Whistleblowing system".
Risk mapping	Ethics & compliance risk mapping is part of the Group Risk Department's annual internal control self-assessment process. Based on this, the entities draw up action plans appropriate to their operational contexts to prevent and mitigate these risks. Since 2018, a specific "corruption" risk map was prepared, which identifies and prioritises, by business sector and country, risks of exposure to corruption. In 2020, the methodology used for the mapping was improved, to enhance its focus on the operational specificities of the Group's various business lines and geographical locations.
Third-party integrity control system	Under the Group Ethics and Compliance Policy, executives of the relevant Group entities are required to implement a system within their entities to control the integrity of any partners with which the Group plans to establish or continue a business relationship, mainly designed to check that there are no risks of exposure to international sanctions and that a clause is inserted in each contract entitling EDF or its subsidiary to terminate a business relationship with immediate effect in the event of a failure to adhere to an international sanctions programme. In 2021, this system was reviewed in line with the Group's corruption risk map.
Accounting controls	Control procedures, containing specific requirements for the detection and prevention of corruption, have been defined for the Company's various processes. Following a technical analysis, any anomalies likely to be characterised as fraud are, where applicable, forwarded to the entity's Ethics and Compliance Officer.
Training schemes	The Group Ethics and Compliance Department develops prevention measures and training for all employees of EDF and its subsidiaries, including: <ul style="list-style-type: none"> • a dedicated community on the Group intranet providing a range of training materials; • the introduction of e-learning training modules, in particular a new interactive training course on the code of conduct, in the form of two e-learning courses ("All employees" and "Exposed employees"), in French and English, enabling participants to deepen and test their knowledge, which has been brought into line with the new version of the code of conduct; • specific face-to-face training: generic training for newcomers to the ethics and compliance network, Directors of subsidiaries and contract managers, and two new training modules given by lawyers for employees responsible for evaluating third parties and handling whistleblowing alerts; sessions have been scheduled at a steady pace from now to mid-2022 to train current employees. Additionally, the Group Legal Affairs Department and Ethics and Compliance Department are also providing a "Preventing corruption and influence peddling" e-learning module, accessible to all employees on the e-campus platform, that teaches about how best to behave in situations relating to business relations, conflicts of interest, and gifts. <p>Since the end of 2020, it became mandatory for all employees moving to a new position exposed to corruption risks to follow an anti-corruption e-learning module (e-learning module added to the standard training given to managers, project managers, buyers and contract managers, etc.).</p>
Internal evaluation system	A system allowing entities to evaluate the level of implementation and meeting of each key requirement has been put in place. It enables identification of improvement actions to be taken.

(1) edf.fr/sites/default/files/contrib/content/engagement%20ethique%20et%20confirmit%20groupe/page%203/code-de-conduite-fr.pdf

A system to prevent conflicts of interest	The entities have put in place a system designed to prevent conflicts of interest and raise employee awareness of high-risk situations, provide a system for employees to declare their links to organisations in which they have a personal interest, and require managers to resolve conflicts of interest with respect for individual freedoms. A support guide, including case studies to help managers identify and deal with conflicts of interest, was introduced in early 2021, and is also being used by RECs and managers to raise awareness among employees during dedicated meetings.
Fight against fraud	In accordance with the "Fight against fraud" memorandum of instructions, executives shall set up systems within their entities to raise awareness among their staff, put in place checks to detect potential cases of fraud, investigate incidents, report proven cases and sanction those responsible.
Regulation of interest representatives	<p>EDF is an interest representative within the meaning of the Sapin II Act. In this respect, it is registered on the list of interest representatives managed by the French High Authority for Transparency in Public Life (Haute Autorité pour la transparence de la vie publique, or HATVP). The network managers RTE, Enedis, and Dalkia are also registered: they each declare interest representation actions carried out during the year. The list of persons in charge of an interest representation identified in the register will be updated regularly. EDF also files with the HATVP an annual declaration relating to interest representation actions carried out that mentions actions aimed at influencing a public decision, with national public officials identified by the legislator. Lastly, lobbying has been added to the new version of the code of conduct.</p> <p>At the European level, EDF is listed on the Transparency Register of the European Parliament and the European Commission (no. 39966101835-69), regularly updates its data and applies the related code of conduct. In addition, in order to continue to raise awareness of ethical issues among interest representatives, the European Affairs Department has published its own internal ethics EU Lobbying Rules, available on the EDF website.</p> <p>EDF presents its positions publicly via this transparency register ⁽¹⁾, and via associations of which it is a member ⁽²⁾. Its main messages are also posted on social media (LinkedIn, Twitter). The European Affairs Department has introduced a regular internal control process for these associations to ensure that they match its mission statement, following which decisions may be taken (withdrawal or new membership) where necessary.</p> <p>The estimated annual cost of the activities covered by the European Transparency Register since 2016 is around €2 million, with a downward trend. In 2021, the main initiatives focused, in particular, on the following priorities: support for the climate ambition (-55%) and the development of low-carbon electricity generation sources (including offshore), acceleration of the electrification of the economy, promotion of low-carbon hydrogen and support for the sustainable finance action plan and taxonomy.</p>
Regulation of financing of political parties	The EDF group complies with the laws and regulations in force concerning the financing of political parties. Such financing may take place only in countries that allow it, and only with due regard to the principle of neutrality. In accordance with the legislation in force in France, EDF makes no payments to political parties. The Group's Italian and UK subsidiaries have written directly into their codes of conduct the prohibition of financing political parties. In countries where it is allowed (such as the United States), EDF group companies may determine whether they wish to provide financial support. Every year, the Group companies concerned must report any financing to their parent company. In 2021, EDF Renewables made payments in the United States, consisting of US\$26,500 in the form of Political Action Committee contributions and US\$314,500 in the form of Corporate contributions

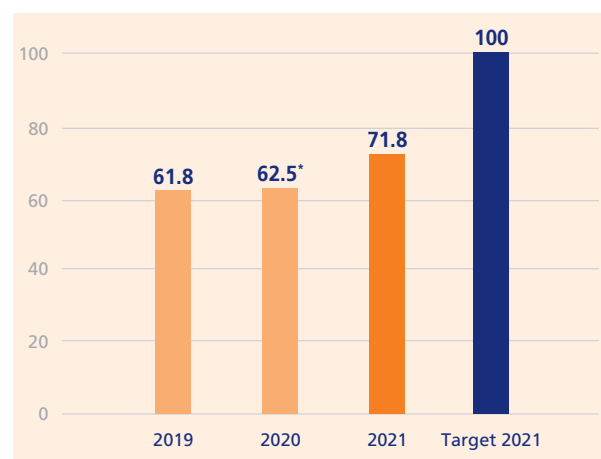
Group key performance indicator

The percentage of Group senior executives who have received training in how to prevent the risk of corruption and influence peddling is the Group's current key performance indicator for the "Ethics, compliance and human rights" commitment. The methodology associated with this indicator is described in section 3.6 "Methodology".

A change in 2020 mathematically led to a lower calculation of the senior executive rate than in 2019. At the end of 2021, this rate was 71.8%.

The increasing demands made during the various stages of the pandemic led some of the executives to prioritise actions to deploy the new code of conduct, which sets rules for all the issues identified in the corruption risk map (see above "An ethics & compliance code of conduct included with the internal rules of procedure and a disciplinary mechanism").

Proportion of executives who have completed the anti-corruption training programme (%)



* Calculation methodology revised in 2020 to include only executives currently serving

(1) ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=39966101835-69

(2) avere.org/wp-content/uploads/2019/02/the_electrification_alliance_-_declaration-2017-030-0453-01-e.pdf (The Electrification Alliance Electricity for an Efficient and Decarbonised Europe).

3.3.2.2.2 Prevention of harassment and discrimination

Banning all harassment or discrimination, preventing and dealing with any physical or psychological violence as well as intolerance or injustice in the workplace are some of the requirements of the Group Ethics Charter. This commitment is part of the regulatory and judicial context which, in many countries, incriminates not only the actions and behaviours themselves, but also employers who fail to implement

sufficient preventive measures. The executives must take all necessary steps to prevent discrimination, harassment and physical and emotional abuse within their entities by informing employees of these risks. They must provide regular information about the Group whistleblowing system and take appropriate disciplinary action in the event of proven wrongdoing.

Reference guides and training	<p>Two reference guides designed to prevent and combat bullying and sexual harassment have been distributed, primarily to managers, the HR Department and the Ethics and Compliance Managers of entities. They have been published in a simplified format for all employees.</p> <p>Several training modules are available for everyone on e-Campus:</p> <ul style="list-style-type: none"> the first module covers identifying and understanding the links between stereotypes and discrimination, through a serious game called <i>Vivre ensemble la diversité</i> (experiencing diversity together); the second is about understanding and preventing ordinary sexism in the workplace and is entitled <i>Sexisme, pas notre genre</i> (Sexism, not our thing); the third is a training module on preventing and fighting against sexual harassment. It is also included in the manager training course, among the manager fundamentals on e-Campus Manager. <p>See also section 3.3.3.2 Combatting sexism and violence.</p>
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3.3.2.2.3 Financial ethics

The Ethics and Compliance Policy sets out the requirements to be followed to prevent market abuse, the risk of money laundering and the financing of terrorism. An Ethical Code for Trading in Securities, updated in 2021, complements this Policy.

The Group Ethics & Compliance Policy also sets out the requirements concerning compliance with the European EMIR regulation.

Support guide	The implementation of this EMIR regulation by the EDF group, the implications for entities as well as the related processes and controls are described in the EDF group EMIR Policy Paper support guide. An e-learning module is available on e-campus.
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3.3.2.2.4 Integrity and transparency of the wholesale energy market (REMIT regulation)

In accordance with the Group Ethics & Compliance Policy, entities concerned must put in place a compliance programme for the European REMIT regulation (on the integrity and transparency of the wholesale energy market). A Group Compliance Officer, appointed in September 2017, was tasked with preventing risks of non-compliance, by developing an appropriate control environment. The practical implementation of this REMIT regulation by the EDF group, the implications for

entities as well as the related processes and controls are described in a memorandum of instructions. An online training system for EDF personnel is available on the EDF group intranet with free access. The subsidiaries outside France, in particular EDF UK, Edison, Luminus, and EDF Trading, have also set up training and awareness-raising programmes for their employees.

Awareness Raising and Training	An online staff training tool has been set up since 2019. It is freely available on VEOL, the EDF group intranet. Subsidiaries outside France, in particular EDF UK, Edison, Luminus, and EDF Trading, have also set up training and awareness-raising programmes for their employees. As far as EDF employees are concerned, 1,335 people have been trained by the end of 2021 through this scheme.
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3.3.2.2.5 Preventing breaches of competition law

The EDF group has made the prevention of anti-competitive practices (cartels and abuse of dominant positions) a major issue for its employees. With this in mind, the Group has implemented a Competition Law Compliance Programme since 2010. The programme, which is binding on all employees, aims to ensure that all

operations of subsidiaries and entities of the Group in France and worldwide comply with competition law. Any suspicion of anti-competitive practices may be reported under the whistleblowing system set up by the Group (see §3.3.2.4).

Awareness Raising and Training	<p>After having deployed from 2010 to 2015 an e-learning module which trained more than 5,400 employees, then between 2016 and 2021 a more general Serious Game entitled "Cap Antitrust" taken by about 2,300 employees, a new module on competition law awareness has been accessible since October 2021 to all employees on the internal training portal of the Group in two languages (French, English). This e-learning module is integrated into the training programme for the directors of the Group's subsidiaries, who also receive additional awareness training in the form of an in-person module.</p> <p>The Group regularly organises simulated investigations by competition authorities in order to raise awareness of the importance of complying with competition law.</p>
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3.3.2.2.6 Personal data protection

EDF, which appointed a Personal Data Officer (PDO) in France as early as 2006, appointed its Data Protection Officer (DPO), pursuant to EU regulation 2016/679 of

27 April 2016 known as the General Data Protection regulation (GDPR). The DPO is the Lead Manager for the Group.

Data Protection Officer (DPO)	Around twenty DPOs have been appointed in French and European subsidiaries and Personal Data Contacts (<i>Relais Informatique et Libertés</i> (I2L) are present in all EDF entities. The DPOs are ensuring compliance with regulations relative to the protection of personal data within the Group, whether with regard to the personal data of its customers, employees, service providers or partners.
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3.3.2.2.7 Export control and international sanctions

In the course of its operations, particularly in the nuclear field, EDF and its subsidiaries carry out a range of operations to meet their own needs or the needs of third parties, requiring the use of goods and technologies including dual-use goods and technologies ("DUG"), i.e. civil and military, that can expose it to certain risks inherent in specific French, European and/or foreign regulations, some of which have extraterritorial scope, and can require the issuing by the competent authorities of a license/authorisation prior to any transfer, export, re-export, brokerage, and/or transit of such goods and technologies. Some regulations, particularly in the United

States, have introduced restrictions on access to goods and technologies applicable to foreign entities that may affect both DUGs and any other commercial goods.

The Group, or some of its partners, may be exposed, directly or indirectly, to sanctions programmes, in particular (i) international sanctions adopted by the United Nations Security Council, (ii) sanctions adopted by regional organisations such as the European Union, and (iii) sanctions adopted unilaterally by certain States, some of which have extraterritorial scope.

Group Export Control and International Sanctions Department	A Group Export Control and International Sanctions Department was set up in August 2019 to strengthen the Group's ability to comply with these regulations. A memorandum of instructions describing the compliance procedures to be implemented was adopted by the Executive Committee on 4 May 2020.
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3.3.2.2.8 Duty of Vigilance

See section 3.9 "Vigilance Plan".

3.3.2.3 Human Rights

One of the EDF group's fundamental goals is to endeavour to respect and ensure respect for human rights in all its activities and wherever it operates.

2021 Guidelines	In March 2021, EDF drew up a set of guidelines listing the commitments of the Group (EDF SA and its controlled subsidiaries ⁽¹⁾) and the fundamental requirements for its business relationships in terms of human rights and fundamental freedoms, environmental protection, protection of personal health and safety and business ethics. In the guidelines, the Group notes and summarises its commitments in terms of compliance with international standards, the rights of its staff and the rights of local communities in particular.
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3.3.2.3.1 Compliance with international standards

The EDF group does not tolerate any infringement of human rights or fundamental freedoms in its operations or in those of its business relationships for operations related to the relationship.

International Standards	EDF strives to comply at least with the international standards protecting and defending human rights and fundamental freedoms, including the United Nations International Bill of Human Rights and the fundamental conventions of the International Labour Organisation (ILO).
Conflicting standards	If the laws of a country where it operates conflict with these international standards, EDF endeavours to find a solution to allow it to comply with both the spirit of the international standards and national laws.
Vigilance approach	To ensure that human rights and fundamental freedoms are respected in its operations, EDF has implemented a vigilance approach to identify, assess and prevent any potential infringement of human rights or fundamental freedoms. The vigilance approach has been designed to comply with the French Duty-of-Care Act and is based on the recommendations of the UN Guiding Principles on Business and Human Rights.
Vulnerable persons	The EDF group pays special attention to the impact of its operations on individuals recognised as vulnerable under international human rights law and investigates, in complete transparency, impartiality and good faith, any alleged infringements of human rights or fundamental freedoms connected to the operations of the Group's entities, providers and subcontractors.
Proven cases of injury	If an infringement of human rights or fundamental freedoms is proven in the operations of the Group's entities or suppliers or subcontractors, EDF has agreed to engage in dialogue with the victims and/or their representatives to address the situation, pursuant to the OECD Principles for Multinational Enterprises applicable to the EDF group.

(1) With the exception of RTE, transmission network operator, and Enedis, subsidiaries independently managed within the meaning of the Energy Code.

3.3.2.3.2 Rights of staff

ILO	The EDF group is committed to the human rights and fundamental freedoms of its staff and complies, as a minimum, with the provisions of the standards published by the International Labour Organisation (ILO).
Fight against discrimination:	In terms of the prevention of discrimination, the EDF group guarantees equal treatment for its employees and is against any form of distinction, exclusion or preference, whether based on presumed race, skin colour, sex, age, religion, political beliefs, national origin, social origin, disability, family status, sexual orientation or gender identity. In the countries where it operates and for its own operations, the EDF group actively promotes equality in the workplace and equal treatment for equal work for the women and men working for the Group and strives to achieve balanced work teams at all levels of the Company. Diversity is encouraged at all staffing levels and employees must be protected from all forms of discrimination or retaliation.
Fight against harassment, sexism and violence	The EDF group does not tolerate any form of harassment or violence, whether within or outside the workplace, relating to the working relationships established in the workplace. The Group is committed to preventing and protecting its employees from all forms of harassment, sexism and violence in the workplace.
Refusal of all forced labour	The EDF group is against all types of forced labour, as defined in the ILO fundamental conventions as well as any form of human trafficking. In particular, for the projects and operations implemented by the Group, it ensures that all employees have given their free, informed consent for the performance of all their duties. In particular, the EDF group ensures that its intermediaries and recruitment agencies do not use any practices that could result in forced labour. The Group is committed to protecting the free movement of workers and, in particular, will not confiscate the travel documents, identity papers or any other personal belongings of workers in any circumstances whatsoever.
No child labour	The EDF group is against all types of child labour, as defined in the ILO fundamental conventions. The Group commits to not employ anyone under the age of 15 (subject to the exceptions set out in ILO Convention 138) or anyone under the age of 18 for work considered dangerous as provided for in the ILO convention.
Freedom of association Right to collective bargaining Trade Union Rights	<p>The EDF group respects an individual's right to freedom of association and the right to collective bargaining as defined by the ILO. The Group recognises that all employees are free to form and/or join the workers' organisation of their choice and will not interfere with that right.</p> <p>In accordance with the Group's Global Framework Agreement on Corporate Social Responsibility, EDF is committed to respecting and protecting the autonomy and independence of trade unions, in compliance with applicable laws and regulations. It aims to guarantee the effective exercise of trade union rights and recognises the representative trade union organisations in the Company as interlocutors and partners. EDF group respects strict neutrality as to whether or not its employees choose to belong to a trade union, and if so, which trade union they wish to be represented by. Employees are not discriminated against because of their union membership and/or activities. Facilities are granted to employee representatives in order to carry out their duties. In particular, EDF provides for a number of hours dedicated to the exercise of trade union functions and mandates, as well as a supervised training programme for employees exercising representative and/or trade union mandates. The EDF group will not tolerate any intimidation, harassment, sanction or discrimination against an employee due to union activities and does not discourage employees from joining the organisations of their choice. The Group respects the right to collective bargaining and the role of workers' organisations in the collective bargaining process.</p>
Worktime	The EDF group complies with the ILO standards and all applicable laws and regulations governing working time, based on the following principles, subject to the exceptions approved by the ILO: regular working weeks should not exceed 48 hours; working weeks are limited to 60 hours, including overtime; workers should have at least one day off for every seven days worked, except in emergencies or unusual situations; workers should have at least three weeks of paid leave for a full year of service; workers are entitled to at least 14 weeks of maternity leave.
Compensation, working conditions, and benefits	The EDF group strives to comply with the ILO standards on pay, working conditions and benefits. The Group is committed to paying a living wage, covering the basic needs of its employees and their families, and to providing adequate social security cover for all its employees. When employee accommodation is provided by the Company, the EDF group ensures that decent housing or accommodation is provided in compliance with the ILO standards.
Global agreement on CSR	In 2018, EDF and two global trade union federations (IndustriAll and PSI) along with 15 trade union organisations representing EDF group employees signed a global framework agreement on the Group's social responsibility, later extended for two years on 29 November 2021. This agreement automatically applies to all the Group's employees, warrants the right to collective bargaining and effectively reflects its commitment to "make upholding human rights a prerequisite to all its business activities, and not to tolerate any violation of these rights whatsoever, whether during the course of its business, or by its suppliers, subcontractors and partners". It confirms that, in the event of conflicting standards with applicable laws in countries in which it operates, the EDF group undertakes to apply the most protective human rights provisions while complying with the national laws. All controlled subsidiaries of the EDF group have now been informed of the agreement and are developing a social progress action plans.

3.3.2.3.3 Rights of local communities

The EDF group is committed to protecting the rights of the local communities affected by its operations and arranging, systematically and worldwide, transparent, debated discussions and consultations for each new project.

The Group recognises the role of human rights and environmental defenders from all walks of life, both among its suppliers and in civil society. It is committed to protecting the exercise of their rights and ensures that it identifies the risks to

human rights and environmental activists caused by its business operations and allows them to speak freely about its operations.

The EDF group identifies, for each project, the potential impact on the health, living conditions and environment of local communities, with reference to the performance standards of the International Finance Corporation (World Bank Group) and proposes suitable measures.

Indigenous People	<p>EDF is committed to respecting the specific characteristics and rights of indigenous peoples as defined in the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and ILO Convention 169, which provides, in particular, that "indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation".</p> <p>EDF is aware of the unique issues facing indigenous peoples and is committed to following the best international standards in this area and, more specifically, the UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples), ILO Convention 169 and World Bank standards. In particular, EDF recognises the criteria for characterising indigenous peoples included in these standards, including historical and geographic "pre-existence", "cultural distinctiveness", "self-identification", and "non-dominance". EDF respects the individual and collective rights of indigenous peoples and communities, including their right to self-determination, their right to land, territories and resources, and their right to FPIC (Free Prior and Informed Consent) in its projects and activities, as defined by ILO Convention 169.</p>
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Whenever its operations threaten or affect the livelihood of a community, the Group implements compensation and/or restoration measures for their livelihood matching or exceeding the level prior to its operations.

The EDF group is committed to respecting and protecting or safeguarding, in agreement with the populations concerned, any expressions of their culture, religion or heritage present on the land used for its operations.

In terms of the use of security forces, the Group is committed to protecting the safety of its employees and sites in strict compliance with human rights, including those of local communities, and only authorises the use of force for preventive or defensive purposes in a manner proportionate to the nature and severity of the threat.



3.3.2.3.4 Implementation of human rights commitments

Human rights commitments are implemented as part of the Group's CSR commitments and requirements ⁽¹⁾, based on the principles of action that apply to all Group operations, such as:

Management of E&S impacts	The initial and ongoing evaluation and the management of environmental and societal impacts and risks, including those caused by operations under its business relationships.
Dialogue and consultation	The organisation, throughout the world, of transparent, debated discussions and consultations for each new.
Implementation and monitoring	The implementation and monitoring of these commitments and requirements is ensured under the Group's existing internal policies or agreements, in particular the sustainable development policy, the ethics and compliance policy, the purchasing policy, the health and safety policy, the global CSR agreement, the Ethics Charter and the roll-out of the vigilance plan.
Collecting and processing reports	Systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff), have also been set up.

Consideration of human rights in projects

At the project management level

Depending on the context of the project, a Human Rights Impact Assessment (HRIA ⁽²⁾) is conducted. It is based on the principles defined by the UN Guiding Principles on Business and Human Rights, as developed for example by the Danish Institute on Human Rights. These studies place the identification of impacted human rights at the centre of the analysis. They include an assessment of the state of human rights in the country as well as in the project area, a mapping of human rights-oriented stakeholders (listing "rights-holders" and "duty bearers"), an analysis of the project's impacts on these rights, and the development of mitigation measures. This type of study identifies the activities at risk according to their importance and sensitivity. These studies are generally entrusted to national or international consultants specialising in the topic, and managed by EDF's internal Human Rights contacts. The conclusions of these studies are intended to be integrated into all development, construction, operation and end-of-life activities of the project, via an *ad hoc* management system (internal Human Rights policy, Human Rights contact and correspondents, contractual tools, audits and performance monitoring, reporting, etc.). They concern both affected communities

and workers, the use of security forces, the whistleblowing system and the protection of whistleblowers, etc.

At the level of investment decision-making processes

The consideration of human rights, through the Group's commitments framework, is integrated into each analysis of projects presented to the Group Executive Committee's Commitments Committee (CECEG), as well as to the Validation Committee for the Group's international development projects (CBDI). This takes the form of identifying the human rights risks associated with the projects, both for the activities developed and for the supplier relationships envisaged in the framework of the project. This identification will be facilitated by the construction of a grid, to be made available in 2021, which will allow for an analysis of projects that are consistent with the Group's *raison d'être*, CSR commitments, and guidelines, as well as with international standards. This grid takes into account environmental, health and safety, human rights, and ethical dimensions. All of the Group's human rights commitments and requirements are addressed, such as compliance with the ILO's fundamental conventions (on child labour, forced labour, freedom of association, discrimination), the rights of local communities, and health and safety conditions for the populations in question.

(1) EDF and the companies it controls. Control is established, in particular, if EDF holds, directly or indirectly, a majority of the share capital or the voting rights within the governing bodies of the relevant companies. Excluding RTE and Enedis which are independently managed subsidiaries within the meaning of the provisions of the Energy Code.

(2) Human Rights Impacts Assessment and Management.

In operational terms

Solar park in India	<p>During the development of EDF Renewables' solar park in Bap Tehsil, India, dialogue with local communities has enabled:</p> <ul style="list-style-type: none"> ● impact avoidance: a bypass road was built to avoid traffic disruption in the village; ● impact mitigation: the plant was redesigned to preserve trees in accordance with local community requests; ● impact compensation: community investments have been made, such as the creation of a water basin in the village. <p>During the operational phase, dialogue and investment have continued: a social budget is devoted each year to programmes such as improving the sanitation of school buildings, and providing fans and sporting equipment to students and bicycles to low-income villagers. The development of the project has also created employment opportunities for the people living in the area.</p>
Biomass plant in Côte d'Ivoire	<p>Concerning the BIOVEA Energie biomass power plant project in Côte d'Ivoire, a specific study was carried out on child labour in order to understand its nature and causes in the agro-industrial sector of the region in which the power plant will be located. On the basis of this study, BIOVEA Energie has chosen to act, in particular through a collaboration with the cooperative of the Toumangoué region, which alone covers the vast majority of small planters in this area. The objective is to develop <i>Champs École Paysans</i> ("Farmer Field Schools", or CEPs), which allow the implementation of good agricultural and management practices based on 6 themes, including a specific one on child labour. A budget of €150,000 is planned for the first two years for the launch and development of the CEPs, followed €24,000 of support per year for 14 years.</p>
Hydroelectric project in Cameroon	<p>In addition to the EDF group's ethics alert system, projects are developing local complaint management systems to ensure that communities directly and indirectly impacted by the projects can raise their concerns and have them addressed. In accordance with international environmental and social standards, the Nachtigal Hydroelectric Project in Cameroon has had a mechanism in place since April 2015 to manage requests and complaints. Anyone can submit them in writing, orally, or by proxy, in all local languages of the project area, as well as in the official languages of the country. Grievances are recorded in the project's query and complaint log. Once recorded, if the complaint relates to the project's commitments, activities, accountability or mandate, an investigation is initiated to determine the basis for the complaint. The project then proposes a treatment to the complainant. A mediation Committee can intervene if the complainant is not satisfied with the treatment applied. Finally, an appeals Committee can be called upon if the complainant is not satisfied with the solution proposed by the mediation Committee.</p>

Modern Slavery Act

EDF UK	<p>In accordance with the Modern Slavery Act, EDF in the United Kingdom is working to ensure that its activities, as well as those of its supply chain, are subject to an assessment of the risks associated with modern slavery and that means of mitigation are put in place. EDF in the UK has a Modern Slavery Statement covering all its employees and procurement. This statement, in accordance with the law (Modern Slavery Act), is published on the subsidiary's website. EDF in the UK employs around 12,000 people, with a supply chain of around 5,000 suppliers. All employees are required to comply with the subsidiary's code of conduct for Employees and Ethics & Business Conduct Policy. The subsidiary has published support guides to make employees aware of these principles and values and to provide the necessary tools to report any behaviour contrary to EDF's principles in the UK.</p> <p>With respect to the supply chain, the potential risks of slavery and human trafficking are assessed to identify areas of focus for procurement. This concerns, for example, the purchase of photovoltaic panels. Suppliers are required to comply with a set of standards, including the obligation to conduct a self-assessment of their risks aligned with the ten principles of the United Nations Global Compact ⁽¹⁾. EDF in the UK is encouraging its supply chain to adopt a social and environmental improvement approach. Modern slavery obligations are included in the upstream contracting process and suppliers are evaluated at all stages of the procurement cycle, from qualification to contract execution.</p>
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Consideration in Group purchasing

Group Procurement	<p>In terms of purchasing, the Group Purchasing Department's CSR risk mapping has included an analysis of "human rights" risks for each purchasing segment since 2019, to determine the level of residual risk and identify the action to be taken with suppliers (see section 3.4.2.3.2 "Responsible procurement strategy and practices"). For fuels, see section 3.4.2.3.4 "Responsibility regarding the fuel supply chain".</p>
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The "human rights in business" e-learning module developed with the association *Entreprises in 2021 pour les droits de l'homme* (i.e. businesses for human rights), of which EDF is a founding member, has been updated in 2021 to include the duty of vigilance and is available to all employees.

Performance indicators are monitored at the Group level, based on Cap 2030, via the Health & Safety Policy (see section 3.3.1.3 "Health and safety of employees and subcontractors"), Let's Talk Energy programme, employee commitment surveys and supplier relations (evaluations, supplier focus survey).

(1) unglobalcompact.org/what-is-gc/mission/principles

3.3.2.4 Whistleblowing system

3.3.2.4.1 Scope

In order to make report-handling more secure and to strengthen the confidentiality and security of personal data, in 2018 the Executive Committee decided to set up a single whistleblowing system for all wrongdoing reported under the Sapin II Act and the Duty-of-Care Act as well as wrongdoing reported by employees alleging harassment and discrimination. The Group Ethics and Compliance Department is the Group point of contact for the system. This Group system benefits all Group entities, except for the subsidiaries in the regulated sector, Enedis and RTE ⁽¹⁾, which have their own whistleblowing system to respect their managerial independence. Whistleblowers may choose to use the Group whistleblowing system or the other channels available to them (manager, human resources, staff representatives, local ethics and compliance officers, mediators etc.).

3.3.2.4.2 Accessibility of the system

The Group whistleblowing system, managed from an independent platform that is not connected to EDF's IS, may be accessed at any time via the EDF group website. The interface is available in several languages (French, English, Italian, Portuguese, Dutch and Mandarin) in France and abroad, and the whistleblower can report wrongdoing in the language of their choosing ⁽²⁾.

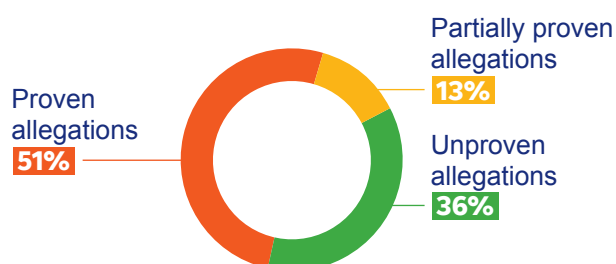
3.3.2.4.3 Reporting wrongdoing

The EDF group ethics and compliance whistleblowing system allows Group employees and external staff (temporary workers, service provider employees, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.), as well as third parties, to report wrongdoing of which the EDF group or its staff are the culprits or victims.

Admissibility of reports in the Group's whistleblowing system



Results of investigations following alerts (all channels combined)



3.3.2.4.4 Analysis of the admissibility of reports

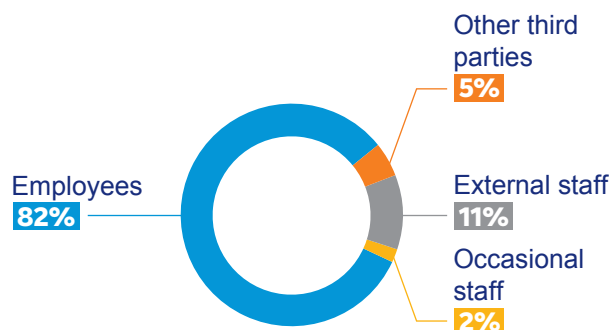
Once the report has been submitted, whistleblowers receive confirmation within 72 hours informing them that the admissibility assessment has begun. Whistleblowers can submit reports anonymously in countries where this is authorised. Wrongdoing can be reported anonymously, as long as the severity of the reported facts is established and the factual elements are provided in precise and sufficient detail, so as to provide evidence for the reality of the reported facts.

The Group Ethics and Compliance Department assesses the admissibility of the report, which depends on the scope of application and the whistleblower's relationship with the Company. This admissibility is independent of whether the alleged facts are well-founded or not, which can only be determined through a report handling process. Once a ruling has been made on admissibility, the whistleblower is informed of the protective measures from which they benefit (protection under the Sapin II Act, French Labour Code, etc.). These vary according to their status (victim or witness, individual or corporation etc.), their relationship with the Company (employee, external service provider, third party, etc.) and the themes involved (fraud, harassment, serious environmental damage, etc.).

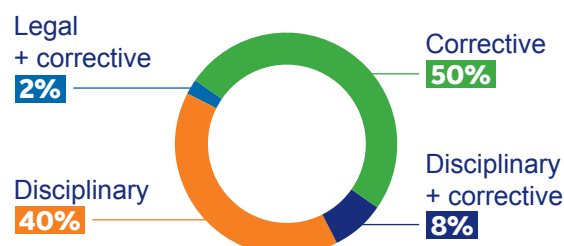
3.3.2.4.5 Processing of admissible reports

Each report that is deemed admissible is processed. The Group Ethics and Compliance Department appoints a case manager and, if necessary, is assisted by Ethics and Compliance Officers and other experts to handle reports. When the investigations have been completed, an investigation report is drawn up by the case manager. If the allegations reported are proven or partially proven, an action plan is implemented. The Group Ethics and Compliance Department monitors the progress of this action plan and ensures it has been fully implemented before the report is closed.

Relationship of whistleblowers with the Group (all channels combined)



Actions taken following alerts (all channels combined)



(1) Distribution network operator Enedis and transmission operator RTE are managed independently.

(2) www.edf.fr/edf/alerte-ethique.

3.3.2.4.6 2021 Results

Whistleblowing results are consolidated and included in the annual ethics & compliance report submitted to the Executive Committee and presented to the EDF Board of Directors' Governance & Corporate Responsibility Committee. The Group Ethics and Compliance Department has consolidated all admissible reports submitted in 2021 within the Group (via the Group system or any other channel). 247 admissible reports were recorded (including 39 via the Group whistleblowing

system). 157 were about incidents occurring in France and 90 related to incidents abroad. 95 related to EDF and 152 to Group subsidiaries. 47% of cases reported relates to harassment/discrimination. In 2021, 71% of the alerts handled were sufficiently detailed to result in corrective action or disciplinary sanctions (in particular, 14 dismissals following proven acts of harassment-discrimination). In 33% of the cases where the facts were not proven, action to improve the relevant processes was still taken.

3.3.3 Equality, diversity and inclusion ⁽¹⁾

In keeping with its responsibility to promote equality, respect for diversity and inclusive values, the EDF group is committed to developing concrete action to promote equality in the workplace and occupational and social integration for disabled people, combating sexism, violence and all forms of discrimination and developing support for parents. As a socially responsible employer, the Group is committed to maintaining and perfecting a high level of social dialogue and strives to secure the skills required for the Group's business lines over the long term, by integrating all aspects of sustainable development into its operations and projects and giving employees an opportunity to develop their employability throughout their careers.

2021 has been extremely busy in terms of all the components of this commitment to equality, diversity and inclusion, and has been particularly marked by a heightened ambition towards gender diversity, including the adopting of targets for the number of women at all levels of the Company, with support from the head of the Diversity, Inclusion and Workplace Performance unit and his team.

The EDF group and some of its subsidiaries have decided to apply for an international certification (GEEIS certification renewable every four years) to assess

the quality and relevance of their commitments to gender diversity and equality in the workplace. The certification was successfully renewed in 2019 and, for the very first time, it was extended to all the Group's other fields of action in terms of diversity and inclusion. The signing of a GEEIS commitment charter marks the Group's commitment to fight stereotypes by deploying inclusive artificial intelligence without gender stereotypes in all business processes and environments.

3.3.3.1 Workplace equality

As part of its CSR commitments, the Global CSR Agreement and its Ethics Charter, the EDF group is committed to and sets objectives for professional equality between women and men, measures the progress made, and deploys appropriate actions. Since 2015, the Group has been acting to promote equality and equity between women and men at all levels of the Company. The EDF group's professional equality policy is based on principles such as equal treatment of women and men throughout their professional lives; condemning any behaviour or practice that discriminates against employees; and EDF's contribution to changing attitudes.

3.3.3.1.1 Reinforcing the Group's commitment

In 2021, EDF's Executive Committee decided to strengthen the Company's gender diversity ambitions, which were formalised at the Group level in 2019. The Group's gender diversity ambition is being implemented in three areas.

1st area: Break the glass ceiling, at all hierarchical levels

A new target for female employment

A new Group-wide target for the number of women has been set for 2021, covering all hierarchical levels: 33% in 2026 and between 36% and 40% of women by 2030.

2nd area: Inspire interest in technical and digital professions

EDF aims at developing gender diversity in science, digital technology and innovation, mainly by: continuing to increase awareness among young women of scientific, technical and digital careers thus encouraging more women to take up careers in the digital professions, and improving the integration of gender diversity in the Group's innovation systems (EDF Pulse, *Parlons Énergies* (Let's talk about energy), Project Y etc.). Each relevant entity develops a programme to include young women in STEMs (Science, Technology, Engineering, Mathematics). For more

about bringing women into technical occupations, see section 3.3.3.8.3 "Recruitment priorities".

The 3rd edition of the Mixed Energy challenge raised awareness among high school girls about the technical professions of energy and helped them discover new career opportunities. Sponsored by women from various EDF entities (Dalkia, Enedis, Citelum, etc.), a discussion was held on the stereotypes associated with technical professions.

3rd area: Guarantee non-sexist communication, promoting balanced M/F representation

EDF group is aiming at developing gender diversity in internal and external representation of the Group, mainly by encouraging women to take part in the Group's public interventions (EDF is a signatory of the #jamaissanselle (#neverwithouther) charter).

3.3.3.1.2 2021 Performance

The results concern the proportion of women in the Group's workforce as a whole, in the executive category (managers) and on Management Committees.

Results by hierarchical level	2026 Target	2020 result	2021 result
Proportion of female employees (%)	33	25.8	25.9
Proportion of female managers (%)	33	28.8	28.9
Proportion of women members of the Management Committees (%)	33	28.7	29.8

(1) Social dialogue is attached to this family of issues, but its development is located within the section "CSR Governance", in section 3.5.3 "Social dialogue".

Details for female employees	2019	2020	2021
Male workforce √	123,815	122,578	123,915
Female workforce √	40,912	42,622	43,242
Women/workforce	24.8%	25.8%	25.9%

√ 2021 figures subject to reasonable assurance audit by Deloitte&Associés

26% of the EDF group's workforce is currently female (30.3% at EDF SA), which places it in the top half of the main French industrial groups. Although the increase in this rate has slowed slightly in recent years (impact of the "15 years, 3 children" measure, reduction in the number of new hires), it is still increasing at double the average rate of French companies, for all sectors combined ⁽¹⁾.

The percentage of women in the Group's management has doubled since 2002, almost reaching 29% in 2021.

EDF strives to guarantee equal access to professional and promotional training, through, for example, a scheme to cover additional childcare costs for parents undergoing training, with a view to securing comparable career paths for women and men.

Details for women managers	2019	2020	2021
Male managers	38,097	38,084	39,338
Female managers	14,999	15,401	15,986
Women/managers	28.2%	28.7%	28.9%
Female managers/female employees	36.6%	36.1%	37%

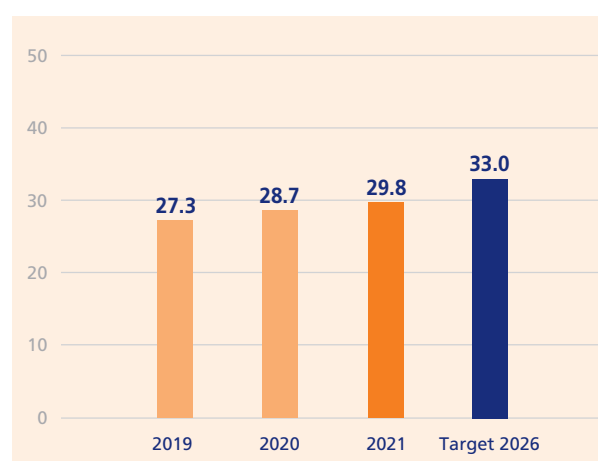
Details for women on the Management Committees: a key performance indicator for the Group

The key performance indicator used by the Group for "Equality, diversity, inclusion" is the percentage of women among the Management Committees of Group entities. Women formed 29.8% of Management Committee members in 2021, an increase of 1.1 points. The methodology associated with this indicator is described in section 3.6 "Methodology".

Over 10 years, the percentage of women in the Group's Management Committee has increased by almost 50% (it was slightly less than 20% at the end of 2011). It also reflects the dynamic observed, more generally, in the Company's managerial body becoming more female.

Succession plans for senior management positions are always mixed-gender. Schemes (such as TALENTS 2.0) help identify a more diverse range of talent, at all stages of the career path.

Gender balance index: percentage of women in the Management Committee of the Group's entities (%)



Detail for women executives

The percentage of women executives at EDF SA was 23.95% as of 31 December 2021.

Gender mix of the Board of Directors

The proportion of women on the Board of Directors is in compliance with the statutory threshold. The Nominations, Remuneration, and Governance Committee and the Corporate Social Responsibility Committee are chaired by women (see section 4.2.1 "Members of the Board of Directors").

Professional gender equality between women and men index (EDF)

	2019	2020	2021
Professional gender equality index (EDF)	95/100	95/100	90/100

The Group in France has professional equality indexes between 75 and 90/100.

EDF publishes an equality index at 90 points for 2021. With this score, the Company announces for the third consecutive year an overall score of 90 points or more on the gender equality index.

In-depth work were conducted on equal pay for women and men, in partnership with the Institut national des études démographiques (National Institute for Demographic Studies or INED), to identify the sources of the gender pay gap, with a particular focus on the impact of additional pay components. Analyses have been carried out at the Division level, and social dialogue on the subject is ongoing (see section 3.5.3 "Social dialogue").

(1) Source: DARES.

3.3.3.2 Combating sexism and violence

EDF group is committed to preventing and combating all forms of violence against women, in the workplace (sexism, harassment) and also domestic and family violence (support, guidance and job retention). The aim is to train and raise the awareness of managers and HR personnel on the subjects of sexism and both moral and sexual harassment.

Fight against sexism

Label	As early as 2016, EDF was the first company to earn the <i>Sexiste, pas notre genre</i> label.
Sexism barometer	With the help of the network <i>ENERGIES mixité!</i> , a new "sexism barometer" was set up in 2021, as part of the #StOpE multi-company initiative, of which EDF has been a member since the beginning.
ENERGIES Mixité! network	The Company acts with the support of the <i>ENERGIES Mixité!</i> network (formerly <i>Energies de femmes</i>) and its more than 4,200 members ⁽¹⁾ .
Employee training	An e-learning programme dedicated to the prevention of common sexism was deployed in 2020 and taken by 3,348 employees on e-campus (EDF scope).

Preventing the risks of moral or sexual harassment

Training for managers and HR staff	An e-learning tool intended to prevent the risk of sexual harassment was deployed for all target groups (management, HR, staff representatives, medical and social teams and employees) and was completed by 1,378 employees. Similar approaches are being deployed by EDF UK and Luminus on moral and sexual harassment risks prevention.
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Combating domestic and family violence

Similar mechanisms have been deployed for domestic violence.

Support, awareness, assistance, and care for victims	Operational implementation of such measures was carried out in partnership with the Company's medical and social teams and the <i>FIT, une femme un toit</i> association in particular. EDF has helped, assisted, supported and guided 102 employees who were victims of domestic violence over 2021. Over 366 employees were coached between 2019 and 2021, or 1 woman every 3 days.
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Operational system

Toll-free hotline	A toll-free hotline for all employees of the Company, operating seven days a week, to allow employees to confide in someone and obtain advice on all harassment and discrimination issues;
Support team	A support team (with internal and external skills) intervenes in investigations carried out when alerts are reported.

3.3.3.3 Parenting support measures

EDF is strengthening the support systems for parents and family carers, under the "Family Rights" agreement signed in the branch; implementing new rights for family carers (access to a platform of advice and services, additional pay for carer's

leave etc.); creating a parental leave scheme available to both women and men that takes into account the different types of contemporary families; giving parents the option to lengthen their paternity and childcare leave.

3.3.3.4 Disability plan

3.3.3.4.1 A long-standing commitment

EDF is one of the first major French companies to be involved in the professional and social integration of people with disabilities, and is committed to doing so well beyond the legal framework. The 11th EDF agreement for equal rights and equal opportunity and the occupational integration of disabled people was signed on 13 December 2018 for the 2019-2022 period. Framatome in October 2020 and

Enedis on 24 March 2021 both began negotiations to renew their agreements for the 2021-2023 period. Its goal is also to encourage sports for all. In 1992, EDF became a partner of the Fédération française handisport (French Federation of Disability Sports). EDF is also a partner of the 2024 Paralympic Games.

	2019	2020	2021
Number of employees with disabilities *	5,682	5,826	6,454

* The methodology associated with this indicator is described in section 3.6 "Methodology".

(1) Network of women and men of the EDF group for workplace equality. Created in 2004, it has nearly 4,300 members.

3.3.3.4.2 Integration and inclusion

The Group pays attention to the integration of disabled employees throughout their careers.

Quality of life at work	To further develop this approach, EDF conducted an IPSOS survey in early 2021 on the quality of life at work for employees with disabilities. The survey was well-received, with a significant response rate of 66%.
New challenges	The Group's commitment to the occupational integration of disabled people is a long-term commitment, but the issues to be addressed are constantly changing. This is for example the issue of digital technology, a priority under EDF's most recent disability agreements (e-learning "digital accessibility at all stages of a project").
Disability compensation	Several Group companies in France have introduced schemes, as part of their disability agreements, to provide them with occasional, back-up aid to offset the challenges they face in the workplace. Applications for aid are examined anonymously, in a multidisciplinary framework.
Extension of rights	The situations of parents of children with disabilities are now taken into account in the related rights.
End-of-career continued employment	As part of their approved agreements, several Group companies in France have also introduced measures to facilitate the continued employment of disabled employees during the second half or at the end of their careers.

3.3.3.4.3 Purchasing from companies who employ disabled people only (*Secteur du travail protégé et adapté* or STPA)

The amount of purchases from the STPA&A sector was €12.4 million in 2021. In September 2021, EDF, in partnership with GESAT, organised a digital meeting dedicated to STPA&A procurement, targeted to its Procurement Department and specifiers. At Enedis, the objective of the 2021-2023 agreement is to earn at least

€10 million in useful revenue (CAU) per year. A new STPA&A Purchasing Guide has been added to the collection of tools for developing relationships with contractors employing disabled workers only⁽¹⁾.

3.3.3.5 Preventing discrimination

3.3.3.5.1 A clear and proactive framework

Backgrounds and racial discrimination	In order to give concrete form to its commitments under the Global CSR Agreement and its Ethics Charter, in 2021 the EDF group addressed the issue of cultural backgrounds, and more specifically racism in the workplace, in a reference document for its managers and HR staff.
Religion in the workplace	Company will perform better if its employees feel respected, including respect for their personal beliefs, as this will allow them to fully commit to their work teams. The EDF group has been committed to respecting religion in the workplace since 2008, and published a first set of guidelines in 2010 (updated in 2016), setting out guidelines for managers and HR officers to help them understand, analyse and act in compliance with the law.
Respect for different sexual orientations or gender identities in the workplace	The Group has adopted a code of ethics based on three main values: respect, solidarity and responsibility. Through these values, all employees should flourish in the workplace, regardless of their sexual orientation or gender identities. EDF is a partner of <i>L'Autre Cercle</i> ⁽²⁾ and has been a signatory of the LGBT charter since 2015. It regularly participates in the inter-company perception survey supported by <i>L'Autre Cercle</i> . EDF has also partnered and supported the Energyay association ⁽³⁾ since 2010. EDF's HR staff and managers have been provided since 2015 with guidelines on "Respect for sexual orientations in the workplace". EDF has also designed, in partnership with Energyay, a process to accompany and support transitioning employees within the Group. "Supporting transitioning employees at EDF – Respect for gender identity" guidelines were published in 2019.
Age discrimination	The Company has set up a "generation contract" negotiated with the trade unions, which includes commitments for the sustainable integration of young people, for the employment of seniors, and for the transmission of knowledge and skills between generations, as well as a serious game (Secret Cam).
Sensitive medical situations	The Group has taken initiatives to encourage employees with health problems to remain at work. Since 2020, EDF has been a partner in the experimental programme "Work and breast cancer in companies and organisations" run by the association "Le Nouvel Institut".

3.3.3.5.2 Freely available materials

Tools available to all to fight against discrimination	To implement these policies of inclusion and equal opportunity, EDF has produced educational and training materials for its entire workforce, whilst still providing managers and HR staff with more targeted materials. For example, in 2018, Enedis ⁽⁴⁾ published a set of guidelines called "Deciding without discrimination". The Company trains everyone involved in its recruitment process, using training course on how to "recruit without discrimination". To raise employee awareness of diversity and encourage new inclusive practices and methods of organisation, the Group has launched a digital training programme called "Together in Diversity" a serious game completed by 2,324 employees in 2021.
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(1) See also section 3.4.2.3.1 "Share of local purchasing".

(2) L'Autre Cercle is an LGBT (Lesbian Gay Bi and Trans) association combating discrimination in the workplace. www.autrecercle.org

(3) Energyay is the LGBT association for the electric and gas industries and their www.energyay.org

(4) A distribution operator managed in accordance with the rules of managerial independence.

3.3.3.6 Skills development

Signed in 2019, the skills development policy "Groupe France" aims to boost the transformation of training and professionalisation practices with a view to securing the skills of the Group's businesses over the long term. The ultimate goal is to

implement a shift from training and employment management to skills management. The aim is to help strengthen the employability of employees.

3.3.3.6.1 Investing in human capital and empowering employees to forge their career path

The work of 2021 has been built around two areas of transformation: meeting employees' needs through responses that are better-suited to the diversity of their needs, and facilitating access to the proposed services.

The financial investment made throughout the Group was more than €475 million in 2021, enabling us to provide, despite the health context, a volume of nearly 6 million hours, approaching 2019 levels and enabling us to maintain a high level of access to training or professionalisation resources.

	2019	2020	2021
Share of employees who benefited from a skills development action (rate of access to training, target 75%)	80%	71%	79%
Total number of skills development hours	6,820,423	4,735,240	5,948,618
Number of skills development hours per employee in the workforce	41	29	36
Number of employees who have taken part in a skills development initiative	131,992	117,341	132,018
Number of employees who have not taken part in a skills development initiative for 3 or more years	6,527	5,907	7,420

Adjusting the training options

In 2021, the acceleration of the deployment of the new educational methods set out by the Group's policy was boosted further by the impact of the pandemic particularly in the first half of the year. As a result, the increase in the use of distance

learning based on digital resources has made it possible to develop access to e-learning modules and also to convert face-to-face sessions into remote virtual classes, using new dedicated digital tools.

Virtual classes and "Blended learning" courses	Virtual classes, the result of a reengineering process, meet these new expectations. At the same time, courses that combine different teaching methods for modules grouped together in a curriculum are tending to become the norm (so-called "blended" courses).
Growing success of digital resources	In 2021 for the Group in France, 99,100 employees were trained. 29% of hours were spent on digital learning ⁽¹⁾ (mainly internal platforms, but also external resources), in its various forms, up 52% since 2019 (EDF scope).

The expansion of training options, beyond the digital realm, has also enabled the development of other methods: Setting up an environment conducive to a "learning

organisation", employee professionalisation practices such as the *Action de Formation En Situation de Travail* (AFEST), and knowledge management.

Facilitate the accessibility of solutions and the training path for employees

Change in employees expectations	Changes in employee expectations as to the length of courses or increased awareness of the health or environmental impacts of travel are prompting us to broaden and diversify the range of resources available, particularly in the office and managerial fields.
Improvement of the employee "user path"	<p>In 2021, the improvement of the employee user path has kept going and even accelerated, by continuing to streamline the catalogue; by making the available training options easier to access and understand, in particular through improved navigation in "MyHR"; and by modernising the features of the e-campus digital platform.</p> <p>In preparation for 2022, and in order to identify areas for improvement, an unprecedented process of reaching out to employees, managers and members of the HR Department has enabled them to share their feelings and suggestions on the stages of their own training programme, in line with the "Let's Talk Energy" approach. The proposals collected on the dedicated platform are then processed and prioritised by workshops of volunteer employees.</p>

(1) Digital Learning: Includes digital methods of developing skills, whether they are e-learning modules integrated into courses, virtual classes, methods using virtual or augmented reality, MOOCs or serious games, or sometimes even digital methods integrated into face-to-face sessions.

3.3.3.6.2 Making skills development a driver for employees' career paths

Commitment to internal promotion and mobility	In addition to the actions set out in the skills development plan, the Group is further strengthening its commitment to internal promotion and mobility, thanks to the richness and diversity of its career paths: information provided at various stages of their career (regional e-forums on mobility); support for changes in pay grade (mainly transitions to executive grade); work-study programmes; and training for promotion, including degree programmes. This commitment is also being strengthened by further deploying retraining schemes through work-study programmes and by extending the successful training-reconversion formula for data analysts to other courses in fields said to be facing "tension", especially in the production fields.
First RNCP certification developed in-house	A two-year degree course to train young nuclear technicians, who will be operational as soon as they take up their posts, has been designed entirely in-house. It is the first course of its kind to be certified by France's <i>Répertoire national des certifications professionnelles</i> (National Directory of Professional Certifications, or RNCP) ⁽¹⁾ . The first two classes started in November 2021 at the Group's two energy profession learning centres (CFAs).

3.3.3.6.3 Group talent management

The Talents policy, implemented at the level of the EDF group, describes the principles and criteria for identifying and validating employees with the potential, in the long and short term, for executive level responsibilities.

Early identification	Early identification of high-potential managers, with strong involvement from the Group's senior managers, enables them to be prepared and monitored over the long term, via individualised support (career paths, development plan, training) and special events as part of a network.
Assessments	To identify the managers of tomorrow, assessments are carried out to evaluate the potential of managers according to a leadership model that is unified at the Group level.
Talents 2.0	Since 2018, the Talents 2.0 allows employees to identify themselves directly through a series of online tests.
Y Project	Each year, the "Y project" mobilises some 30 young employees from the Group's entities and subsidiaries. The aim of the meeting was to accelerate EDF's transformation using digital technology, and their work has resulted in concrete proposals being presented to the enlarged Executive Committee. For the fourth season, the "Ys" proposed to develop the Group's main digital interfaces in order to better address three key issues: Each employee learning the <i>raison d'être</i> , stimulating internal mobility, and transferring skills.

3.3.3.6.4 Support for the Group's executives and managers: the Group Management University (GMU)

The Group Management University (GMU) was created in 2010 to support the development of EDF group managers and executives throughout their careers.

GMU has pooled its intelligence to develop the new leadership ambition and has been deploying it since early 2020. More than 120 Management Committees have adopted this new model through collective workshops and a network of 50 ambassadors.

3.3.3.6.5 Skills development in the area of sustainable development

In line with the Company's training policy, there are many training courses available for employees and managers and also executives and Directors on sustainable development issues.

These training options include, to take a few examples: "Strategic energy business" for senior executives, "Building a decarbonised electricity mix by 2050: Challenges

and methodology", "Business and sustainable development" for new Directors of the Group ⁽²⁾, and "New Energy World" for the Group's talents.

Skills relating to low-carbon electricity generation and the safety of facilities are maintained and developed through the training programmes for business lines and employee on-boarding programmes.

Comprehensive "environment - sustainable development" training programme

In France, a comprehensive "environment - sustainable development" training programme features both business line and cross-disciplinary training focusing on

themes of environmental management, standards and regulations, and environmental analysis.

"Environment - sustainable development" training programme	2021
Number of employees trained in "Environment - Sustainable Development"	3,593
Number of hours of training	24,683

E&S pathway	As part of the creation of the new "Environment and Social" skills community, a special training programme, consisting of 17 modules, has been designed to strengthen and standardise the skills of employees already experienced in one of the two E&S areas. In 2021, some 15 high-level managers have been trained to provide advisory support to project teams in order to ensure that environmental, social and societal aspects are better integrated from the outset. Several projects have been supported within this framework since 2021.
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(1) Certification issued by France Compétences.

(2) Enhanced with the "Eco2" system, see section 3.1.3.5.2 "Innovation and collective intelligence focused on climate action".

3.3.3.6.6 Developing a culture of innovation: the EDF Pulse ecosystem

The Company wishes to develop a culture of innovation within the Company in order to support its development and transformation in line with its performance needs, the expectations of its employees and customers, and societal changes.

The internal innovation dynamic is structured around the "EDF Pulse" ecosystem, which relies on several levers:

- the EDF Pulse programmes, a set of support mechanisms to help all innovators grow;

- the EDF Pulse awards, a competition started in 2014 to promote "the women and men who are creating and inventing tomorrow's world today", with a section for external startups and a section for internal efforts;
- the EDF Pulse community, a network for developing and disseminating best practices in innovation within the Group.

3.3.3.7 Remuneration

Total remuneration is a key component in recognising the contribution of every staff member to the Group's performance. It contributes to employee engagement, increases the loyalty of talent and adds to the Group's attractiveness.

3.3.3.7.1 Fair and competitive global remuneration

Accordingly, the Group is committed to offering its employees fair and competitive remuneration, while paying great attention to the quality and level of social welfare it proposes, particularly in terms of cover against the major risks of life.

Global remuneration policy:

- it covers all employees of the main companies controlled by the Group. The Group's main companies' remuneration and social welfare systems have been reviewed based on this policy;
- the policy is based on four main principles: competitiveness in the external market; internal consistency and fairness; financial sustainability; and readability.

It is based on fixed remuneration and individual and/or collective variable remuneration which serves to recognise the achievement of objectives, connected to the companies' economic results. There is a direct and visible link between the employee's contribution and the related remuneration. The Group's companies

guarantee the meeting of the minimum legal or professional requirements in each country and the absence of discrimination.

EDF is reaffirming its priorities in terms of recognition and updates its policies by:

- improving the integration of recognition into its managerial practices and processes;
- strengthening the direct, unbiased and obvious link between personal contribution (performance, ability to adapt and take the initiative), professional development and financial recognition; and
- developing variable remuneration schemes, linked to the Company's financial performance, to recognise through differentiation.

To meet the challenges of employee and manager recognition, the project to modernise the pay classification system for the Electricity and Gas Industries branch was carried out throughout 2021. For total gross remuneration, please refer to the note on employee expenses.

	2019	2020	2021
Equity ratio/Average remuneration	6.8	6.6	6.6
Equity ratio/Median remuneration	7.4	7.2	7.2

3.3.3.7.2 Variable remuneration plans to boost performance

Variable remuneration: within the Group, most employees have individual or collective performance-based variable remuneration. The terms and conditions of this variable remuneration differ from one Group company to another based on historical agreements or applicable regulations.

Profit-sharing: in France, EDF and Enedis employees benefit from a profit-sharing scheme, introduced more than 20 years ago for EDF and for Enedis when it became a subsidiary. Most of the Group's European subsidiaries have similar schemes. EDF and Enedis employees can choose either to receive payment and/or to invest it into either the Group Corporate Savings Plan or the Group Collective Retirement Saving

Plan. In a constrained economic context, a policy of matching contribution is maintained. EDF's profit-sharing agreements, usually three-yearly, have been concluded for a one-year period in 2020 and 2021. EDF and Enedis require the profit-sharing amount payable to be set based on the meeting of national objectives reflecting the different components of the companies' performances (economic, business lines, social and environmental).

Professional training on compensation issues: EDF and Enedis pay special attention to the professional training of their managers on issues of remuneration.

3.3.3.7.3 Employee savings policy

It is open to employees of EDF and of the Group's French companies in which EDF owns directly or indirectly at least 40% of the share capital and which have signed up for the Group Corporate Savings Plan (PEG) and/or the Collective Retirement Savings Plan (PERCO).

Group corporate savings plan

A full range of diversified mutual funds is available for subscription, including conservative funds mainly invested in bonds and money market investments, balanced funds and dynamic funds, mainly invested in shares, including shareholding funds invested in EDF shares. A dedicated, solidarity-based, low-

carbon fund aims to invest in the energy transition while respecting agreements that limit CO₂ emissions. Profit-sharing, as well as individual payments and transfers from the Time Savings Accounts, are matched by the Company under conditions negotiated within each company.

PEG EDF group	2021
Number of employees, retirees and former employees of the Group holding a Group Retirement Savings Plan	199,727
Share of total population (in %)	97.3%
Outstanding amounts (in billions of euros)	5,557

Collective Retirement Savings Plan

The EDF group's Collective Retirement Savings Plan is made up of two FCPE (Employee Mutual Investment Funds) profit-sharing funds with a total of eight investment vehicles: one solidarity fund and one set-maturity fund. The plan may be managed independently, in which case it may be invested in any sub-fund regardless of the retirement date, or by the fund manager, in which case the level of

risk will be automatically reduced as the maturity date approaches (retirement, acquisition of their primary residence). Profit-sharing, as well as individual payments and transfers from the Time Savings Accounts, are matched by the Company under conditions negotiated within each company.

PERCO EDF group	2021
Number of employees, retirees and former employees of the Group holding a Group Collective Retirement Savings Plan	87,436
Share of total population (in %)	42.6%
Outstanding amounts (in billions of euros)	1,135

3.3.3.7.4 Employee shareholding

As at 31 December 2021, the employees held 1.32% of the share capital, divided between the shares held by the "EDF Actions" and "EDF ORS" employee

shareholding funds (FCPEs) of the Group Savings Plan and the shares held in registered form:

	Employee shareholders	Number of shares	% of share capital	% of voting rights
Employee shareholdings		42,673,879	1.32%	1.39%
Group Savings Plan ("Actions EDF" and "EDF ORS" employee shareholding funds)	91,074	38,775,926	1.20%	1.26%
● Of which EDF shares	71,516	31,708,642	0.98%	1.11%
● Of which EDF ORS	34,593	7,067,284	0.22%	0.15%
Shares held in registered form	~45,000	3,897,953	0.12%	0.14%

3.3.3.8 Attract and retain talent

3.3.3.8.1 EDF remains one of the top industrial recruiters

In a context of strong competition between economic players for skills and talent, the EDF group remains one of the largest industrial recruiters, with 20,095 employees hired in the Group by 2021. The EDF group recruited

10,260 employees on permanent contracts, 1,847 employees on fixed-term contracts (excluding work-study students), 7,988 work-study students, and 3,500 interns.

Hires/departures ⁽¹⁾	Unit	2019	2020	2021
Hires ⁽¹⁾	Number	10,377	11,214	10,254
Retirement departures/inactive employees	Number	3,444	3,523	3,333
Resignations	Number	3,285	2,452	3,522
Redundancies, dismissals, people made inactive	Number	1,545	1,174	1,524
Turnover	%	5.6%	5.6%	5.6%
Other arrivals ⁽²⁾	Number	7,289	6,258	9,856
Other departures	Number	10,259	8,691	9,940

(1) The Hires indicator was revised in 2021 and only takes into account permanent hires on the Group level.

(2) Other arrivals: Return from unpaid leave; other departures: Unpaid leave, death, contractual termination, external career development.

3.3.3.8.2 Attractiveness of the employer brand

In order to attract candidates who are of interest to the Group and who will contribute to its performance through their added value, the Company relies on a CSR and appealing Group employer brand. EDF remains one of the most attractive

employers for students, work-study students and young graduates and this is confirmed by this year's rankings:

Epoka ranking	For the second year in a row, EDF is the number one preferred company among students and young graduates in the energy sector according to the Harris Interactive study for Epoka and 4th for all sectors combined among engineers.
Universum ranking	In 2021 ⁽¹⁾ , EDF ranked as the third most attractive company for managers who graduated from engineering schools and ranked second for experienced professionals at the Baccalaureat (Bac or high school) +2/3 level.
IFOP	EDF is ranked 3rd for employer brand and environmental responsibility in the IFOP rankings of the most admired companies ⁽²⁾ .
Happy Trainees	EDF is ranked first in the energy sector and second in the general ranking measuring the level of satisfaction of work-study students and interns for 2022. EDF ranked third in the category of companies hosting more than 1,000 young work study students and trainees.

(1) universumglobal.com/fr/classements-cadres-2021/

(2) fop.com/wp-content/uploads/2021/11/Vague-3-Eight-Advisory-principaux-resultats.pdf

3.3.3.8.3 Recruitment priorities

In 2021, while continuing to give priority to the employability of its employees and targeting its hiring to profiles not available through internal mobility, EDF has continued its commitments on recruitment volumes, the inclusion of young people

and people with disabilities, and adding more women to its businesses. The Group has also reinvented itself with more digital and more innovative tools.

Industrial, technical, and digital skills

Technical and digital industrial skill needs	To meet the need for excellence in industrial, technical and digital skills (see in particular section 3.4.3.2.1 "The Excell plan"), EDF's hiring in 2021 prioritised recruiting in technical, IS, high-voltage, rare or developing professions. These include mechanical maintenance technicians, electrical maintenance technicians, electrical project engineers, design office technicians, contract managers, welders, and data scientists.
Co-hiring	The Company is setting up joint hiring between two departments, mainly in production and nuclear engineering. As soon as the candidate arrives, they are given insight into the next job, so as to be able to follow a dual course of study (engineering/research) and operational implementation (operation-maintenance).

Prioritisation in technical professions	2021
Percentage of young graduates recruited through work-study programmes	23%
Percentage of young graduates recruited from end-of-study internships	6%
Share of experienced technicians and engineers among hires	40%

Adding more women to technical professions

Thanks to the Group's determined efforts to promote the participation of women in technical professions, industry is also a female field. EDF has launched the "Co-

developing industry for women" campaign (see section 3.5.4.8 "Responsible communication").

Women's Energy In Transition Award	For the past three years, Dalkia has organised the Women's Energy In Transition award, which provides financial support to female students and working professionals, with the aim of encouraging women to join training programmes or technical professions related to the energy transition.
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Recruitment of women in technical professions (EDF)	2020	2021
Total number of hires in technical professions	671	1,219
Share of women among hires in technical professions	16%	17%
Total number of hires in the information systems business units	113	159
Share of women among hires in information systems professions	31%	21%

Highlighting of work-study programmes and internships

Key element of the Group's sourcing and human ambition	EDF has made work-study programmes and end-of-study internships a key component of its skills sourcing and "human ambition", meaning that more than one out of every 100 work-study students in France is trained by the Group.
"# 1jeune 1 solution" (a young person/a solution)	6,800 work-study students, including 4,000 for the class of 2021-2022, as well as 3,500 interns.

Promoting work-study programmes in hiring	2021
Number of work-study students	3,518
Number of interns received	1,727
Percentage of young graduates recruited through work-study programmes or internships (%)	40

Commitment to launching the careers of young people and inclusion

Helping young people find employment remains one of the Group's priorities. For many years, the Group has been working for a more inclusive economy, especially for young people.

Priority neighbourhoods and revitalised rural areas	EDF is committed to bringing in young people who are far from employment and those who come from Priority Urban Neighbourhoods and Revitalised Rural Zones.
"From the stadium to a job by 2024"	New recruitment methods in line with the values of the EDF group make it easier for people who are far from employment to enter the job market.

Mobilisation for economic and social recovery

Agreement with Pôle emploi	In March 2021, EDF signed an agreement with Pôle Emploi that aims to match EDF group job listings with the skills of job seekers.
Train de la relance	EDF took part in the <i>Train de la Relance</i> ("Recovery Train") programme organised as part of the Plan France Relance. EDF group's HR and business teams, including Dalkia, Framatome and ES (Électricité de Strasbourg), in partnership with Pôle emploi, offered "speed dating for a job" sessions.
Sector in decline or affected by PSE	EDF is pursuing its responsible and win-win sourcing approach and is offering jobs to employees with experience in sectors that are shrinking or affected by PSEs ⁽¹⁾ .

3.3.3.8.4 Other innovative sourcing methods

The Group maintains a high level of digital communication in order to maintain its position and role as an indirect "source" via social media and online events targeted at the profiles it seeks. Communication on the Group's businesses and

subsidiaries has been strengthened, with a particular focus on the Group's recruitment priorities.

Webseries Videos	On EDF Recrute, EDF offers a web series of 6 videos to introduce young people aged 18 to 25 to the electricity industry by highlighting employees through their know-how and their passion for their profession.
Cartes en main Podcast	A series of podcasts that discusses the variety of jobs at EDF, gives advice about getting hired, addresses social issues that have an impact on professional careers, and highlights some of the Group's more hard-to-fill job listings. The podcast is available on Spotify, Deezer and the EDF Recrute career site.

3.3.3.9 Detailed information on the Group's workforce

3.3.3.9.1 A workforce trajectory in line with the Group's strategic orientations

The EDF group's consolidated workforce totalled 167,157 employees as of 31 December 2021 (subsidiaries consolidated).

The number of employees increased slightly compared to the end of 2020 (+1.2%), in line with the Group's industrial and commercial challenges. This increase is due to new acquisitions in 2021, including Framatome's acquisition of the nuclear instrumentation-and-control business of the British group Rolls-Royce, the integration of IZI Solutions Renov, and a higher volume of recruitment for the Group's nuclear and renewable energy companies.

Five companies have more than 10,000 employees: EDF (63,070), Enedis (38,701), Framatome (16,551), Dalkia (18,451) and EDF in the United Kingdom (11,141). The overall workforce rose slightly compared to the end of 2020 (+0.7%) against a backdrop of the energy transition, technological developments and intensifying competition in France and the UK. 80% of the workforce is French, 96% of the workforce is located in Europe (including France) and 4% outside Europe.

3.3.3.9.2 The workforce in France

EDF remains committed to its transformation and to adapting its business model (new nuclear power, development of renewable energies, development of new commercial offers, including offers, electric mobility, optimisation of support functions, digitalisation of internal tertiary processes, targeted international development etc.).

In France, the Group companies had 133,467 employees on 31 December 2021, a very slight increase on the figures for 2020 (+1.4%). The Group's companies in the nuclear and renewable energy services sector are expanding quickly to support the development of their business, with Framatome's workforce growing 14.8% and that of EDF Renewables, 9.3%.

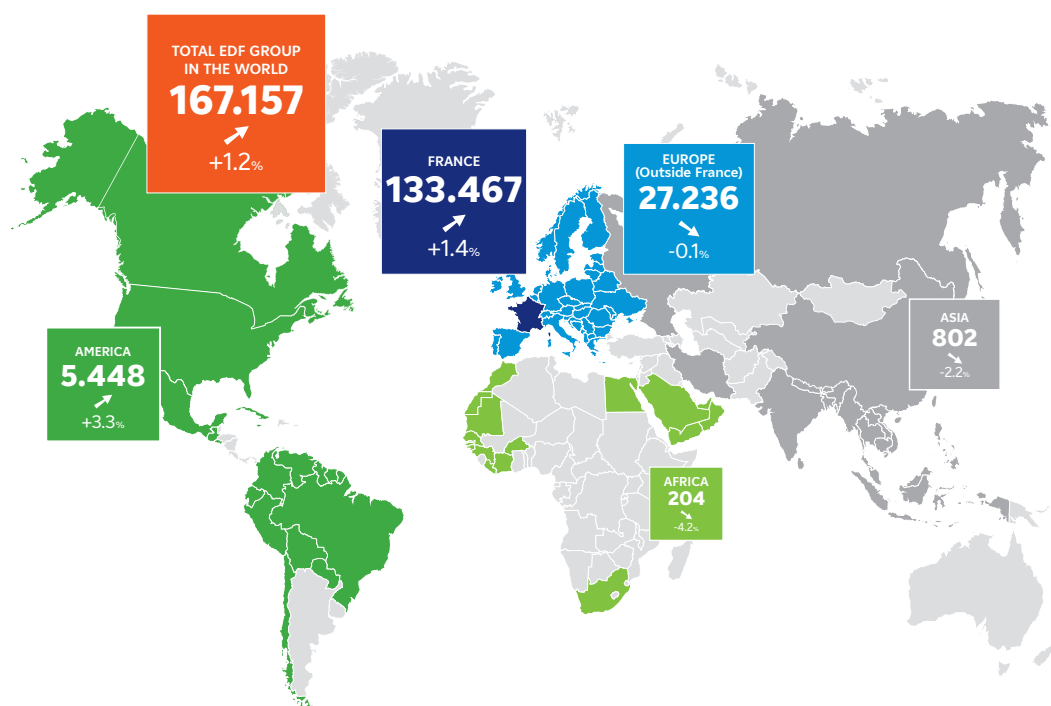
3.3.3.9.3 International Group workforces: 96% of the international workforce is European

The international workforce increased by 2.3%, with EDF Renewables in particular growing 14.3%. The workforce of the Group outside Europe is mainly located in America (5,448), Asia (802) and to a lesser extent in Africa (204).

16% of the Group's workforce is located in Europe (excluding France). This evolution reflects contrasting trends among EDF group companies in Europe. The Group's companies in the field of nuclear services are growing (+8.5% for the deconstruction company Cyclife). Conversely, increased competitive pressure in the United Kingdom led to a downward adjustment in the workforce for EDF Energy (-4.9%).

(1) PSE: Employment Protection Plan (*Plan de Sauvegarde de l'Emploi*).

3.3.3.9.4 Details of the allocation as of 31 December 2021



Further details on the breakdown of the workforce ⁽¹⁾

By age		2019	2020	2021
Under 25 years old ✓	%	7%	7%	7%
From 25 to 35 years old ✓	%	29%	28%	27%
From 36 to 45 years old ✓	%	26%	27%	27%
From 46 to 55 years old ✓	%	26%	26%	26%
56 years old and older ✓	%	12%	13%	13%
Per category				
Managers	Number	53,095	53,485	55,324
Non-management employees	Number	111,632	111,715	111,833
Worktime				
Part-time employees	Number	10,389	9,748	9,234

✓ 2021 indicator subject to reasonable assurance check by Deloitte & Associés.
For gender distribution, see section 3.3.3.1 "Workplace equality".

The distribution of the workforce reflects a balanced staff, the result of the EDF group's employment strategy. The proportion of employees under 35 years of age is the result of the Group's desire to integrate young graduates from work-study

programmes and internships. The proportion of managers at the Group level will increase in 2021 due to the significant increase in nuclear engineering hires.

3.3.4 Energy poverty and social innovation

Taking into account the most vulnerable customers is at the heart of the Group's efforts to ensure a just and inclusive energy transition. It is for this reason that EDF group confirms and renews its commitment to its most vulnerable customers, by

increasing the understanding of this diverse, complex reality, implementing support solutions based on public solidarity schemes and specific initiatives.

3.3.4.1 Understanding energy poverty

The first part of EDF's efforts consists of gaining a better understanding of the complexity of energy insecurity situations to be able to identify more precisely the customers most at risk, with a view to providing them with better support.

(1) The methodology associated with this data is explained in section 3.6 "Methodology".

Complexity of the problem

The problems due to access to energy and energy poverty keep intensifying in most developed countries, in terms of the number of households concerned or the severity of the impacts encountered. Vulnerability varies according to geographical location, income, and size and type of accommodation, as well as the type of energy used. The pandemic has worsened a growing phenomenon.

And its measurement is complex and varies from one country to another. In France, the French National Energy Poverty Observatory, of which EDF is a partner,

published its indicator ⁽¹⁾, revealing that 3.3 million households were in a situation of energy poverty. In the United Kingdom, the indicator published by the public authorities ⁽²⁾ showed the country had 2.5 households in a situation of energy poverty. In Italy and Belgium, there is currently neither a definition nor an indicator relating to energy poverty.

Group initiatives

In these very different national contexts in regulatory, economic, political, and competitive terms, the EDF group is committed to the fight against energy poverty alongside public and social organisations and associations.

Understand

R&D programme	EDF R&D runs an "Energy poverty: understand-innovate" programme to anticipate the changes in energy poverty and public policies and to design and develop innovations allowing to fight against energy poverty more efficiently. In France, EDF was involved in the work of the National Fuel Poverty Monitoring Centre.
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Identify

GEODIP	Since late 2021, the National Observatory of Energy Poverty (ONPE) has enabled local actors to use the GEODIP tool (Geolocate Diagnose Energy Poverty), which makes it possible to visualise energy poverty zones based on housing and household car use.
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3.3.4.2 Fight against energy poverty.

The Group has long been acting to ensure that an electricity bill is not an additional aggravating factor for its most vulnerable customers. EDF's efforts are supported by its solidarity policy, which either serve as a supplement to public programmes or work by deploying special actions of their own. The operational implementation of this policy is based on three components: payment assistance, customer support, and prevention.

3.3.4.2.1 Payment assistance

In addition to the personalised payment terms that may be granted (see section 3.3.4.2.2), the EDF group is closely involved in national and regional public schemes and participates in the *Don d'Énergie* (energy donation) programme.

Energy vouchers	The French Government sent energy vouchers to 5.8 million households in 2021, worth an average amount of €150. In a context of rising energy prices, the government announced in mid-September, a one-time additional energy voucher of €100, which was sent in December 2021 automatically to all households that already received the energy voucher for the year 2021. EDF supports the sending of energy vouchers by sending all forms of reminders at the beginning of the winter break, and by conducting information campaigns with social workers and with EDF partners through solidarity contacts and solidarity customer advisors. Online delivery of the voucher and certificate on the chequeenergie.gouv.fr website is encouraged and supported.
Fonds de solidarité logement (Housing Solidarity Fund or FSL)	For the past 30 years, EDF has had an active partnership with the <i>Fonds de Solidarité Logement</i> , granting financial aid to people who have difficulty paying for their housing expenses. With €20.7 million in 2021, EDF is the largest contributor to the <i>Fonds de Solidarité Logement</i> , after government agencies.
Don d'énergie (i.e. "Energy gift")	In France, EDF is developing <i>Don d'énergie</i> (i.e. "Energy gift"), in partnership with the Abbé Pierre Foundation. Since 2018, EDF's customers with the EDF & MOI application and its newsfeed can make a donation to help vulnerable households pay their electricity bill, irrespective of their electricity supplier. EDF matches this tax-free donation up to 100% up to a certain limit.

In Italy, Edison is rolling out the "social bonus" scheme, a public scheme which takes the form of a reduction applied to electricity bills, based on levels of income. In Belgium, Luminus developed all the public schemes that are very specific to Flanders, Wallonia and the Brussels Capital Region. In the UK, the Energy Carbon Obligation (ECO3), aimed at vulnerable customers and implemented by EDF Energy, encompasses both measures for reducing carbon emissions and fighting against fuel poverty through the improvement of energy efficiency.

3.3.4.2.2 Support initiatives

EDF has made arrangements to provide massive support to customers facing hardship. This translates into an Energy Support service, increased vigilance during the winter break, and a firm local basis for the solidarity policy.

Recently EDF committed itself to no longer requesting that electricity be cut off for unpaid bills by its private customers in France.

With this measure, EDF goes further than its regulatory obligations outside the winter grace period, by replacing the cut-off with a power limit of 1kVA ⁽³⁾. This measure, which will take effect on 1 April 2022, will apply in all cases, unless there is a physical or technical inability to limit the power supply of the dwelling.

(1) French National Energy Poverty Observatory 2019 dashboard (Energy poverty quantification indicators).

(2) National Statistics Fuel poverty detailed tables 2019.

(3) A power of 1kVA is enough to maintain several essential uses of electricity, such as lighting, operating kitchen equipment (refrigerator, freezer, etc.), or charging electronic devices. This is sufficient power to provide minimum service while waiting for the customer to settle their energy bills.

Energy Support Service: the Group's key performance indicator

Since 2010, *Accompagnement Énergie* has been providing a personalised solution to any EDF customer who has trouble paying. This is a system deployed by telephone by 5,000 customer advisors and 230 solidarity experts.

The Energy Support Service and who is involved

5,000 Customer Relations Advisors	All of them are based in France ⁽¹⁾ , and have been taught all about energy insecurity situations. They detect the first signs of hardship and offer the first forms of assistance. The EDF advisor checks that the customer is getting the right rate for their consumption habits and that the bill has been calculated on the basis of a real index. The advisor tells the customer how to lower their consumption and discusses the terms of payment. They inform the customer about the energy voucher, directing them to those who can help if necessary.
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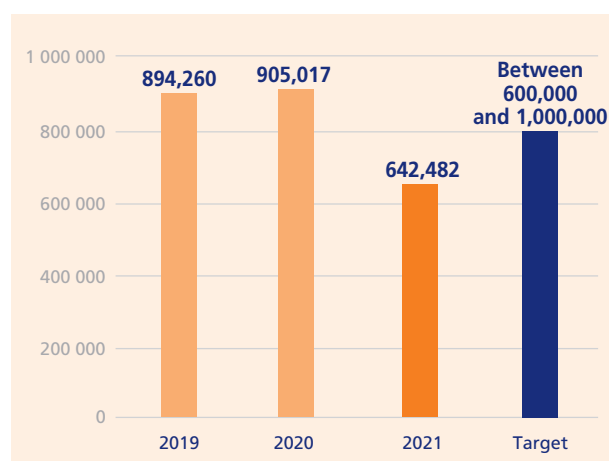
230 Solidarity Experts	230 EDF Solidarity Experts dedicated to solidarity who work directly with social action organisations to provide the best possible support to the most vulnerable customers.
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Group key performance indicator

The key performance indicator relates to the number of advisory actions carried out with customers within the framework of the Energy Support Service. The methodology associated with this indicator is described in section 3.6 "Methodology".

In 2021, the number of advisory actions is within the range of the annual target. These actions have increased by more than 15% for customers facing recurring situations of energy insecurity and receiving personalised support from EDF's Solidarity Centres. In a context of moderate rate changes (limited to a 2% increase in the blue rate in 2021) and the preservation of effective support measures for customers facing hardship (winter grace period extended by two months and increased distribution of energy vouchers by the public authorities), these actions have been significantly reduced for our customers affected by occasional payment difficulties.

Individual guidance provided every year to our clients as part of the "Energy Support" framework (number of actions)



Local basis for the solidarity policy

Several additional tools allow EDF's solidarity policy to be fleshed out and rooted as close as possible to the problems being faced.

Solidarity contacts	The work of the Solidarity Experts is supplemented by that of the Solidarity Contacts, who are the regional leaders of EDF's solidarity policy. They raise awareness of energy insecurity issues among their partners and provide them with training.
Partnerships	Effectively fighting against energy insecurity usually means working with partners. EDF works with the <i>Centres communaux d'action sociale</i> (CCAS), as well as with major charities such as the Abbé Pierre Foundation, the Red Cross, Secours Catholique, and Secours Populaire Français. EDF cooperates with the Union Nationale des CCAS (UNCCAS) and the Association des cadres territoriaux de l'action sociale (ACTAS) to seek all forms of innovation, for example in terms of access to rights.
Mediation points (PIMMS) and social mediation	To strengthen its support in the field, EDF works with many social conciliation structures throughout France, including around forty PIMMS (multiservice conciliation and information points). As part of its partnership with the national Pimms mediation network, EDF participates in the development of PANDAs (<i>Point d'accompagnement numérique pour les démarches administratives</i>), which are dedicated spaces for supporting people who are least acquainted with digital technology.

Enedis chairs the National PIMMS Mediation Network and acts provides support in the form of information and awareness-building, and in the context of procedures for unpaid bills, always contacts the customer before cutting off or limiting their power.

(1) see section 3.4.2.1.4 "Focus on the customer service lines of business".

3.3.4.2.3 Prevention initiatives

In conjunction with its partners, EDF is deploying strong efforts in the area of prevention, taking action either in housing or in energy efficiency.

Actions to improve housing

Habiter mieux programme	For the past ten years, EDF has been involved in the <i>Habiter mieux</i> (Living Better) programme of the ANAH (National Housing Agency). To date, more than 549,000 housing units occupied by vulnerable households have been renovated under this programme.
Toits d'abord programme	EDF and the Abbé Pierre Foundation have signed a three-year extension to the <i>Toits d'abord</i> (Roofs First) programme, which aims to build and renovate housing for people on very low incomes. To this effort, EDF contributed €6.3 million over the period 2021-2023.
EDF Energy bonus	This offer of support is for carrying out renovations that are likely to save energy. It is based on a public system, which has been enhanced under the Recovery Plan.
"Mon chauffage durable" offer	The " <i>Mon chauffage Durable</i> " (My Sustainable Heating) solution allows customers to replace a fossil fuel-fired boiler with a heat pump, or electric radiators with smart, efficient radiators (until 30 June 2021). This solution is part of the <i>Coup de Pouce Chauffage</i> (i.e. Heating boost) initiative launched by the French government in 2019. For heat pumps, EDF goes further than the state scheme, and offers additional bonuses for households facing energy insecurity.
Ashoka Partnership	As the issue of housing renovation for customers facing hardship is a priority in the fight against energy insecurity, a new partnership with Ashoka was signed in 2021 on the subject of "Energy insecurity and thermal renovation". The aim is to encourage the emergence of new solutions within social innovation startups on the issue of housing renovation for customers facing hardship.
Alogia solution	EDF and its partner Alogia are committed to helping senior citizens through the energy transition. This solution for social-housing landlords addresses two important societal challenges: Helping seniors stay in their homes by improving comfort and security, and fighting poverty.
Green Homes Grant	EDF in the UK is the only supplier to have taken the decision to help its customers access the Green Homes Grant new government fund that finances households via a voucher system for insulation and low-carbon heating systems (UK Government programme "Energy Company Obligation" (ECO). In 2021, EDF helped 900 households.

Energy efficiency actions

Mes Eco & moi	This digital solution allows you to track and understand your energy consumption data and take action to better control your budget. Customers equipped with the Linky meter can also access their consumption calculated in euros. According to an internal study, customers who check their energy monitoring tools more than two to three times a month, and change their behaviour, can save up to 12% of their energy costs ⁽¹⁾ .
Brainstorming in the fridge	In partnership with the <i>Conseil Départemental</i> du Bas-Rhin, ÉS has been deploying an energy-saving educational project since September 2021. The objective of this escape game is to help people discover smart things they can do in their daily lives, using simulations.
SLIME programme	On Reunion Island, EDF carries out awareness-raising and DSM diagnosis actions for households facing hardship. These actions are carried out in partnership with the Region via the Local Intervention Services for Energy Management (SLIME in French).

3.3.4.3 Social innovation for a just and inclusive energy transition

The EDF group, through its employees, businesses, and Foundation, is working to bring out all forms of social innovation to promote a just, inclusive energy transition.

Supported by EDF, EDF Renewables, Enedis, Dalkia and Citelum, the EDF group Foundation assists community organisations and encourages employee involvement. Its efforts are mainly focused on three areas in France and elsewhere:

environment, education and inclusion, with priority given to actions to help future generations and the most vulnerable. In 2021, Edison also established a foundation, Edison Orizzonte Sociale (EOS), which aims to promote inclusion and a culture of sustainability.

The Group's philanthropic efforts involve both financial support and assigning employees via skills-based sponsorship and volunteer work.

Volume	The EDF group has given €12 million to support projects in the public interest ⁽²⁾ .
Breakdown	44% of the actions are carried out by the EDF group Foundation, 38% by the EDF parent company, and 18% by the Group's subsidiaries.
Projects	In 2021, the EDF group Foundation supported 230 projects in France and 41 projects abroad, mainly focused on the environment, education and inclusion.
Assessment	The EDF group Foundation routinely assesses the implementation and impact of the projects financed. Sponsorship agreements set out indicators measuring the implementation and impact for beneficiaries and their achievement is monitored through an annual review requested from the association running the project. 10% the amount awarded is withheld until the review is produced and the indicators met.

For details of the EDF group Foundation's philanthropic efforts, see the online annual report ⁽³⁾

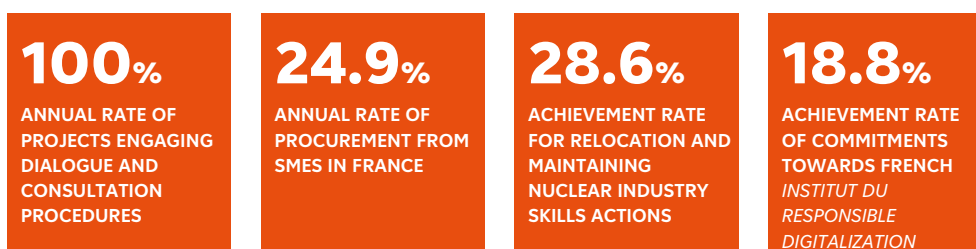
(1) 2017 EDF R&D Survey Result from a study conducted from 1 June 2015 to 30 June 2017 based on a control sample of 1,910 customers on off-peak contracts and a test sample of 1,672 users also on off-peak contracts.

(2) 2020 figures; on the date of the publication of the non-financial performance statement, the consolidated amounts of support managed directly were still pending.

(3) fondation.edf.com/rapports-et-communiqués-de-presse/

3.4 Responsible development

The Group aims to achieve responsible growth. To do so, it has made a priority commitment to maintaining and developing a high level of stakeholder dialogue and consultation in all projects and operational business, whilst ensuring that regulated network operator management remains properly independent. Indeed, over and above its environmental responsibility and alongside its social and societal responsibility, the Group seeks to nurture economic, social, and human development in all territories in which it operates. The Group is keen to develop, stimulate, and support industries, and aims to implement responsible behaviour as its digital development expands.



3.4.1 Dialogue and consultation with stakeholders

Stakeholder dialogue is a key component of EDF culture, forming the basis of the cooperative approach EDF takes with its stakeholders. The Group has made dialogue and consultation one of its priority societal commitments.

3.4.1.1 Experience in dialogue and consultation

EDF's history and its role as a major investor and operator throughout France have allowed it to develop long-standing, tried and tested experience in listening, dialogue, and consultation with stakeholders. Today, stakeholder dialogue and relations are organised with a view to taking into account multiple stakeholders and a diverse range of situations. In a fast-changing society, EDF supports social innovation in local stakeholder relations.

3.4.1.1.1 EDF, a policy of dialogue and consultation

EDF: a pioneer in the implementation of stakeholder panels

For over 20 years, the EDF group has relied on different external stakeholder councils, at corporate, country and subsidiary level. Several panels of experts from civil society provide Group managers with their view on the major topics of interest to EDF.

Group Stakeholder Advisory Committee

For dialogue with external stakeholders, over and above forums for listening to third parties, strategic watch, and ongoing partnerships, EDF group's main body is the new Stakeholder Advisory Committee ⁽¹⁾. This is a joint, multidisciplinary, voluntary group made up of thirteen individuals representing civil society (climatologists, delegates from student and consumer groups, economists, solidarity actors, etc.).

They share their insights on the Company's strategic orientations with the Chairman. Recommendations are systematically made following their work.

Sessions	Three sessions were held during the past year: <ul style="list-style-type: none"> EDF's <i>raison d'être</i> and its links with the CAP 2030 strategy to deliver integrated CSR; the development of renewable energies, in particular wind and solar power; energy mix scenarios for 2050 and related externalities.
Engagement of members in follow-up work	EDF makes sure members of this Advisory Committee are heard outside the Company: <ul style="list-style-type: none"> first impact report, 2021: EDF gave space over to several members of its Stakeholder Advisory Committee in this unprecedented document for them to assess EDF's orientations; media: together with the Le Monde newspaper and M magazine, two members of the Advisory Committee discussed their views on climate change issues and the Company's strategy with senior executives of the Group.

Other Advisory Committees in which stakeholders are involved

- Scientific Council:** chaired by Sébastien Candel, Chairman of the Academy of Sciences, the Scientific Council met three times in 2021 to discuss on the following topics: the international R&D activities, biodiversity and EDF's R&D orientations.
- Edison Stakeholder Advisory Panel:** the Panel met three times in 2021, discussing local value creation arising from energy demand management and the reduction of greenhouse gas emissions.

- Enedis Stakeholder Advisory Committee:** the Committee met three times, discussing the contribution of R&D to CSR, the culture of fairness amid new societal trends, and cybersecurity. The minutes of the conclusions of each Advisory Committee meeting are shared with the members of Enedis' Executive Committee. Members of these bodies were invited to continue dialogue on the topic of new societal trends with the Strategy Department. Enedis regularly implements regional iterations of the Stakeholder Advisory Committee. In 2021, seven of its 25 regional Divisions engaged in a pilot phase.

(1) This has replaced the Sustainable Development Council, set up eight years previously.

Experience in public debate

One specific aspect of major local development projects in France is the 'public debate', a participatory process that lasts between four and six months during which individuals with an interest in the project can have their say about its implementation. EDF group has implemented many projects entailing a formal public debate.

Dunkirk Wind farm	The public debate devoted to the Dunkirk offshore wind farm ⁽¹⁾ ran from 14 September to 13 December 2020. Cross-border consultation opened up the discussion to include the role played by the landscape and local heritage in the identity of the French and Belgian coast. Consultation with the public and stakeholders continued after the end of the public debate. The resulting action plan will be reviewed annually. ⁽²⁾
Nuclear fleet in France	The consultation improving the safety of 32 French reactors was launched by France's High Committee for Transparency and Information on Nuclear Safety (HCTISN). Given its responsibility for periodic review, EDF was involved alongside the main stakeholders in French nuclear power plant safety. 16 public meetings brought together a total of 1,300 people; 1,600 contributions were made to the digital platform consulted by 4,000 visitors. The public were invited to express their opinions about the 'Response to Objectives' brief in respect of the fourth periodic review of these reactors, submitted to the French Nuclear Safety Authority by EDF that produced a public report detailing lessons learned from this consultation ⁽³⁾ .

Fresh stimulus for dialogue with NGOs

EDF group has long-standing relations with NGOs, spanning all the Group's various business lines on a regional, national, and international level. For more than twenty years, it has had an institutional outworking in the form of the Group's Stakeholder Panels (Environment Panel, Societal Council, Sustainable Development Council, etc.). Regular discussions are held with leading non-governmental organisations covering issues such as the environment and human rights. These relations have led to many practical joint implementations. For instance, our bird life protection policy in respect of electricity infrastructures has been put together in consultation with

France's League for the Protection of Birds (LPO) ⁽⁴⁾. EDF recognises the vital role of NGOs in our societies, in particular as regards energy-related decisions, and is seeking to do more going forward.

Closer relations with NGOs aim to prevent the emergence of any high-risk situations by maintaining regular monitoring and establishing forums for dialogue. This also allows the Company's decisions to be challenged, improves its expertise, and strengthens the legitimacy of Group projects. The Group encourages its employees to be involved in NGOs.

Closer ties	A new policy currently under development takes into account the existing NGO environment, its dynamics, and recent modes of action. With this in mind, the position of NGO Relations Manager for the environment and human rights has been created within the Sustainable Development Department.
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3.4.1.1.2 An open dialogue with all, involving all the Group's businesses and subsidiaries

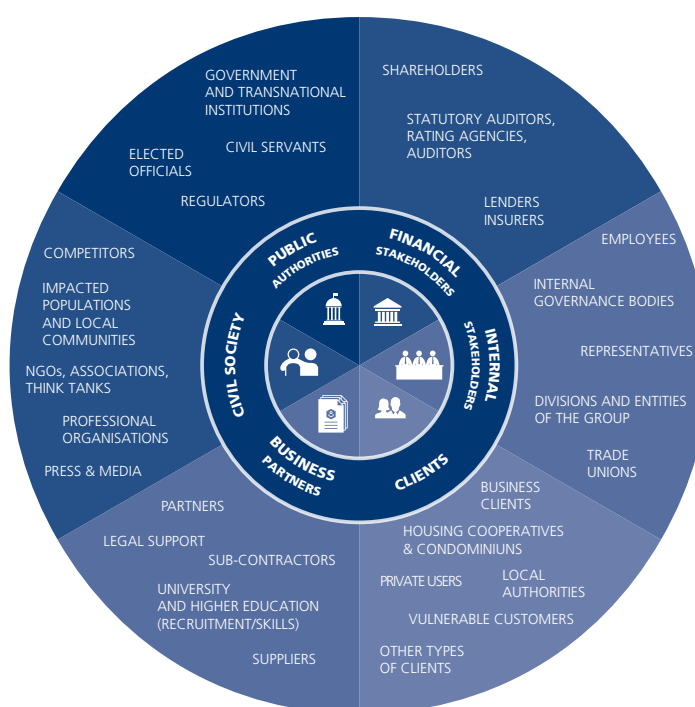
The culture of dialogue promoted by the Group underpins the way it engages in stakeholder relations.

Mapping Group stakeholders to inform actions

Stakeholder relations are at the heart of EDF group's CSR policy.

- The Group has drawn up an overall map of its stakeholders, approved by the Executive Committee; this provides Group divisions and companies with a framework within which to organise dialogue *.
- As part of ISO 9001 and 14001 certification, the Group's divisions and companies systematically map their stakeholders in order to define appropriate modes of dialogue adapted to their specific context.
- Relations with local communities fall within the scope of internal control.

* Accompanied by a stakeholder relations guide produced with French CSR Observatory ORSE: orse.org/nos-travaux/nouveau-guide-un-comite-de-parties-prenantes-reponse-pour-un-dialogue-renouvele



(1) For a wind farm with 46 turbines and total capacity of 600MW.

(2) dunkerque-eolien.debatpublic.fr/actualites

(3) enseignements_edf_-_rp4_900.pdf

(4) Examples of long-standing and highly practical relations via panels include those with FNH, Care France, France Nature Environnement, ADIE, and ENDA Europe, as well as the involvement of Transparency International in the materiality matrix review process carried out in 2017.

Dialogue with all types of stakeholder

External stakeholders	Each department in the Company maintains close relations with institutional stakeholders that fall within the scope of its business and/or geographical area. Relations with external stakeholders are especially important with respect to the Group's projects,
Internal stakeholders	Relations with employee representatives fall within the scope of social dialogue and are dealt with in section 3.5.3 "Social dialogue".

Principles for dialogue and relations in projects

Principles	EDF engages in a societal approach based on identifying stakeholders (with special attention paid to indigenous communities), the principles of "Avoid, Mitigate, Offset", and seeking to manage the positive and negative impacts of its activities. The project process is based on the Equator Principles. ⁽¹⁾
Due diligence	The impacts of each project are assessed on the basis of reasonable environmental and social due diligence. E&S ⁽²⁾ impact studies encompass human rights aspects and stakeholder identification. Dialogue and consultation begin as early as possible, with special attention being paid to groups that are typically marginalised. A public claims mechanism is set up at a very early stage of the project. Public reporting is provided.
Detailed doctrine	Details of EDF doctrine with respect to dialogue, consultation, and stakeholder relations are to be found in a collection of practical guides ("Stakeholder dialogue") ⁽³⁾ .

Dedicated local organisation

EDF has set up a Regional Action and Territories Department (*Direction des territoires et de l'action régionale*, DTAR) to organise more specific dialogue and stakeholder relations locally. In addition to its role in cross-cutting dialogue and internal coordination, DTAR engages in dialogue with the local stakeholders closest to Group projects and operational activities, and more generally, with all bodies and stakeholders concerned with the French government's 'Recovery Plan'.

Making high-level expertise available

EDF R&D has 15 years' worth of cutting-edge expertise in the local acceptability of structures, and devotes part of its research work to this aspect. For instance, in 2021, the expert team worked on EPR2 and the socio-economic acceptability of various energy scenarios.

Skills development for managers and project managers

Identifying and understanding stakeholder circumstances and expectations, taking the related decisions, and implementing appropriate action plans requires professional upskilling for managers and all other stakeholders.

A full-scope training offering	Since 2008, EDF group has provided a training offering to develop stakeholder knowledge, nurture understanding of issues, and improve the management of dialogue and consultation practices. Open to all EDF group departments and subsidiaries in France, it is directed more particularly at project managers, managers, communications officers, and the members of regional delegations, in liaison with stakeholders.
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Listening and dialogue innovations in stakeholder relations

EDF systematically implements tools that promote listening, dialogue, and understanding of its environment using a wide range of instruments, from opinion barometers to forums for listening to stakeholders and employees implemented in the form of ongoing surveys or organised in connection with institutionalised dialogues.

Opening up the "Let's talk about energy" Collective Intelligence lab to outside parties ⁽⁴⁾

Parlons Énergies: outward-facing since 2021	For the first time in 2021, <i>Parlons Énergies</i> ("Let's talk about energy") became outward-facing. 3,500 interviews with private individuals and 52 participatory workshops were organised across France, led by 700 employees trained in interview techniques and overseen by a supervisory Committee made up of academics, company leaders, and think tanks. Discussions related to perceptions and expectations in respect of modes of production and consumption, global warming, and EDF in general.
	The lessons learned were published in late 2021 ⁽⁵⁾ in the form of a "grassroots handbook". The expectation of those consulted was that EDF should be engaged in a French low-carbon production strategy. They were keen to see the Company innovate, establish partnerships to hasten the energy transition, and create closer ties with its customers.

(1) Identify the stakeholders; launch consultation as far upstream as possible; provide transparent and clear information to stakeholders on the project; gather stakeholder opinions on the project and address them; set up a system for dealing with suggestions and complaints; ensure that local populations are able to participate in the consultation process; ensure that consultations are publicly reported.

(2) E&S: environment and social.

(3) This covers consultation with elected officials, public debate, public inquiries, energy transition in rural areas, the circular economy, and consultation evaluation.

(4) *Parlons Énergies* is the working name of the Collective Intelligence Programme Department (*Direction des programmes d'Intelligence Collective*). Established in 2018, the department launches, coordinates, and analyses major debates across EDF to enrich strategy and generate new actions engaging employees in the transformation of the Company. As of the end of 2021, over 25,000 employees had taken part in *Parlons Énergies* initiatives, including one to develop the Company's raison d'être, published in 2020 after its adoption at the General Meeting. All related interviews and dialogue sessions were carried out by some 200 volunteer employees trained in interviews. In 2021, *Parlons Énergies* continued its work with a score of internal operations, including a major dialogue spanning all nuclear power plants about how to optimise the maintenance of nuclear reactors. This work contributed to the Start 2025 plan, which has altered maintenance practices to reduce the lead times in question. Other actions were organised to support departmental strategic plans in practice.

(5) parlonsenergies.fr/chez-vous/EDF_PECV_livre_T1.pdf

Innovation in terms of being attuned to and understanding stakeholder expectations ⁽¹⁾

ObsCop	EDF supervised the third edition of ObsCop, the <i>Observatoire climat & opinions publiques</i> (i.e. French climate and public opinion monitoring survey), which is a poll organised by IPSOS in 30 countries based on a representative sample of 24,000 people. Its aim is to produce an international overview of opinions, knowledge, expectations and levels of public engagement regarding climate change in order to provide food for thought and contribute to the constructive identification of solutions for the future. The full results are available as open data ⁽²⁾ .
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3.4.1.1.3 A dynamic of continuous improvement

The culture of dialogue promoted by EDF group constantly seeks to improve and encourage social innovation at grassroots level and in the immediate environment of projects.

An innovative landscape partnership with ENSP

EDF is a partner of France's new Versailles-Marseille National School of Landscape Architecture (École nationale supérieure des paysages de Versailles-Marseille, ENSP). It provides regular consultancy support for projects and infrastructures that raise landscape integration issues. EDF and ENSP have produced a best practice guide for infrastructure managers and project managers.

Constantly improving public information practice

Ricanto power plant, Corsica	The planned construction of the Ricanto power plant led to a consultation being held between 19 May and 24 May 2021. High levels of participation by non-profits led to discussions being engaged on topics such as atmospheric emissions and the risks of flooding and submersion. However, EDF PEI noted poor attendance among Ajaccio residents and those living close to Vazzio. To address this, it implemented new informational resources, including a quarterly newsletter and a dedicated website with an FAQ system.
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Increasingly sophisticated systems to handle requests and complaints

The practical outworking of dialogue relating to local situations takes the form of action plans: from a very early stage, these include a question and complaints handling process. One example is the project in Nachtigal (see section 3.3.2.3.4 "Implementation of human rights commitments").

3.4.1.2 Continuous improvement of dialogue and consultation practices

EDF group constantly monitors the quality of stakeholder dialogue and relations. An internal guide to evaluate consultations (in the "Stakeholder dialogue" collection) destined for managers and project managers has been put together jointly with EDF entities. An intranet site has also been set up to improve experience-sharing between project teams.

3.4.1.2.1 Dialogue and consultation improve the identification and management of project impacts

This is the clearest benefit of engaging dialogue directly at stakeholder level.

Atlantic Shores wind farm (USA)	As part of the consultation, Atlantic Shores has committed to taking care of the environment, more specifically via a programme to attenuate its impacts on marine mammals; this includes acoustic monitoring and vessel speed limits. Atlantic Shores will also avoid pile-driving during right whale migration periods and at night.
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3.4.1.2.2 Dialogue and consultation stimulate questioning

Dialogue and consultation encourage questions to be raised, thereby improving project design; this can result in significant changes to developments, routes, and the location of structures.

Reconfiguration of the Poutès dam	A steering Committee set up under the auspices of the Haute-Loire prefect brought together all project stakeholders (elected officials, environmental protection non-profits and government departments) to validate each major stage of the Nouveau Poutès project. Co-developed in partnership, the project engaged all stakeholders in every aspect of the project, including technical aspects, scientific monitoring, local integration, and communication. At present, the first spawning grounds upstream from the temporary dam have confirmed the appropriateness of the co-developed solution, with the return of spawner salmon. This innovative governance will continue throughout the lifetime of the infrastructure. The Nouveau Poutès dam will be commissioned in 2022.
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(1) There are many other initiatives to listen to customers and ensure that consultations are publicly reported. Examples include the Sustainable Development Barometer (*Baromètre Développement Durable*, BDD), the in-house environmental perceptions barometer (BIPE), and *Ma Rivière et Moi*, a digital information exchange and multiservice data platform developed by EDF Hydro.

(2) edf.fr/observatoire-opinion-rechauffement-climatique

3.4.1.2.3 Dialogue and consultation improve the management of the construction phases

This is especially applicable in respect of road traffic and noise pollution impacts during a worksite.

La Coche hydroelectric plant	Dialogue concerning the construction of the plant with local elected officials and residents enabled potential worksite disruption for local residents to be identified. Measures taken to remedy this included acoustic and vibration monitoring and the regular spraying of earthworks and roads to avoid dust clouds. Local residents can monitor progress of the worksite by reading information distributed directly to their letterboxes, at the town hall, online, in the local press, and at meetings.
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3.4.1.2.4 New participatory financing tools strengthen the relationship with stakeholders

Crowdfunding	Since the first such fundraising drive in 2015, EDF Renewables has launched 39 crowdfunding initiatives raising over €7 million from 3,572 private individuals to finance solar and wind power projects. This funding method has intensified: in 2021 alone, 16 such initiatives were launched by EDF Renewables in partnership with crowdfunding operators (3 for wind power projects – 2 onshore and 1 offshore – and 13 solar power projects), raising some €3 million from 1,317 investors. In Belgium, following on from the success of Luminus Wind Together (its first crowdfunding initiative for wind farms) Luminus launched Lumiwind, a new cooperative allowing the general public and those living close to wind farms to invest in energy transition. For instance, 1,462 Belgian citizens invested in two wind turbines at Fernelmont and Turnhout.
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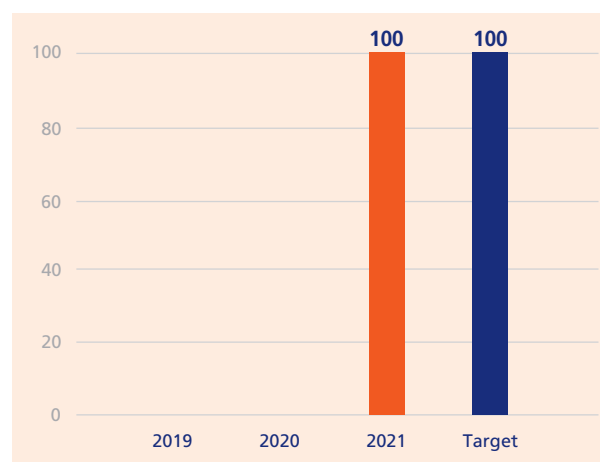
3.4.1.3 Group key performance indicator

For projects of over €50 million examined by the Group Executive Committee's Commitments Committee (CECEG) with a significant impact on localities and/or the environment, the Group entities in question implement the appropriate dialogue and consultation, in line with the Equator Principles.

The Group's key performance indicator in this respect is the annual proportion of such projects for which a dialogue and consultation processes has been initiated. Practically speaking, this means that as a minimum, each project has initiated or implemented a dialogue and consultation strategy and that the various stakeholders (in particular local and indigenous communities) are taken into account, e.g. through specific measures being taken to address their expectations. The methodology associated with this indicator is described in section 3.6 "Methodology".

In 2021, this indicator was 100% for all projects within the scope of the defined criteria.

Annual rate of projects for which a dialogue and consultation procedure is engaged (%)



3.4.2 Responsible regional development

The EDF group is committed to contributing to the development of the regions where it operates, by creating local jobs, purchasing locally, creating economic value and providing a tax revenue. The EDF group is also committed to developing low-carbon sources of energy and access to energy in developing countries.

3.4.2.1 Contribution to development through jobs: employment footprint

The employment footprint of a territory, project, or scope of business may be broken down into direct impacts (EDF employees, see section 3.3.3.9 "Details of EDF group headcount"), indirect impacts (the impact of EDF purchases throughout its supply chain) and induced impacts (impact of spending by employees and suppliers,

and induced employment generated by taxation). Both EDF employees and the employees of companies in the supply chain spend some of their salary in the region and pay taxes and duties.

3.4.2.1.1 Global study

One direct job supports 4.4 indirect and spin-off jobs.

The EDF group contributes to the development of the regions where it operates, by creating local jobs ⁽¹⁾. The 2021 * study shows that 323,000 jobs (including 59,700 direct jobs) are supported by EDF. The leverage effect has remained at the same levels as last year: one direct job generates 4.4 indirect and induced jobs in the locality in question; EDF supports some 1.1% of all French jobs.

* Goodwill study on the base of 2020 consolidated figures; the methodology has been revised and the scope redefined.

3.4.2.1.2 Studying the employment footprint of nuclear power plants

Regional study in collaboration with INSEE

EDF has undertaken a partnership initiative with regional departments of the French National Institute of Statistics & Economic Studies (INSEE) to produce public studies describing the socio-economic footprint of Nuclear Power Generation Plants (Centres nucléaires de production d'électricité, CNPE) and, more generally, its nuclear business within the localities in question. In the Centre-Val de Loire region, EDF's nuclear business generates a total of 11,800 jobs: 6,200 direct jobs relating to production sites (95% of which are permanent), 2,300 indirect jobs relating to orders from suppliers located in the region, and 3,300 jobs induced as a result of consumer spending by directly and indirectly employed individuals and their families. ⁽²⁾

3.4.2.1.3 Focus on the various hydropower lines of business

Innovation

EDF Hydro has developed a Local Economic Impact Simulator (*Simulateur des Retombées Economiques Territoriales*, SIRET). Simulated input-output data allows the numbers of indirect and induced jobs generated by purchases to be estimated. For instance, it is estimated that purchases from French businesses totalling €403 million in 2020 corresponded to 3,994 indirect jobs, 2,356 with Tier 1 suppliers, and 1,638 in other tiers. ⁽³⁾

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3.4.2.1.4 Focus on the customer service lines of business

Preserving employment basins

In 2021, EDF became the first energy supplier to obtain *Relation Client France* ⁽⁴⁾ certification created by the French Association of Customer Relations (Association française de la relation client, AFRC) and the Pro France Association. This corresponds to 6200 customer advisers, employees, and external partners serving consumers, professionals, industry, and local authorities.

3.4.2.2 Contribution to development through taxation

EDF has implemented a Group tax policy to define the applicable principles, in terms of taxation, to all of the Group's relations with its financial or business partners and the government or tax authorities. The tax policy is applied by the Group Executive Director responsible for the Group's Financial Management. It was approved in 2017 by the Executive Committee.

At the end of 2021, as in 2020, the Group uploaded its country-by-country report (of data for fiscal year 2017) to the French tax authorities, in accordance with the provisions of Article 223 (5) c) of the French General Tax Code which follows the OECD's recommendations.

3.4.2.2.1 Group tax policy

A wide scope

The policy covers all the Group's taxes: direct and indirect taxes, duties, contributions, any tax or customs deductions which are ultimately the responsibility of the Company or its customers (when EDF merely acts as a collector on behalf of third parties).

This policy must be applied throughout the Group, by all controlled entities regardless of their nature or geographical location, with the exception of regulated infrastructure managers, for whom it constitutes a guide. All Group staff must comply with this policy which aims to protect the Group's reputation and to reduce any tax risks to which it may be exposed through its activities. The policy follows the following guidelines:

- strengthen the tax performance of the Group in strict compliance with national and international tax laws and regulations;

- control tax risks through continued, systematic improvement, in all Group entities, of the identification and management of fiscal risks;
- implement the tools, reporting and actions necessary for the continued, optimum, forward-looking management of tax cash flows ⁽⁵⁾, as well as attentive and proactive monitoring of the Group's effective tax rate;
- ensure the conditions necessary for obtaining constructive relations with the tax and government authorities of all kinds by maintaining a transparent, professional relationship with them.

Ethical principles

In the context of the allocation between countries of operating margins internal to the Group, EDF strives to apply a transfer price policy in accordance with the principles of the OECD to justify the resulting revenues. EDF has no legal implantation in a territory listed as a non-cooperative state or territory as defined by French and international legislation which is not determined by economic activity reasons and under no circumstances purely by tax reasons. Similarly, cash flow through these countries is prohibited where it is for tax reasons only.

Presence in Luxembourg and Ireland

Like all major French and international groups, EDF relies on captive and mutual insurance companies to supplement the cover provided by traditional insurance markets. The captive and mutual insurance companies enable EDF to reduce the cost of its insurance schemes and the total sum of premiums paid. EDF has three captive insurance companies, based in Ireland and Luxembourg:

- Wagram Insurance Company DAC. (wholly owned by EDF), an insurance company founded in 2003 in Dublin which is involved in the majority of the Group's insurance schemes;

(1) And contributes, at territory level, to the shared economic growth promoted by SDG no. 8.

(2) INSEE studies are public, and may be consulted on its regional department websites, e.g. insee.fr/fr/statistiques/4804924

(3) Full Time Equivalent, INSEE average for total jobs (salaried and non-salaried) based on a 35-hour working week.

(4) See also section 3.1.4.1.4 "Earning trust through quality of service".

(5) Tax cash: tax actually paid or recovered.

- Océane Ré (wholly owned by EDF), a reinsurance company founded in 2003 in Luxembourg to reinsure EDF's nuclear civil liability risk;

- Tereco (wholly owned by Framatome), a reinsurance company within the Framatome consolidation scope located in Luxembourg, to reinsure a portfolio of risks including that of Framatome's nuclear civil liability.

3.4.2.2 Taxes paid by the Group

In 2021, the EDF group's tax expense (on EBITDA) was €3,330 million, €467 million less than in 2020.

The income tax expense amounted to -€1,400 million in 2021, corresponding to an effective tax rate of 25.09% ⁽¹⁾ (compared to an expense of -€945 million in 2020,

corresponding to an effective tax rate of 73.10%). The €456 million rise in income tax expense between 2021 and 2020 is analysed in section 5.5.5 "Income taxes". Income tax paid in all the countries where the Group has subsidiaries is detailed in the ESG Pack publish on the edf.fr website ⁽²⁾.

Corporate income tax	Income taxes paid by the Group amounted to €2,276 million in 2021, compared to €983 million in 2020.
Local taxes	The EDF group thus contributes to the development of the French regions through an annual payment of more than €1.2 billion in local taxes to local authorities.

3.4.2.3 Contribution to development through purchasing

EDF works with around 11,000 suppliers each year. The Group Procurement Department manages EDF's purchases, excluding fuel purchases and a portion of tertiary, IT and telecommunications purchases for certain subsidiaries. This totalled €7.9 billion in orders in 2021 (compared to nearly €7.2 billion in 2020), excluding suppliers belonging to the EDF group, broken down as follows: €4.5 billion in engineering and production purchases, €2.1 billion in tertiary and services purchases and €1.3 billion in IT and telecom purchases. In 2021, EDF's top five suppliers accounted for 9.9% of the total amount ordered by EDF (excluding fuel purchases), and the top ten accounted for 16.5% of that amount. In alphabetical order: Assystem Engineering and Operation Services, Cap Gemini Technology Services, Eiffage Energie Systèmes – Clemessy, Endel SAS, GE Steam Power Service

France, Onet Technologies TI, Orange, Orano DS Démantèlement et Services, Spie Nucléaire and Westinghouse Électrique France SAS.

Suppliers are considered strategic based on a criterion of non-substitutability and the purchasing volume. EDF monitors the supplier dependency rate and implements suitable monitoring actions.

The voluntary development of industrial synergies between EDF entities reinforces the Group's coherence in its relations with suppliers and service providers. This is the case, for example, for purchases of wind turbines (for which Luminus and EDF Renewables cooperate) and also for hydro, nuclear, thermal and HVB power and tertiary and IT purchases, for which nearly all of the European subsidisers benefit from EDF framework agreements.

3.4.2.3.1 Share of local purchasing

Local value creation

The Group Purchasing policy encourages local sourcing and value creation in the regions ⁽³⁾. More than 97% of its purchases are made in France, mainly due to the mechanism used to split contracts into various lots, which facilitates access to the Group's contracts.

In 2021, as part of the consultation process, the Group Procurement Department keeps on encouraging tier-1 suppliers to employ local suppliers meeting the requirements of European Directive 2014/25/EU, for work or service contracts on electricity generation sites. As in previous years, the Group Procurement Department (GPD) has taken part in programmes and events organised by the *Pacte*

PME association, including *Destination EIT express* and *Destination RSE*, as well as various events organised by BPI France and Chambers of Commerce and Industry (CCI). It also sits on a number of *Pacte PME Strategy Committees* and steering Committees. It runs awareness-raising campaigns for SMEs regarding the contracts and authorisations required to tender for EDF group contracts and puts them in touch with interested business lines and subsidiaries. It also assists business lines, to help local companies access decommissioning projects (Brennilis, Bugey etc.) or take part in calls for tenders for the Grand Carénage refurbishment projects.

Recent examples:

Hinkley Point C reactor	More than 4,000 businesses are registered on the HPC supplier portal for the Hinkley Point C (HPC) project. Local suppliers sign contracts directly with HPC or with its tier-1 suppliers. Since the start of the project, £4.1 billion has been spent with regional suppliers directly.
Romanche Gavet reactor	Inauguration of the Romanche Gavet power plant in September 2020 marked a key stage in the Romanche Valley hydroelectric reconfiguration project: in terms of its contribution to local economic development, 637 companies and subcontractors worked on the project and orders worth €108 million were placed with local companies in Auvergne, not to mention the 306 FTEs working at the peak of the project.
Decommissioning and waste management	As part of the embedding policy initiated to become more aware of the socioeconomic footprint and added value of projects relating to decommissioning, waste management, and the construction of EDF intermediate storage facilities in a given locality, a number of actions have been implemented to promote these business lines to local companies at business forums, work with CCIs to identify contractors, organise meetings with EDF suppliers and any local subcontractors (notably for Brennilis), break down projects into workpackages to facilitate access for local contractors, and participate in nuclear industry events (Nuclear Valley) such as the Néopolis event in Nantes.

Solidarity-based purchasing

The Supplier policy has a long track record of giving preference to relationships with SMEs and using the sheltered worker sector (STPA&A) and structures for integration through economic activity (SIAE). EDF makes full use of the possibilities offered under Directive 2014/25/EU, allowing certain purchases to be reserved for

these sectors. In 2021, EDF's purchases from the solidarity sector amounted to €15.6 million. Pursuant to its disability agreements, EDF is developing close ties with ESAT and EA sheltered workshops working in landscaping. ⁽⁴⁾

	2019	2020	2021
Solidarity-based purchasing (STPA&A and SIAE sheltered and back-to work structures)	11.3	13.8	15.6

⁽¹⁾ See note 9.2 "Reconciliation of the theoretical and effective tax expenses (tax proof)" in the notes to the consolidated financial statements.

⁽²⁾ [edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/indicateurs-extra-financiers/indicateurs-esg](https://www.edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/indicateurs-extra-financiers/indicateurs-esg)

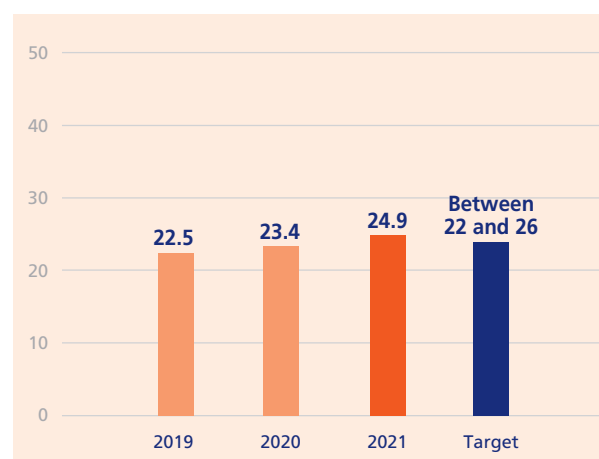
⁽³⁾ See section 3.4.2.4.1 "Boosting the economic, social and human fabric".

⁽⁴⁾ See section 3.3.3.4 "Disability plan".

Group key performance indicator

In terms of purchases from SMEs located in France, the target range is between 22% and 26% of purchases by EDF and the distribution network manager, Enedis ⁽¹⁾. The methodology associated with this indicator is described in section 3.6 "Methodology". For 2021, this figure stands at 24.9%, within the target range.

Annual rate of procurement from SMEs in France (%)



3.4.2.3.2 Sustainable and balanced relationships

EDF's responsible purchasing policy is at the heart of the Group's social and environmental responsibility practices in its supply chain. It is structured by the Group Procurement Department, which sets the general framework and manages the Purchasing function while respecting the management independence of network managers.

Improving the quality of supplier relations

Strategic Supplier Manager	As part of the reorganisation completed in late 2020, the GPD created new jobs to further improve the quality of its supplier relations. These new jobs included the position of Strategic Supplier Manager, the key point of contact for some 40 suppliers identified as strategic. The Manager establishes a trust-based relationship, encourages strategic alignment between EDF group entities and its suppliers, and facilitates the setting up of productivity and innovation partnerships on a win/win basis. Procurement Category Managers are responsible for relations with other suppliers.
Responsible Suppliers and Procurement Charter	On 2 December 2021, the Group's Senior Executive Vice-President, New Nuclear Projects and Engineering signed the "Responsible Suppliers and Procurement" Charter in the presence of France's junior Minister for Industry, who reports to the Minister for the Economy, Finance, and Recovery, at the 2021 World Nuclear Exhibition. Updated in October 2021, the Charter seeks to uphold the quality of client and supplier relations, as well as the values of solidarity, ethics, and trust. ⁽²⁾
Responsible Supplier and Procurement Label (RFAR)	On 30 November 2021, under the auspices of France's Ministry for the Economy, Finance, and Recovery, for the third time running the accreditation Committee endorsed EDF by awarding the Group its Responsible Supplier and Procurement Label (<i>Relations Fournisseurs et Achats Responsables</i> , RFAR) for a three-year period. First secured in 2015, the Label, accompanying the ISO 20400 standard, recognises companies that maintain balanced, sustainable relations with their suppliers.

Supplier policy

Supplier Policy and Responsible Procurement	<p>The new supplier policy adopted in October 2021 to replace the Group Procurement Policy has a special focus on the Group's commitment to maintaining robust, sustainable partnerships with its suppliers. It details the Group's <i>raison d'être</i> and its CSR commitments with respect to responsible procurement, the use of sheltered and disability-friendly suppliers, local engagement, and supplier awareness-raising. The responsible procurement policy remains central to this approach, with the systematic inclusion of environmental, social, and human rights-related clauses in agreements.</p> <p>When implementing purchasing contracts, the Group Procurement Department ensures that financial balance is maintained with respect to suppliers, in particular through compliance with payment deadlines and pricing analysis and structuring actions. Each buyer shall sign the mandatory ethical undertaking which lists the principles to be complied with in relationships with current and prospective suppliers.</p>
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(1) Enedis is an independently managed subsidiary.

(2) EDF was one of the first signatories of the Responsible Supplier Relations Charter. The goal of the action plan to ensure suppliers are paid more quickly, rolled out following an inspection by France's Directorate-General for Competition, Consumer Affairs and Fraud Control (DGCCRF) in 2019, is ongoing in 2021.

Listening, dialogue, and partnerships

With a view to continuous improvement, EDF engages in listening, dialogue, and partnership relations in respect of responsible procurement.

Partners	EDF supports and contributes to the work done by France's National Procurement Council (Conseil national des achats), Responsible Procurement Observatory (Observatoire des achats responsables, OBSAR), the <i>Pacte PME</i> Association, and the French Nuclear Energy Industry Group (Groupement des industriels français de l'énergie nucléaire, GIFEN). EDF's membership of GIFEN allows it to contribute to excellence in the nuclear industry, for instance with the recent creation of Université des métiers du nucléaire, a Nuclear Industry University. For some 15 years now, EDF has had a partnership agreement with GESAT, a national French network of sheltered workshop providers; the latter facilitates contact between businesses in this sector and clients. EDF is also involved with France's New Energy Systems Strategic Sector Committee (<i>Comité stratégique de la filière des nouveaux systèmes énergétiques</i>), which brings together stakeholders in renewable energies, storage, energy efficiency, decarbonation, and grids.
Attunement	In 2021, a survey of GIFEN members was conducted to measure the effects of the implementation of the New Contractual Model and Contractual Engineering. EDF took part in the <i>Pacte PME</i> Association's 2021 Observatory; this assessed the quality of relationships between major clients and SMEs.
Dialogue at site level	In each country, to nurture dialogue, promote the development of relations between EDF suppliers and local businesses, and improve the skills of these companies, EDF entities organise regular forums and specific schemes such as the "One River, One Territory" agency to encourage local economic development around its hydroelectric installations, the <i>Salon à l'Envers</i> event at Cattenom, and the <i>Rencontre Performance® Les marchés publics, un bon plan pour booster son entreprise</i> initiative organised by the Loiret CCI.

The responsible procurement process

Group commitments and obligations in respect of responsible procurement apply to every stage of the procurement process, including during prior supplier qualification, as well as during preparation of calls for tenders.

The EDF group's Procurement Department takes CSR into account in supplier relations in line with the following principles:

Principles	<p>The EDF group's Procurement Department takes CSR into account in supplier relations in line with the following principles:</p> <p>Supplier commitments:</p> <ul style="list-style-type: none"> ● systematic inclusion of a Sustainable Development Charter for EDF and its supplier as part of tender documentation; ● the inclusion of a sustainable development clause in General Terms and Conditions of Purchase; ● validation of a compliance commitment for all bidders (mandatory to respond to the call for tenders) coverings the following areas: corruption, money-laundering, the funding of terrorism, and the absence of any conflict of interest. Bidders undertake to comply with requirements pursuant to the French Duty of Vigilance Act: observing human rights and the fundamental rights of individuals, guaranteeing individuals' health and safety at work, protecting the environment, and complying with social and environmental legislation applying to their business; ● incorporation of CSR criteria in tenders, including specific criteria in the specifications on the basis of the risks identified for each type of contract and/or to address Group CSR aspirations such as the use of sheltered workshops, local engagement, and the inclusion of SMEs in the supplier panel; ● the development of Productivity Partnerships; ● ensuring these principles are upheld by suppliers (see section 3.4.2.3.3).
Procedures	<p>The Group Procurement Department continues to interact with suppliers – including SMEs, ISEs, VSEs and startups – with the operational implementation of a process adapted for innovative purchasing and to make it easier for SMEs to access EDF's markets. This entails the acceptance of:</p> <ul style="list-style-type: none"> ● a single point of contact in the form of a dedicated space on the institutional www.edf.fr website, specifying the general terms and conditions of purchase and the general terms and conditions of purchase for "small orders"; ● a simplified capacity questionnaire for new suppliers, for tenders with amounts lower than the thresholds of European Directive 2014/25/EU; ● a tailored purchasing process and standard agreements for innovative startups and SMEs.

Other practical procedures within EDF group

Even when these mechanisms are not directly applied, the major Divisions or subsidiaries use equivalent methods of commitment adapted to their specific industrial or geographic characteristics. Therefore, suppliers of the Nuclear Division must agree to comply with the Progress Charter for Exemplary and Efficient Nuclear Power and the Social Specifications of the Strategy Committee for the Nuclear Sector. In addition:

EDF Renewables	EDF Renewables responsible procurement is based on two pillars. The first is the supplier qualification process, which takes place in two stages. The first of these is a request for information phase, during which suppliers answer a list of questions and provide documents about their environmental and societal management, including information about human rights (policies, codes of conduct, commitments, procedures, supply chain management, and any sanctions). Following this first stage of qualification, they are then audited to ensure that the practices adopted are in line with EDF Renewables standards. Contractual clauses make up the second Responsible Procurement pillar. When they enter into the agreement, providers undertake to abide by EDF Renewables environmental and societal requirements and to apply these to their own suppliers and subcontractors. Failure to fulfil these requirements may entail termination of the agreement.
Edison	In 2021, Edison set up a supply qualification process based on the use of a CSR criteria checklist to be completed during the supplier qualification process. In particular, this includes requesting the following ISO certifications: 26000 (Social Responsibility), 30415 (Diversity & Inclusion), and 20400 (Sustainable Procurement), as well as the AA1000 Accountability standard. The list also includes questions relating to supplier goals, in particular with respect to sustainability and calculation of their carbon footprint.
Luminus	Luminus systematically takes CSR criteria into account in its calls for tenders. Since 2020, a CSR questionnaire has been included in each call for tenders via a procurement platform. Suppliers cannot respond to the call for tenders unless they complete this questionnaire. CSR criteria encompass carbon emissions, packaging, recycling, waste management, and shipping.
EDF in the UK	EDF in the UK is also conducting a risk assessment in respect of modern slavery to ensure that mitigation measures are in place (see section 3.3.2.3.4 "Implementation of human rights commitments").
Edvance	Since 2020, Edvance has required each of its suppliers to evaluate its CSR performance via the global EcoVadis platform. Edvance reserves the right not to list any supplier whose score on this platform is not high enough. 88% of its suppliers are 'medallists' in the platform's CSR guide. Edvance also includes a clause committing signatories to the United Nations Charter in all its contracts, as well as an ethics and compliance clause.



Procurement stakeholder training

Likewise, buyers are also educated about the importance of the responsible purchasing approach, mainly through their training (special module on this subject).

Collaborative reverse factoring

The EDF group offers its suppliers collaborative reverse factoring, granting them the possibility to pre-finance their invoices before the contractual due date, as soon as EDF issues the payment voucher ⁽¹⁾.

	2019	2020	2021
No. of beneficiary suppliers	550	692	718
Amounts (in millions of euros)	1,074	1,183	2,857

In 2021, EDF began an experiment to assess the potential benefits of incorporating a CSR strand in this scheme directed at EDF suppliers.

Mutual benefits

The Group Procurement Department continued its proactive programme of "Productivity Partnerships". The aim is to improve contract performance through cooperation between EDF and its suppliers, to their mutual benefit. The benefits may be financial, organisational or technical. For instance, a technique to reduce the quantity of hazardous waste developed subsequently by the successful bidder for a service contract may bring down the cost to EDF of shipping and reprocessing this waste. Since last year, the Group Procurement Department decided to switch the focus of the "Productivity Partnership" monitoring to accurately measurable gains.

Productivity Partnerships	2019	2020	2021
Productivity gains within the scope of EDF (in millions of euros)	-	44.1	55.2

Company ombudsman and whistleblowing

- The EDF group has used a company mediator since 2010. Suppliers may refer a matter to the mediator directly, free of charge, through its website or by post ⁽²⁾, as stated in the General Terms and Conditions of Purchase and on the Group's purchasing platform.
- As is the case for all stakeholders, suppliers can use the Group's whistleblowing system, set up in accordance with the Sapin 2 and Duty of Vigilance Acts, which guarantees anonymity and is available in the Group's six languages ⁽³⁾.

(1) EDF enables its suppliers to benefit from interest rates based on its own financial risk and credit standards.

(2) mediateur.edf.fr] by post (Médiateur du groupe EDF – TSA 50026 – 75804 Paris cedex 08).

(3) edf.fr/edf/dispositif-alerte-groupe

3.4.2.3.3 Supplier monitoring ⁽¹⁾

Identifying the CSR risks

Supplier compliance with CSR commitments is primarily ensured by a mechanism prioritising assessments based on risk mapping covering all of EDF's purchasing categories, limited to the purchases covered by the Group Procurement Department.

Enhancing the supplier risk map	On this basis, the Group Procurement Department enhanced the performance of its risk analysis, implemented in particular in accordance with the "Duty-of-Care" Act. The new method takes into account all aspects of CSR (environment, working relations and conditions, human rights, ethics and compliance). Its ultimate aim is to determine the degree of residual risk and identify actions for the supplier. The risk analysis encompasses all procurement categories, covering some 11,000 suppliers.
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CSR risk level

Inherent risks and residual risks ⁽²⁾ are assessed per purchasing categories on a scale of 1 to 4: low, material, major or critical risk. Risk assessment is based on the business of the supplier; their geographical location is also a significant risk assessment component.

Any critical residual risk in the assessed segments can be secured using countermeasures implemented prior to contracting, the contractual clauses and contract monitoring.

Major residual risks have been identified in the various sectors of purchasing, mainly concerning safety, ethics, waste, the use of rare materials and human rights. 15% of the purchasing segments analysed are classified as having a major residual risk, 50% are classified as having a material residual risk and 35% are classified as having a low residual risk.

The largest procurement categories in financial terms for which major residual risks are deemed to remain include the following:

- IT and electronic services and hardware (supply chain human rights risk);
- industrial environment works and maintenance services (heightened safety risk);
- decommissioning/de-pollution services (environmental risk: waste production).

Some less financially significant categories are also included, such as airline tickets. More than 97% of its purchases are made in France and 98.5% in Europe.

In 2021, supply chain-related human rights risks were clarified for the procurement of textiles, IT hardware, Instrumentation & Control, and solar panels with respect to the risk of forced labour.

Internal service assessments

Supplier monitoring includes a CSR strand and starts with an internal assessment of services. Supplier monitoring is mainly carried out by the Division or Contract Management, which uses Performance Assessment Sheets and Supplier Assessment Sheets.

	2021
Number of internal assessments of services	~11,000
Number of suppliers assessed	~1,500

Documentary audits (CSR)

These audits are completed and documented by the supplier and then systematically verified by an independent body, French standards agency AFNOR. Questionnaires cover the entire scope of CSR; some are custom-designed to take issues specific to a given category into account. In 2021, most questionnaires were addressed to suppliers in at-risk categories (mobility and nuclear facility service providers). Some suppliers have also been interviewed following a request by Procurement Category Managers (accommodation). In the last quarter of 2021, the GPD developed a specific human rights questionnaire with AFNOR. This questionnaire was sent out to suppliers with a contract in progress belonging to procurement categories listed in international reports on failures to observe human

rights and/or specifically named therein in the fields of textiles, electronics, Instrumentation & Control, and IT. In 2021, EDF Renewables sent out a supplier questionnaire on human rights in respect of solar panel procurement.

At the end of 2021, 3,000 suppliers were questioned using the Acesia platform, and nearly a thousand of them have been controlled. In 2021, the assessments were "satisfactory" for 63% of the audited questionnaires. The decision to evaluate a supplier is based in particular on the supplier risk map, business line and purchaser requirements, and contracts in progress.

This tool makes it possible for purchasers and suppliers to share an approach of continuous improvement in Corporate Social and Environmental Responsibility.

	2021
Verified documentary assessments verified (completed or in progress)	139

(1) This monitoring is performed from supplier qualification onwards. For example, EDF Renewables assesses its suppliers of strategic wind and solar energy equipment in its qualification processes, comprising selection criteria in all CSR fields. A Chinese turbine supplier that qualified for the very first time was only selected for its ISO 14001-certified plants.

(2) Residual risks are the risks remaining after countermeasures have been adopted.

On-site audits ordered by the Group Procurement Department

These audits cover all CSR aspects: environmental, social and ethical (in particular human rights) policies, commitments and practices. Eight quality audits were also conducted. On-site supplier audits are conducted by external, independent providers. CSR audits are triggered on the basis of feedback capitalised by Procurement Category Managers on how contracts are executed, in particular with respect to the supplier risk map.

	2021
Number of on-site audits ordered by the Group Procurement Department	52
Proportion of audits conducted outside France (percent)	67%

60% of the finalised audits received a "Satisfactory" rating, 34% an "Acceptable with Comment" rating and 6% an "Insufficient" rating, requiring supplier action plans.

"Work clothing" campaign

In 2021, many of the CSR audits related to a call for tenders in the "work clothing" category. "Insufficient" and/or "unsatisfactory" scores for audited production sites led to the bidding supplier in question being excluded from the supply chain. The results of this specific campaign, most of which concerned sites outside France, were quite diverse. Best practice was noted at several facilities (voluntary accreditation and labels, proactive employment/pay policy, proper management of chemicals). However, there were also shortcomings relating to pay, working hours, and safety (lack of periodic inspections, collective protective equipment, and inappropriate PPE), in some cases within Europe. All 'insufficient' scores in the 2021 CSR audits related to the textile category.

Audits for other procurement categories

As in previous years, overall results indicated appropriate management of safety and environment-related operational risks, due mainly to certification providing a framework and a robust safety culture. There were several noteworthy best practices and opportunities, including an in-house innovation challenge and seeking improvements in eco-design and in the reduction of greenhouse gases. There is still room for improvement in how CSR criteria are taken into account in the supply chains of successful bidders themselves. CSR policies and commitments are proving difficult to apply on different sites (training, deployment of responsible purchasing, and so on). EDF's requirements in this respect still need to be promoted in audited companies.

Audits have also been conducted by other companies, e.g. Dalkia (2916 audits in 2021) and Luminus, where a significant shortcoming was noted at a subcontractor for one of its main suppliers. After several alerts, the entity suspended its contract until the relevant company became compliant.



3.4.2.3.4 Responsibility in the fuel supply chain

Coal supply chain

Bettercoal	<p>Since its coal contracts were taken over by JERA Trading (JERAT), EDF has no direct contractual relations with mining companies or the market, but remains an active promoter of the Bettercoal responsible coal purchasing initiative that EDF helped to found. Bettercoal brings together energy companies, port institutions and coal terminals to promote CSR in the coal supply chain, mainly at mining sites, to ensure that fundamental rights are respected.</p> <p>The operational approach is based on a code that sets out ethical, corporate and environmental principles and provisions relevant to mining companies. It takes into account general performance requirements, including management systems, and also performance requirements concerning: ethics and transparency, human and labour rights (such as the prevention of forced and child labour, the right to a decent wage), social issues, including health and safety, and the environment.</p> <p>EDF supplier JERA Trading has become a member of Bettercoal, thus raising the profile and influence of this initiative in Asia. In 2021, 92% of JERAT supplies of coal to the EDF group came from operators that have adopted the Bettercoal initiative; 8% came from North American operators.</p>
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Uranium supply chain

EDF obtains its uranium supplies over the long term under diversified contracts in terms of origin and suppliers, in most of the main producing countries (Australia, United States, Canada, Kazakhstan and Russia). The clauses authorising the completion of audits and setting out EDF's expectations in terms of enforcement of the fundamental rights and main international standards by suppliers and sub-contractors have progressively been added to contracts.

Audit reference framework	The uranium mine audit system used by EDF since 2011 ensures that the ore is extracted and processed in good environmental, social and societal conditions. The method and evaluation chart were developed with the World Nuclear Association (WMA). ⁽¹⁾ This method is based on international standards, including The World Nuclear Association's Sustaining Global Best Practices in Uranium Mining and Processing: Principles for Managing Radiation, Health and Safety, and Waste and the Environment, The Global reporting Initiative's (GRI), Sustainability reporting Guidelines & Mining and Metals Sector Supplement, and The International Council on Mining and Metals' (ICMM) Sustainable Development Framework. Safety is an especially critical issue in mining (process safety), and as such is standardised and recognised by all players in the industry. It takes into account the issues of human rights and fundamental freedoms (human rights, whistleblowing register, rights of indigenous peoples and radiation protection) and also the environment, in the broadest sense of that term (water, diversity, waste, site clean-up after extraction).
Audits	Every year, EDF carries out mine audits through internal means (2 audits per year). The reports present the main strengths, recommendations and suggestions. The most common ones relate to health and safety (wearing personal protective equipment such as gloves or goggles), the display of safety instructions, monitoring accidents, performing radiological controls, monitoring environmental footprint (specifically carbon emissions) and proposals relating to well-being in the workplace. Audit recommendations are included in the continuous improvement plans and action plans.
2021 Programme	After being suspended in 2020 due to the international health crisis, the audit programme resumed in August 2021 remotely; on-site auditing was resumed in October 2021.

(1) Guidelines for Evaluating Supplier Performance at Uranium Mining and other Processing Sites in the Nuclear Fuel Supply Chain.

3.4.2.3.5 Responsible subcontracting

Policy and Agreements

EDF's subcontracting policy focuses on three major themes:

Providing visibility	Providing service providers with visibility and having long-term supply.
Improving subcontractor practice	Helping the Group improve its sub-contracting practices by defining criteria to support decision-making in terms of strategy, economics, skills and social.
Promoting responsible subcontracting practices	Developing socially-responsible sub-contracting practices, through the new Group CSR agreement on 19 June 2018, as well as the agreement on "Socially-Responsible Subcontracting" signed on 19 October 2006.

Commitments

Vigilance	The Group may be required to use subcontractors with employees under contracts drawn up in a country other than the one in which it operates. In this case, particular attention is paid to human rights, working conditions, housing conditions and employee health and safety.
Risk mapping	The EDF group implements a compliance plan, including a map of the risks identified in relation to its suppliers and subcontractors, a risk assessment, and the risk mitigation measures taken.
Strategic analysis	The decision to outsource or backsource activities in this areas is based on a strategic analysis for each industrial policy segment. The analysis takes into account criteria such as the need for the Company to master strategic skills (core businesses etc.) and variations in workload and the flexibility needed to address them.
Monitoring	CSR Agreement commitments are monitored by the global CSR Committee. For EDF, a Committee to monitor the socially responsible subcontracting agreement, made up of signatory trade union organisations, meets twice a year.

Key events in 2021

In the industrial field

Progress charter	The improvement measures launched in 2015, reflected in the Progress Charter signed in June 2016 between EDF and the Professional Organisations representing the Group's subcontractors, continued in 2020 and provided for in particular support for subcontractors, in place since 2017, will continue at the Flamanville 3 work site, with a view to reducing the workload.
9-year workload visibility	In the nuclear field, EDF gave industrial operators an idea of their workload over the next nine years, at the <i>Journée Perspectives France</i> organised by the Groupement des industriels français de l'énergie nucléaire (Grouping of French industrial operators in the nuclear power sector or GIFEN).
Supplier relations barometer	EDF launched its first Supplier Relationship survey in September (144 suppliers surveyed) to compile information about their points of view and obtain feedback. The results support the action taken in terms of contractual improvements and the extended enterprise model. Among the points of satisfaction, suppliers are very happy with the working conditions at EDF sites, in terms of safety (97% stated that their employees work in optimal safety conditions), their treatment (91% stated that they were treated well) and health (89% stated that they received appropriate health monitoring).

In the field of Information Systems

Open source	In 2021, the Company continued to implement its industrial strategy for IT as regards subcontracting: <ul style="list-style-type: none"> ● a proactive initiative promoting open-source software (unrestricted use, free of charge) for the upskilling of MSEs, SMEs, and startups; ● monitoring provider training environments and turnover.
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In the commercial field

External providers	In an increasingly competitive context, the Sales Division continued to use outsourcing to deal with variations in workload and cover extended hours. These external centres are also located within metropolitan France (see section 3.4.2.1.4 "Focus on the customer service lines of business").
AFNOR regulation and certification	External providers are chosen and accredited for customer relations and sales development (<i>Engagé RSE Afnor</i> label).

3.4.2.4 Other kind of contribution to local development

The Group also contributes to local development through employment, taxes, and procurement, as well as via a large number of initiatives promoting a local dynamic, together with its action to facilitate access to energy in developing countries.

3.4.2.4.1 Boosting the economic, social and human fabric

At local level, the Group rolls out a great many initiatives to nurture the economic, social, and human environment:

Socioeconomic support for the Cigéo host locality

Meuse and Haute Marne departments	As part of its socioeconomic support for the site where Cigéo is to be located, in Meuse and Haute-Marne, energy transition and energy demand management initiatives have continued. These include the 1000th Low Energy Renovation (<i>Rénovation basse consommation</i> , RBC) project in the space of 10 years; 500 contractors trained in thermal renovation at Ecurey over a period of 4 years; and the successful launch of the High-Performance Energy Renovation Track (<i>Parcours rénovation énergétique performante</i> , PREP) in liaison with IZI by EDF and Saint Dizier and Bar le Duc councils, the purpose of which is to consolidate home renovations.
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Socioeconomic support for localities around Hinkley Point (UK)

Hinkley Point C	The Hinkley Point C project is being accompanied by investment worth £3.5 billion in south-west England and £2 billion in the north of England, creating 8,000 jobs in the 1,300 regional companies in the supply chain. £40 million has been invested in skills development: for example, a centre of excellence for industrial welding has been opened to support local training of employees, together with a team of advisers to assist in finding jobs. The Hinkley Point C "Inspire Education" programme provides careers development support for young people.
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Socioeconomic support in Laos

For some 20 years now, EDF group has been supporting development in Laos as part of an ambitious social and environmental assistance programme. This has been implemented jointly by the government of Laos and Nam Theun 2 Power Company (NTPC), a company created by EDF, EGCO and Lao Holding State Enterprise responsible for the design, construction, and operation of the Nam Theun 2 hydropower complex.

Support over and above World Bank standards	Developed in consultation with local inhabitants and implemented by the government of Laos with the support of NTPC, the entire social and environmental programme complies with, and indeed exceeds, standards set by the World Bank and the Asian Development Bank.
Significant results	Houses have been built for all the affected households, alongside 2 dispensaries and 32 schools. Following a programme to support economic activity, Nakai plateau has undergone economic development; 97% of displaced households have achieved the revenue levels established by the programme. The median levels of consumption in the area are three times higher than the poverty threshold determined by the government. The entire population now has access to healthcare and education. 37% of those on village Committees are women.
New goals for 2035	New goals have been set for 2035: maintaining sustainable means of subsistence around the reservoir; preserving world heritage biodiversity; maximising renewable production potential, (including top-up production through the use of floating solar panels); optimisation of the use of downstream water

Social and economic support in Cameroon

In Cameroon, across the 7 districts within the Project's area of influence, the Nachtigal Hydro Power Company (NHPC) is implementing a local economic development action plan to support micro-infrastructure and local development, as well as funding revenue-generating business projects at local level.

Most major EDF projects, especially those in Africa and Asia, are designed to improve access to electricity on a local, regional and national scale, such as the Nachtigal hydropower dam project in Cameroon.

Besides its major projects, EDF intends to developing new business models that combine its traditional know-how with technological and economic innovation. These measures are supplemented by Group sponsorship.

3.4.2.4.2 Access to electricity in developing countries

Access to electricity is a vector for progress and development, including in the areas of health, education and security. The global electrification rate has increased steadily since 2010 but more than 800 million people still have no access to electricity, with around one half of them being located in Sub-Saharan Africa.

New business models

EDF is developing off-grid projects designed to provide residential customers and very small enterprises, mainly in Africa, with electrical services, including ZECL in Ivory Coast or Bboxx in Togo (see section 1.4.5.3.9 "Off-grid energy").

Sponsorship and access to energy

The EDF group also supports energy access across the globe in the form of sponsorship, through its Foundation.

EDF Foundation	The EDF Foundation supported in 2021 41 projects run by non-profits (in an amount of €1.93 million) for which electricity aids in access to water, health, education and development, by providing them with a combination of funding and technical expertise from the Group's employees.
Electricians Without Borders	Since 1986, Electricians Without Borders (EWB), of which EDF and Enedis are partners, has been striving to overcome unequal access to electricity and water worldwide.

3.4.3 Responsible development of industrial sectors

The Group is committed to contributing to the development of the industrial sectors needed for the energy transition (renewable energies, batteries, hydrogen etc.) or their revitalisation (nuclear) by developing, adapting and redeploying the necessary skills, and setting up support, retraining and protection schemes for employees for a just transition.

3.4.3.1 The Group's contribution to the creation of new industrial sectors

The Group's contribution to the creation of new industries is especially noteworthy in the fields of offshore wind power and graphite reactor decommissioning.

3.4.3.1.1 Offshore wind sector

The three offshore wind power projects at Fécamp, Courseulles-sur-Mer and Saint-Nazaire, with combined total capacity of 1,428MW, were awarded to EDF by the French government in April 2012. Destined to play a key role in the development of the French offshore wind power industry, they are the product of extensive consultation and grassroots work conducted by EDF Renewables and its partners with local stakeholders, government departments, industry, non-profit associations, and local residents.

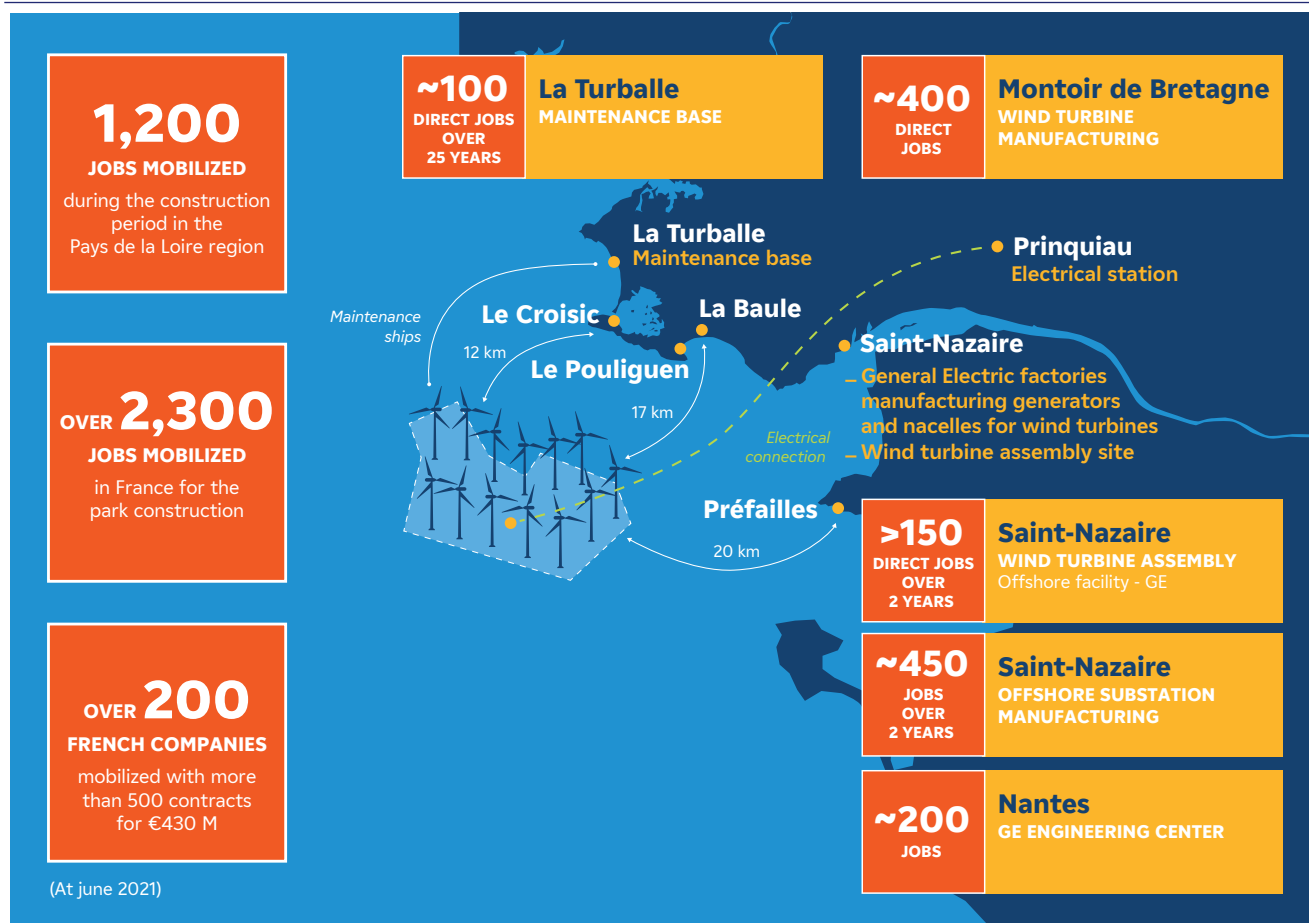
Partnerships encouraging the creation of a dedicated industry

A partnership entered into with Siemens Gamesa in September 2021 covers the supply of wind turbines to 2 projects in France (Fécamp and Courseulles); wind turbines for the first project under construction, offshore from Saint-Nazaire, will be supplied by GE.

The Saint-Nazaire wind farm: case study

On commissioning, the Saint-Nazaire wind farm will produce the equivalent of the annual electricity consumption of 700,000 people, corresponding to 20% of electricity consumption in Loire-Atlantique. The EDF group is thus involved in the creation of a new French industrial sector and new jobs, in particular in Loire-Atlantique.

Saint-Nazaire's park



3.4.3.1.2 Graphite reactor dismantling sector

The Graphite Industrial Demonstrator (*Démonstrateur industriel graphite*, DIG) near Chinon (Indre-et-Loire) is a key installation for graphite reactor decommissioning, allowing physical and digital tests to be carried out on models of these reactors. Construction was completed at the end of 2021 and involved a consortium of local contractors (80% of purchases and services were local); operation will provide a score of long-term jobs.

European project	Decommissioning scenarios and resources tested using the DIG will be developed as part of the EU's 2020-2023 Inno4Graph project; this brings together 13 entities involved in decommissioning including CEA, ENRESA (Spain), SOGIN (Italy), and LEI (Lithuania) as well as EDF subsidiaries Graphitech and Cyclife Digital Solutions.
IEAE	The DIG is the first EDF installation to receive the International Atomic Energy Agency's Collaborating Centre label.

3.4.3.2 The Group's contribution to revitalising existing sectors

3.4.3.2.1 The excell plan

EDF plays a key role in supporting the development of France's nuclear industry, its third-largest industrial sector.

Being present in major nuclear power projects	The excell plan, which was announced in December 2019 and launched in spring 2020, aims to enable the French nuclear industry to restore the most stringent standards and the highest levels of quality and excellence to be at the forefront of major nuclear projects. Together with the rest of the nuclear industry, EDF is now entering the third phase of excell, consolidating results to date and extending the actions undertaken over the long term to achieve the best possible industrial standards. Practically, this goal takes the form of 30 commitments to be honoured by mid-2022, two-thirds of which are direct continuations of those made in 2021. ⁽¹⁾
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A large number of actions were initiated and accelerated in 2021 to address issues including the attractiveness of the industry, capitalising the knowledge of those leaving the industry, and accelerating the experience and skills of those joining it.

Job and Skills Development Commitment (EDEC)	A Job and Skills Development Commitment (<i>Engagement de développement de l'emploi et des compétences</i> , EDEC) has been put in place across the industry; this proactive policy is aimed at delivering a clearer picture of the sector's jobs, training, and attractiveness. For the EDF group, this entails engaging in local strategic workforce planning to provide assessment and information about needs and potential labour shortages, destined for training and employment stakeholders in each region.
Nuclear Industry University (UMN)	The French Nuclear Industry University (Université des métiers du nucléaire, UMN) was established on 27 April 2021 by 12 founding members: France's Nuclear Industry Strategic Committee, 5 major clients (EDF; CEA; Orano; Framatome; ANDRA), and 6 organisations (France Industrie; GIFEN; Nuclear Valley; UIMM; UFE; the Pôle Emploi employment agency). The mission of the UMN is to stimulate training projects, in particular at regional level. It has also played a role in the selection of projects taken up by BPI as part of the France Relance recovery programme, and will continue to support these.
Experienced employees	The target proportion of experienced employees in EDF recruitments for its "new nuclear" business was raised to at least 40% of all such recruitments. In 2021, this target was exceeded, with experienced profiles accounting for 52% of the total. EDF has joined forces with the aerospace industry to implement an "EDF Aerospace Challenge" for the recruitment of experienced employees affected by redundancies in the latter.
New hire journey	EDF has implemented a four-month in-field onboarding journey for all new hires without prior experience in the new nuclear sector to accelerate their acquisition of experience and upskilling. Some 150 of the 500 new arrivals in the New Nuclear Engineering and Projects Department (DIPNN) benefit from this scheme every year.
Crossover career moves	Crossover career moves between production, engineering, construction, manufacture, project functions and cross-disciplinary jobs have been developed and defined, enabling employees to consolidate their skills and use them constructively on return to their original entity. The goal for 2021 was to have 520 such transfers, up 20% compared to 2019; the actual figure was 839.
Knowledge Management	2021 also saw the rollout of a Knowledge Management policy throughout EDF engineering and Framatome, in the form of a best practice guide to disseminate knowledge backed by powerful resources to support these practices. These include a digital encyclopaedia, a knowledge-sharing database (wiki) accessible for EDF, EDF Energy, and Framatome, and a search engine (currently under development).
Creation of HEFAÏS	Given the specific challenges in terms of skills and quality, a "welding plan" has been put into place to provides structure for the training and qualification of welders intervening on worksites in the nuclear industry. As part of this scheme, at the initiative of EDF, Naval Group, Orano, and CMN and with the support of the authorities, the Higher School of Welding Training (Haute école de formation en soudage, HEFAÏS) was born in February 2021. The school will offer practical, innovative training courses in industrial workshops to achieve excellence in welding, working with beginners, jobseekers, and experienced employees, and is open to women and men in Normandy and elsewhere with the aim of making them the best welders in France for the nuclear and naval industries. HEFAÏS will be hosting its first excellence training courses in the Cotentin region in September 2022.

(1) edf.fr/plan-excell

3.4.3.2 The Group's commitment to the *France Relance* plan

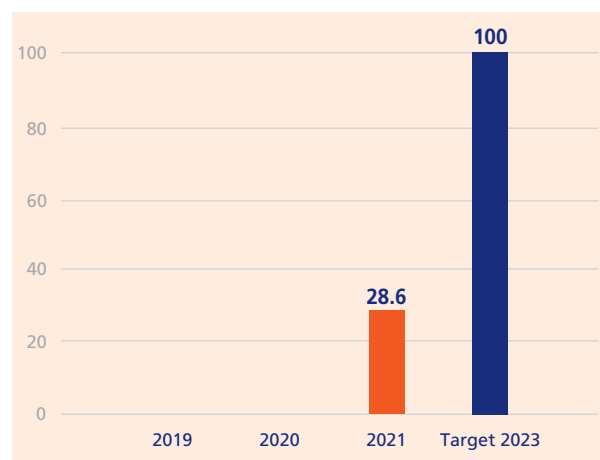
"France Relance" plan

The action provided for in the excell plan will be further strengthened and stepped up under the stimulus package. On 27 November 2020, the French government announced a sector support plan as part of the *France Relance* recovery plan, with €470 million earmarked for the nuclear industry.

Group key performance indicator

EDF's performance in respect of its "Development of industries" commitment is assessed on the basis of the rollout rate for EDF-backed support initiatives to promote nuclear industry skills insourcing and maintenance as part of the *France Relance* programme. These support initiatives include the creation of a fund to assist SMEs and MSEs in the sector, the setting up of a Nuclear Industry University, and funding for re-industrialisation and insourcing projects. The methodology associated with this indicator is described in section 3.6 "Methodology".

Achievement rate of supporting actions backed by EDF, encouraging relocation and maintaining nuclear industry skills (*France Relance* Plan)



3.4.3.3 Support in the context of redeployment of sites and professions

All employees affected by job cuts are given specific support. They benefit from specific schemes in terms of priority mobility (individual personalised support and financial support), external career plans and pre-retirement paid leave.

3.4.3.3.1 Declining activities and territories

Power plant closures: greater solidarity

Social dialogue	EDF continues with social dialogue during the various shutdown phases of power plants. In France, plant closures are the subject of consultations with staff representative bodies ⁽¹⁾ . Three 'business-specific' agreements cover production fleet closures and include dedicated measures to provide recognition and financial assistance.
Redeployment measures	EDF has committed to implement all means necessary to carry out exemplary closures and enable employees to envisage new career prospects taking their individual aspirations into account. Plant closures are implemented with measures to redeploy employees within the Group and initiatives to develop new local economic activities, to offset the loss of jobs and tax revenues in the affected municipalities.
Fessenheim and Le Havre	Employees from the Fessenheim and Le Havre power plants (which closed in June 2020 and April 2021 respectively) are benefiting from social innovation measures to facilitate their redeployment within the Group's regional or national entities. As of the end of 2021, 85% of Fessenheim employees and 80% of Le Havre employees had found another job within the Company.

Instruments to preserve local economic vibrancy: Social Bonds and Ecological Transition Contracts

EDF ensures to develop new local economic activities, to offset the loss of jobs and tax revenues in the affected municipalities.

Innovative use of Social Bonds

First Social Bond totalling €1.25 billion	EDF's first Social Bond issue, totalling €1.25 billion, was made in May 2021. The social purpose of eligible projects is support for SMEs that form part of EDF's industrial fabric and provide job opportunities in localities where EDF is present. 100% of the funds raised will be used to support investment in areas with high levels of unemployment. For full details, see section 6.8 "Details of the allocation of funds from the EDF Social Bond issue".
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(1) See section 3.5.3 "Social dialogue".

Use of Ecological Transition Contracts (CTE)

The Group uses Ecological Transition Contracts (*contrats de transition écologique*, CTE) as part of a consultative process bringing together local authorities alongside local NGOs and companies to refocus the local economy around sustainable, job-centred projects.

CleanTechBooster at Aramon	The closure of the Aramon thermal power plant in the Gard department, shut down in 2016, led to the creation of a 5MWp photovoltaic plant and the implementation of a programme to step up the development of startups for the local energy transition, called CleanTechBooster, supported by an ecological transition contract signed with the State. This scheme supports local startups and encourages cooperation with major industrial groups through open innovation projects designed to create new solutions. Ahead of the third support season, the review conducted in July highlighted CleanTechBooster's function as a development accelerator and noted the practical implementation of four projects, including in the field of self-consumption management systems; these created several dozen jobs locally. The plans for the decommissioning of the thermal power plant, scheduled to take ten years, involved a consideration of how best to involve small local companies in the calls for tenders process and achieve a recovery and recycling rate for the plant's materials of more than 95%.
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3.4.3.3.2 Declining departments and subsidiaries

Enhanced employee mobility and onboarding measures

Priority given to redeployed employees	All candidate searches must first seek internal solutions, with priority given to redeployed employees; this hinges on solidarity between different entities within the Group and the development of fast-tracking between business lines.
Sandwich-based redeployment courses.	The EDF group has implemented sandwich-based redeployment courses, allowing employees to retrain for positions in line with the Group's strategic workforce planning priorities. In 2021, 60 employees benefited from this type of course, including 30 in the process of redeployment, for positions such as that of data analyst and maintenance technician. The EDF group has continued to enrich its offering, drawing on lessons learned from previous intakes. ⁽¹⁾
EDF Impulsion	The EDF group has set up EDF Impulsion, an in-house team of high-level internal managers seeking new jobs that makes its skills available to Group business lines by carrying out operational assignments. The 31 manager-consultants recruited between 2020 and 21 have already completed over 70 assignments. EDF Impulsion also provides specific, targeted support for each team member, to help them find a job matching their aspirations and the Group's needs within 18 months.
My Job	Declining departments have been supported through a specific project called My Job, designed to enhance the visibility of pools of qualified employees and solidarity between departments for EDF.



Mobility and redeployment in 2021

	2021
Employees who found a job in line with the Group's needs	703
employees redeployed since 2018 (EDF)	2,993

3.4.3.3.3 Intensifying the mobility dynamic

In 2021, the EDF group initiated the *Booster la Mobilité* plan: alongside existing mobility schemes and targeted actions, this seeks to overcome other obstacles and further enhance mobility.

The new *Booster la mobilité* plan

This major initiative brings together all EDF Divisions and subsidiaries, with a series of actions focused on three goals:

Three goals	<ul style="list-style-type: none"> ● matching supply and demand for jobs across the Group; ● redefining financial support for mobility and redeployment programmes; ● creating and enhancing attractive career paths.
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Building on past experience, the plan offers new solutions to encourage mobility in line with the challenges facing the Company.

New solutions	<ul style="list-style-type: none"> ● "Modular mobility capital", "facilitated mobility pack", "locality discovery" service. ● National People Reviews, the aim of which is to have an overview of positions that are hard to fill nationally alongside Group mobility potential beyond regional level, and to facilitate individual mobility between EDF and other entities within the Group.
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The *Booster la mobilité* programme supplements the Group's existing mobility schemes, making it easier for employees to apply for jobs far from home without needing to move (*Mon Job en Proximité*); facilitating discussions about financial questions (before/after financial situation) and other issues (relocation);

encouraging transparency and fluidity in the internal job market (since 2020, a Group IS scheme devoted to mobility and recruitment has made it easier for all employees to have an overview of the internal job market).

(1) A new course for Enedis project officers was launched in September 2021.

3.4.4 Sustainable and inclusive digitalization ⁽¹⁾

3.4.4.1 EDF, the first energy company to be awarded the "Responsible digitalization" label

The EDF group is committed to responsible digital transformation that is low-carbon, low-energy, inclusive, ethical, and adds environmental value for its employees and customers.

3.4.4.1.1 Roadmap

Priority	This aim has been asserted at the highest level of the Company in the Group's SI 2020-2025 roadmap. On the occasion of a seminar on digital transformation on 17 September 2021, the EDF group EXCOM affirmed responsible digitalization as one of its priorities.
Implementation	This commitment is coordinated by the Digital Transformation Committee, co-chaired by three members of the EDF EXCOM and implemented through a programme dedicated to responsible digitalization.

3.4.4.1.2 Responsible digitalization Charter

Digital responsibility	By signing the "Responsible Digitalization Charter", EDF, Enedis and Luminus (alongside the Belgian Institute) have strengthened their goal, by formally committing to develop sustainable, inclusive and value-creating digital services. Established by France's Institut du Responsible digitalization ("Responsible Digitalization Institute" think tank), the charter covers every aspect of responsible digitalization.
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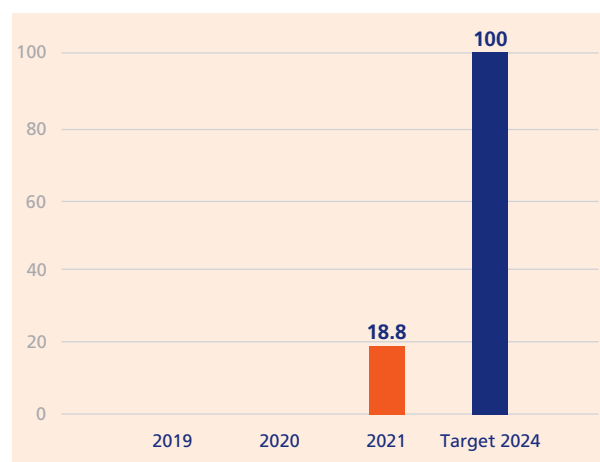
3.4.4.1.3 Responsible digitalization Label

20 binding commitments for progress	Drawing on robust achievements, in March 2021 EDF became the first energy supplier to obtain the Responsible Digitalization label developed by the Institut du Responsible digitalization with the support of France's Ministry of Ecological and Solidarity Transition, research agency ADEME, and WWF. Pursuant to the charter, 20 binding commitments for progress have been made, coordinated by a 2021-2024 action plan structured around three areas: development of responsible digitalization by design, improving user experience, and innovation.
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3.4.4.1.4 The Group's commitment

The key performance indicator is the achievement of the commitments made to the French Responsible Digitalization Institute. The related action plan comprises 18 actions and 32 related deliverables. It must be completed in full by the end of 2024. The methodology associated with this indicator is described in section 3.6 "Methodology".

Achievement rate of EDF commitments towards the French Responsible Digitalization Institute (INR) (%)



⁽¹⁾ This section may be usefully supplemented by the action taken by R&D in section 1.5.1.3 "Digital and societal transition", and the section "Risks to which the Group is exposed" in section 2.2.4, which deals in particular with cybersecurity issues.

3.4.4.2 Acculturation of employees to responsible digitalization

EDF's Transformation and Operational Efficiency Department has set up a mini website within the EDF group's intranet devoted to digital responsibility, featuring educational videos (accessibility, smartphones, printing), 'digital responsibility' MOOCs, toolboxes, and interviews with employees, managers, and sponsors involved in the initiative.

The responsible digitalization programme also includes awareness-raising actions such as the OCCI Clean IT challenge. Over the course of a week, employees from the Occitanie Division's digital business lines had the opportunity to attend a series of talks on responsible digitalization and get directly involved by taking part in challenges (cutting emails, collecting unused smartphones, cleaning servers).

3.4.4.3 Sensible use of digital tools

3.4.4.3.1 Reduction of environmental impact

Decreasing the carbon footprint of digital technology involves responsible use of IT and telephony. EDF is seeking to reduce the related environmental impact by extending the lifetime of hardware, promoting the circular economy, and seeking to bring down the average electricity consumption of servers (see section 3.2.4 "Waste and circular economy").

3.4.4.3.2 Eco-design

The first environmentally-responsible website in the energy sector

Eco-designing digital services allows the key requirements of low-energy use and accessibility to be incorporated from the design stage. With this in mind, in 2021 Dalkia launched the first environmentally-responsible website in the energy sector, dividing the total number of web pages by 4, resulting in a 64% reduction in CO₂ emissions compared to the previous website. The efficiency of the code was also reviewed, the number of servers was brought down from 7 to 2, and the backup space was reduced. The website meets 94% of the French general accessibility improvement guidelines (*Référentiel général d'amélioration de l'accessibilité*, RGAA).

3.4.4.3.3 Inclusion

Digital technology will only be responsible and sustainable if it is also accessible and inclusive and makes no discrimination, but for this, progress must be made in the following three inseparable areas: the IT work environment, applications and digital content. With accessibility in mind, EDF's IT operator integrates appropriate peripheral devices, media, and software (zoom feature, voice recognition, etc.).

3.4.4.4 Digital technology as a vector for responsible action

3.4.4.4.1 Saving of resources

The EDF group considers digital technology as a key way of leveraging responsible development, opening up the way for innovations to reduce the impact of the Group and the services it provides in terms of carbon and resources, e.g. by the setting up in 2021 of the *EDF Reutiliz* digital platform (cf. section 3.2.4.3.2 "Optimisation of materials").

3.4.4.4.2 Customer energy savings

Digital solutions allow customers to achieve energy savings, too. Customers can use the *e.quilibres* platform and the EDF and Me app to track the various ways they use electricity and target energy savings. For more details of these aspects of digital responsibility, see section 3.1.4.2.4 "Earning trust through quality of service".

3.4.4.4.3 Digital for customer development

For extensive examples of how digital technology is used for customer support and development, see section 3.1 4 "Developing low-energy use and innovative energy services".

3.4.4.4.4 Transparency and data sharing

Open data

Digital tools also encourage transparency and data-sharing. Since 2020, the EDF group decided to release its public data, in particular its consolidated financial statements, non-financial performance indicators, the Group's installed capacity, the corresponding generation figures and operational data such as EDF Hydro's average daily river flow data. It is released through an open data platform.

3.5 CSR Governance

The CSR governance structure is based on venues for information and forums for dialogue that strive to constantly improve the identification and assessment of the risks and opportunities specific to each issue and each commitment. This constant identification endeavour is buttressed by a complete organisational system that supervises the implementation of the Group's commitments.

3.5.1 Group policies

3.5.1.1 The Corporate Social Responsibility (CSR) Policy

In 2021, a new EDF group Corporate Social Responsibility policy was adopted by the Executive Committee to replace the previous Sustainable Development policy.

Consistency and subsidiarity	The Company's environmental, social and economic performance is driven in the first place by the contributions of the various entities. The CSR policy provides a framework for these actions by formulating common requirements and principles of action aimed at implementing the 16 CSR commitments to prove that the Group's <i>raison d'être</i> is being carried out. It applies to Group entities without overriding the managerial independence of regulated infrastructure operators, and defines the priorities for 2030 at the Group level, which each entity implements taking into account its specific activities and challenges, in line with the principle of subsidiarity. Where appropriate, an entity may choose to supplement the requirements of this policy.
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3.5.1.2 Other CSR policies

Extension of CSR	In addition to the CSR policy, other Group policies focus on other specific aspects of corporate responsibility (HR policies, Procurement policies, Ethics & Compliance policy, Nuclear Safety policy, etc.). In line with the Group's <i>raison d'être</i> , CSR is gradually being extended to all areas of the Group's activity.
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3.5.2 CSR governance bodies

3.5.2.1 Board of Directors

The duties, powers, composition and operation of EDF's Board of Directors are described in detail in chapter 4, section 4.2 "Composition and operation of the Board of Directors". The Corporate Responsibility Committee ⁽¹⁾, as one of the Board of Directors Committees, examines, in connection with the Group's strategy, the Group's commitments and policies, as well as their implementation, in terms of ethics, compliance, and corporate responsibility. For more information, see section 4.2.3.4 "Duties and activities of the Board's CR Committee in 2021".

3.5.2.2 CSR Strategy Committee

The CSR Strategic Committee, which is chaired by the Chairman & Chief Executive Officer and composed of the Group's Executive Directors ⁽²⁾, conducts an in-depth review of all CSR issues for which it provides strategic management and coordination.

News in 2021	In 2021, the CSR Strategy Committee met twice and dealt in particular with the just transition, the duty of vigilance, the strengthening of the solidarity policy, plans for adaptation to climate change, and the APE's CSR Charter. Depending on the agenda, the conclusions of the meetings are reported to the Board of Directors ⁽³⁾ .
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3.5.2.3 Sustainable Development Committee (SDC)

The SDC prepares the files presented to the CSR Strategy Committee and acts as a sector Committee for environmental and societal competencies. It is chaired by the Sustainable Development Director and made up of some twenty representatives in charge of sustainable development within their respective entities. In 2021, the SDC met on 6 occasions.

3.5.2.4 Sustainable Development Department (DDD)

It reports to the Executive Director in charge of Innovation, Corporate Social Responsibility and Strategy, a member of the Executive Committee.

Ambition

Its aim is to represent a differentiating factor for the Group's performance, as a responsible company and while respecting the management independence of network managers, that creates value for all stakeholders (employees, shareholders, customers).

Contribution to the Group's strategic transformation

It contributes to the Group's strategic transformation by accompanying business lines and projects:

- in specifically taking into account environmental and social issues (opportunities and risks);
- with respect to business choices and actions, in particular by integrating the four key issues derived from the *raison d'être* in the strategic supervision of the operational entities; and
- in screening new projects from the point of view of sustainable development ⁽⁴⁾. It is particularly responsible for monitoring the Group's target for reducing "Scope 1" direct GHG emissions ⁽⁵⁾.

(1) Internal rules of procedure of 8 October 2019.

(2) As well as the Communications Directors, the EDF group Foundation and Regional Action.

(3) Through its Social Responsibility Committee.

(4) See section 3.5.4.1 "Integration of the commitments into the Group's strategic process and project screening".

(5) See section 3.6 "Methodology".

Sustainable development guidance

It coordinates sustainable development in the Group: corporate coordination of the business lines and subsidiaries through the SDC (Sustainable Development Committee) (see section 3.5.2.3 “Sustainable Development Committee”), coordination of the dedicated internal networks such as the EMS and the predictive watch networks (see sections 3.5.4.2 “Environmental management system (EMS)”

and 3.5.4.4. “Predictive watch networks”), coordination of relations and dialogue with external partners (see section 3.4.1.1.1 “EDF, a policy of dialogue and consultation”).

The detailed outline of the Group’s general CSR governance is similar to that shown in section 3.1.3 “EDF climate governance”.

3.5.3 Social dialogue

3.5.3.1 International and European social dialogue

3.5.3.1.1 The Global Social Responsibility Agreement

The Group’s actions go beyond merely integrating environmental issues into its strategy, as EDF remains a socially-responsible, committed employer and a leader in terms of the professionalism and involvement of its employees, by building their skills and fostering greater workforce diversity.

Principles of the Agreement	The EDF group’s Global Social Responsibility Agreement was signed in 2018, and sets out the major principles to be respected in several areas: respect and integrity, people development, dialogue and consultation, support for local residents and the impact of the Company’s policies on local regions.
Scope	All Group employees and subcontractors worldwide are covered by the provisions of this agreement, which the Group’s subsidiaries apply with a view to continuous improvement by including it in their strategic action plans.
Preliminary assessment	Three years after the agreement came into force, a preliminary assessment was carried out based on a survey of a significant sample of seven Group subsidiaries and five departments of the parent company. The conclusions of this preliminary assessment highlighted the abundance of actions linked to the areas of the agreement, as well as the need to give a renewed push to a dynamic that was slowed down by the pandemic. The subsidiaries and business units of EDF also shared the same observation.
Extension agreement	A rider extending the agreement by two years, i.e. until July 2024, was signed on 29 November 2021 by 15 trade unions and the two global federations (IndustriALL and PSI). This added time should make it possible to complete the process of firmly anchoring this set of fundamental Corporate Social Responsibility principles into the practices and strategies of all EDF group entities.
Monitoring body	The EDF group’s global Committee for Dialogue on Social Responsibility (CDRS) is made up of representatives of all the signatories to the agreement. They are responsible for monitoring the implementation of this framework agreement and, in 2021, became committed to the Duty of Vigilance. The two global union federations, IndustriALL and PSI, held training for the CDRS on 24 November 2021.

3.5.3.1.2 European Works Council (EWC)

The European Works Council was marked in 2021 by the effects of Brexit in the United Kingdom. The body, which brings together 37 employee representatives from the parent company and European subsidiaries (French, German, British, Italian, Belgian and Polish), decided that the British delegation would leave the Company as of 1 January 2021.

As part of the project to renew social dialogue initiated within the Group in 2018 and the announced revision of the agreement on the European Works Council, a proposal was made in January 2021 to review the scope of the body’s competence.

A method agreement defining the terms of collective bargaining was unanimously signed with the Director of Social Dialogue and the representatives on the EWC on 5 May 2021. Negotiations to revise the EWC agreement opened on 28 September with three ambitions: to revamp and simplify the functioning of the body set up in 2001 (composition, competences, resources, etc.), to determine the fate of the United Kingdom within the body post-Brexit, and to incorporate the lessons of the pandemic. Negotiations were completed on 4 November 2021, and Amendment no. 4 was signed by a majority of the Negotiating Group on 25 November 2021.

In 2021, the EWC met twice. The meetings focused on news from the European subsidiaries, the Group’s employment situation and outlook, the annual presentation of the Group’s consolidated financial statements, the organisation and strategy of the nuclear decommissioning business, a discussion with the Chairman, Jean-Bernard Lévy, a discussion on backing Citelum’s activities, the Group’s subsidiaries in Europe, and an update on the work of the EWC’s working groups.

The EWC Secretariat met four times in 2021, including two extraordinary meetings in February on the pandemic, the Hercules project, the entry into force of Brexit and its consequences for the functioning of the EWC, and in March on the negotiation of the revision of the EWC agreement and the proposed method agreement.

Through five working groups, EWC employee representatives carry out work at the European level in connection with European news and Group policies (health and safety, site closures, consolidated accounts, energy transition, equality and diversity). In 2021, a guide of recommendations for what to do in the event of an industrial site closure was published.

3.5.3.2 Social dialogue in France

In the context of the health crisis, EDF maintained close social dialogue with employee and trade union representatives in 2021 at all levels of the Company (sites, departments, company and group). This sustained dialogue, based on transparency and trust, made it possible to continue discussions on the management of the pandemic and the implementation of measures taken by public authorities within the Group, and to carry out a major transformation through collective bargaining within the Group’s companies on the theme of “managing and working differently”, with the aim of making operating methods more flexible and adaptable based on the lessons learned from the pandemic.

For EDF, the “relaunch” agreement signed unanimously in 2020 was extended with all the signatories for the year 2021 to maintain employee protection and organisational and social measures adapted to the Company’s context.

3.5.3.2.1 2021 social agenda

The 2021 social agenda, marked by the pandemic, was the subject of several discussions with the Central Trade Union Representatives.

Three agreements and two amendments concluded unanimously	<ul style="list-style-type: none"> • two extensions of the collective agreement on employee protection and social measures as part of the relaunch of activity at EDF; • the 2021 profit-sharing agreement at EDF; • the method agreement on the revision of EDF's European Works Council agreement; • the agreement on professional gender equality at EDF 2021-2025.
Other collective agreements or amendments signed by EDF	<p>Agreement on EDF's contributions to the PERCO and PEG employee savings plans</p> <p>In keeping with the "Social Dialogue 2020" project:</p> <ul style="list-style-type: none"> • revision of the collective agreement relating to the establishment of SECs and local representatives within EDF; • revision of the collective agreement on the establishment of union delegates and the exercise of union rights at EDF; • amendment no. 4 to the EDF European Works Council agreement; • the <i>Travailler Autrement, Manager Autrement</i> (Work differently, Manage differently) agreement, after 14 negotiating sessions.

Negotiations on EDF salary measures were opened on 2 December 2021.

Oversight process for implementing collective agreements	The process for monitoring the implementation of collective agreements provided for in the organisational decision of the Group HR Department ⁽¹⁾ to assess the effects of agreements in force and improve their efficiency has resulted in an initial action plan drawn up jointly with EDF's business divisions and the HR operator. It was approved in early 2021, and is currently being deployed.
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3.5.3.2.2 EDF's Consultation and Coordination Body (ICCE)

The ICCE is a forum for social dialogue, exchange and/or consultation with EDF's representative trade union organisations, led by the Group Social Dialogue Director. Its role is to discuss societal and development issues that do not fall within the remit of employee representative bodies or emerging issues, decisions or policy orientations.

For the year 2021, five sessions were held (two of which were in-person), and 11 topics were presented, including the results of the My EDF 2020 survey, the Nuclear EDEC and the Nuclear University, the new e-Campus, and an assessment of salary measures.

3.5.3.2.3 Employee Representative Bodies (ERB)

In 2021, the structure of the Employee Representative Bodies included 48 site-level Social and Economic Committees, one Central Social and Economic Committee for EDF and one France Group Committee.

3.5.3.2.4 Central Social and Economic Committee (CSEC)

The Central SEC, which was established in December 2019, is made up of 25 employee representatives and 4 trade union representatives.

15 plenary sessions were held in 2021, covering current affairs, the economic and financial situation, corporate employment policy, and projects such as the creation of a national Hydro Conduite centre, the creation of the Group Innovation Department, the IS Strategy, the Contact project within the Insular Energy Systems Department, and real estate projects.

3.5.3.2.5 France Group Committee (CGF)

The France Group Committee is a forum for dialogue at the Group level in France, and is made up of 28 employee representatives of the Group's subsidiaries (EDF, Dalkia, EDF Renewables, Framatome, Enedis, Cham, RTE, Citelum).

In 2021, this Committee met four times, including one special session. The following topics were discussed in 2021: mobility within the Group, the employment situation, the economic and financial situation, the Group's strategic orientations, the sale of Dalkia Wastenergy, and news from subsidiaries in France.

3.5.3.3 Social dialogue metrics

The social dialogue indicator selected at the Group level measures the existence of collective agreements in the key companies controlled. While taking into account certain particularities encountered internationally, the commitment aims to achieve social performance measured by this indicator at a rate of over 87% of employees covered in the consolidated scope.

	Annual target	2019	2020	2021
Rate of employees covered by a collective agreement (in %)	87	-	87.2	87.5

(1) "Overseeing collective bargaining at EDF".

3.5.4 Transformation drivers

3.5.4.1 Integration of commitments into the Group's strategic process and project screening

Screening letters and performance reviews	Commitments are implemented and set out in screening letters specifying the contribution of each of the Group's entities and subsidiaries to achieving the common objective. The system for monitoring these commitments is integrated into the Group's strategic planning loop. Annual performance reviews allow entities and subsidiaries to monitor and control their actual performance.
Investments	Projects and investments subject to the approval of the Group's various Commitments Committees, and particularly those of the Group Executive Committee ⁽¹⁾ (CECEG) and the International Business Development Committee (CBDI) that are the subject of an opinion of the Sustainable Development Department based on a screening grid that translates the issues of the Group's CSR commitments into operational terms ⁽²⁾ . Where necessary, the Sustainable Development Department organises due diligence investigations specific to these issues.

3.5.4.2 Environmental management system (EMS)

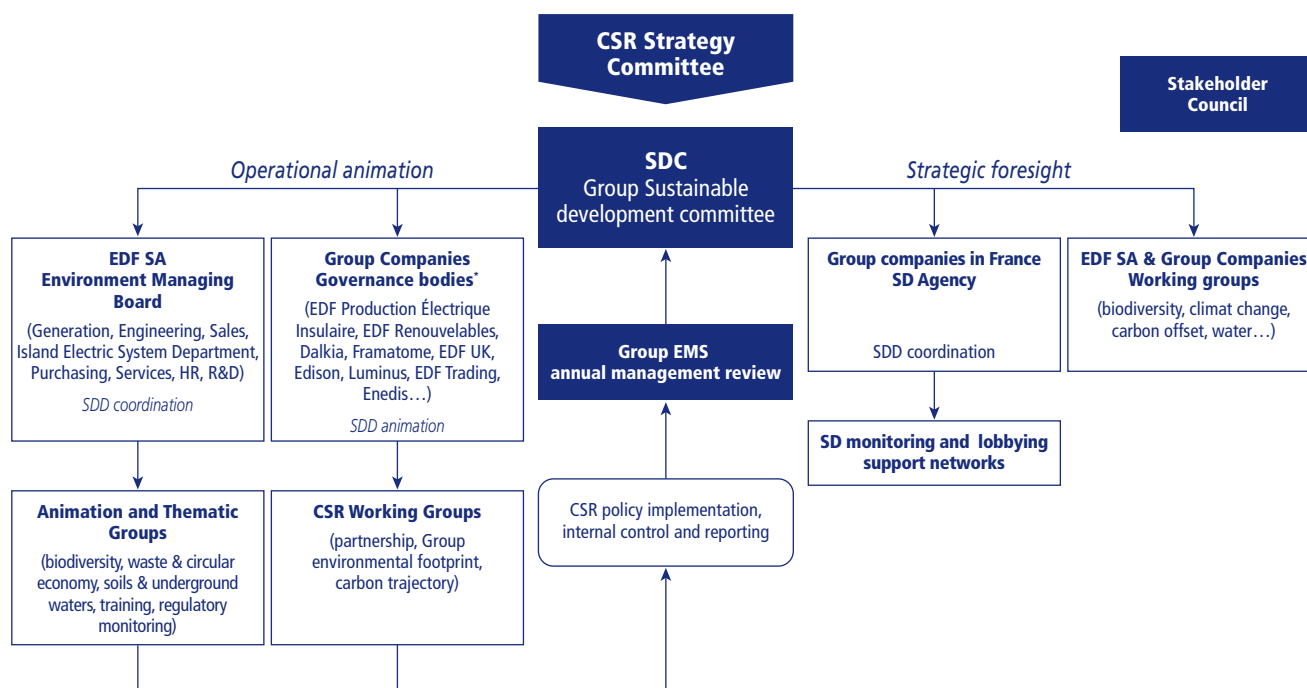
In order to implement the environmental goals and related actions based on its CSR commitments and policy, the EDF group has set up a Group-wide environmental management mechanism using an environmental management system (EMS). This management system is based on EDF's governance bodies (see chapter 4 "Corporate governance" and section 3.5.2 "CSR governance bodies"), which define the environmental guidelines and performance to be achieved, in line with the expectations of external and internal stakeholders.

In accordance with the requirements of the CSR policy, each of the Group's entities ⁽³⁾ has put in place an environmental management approach adapted to its own challenges, defining its organisation and the various levels of responsibility and authority associated with it in order to meet its environmental commitments and control its risks by making appropriate resources (human and financial) available.

The EMS is carried out *via* Group and business processes that allow for certifying to stakeholders that the Group:

- controls environmental risks and ensures that the EDF group complies with regulations and its commitments: each entity draws up and implements an environmental programme or action plan that takes into account the Group's commitments concerning it, its significant environmental aspects, and its regulatory obligations, considering its risks and opportunities;
- improving the efficiency of its organisations in a way that is appropriate to the issues at stake: each entity is responsible for its own internal control, internal and external audits of its EMS, and interfaces with the Group EMS;
- mandatory non-financial reporting of the environmental activities of the entities: each entity collects and communicates the required environmental information to the Sustainable Development Department.

The Sustainable Development Department is responsible for the overall coordination of the Group's EMS and the necessary interfaces with EDF and its subsidiaries through the operational coordination of environmental management, which involves the participation of each entity with significant environmental impacts at the Group level.



* Environment managing boards or equivalent

This EMS system is ISO 14001 (2015 version) certified by the external certification expert AFNOR. All industrial sites are covered by an EMS, and 87% of them are certified.

In 2021, the results of the certification audits conducted by AFNOR highlight the quality of the leadership, strategies, and policies built in alignment with regional issues and the needs and expectations of stakeholders. The auditors note the Group's increased ambitions, in particular with regard to issues related to CO₂ and biodiversity, and note the progress made in limiting the environmental impacts of its businesses.

(1) This concerns new projects involving investments of more than €50 million, entailing a significant impact on regions and the environment. The Group plans to lower this investment threshold to €30 million by 2030.

(2) See the high-stake non-financial issues and the materiality matrix in the introduction to chapter 3.

(3) Companies with industrial, operational (installation, operation, maintenance), engineering, distribution and marketing activities relating to goods and services.

3.5.4.3 Management of environmental risks

Environmental risks, including those associated with climate change, are fully integrated into the Group's EMS and internal control system in coordination with Group risk management. They are subject to action plans resulting from strategic priorities in the Group's CSR policy.

3.5.4.3.1 Identifying the environmental risks

The identification of environmental risks is part of the Group's overall risk management system (see chapter 2 "Risk factors and control framework"). Each company draws up its own risk map, based on the Group's methodology, and defines action plans to reduce and limit its risks. As in previous years, the most significant factors pertain to the following subjects:

Main environmental risks	
Risk factors	Activities most affected
Climate change and GHG emissions	Power and heat generation activities from fossil fuel
<ul style="list-style-type: none"> • The impacts of EDF's activities on the air, water and soil and waste production • Protection of biodiversity and services provided by ecosystems • The management of water resources 	Power generation activities (nuclear, thermal, hydropower, wind and solar power)

The main change concerns the observation of the effects of climate change with higher temperatures in summer and droughts increasing the pressure on both environments and some of the Group's business lines such as hydropower and nuclear activities.

At the end of 2021, the Group has eight high-threshold SEVESO sites ⁽¹⁾ and 32 low-threshold sites ⁽²⁾.

3.5.4.3.2 Managing the environmental risks

In order to control risks of industrial incidents or accidents that could harm the natural environment or public health, EDF has implemented a Group environmental management system. The system is based on an active investment policy incorporating:

- the best available technologies (BAT) for protecting the environment;
- an industrial asset decommissioning programme for assets no longer in operation, which includes decontamination operations where necessary;
- an employee training and awareness-raising programme for all stakeholders, including feedback from crises lived and drills;
- inspections and audits at generation and tertiary sites;
- a crisis management policy.

Crisis management policy

The Group crisis management policy which requires the regular testing of crisis systems through an annual programme of crisis response drills (see section 2.1.3.6 "Crisis management and business continuity"). The industrial incident at the Lubrizol Seveso site in France (non-EDF site) led to a change in the regulatory framework and generated specific internal feedback in order to identify avenues for progress in the layout and protection of storage facilities.

High-stake environmental event (EVE) ⁽³⁾

Locally, each of the Group's operational units and companies identify events that could have an environmental impact, manage emergency situations that could result from them, conduct corresponding crisis response drills, implement investigations and monitoring corrective actions, and communicate on environmental events under its responsibility.

No EVE	Actions to closely supervise and monitor production processes have made it possible to avoid high-stake environmental events with a significant impact on the environment. Certain operational events such as hydrocarbon leaks and alignment deficiencies in effluent transfers may result in litigation arising from complaints lodged by NGOs or associations and notices to comply issued by national regulatory authorities (ASN, DREAL, etc.).
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In 2021, €7,000 in penalties were imposed on EDF for shortcomings in adhering to current regulations on monitoring and control, in application of the Environmental Code, at the Bugey and Gravelines sites. The corrective actions undertaken led to the resolution of these two situations.

(1) These sites include Bellefontaine B, Pointe Jarry, East Port and Jarrie in France, Hole House in the UK, and Collalto, Cellino and San Polito in Italy.

(2) Upper and lower threshold: industrial sites are "Seveso" classified according to their technological risk depending on the quantities and types of hazardous products they handle. There are two different thresholds which classify sites as "Seveso low-threshold" or "Seveso high-threshold". The requirements vary significantly between these two types; they are very restrictive for the high threshold, particularly with regard to the safety management system, informing the public and the prevention plan, etc.

(3) High-stake environmental event: an event causing serious environmental damage (areas, resources and natural environments, sites and landscapes, air quality, animal and plant species, biological diversity and equilibriums) combined with extensive media coverage or a financial impact of more than €3 million. An event causing environmental damage and likely to affect human health falls within the scope of a high-stake environmental event for the EDF group.

Reduction of chemical risks

When it is technically feasible, in order to reduce pollution risks, the Group's entities have also implemented a programme to eliminate or substitute certain chemical substances with more environmentally-friendly products. This work focuses as a priority on CMR (carcinogenic, mutagenic, or toxic for reproduction) substances or those considered subject for concern.

Substitution and disposal	Substitute products are often environmentally certified, e.g. cleaning products (regarding our subsidiaries Citelum, Électricité de Strasbourg (ÉS) and data centres). Following on from the R&D studies, substitutions are implemented, such as: environmentally acceptable oils for hydraulic production, fluids for thermal and nuclear power plant turbines in France and the United Kingdom, varnishes and paints (Industrial Division, Property Management and Citelum), and the decision by the Real Estate Department to stop using pesticides.
PCBs and PCTs	EDF, Hydro, Property Management, Enedis and ÉS are continuing with their programmes to decontaminate equipment with concentrations higher than 50 ppm for PCBs ⁽¹⁾ and PCTs ⁽²⁾ . These action plans continued in 2021 and are on target. For the "Electrical Equipment Laboratory" Department at the site in Les Renardières, the matter was fully handled. Complete disposal is set for the end of 2025 for EDF IES and Dalkia. Thermal and nuclear generation lines no longer have any equipment exceeding the threshold.

3.5.4.4 Predictive watch networks

EDF anticipates changes to environmental and energy policies in order to take appropriate measures to guarantee regulatory compliance and manage business integration or reputational risk issues. To this end, the Sustainable Development Division coordinates a predictive watch system that mobilises and coordinates the Group's experts.

- **Watch networks:** this process is based on the work of thematic groups known as "watch networks": water, waste and soil, air, biodiversity, industrial risks, energy efficiency, energy poverty, health and climate change, sustainable finance.
- **Sustainable Development Agency:** the managers of each network meet every month as a Sustainable Development Agency which monitors the transversality of approaches and ensures that the Group's challenges are taken into consideration.
- **Cross-functionality:** each network works closely with the Legal, Public Affairs and European Affairs Divisions.
- **Recognition:** EDF was considered by the InfluenceMap think tank to be one of the 17 companies most actively supporting regulation in accordance with the Paris Agreements ⁽³⁾.

3.5.4.5 Controversy management process

The EDF group attaches great importance to identifying, preventing and mitigating the risks of serious human rights, environmental and health and safety risks in all its activities and projects. Accordingly, in order to identify and anticipate the risks of ESG (Environment, Social and Governance) controversies, EDF has set up a dual system for managing controversies:

- **Prevention:** pursuant to its risk anticipation approach, and thanks to monitoring tools ⁽⁴⁾, EDF identifies the risks of ESG controversies in France and internationally to which its operating activities and projects may contribute. EDF classifies these risks in consultation with the relevant entities and countries and decides on appropriate measures and/or communication.
- **Engagement and responsiveness:** when reacting to the occurrence of risks, EDF responds systematically and transparently to rating agencies that ask for explanations on issues they have deemed controversial. This process is applied in particular when screening projects eligible for EDF's green emissions financing.

3.5.4.6 CSR and remuneration policy for group executives

In line with EDF's desire to promote integrated performance based on both finance and CSR, the annual variable compensation of the Group's senior executives is also based on financial and CSR criteria.

The CSR criteria, which can represent up to 15% of the variable compensation of executives, consist of a climate criterion and two social criteria.

A Climate criterion, based on carbon intensity

	Weighting in the Group share of bonuses	2021 result	2021 target	2021 attainment rate
Carbon intensity	30%	48g/KWh	51g/KWh	114%

Two social criteria

The global LTIR and the leadership index ⁽⁵⁾ together represent up to 30% (17.5% + 12.5%) of the bonus linked to objectives that are specific to the different structures of the Group (Divisions, companies).

(1) PCB: Polychlorobiphenyl.

(2) PCT: Polychloroterphenyl.

(3) How companies really impact progress on climate, 2019, influencemap.org/climate-lobbying.

(4) Such as RepRisk.

(5) See sections 3.3.1.3.3 "Occupational accidents" and 3.3 "Well-being and solidarity"

3.5.4.7 Partnerships

Partnerships are an important commitment for the Group, which evidence its mobilisation to promote the energy transition in local regions. These partnerships are in line with EDF's *raison d'être*, built through dialogue with stakeholders, and in line with the four major Corporate Social Responsibility issues.

Key CSR issues	Complete references in the NFPS	Example
Carbon neutrality and the climate	Section 3.1	Iddri
Preserving the planet's resources	Section 3.2	LPO
Well-being and solidarity	Section 3.3	Ashoka
Responsible development	Section 3.4	UNCPIE

3.5.4.8 Responsible communication

For over 20 years, EDF has developed responsible, educational and local communication, focusing on its public service values and based on authenticity and respect. In January 2021, the EDF group ranked first in the list of the most credible companies in terms of communication, in the utilities/energy category ⁽¹⁾.

3.5.4.8.1 Responsible communication focused on the four key issues derived from EDF's *raison d'être*

In its communications, the Group expresses itself in a manner consistent with the four key issues of Corporate Social Responsibility, based on its *raison d'être*.

Carbon neutrality and the climate

COP26 Climathon	The Climathon Sprint was a climate hackathon co-organised by EDF ⁽²⁾ during the COP26 for students from all backgrounds. For this first edition, more than 60 participants, divided into 12 teams over several time zones (United Kingdom, China, France), mobilised to produce in 2 days a low-carbon regeneration concept for West Burton A, the last coal-fired power plant operated by EDF in the United Kingdom, which is scheduled to close in September 2022.
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Preserving the planet's resources

IUCN World Conservation Congress	Held every four years, this Congress influences international policies on biodiversity, especially through the motions voted to be sent to governments and other leaders. Through various events, the Group conveyed a clear message: climate and biodiversity are the same emergency, the same fight.
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Well-being and solidarity

Women in industry	EDF has launched an "Open innovation" campaign entitled "Co-developing industry for women", to raise awareness of technical professions and make them more appealing to women.
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Responsible development

Sustainable Development Meetings	The Group was a partner of the "2021 Sustainable Development meetings", organised by the Open Diplomacy Institute, on the cities of tomorrow, the energy mix of the future, the industry of the future, and investments in responsible finance.
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3.5.4.8.2 Responsible communication visible to the general public

FAIRe	EDF is a signatory of the FAIRe programme (2018), which is led by the Union des marques association. This programme allows companies to start engaging in responsible communication and allows Union des marques to evaluate their performance in this area each year. In 2021, EDF earned a score of 2.67/3, up slightly from 2020, above the general average of members.
At the top of the "Scan Eco-responsible" ratings	In September 2021, the "Scan Eco-responsible" ratings guide, commissioned by Capital and Advent, put EDF at the top of the transport and energy sector, which includes 80 French companies rated on their image based on 28 environmental and social criteria.
Luminus wins awards in Belgium	In January 2021, Luminus NV's sustainability report, published since 2012, received three awards from the jury for the best Belgian sustainability report, including "Best Stakeholders Inclusiveness and Engagement", across all company categories.

(1) Epoka awards, 29 January 2021: player.vimeo.com/video/502701862?title=0&byline=0&portrait=0.

(2) With Urbanomy, Artelia, Novazure, IDEALondon, UCL, Capital Enterprise.

3.6 Methodology

Details on the methodology used for the 2021 statement of non-financial performance are online at edf.fr ⁽¹⁾.

3.6.1 Principles

With regard to environmental, social and societal indicators, the reporting scope is based on the Group's financial consolidation scope and comprises EDF as well as all the fully consolidated subsidiaries (100% integration of the value of the indicators) in accordance with financial standards (IAS-IFRS) ⁽²⁾.

The contributions of entities accounted for using the equity method are excluded from non-financial reporting, with the exception of the indicator on renewable capacities in net consolidation.

The entities acquired during the fiscal year are included in the scope of consolidation in the year following the date of acquisition for environmental and societal data, and in the year of acquisition for social data if the acquisition was made more than six months from the reporting date. Data on both workforce and production capacities is presented at 31 December of the relevant year.

The reporting indicators are used on the following basis:

- the scope of consolidation established by the Financial Department;
- the aforementioned rules in terms of variation of scope;

- the criteria linked to the relevance of the subsidiaries' activities in terms of environmental and societal impact;

› for the environmental and societal data, only data from industrial activities that are significant in terms of their environmental impact are reported, therefore the data for some subsidiaries included in the financial scope may not appear in the report due to their activity or their small size with respect to the environmental challenges;

› concerning social data, the selection criterion is the entity's workforce (greater than 50).

The environmental and societal data in the Statement of non-financial performance are based on methodological sheets. This is the Group's standard for non-financial reporting in force in 2021. All of the indicators relating to consumption and emissions are produced based on the processes for electricity and heat generation and marketing, and the other processes related to these activities. If data are missing, particularly during the last days of the year, estimates are made on the basis of the best information available on that date.

3.6.2 2021 Scope

In 2021, Izi Solutions Renov joined the scope of social indicators.

List of main entities included in the consolidation scope of the social, societal and environmental data as at 31/12/2021	Scope of environmental indicators	Scope of social indicators
Électricité de France, Enedis, EDF PEI, Électricité de Strasbourg, EDF Renewables, EDF ENR, Dalkia, Framatome, Cyclife, EDF UK, Edison, Luminus, EDF Norte Fluminense, MECO, China Holding	X	X
EDF Trading	X*	X
EDF Belgium	X	
Citelum, Cham, IZI solutions, IZI Solutions Renov, G2S		X

* Only the subsidiary EDF Trading North America and its own subsidiary EES—EDF Energy Services (USA).

(1) edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/rapports.

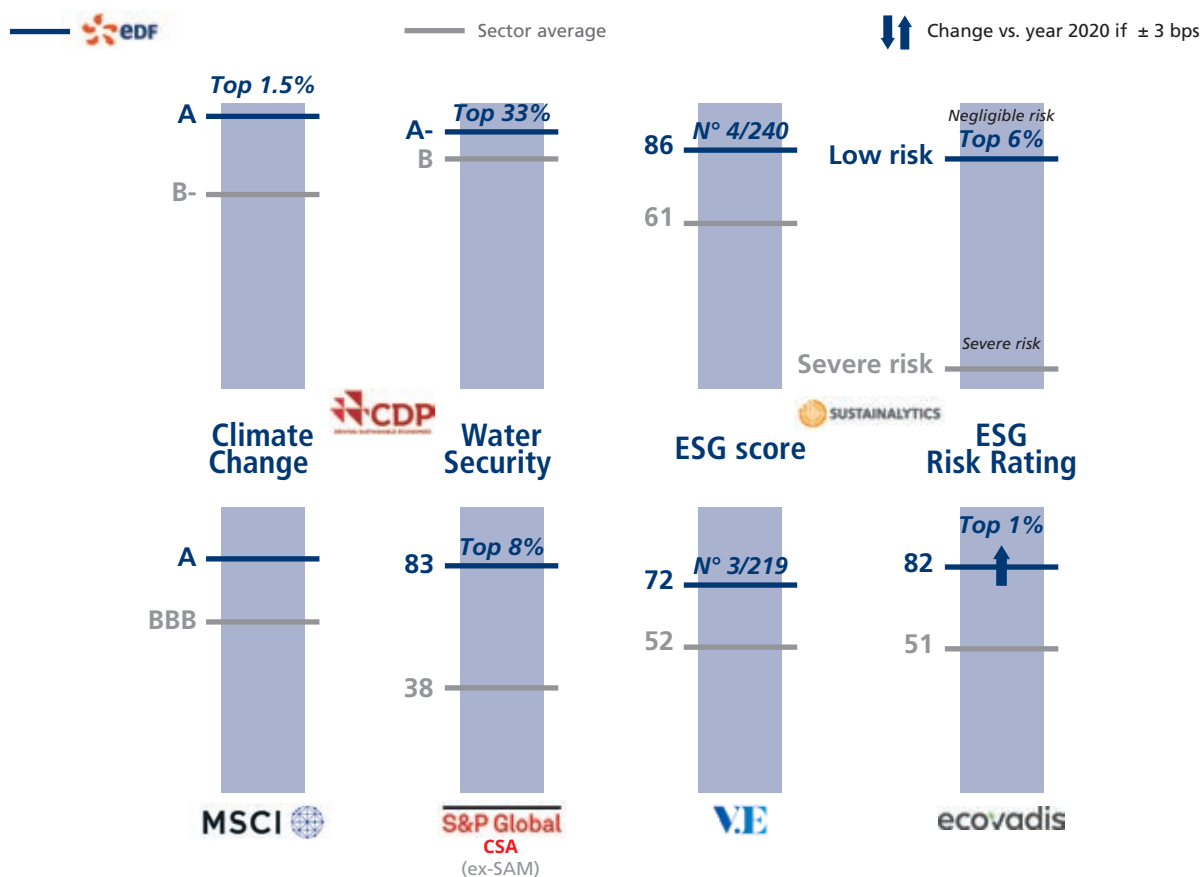
(2) Note that for fiscal year 2021, as an exception to this principle, the companies Sowee, E2M, and Izivia are not included in the scope of the workforce mentioned in section 3.3.3.9, "Group workforce details", nor in the corresponding social indicators. The total workforce of these three companies is 249.

3.7 Non-financial rating

Evaluations by the main specialised rating agencies and managers of ethical funds indicate the Group's CSR performance, in its benchmark sector. Assessments and rewards underscore external recognition of the Group's sustainable development performance. In 2021, EDF maintained its excellent standing with non-financial rating agencies.

RANKING MAINTAINED IN MAIN NON-FINANCIAL INDICES

(non-exhaustive list)







MAIN INTERNATIONAL COALITIONS OF EDF



3.8 Appendixes and report by the independent third party

3.8.1 Contribution to UN sustainable development goals

















As part of its work, the WBCSD ⁽¹⁾ has identified priority Sustainable Development Objectives to which companies in the electricity sector must contribute in order to maximise their positive impacts or minimise their negative impacts ⁽²⁾. The following table summarises EDF's contribution in relation to this analytical grid, and assesses its contribution in relation to the commitments, policies and actions undertaken (with cross-references to the relevant sections of the Statement of non-financial performance).

Sustainable development objectives		Details of commitments, policies and actions carried out by EDF (§DPEF)		EDF's contribution to each of the Objectives
		Maximising positive impact	Minimising negative impact	
	Gender equality	X		Equality, diversity and inclusion § 3.3.3
	Sustainable water management for all		X	Integrated and sustainable water management § 3.2.3; Responsible regional development § 3.4.2 Integrating the maximisation of positive impacts
	Affordable and clean energy	X	X	Group carbon trajectory § 3.1.1; Use of negative emission solutions § 3.1.1.6; Adapting to climate change § 3.1.2; Developing electricity use sobriety and innovative energy services § 3.1.4; Integrated and sustainable water management § 3.2.3; Circular economy and waste § 3.2.4; Energy insecurity and social innovation § 3.3.4; Responsible regional development § 3.4.2
	Decent work and economic growth	X		Developing electricity use sobriety and innovative energy services § 3.1.4; Responsible regional development § 3.4.2
	Industry, Innovation and Infrastructure	X		Integrated and sustainable water management § 3.2.3; Circular economy and waste § 3.2.4; Responsible regional development § 3.4.2; Responsible development of industrial sectors § 3.4.3
	Sustainable cities and communities	X		Developing electricity use sobriety and innovative energy services § 3.1.4 ; Responsible regional development § 3.4.2
	Responsible Production and Consumption		X	Biodiversity § 3.2.1; Responsible asset management § 3.2.2; Integrated and sustainable water management § 3.2.3; Circular economy and waste § 3.2.4; Health and safety for all § 3.3.1; Ethics, compliance and human rights § 3.3.2; Dialogue and consultation with stakeholders § 3.4.1; Responsible regional development § 3.4.2; Responsible digital development § 3.4.4 Integrating the maximization of positive impacts
	Climate action	X	X	Group carbon trajectory § 3.1.1; Use of negative emissions solutions § 3.1.1.6; Adapting to climate change § 3.1.2; Developing electricity use sobriety and innovative energy services § 3.1.4, Integrated and sustainable water management § 3.2.3; Responsible digital development § 3.4.4
	Life on land		X	Biodiversity § 3.2.1; Responsible land management § 3.2.2; Circular economy and waste § 3.2.4 Integrating the maximisation of positive impact



(1) The World Business Council for Sustainable Development (WBCSD) is a coalition of international companies created in 1995 and united by a common commitment to sustainable development.
(2) WBCSD, Sector Transformation: An SDG Roadmap for Electric Utilities, 2020.

The following table assesses the EDF group's contribution to the other UN Sustainable Development goals:

Sustainable development Objectives		EDF's contribution to each of the Objectives	Details of commitments, policies and actions carried out by EDF (§ DPEF)
	Eradication of poverty		Equality, diversity and inclusion § 3.3.3 ; Energy poverty and social innovation § 3.3.4
	Food security and sustainable farming		Integrated and sustainable water management § 3.2.3
	Health and well-being		Health and security for all § 3.3.1
	Quality education		Biodiversity § 3.2.1 ; Ethics, compliance and human rights § 3.3.2 ; Responsible development of industrial sectors § 3.4.3
	Reduced inequalities		Equality, diversity and inclusion § 3.3.3 ; Responsible regional development § 3.4.2
	Marine aquatic life		Biodiversity § 3.2.1 ; Integrated and sustainable water management § 3.2.3
	Peace, justice and strong institutions		Equality, diversity and inclusion § 3.3.3 ; Dialogue and consultation with stakeholders § 3.4.1
	Partnerships to meet objectives		Responsible regional development § 3.4.2

3.8.2 Compliance with best international standards

Global Compact ⁽¹⁾



The United Nations Global Compact brings together, under the aegis of the UN, companies and NGOs committed to 10 guiding principles articulated in four areas: human rights, labour rights, the environment and the fight against corruption. EDF has been committed to the United Nations Global Compact since 2001 and has published a Communication on Progress (CoP) at the Advanced level every year since 2012.

The Group also complies with the Declaration of the Rights of the Child, the Convention on the Elimination of All Forms of Discrimination Against Women, the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, and the United Nations Convention against Corruption. EDF promotes international human rights law by recognising the ILO's fundamental conventions, which guarantee fundamental labour principles and rights, and the fight against discrimination.

Global reporting Initiative (GRI) ⁽²⁾



The GRI is an independent international non-profit organisation created in 1997 by the non-profit CERES (Coalition for Environmentally Responsible Economies) and the UNEP (United Nations Environment Programme). GRI helps companies and governments around the world to understand and communicate their impact on

critical sustainable development issues such as climate change, human rights, governance and social well-being. This enables concrete actions to be taken to create social, environmental and economic benefits for all.

EDF has a long history of integrating GRI Standards as they evolve. A table comparing the Group's indicators and those proposed by the GRI is available on the edf.fr website and in the ESG Pack.

Sustainability Accounting Standards Board (SASB) ⁽³⁾



Created in 2011, the SASB (Sustainability Accounting Standards Board) is an independent, non-profit standard-setting body that develops and maintains reporting standards enabling companies around the world to identify, manage and communicate non-financial and financial information of material importance to investors. The SASB standards are evidence-based, developed with broad market participation and designed to be beneficial to companies and useful to investors. The SASB has established standards specific to 77 industry sectors identified in its Sustainable Industry Classification System® (SICS®).

EDF is the first European energy company to act as an advisor within the SASB organisation. ⁽⁴⁾ As such, EDF has been proactively involved since 2020 in the process of revising this standard to enable its use worldwide. In 2021, EDF was one of the main contributors to the SASB "Globalization Project" ⁽⁵⁾, which remains to this day, for certain subjects, specific to the American market, particularly in terms of the environment or regulation.

(1) globalcompact-france.org

(2) globalreporting.org

(3) sasb.org

(4) sasb.org/standard-setting-process/standards-advisory-group/#if

(5) sasb.org/standard-setting-process/active-projects/standards-internationalization-advancement/

For items for which the standard is identical (e.g. GHG protocol) or close to the standards used in France and Europe, EDF's 2021 Statement of Non-Financial Performance covers most of the reporting topics required by the SASB for the "Electric Utilities & Power generators" sector:

	NFPS Sections
Greenhouse Gas Emission & Energy Resources Planning	Section 3.1.1
Air Quality	Section 3.3.1.5
Water Management	Section 3.2.3
Coal Ash Management	Section 3.2.4.4.2
Energy Affordability	Section 3.1.4.2.4
End use efficiency and Demand	Section 3.1.4.3
Nuclear Safety and Emergency management	Section 3.3.1.1
Grid Resiliency	Section 3.1.4.2.1

3.8.3 Details on the taxonomy

3.8.3.1 Regulatory framework

On 4 June 2021, the European Commission, pursuant to regulation 2020/852 of 18 June 2020 (known as "Taxonomy regulation"), adopted the Delegated Act to determine the conditions under which economic activities can be considered as contributing substantially to climate objectives. On 6 July 2021, the Delegated Act known as "Article 8" relating to the content and presentation of information to be communicated was in turn adopted.

With a view to contributing to the achievement of carbon neutrality by 2050, the objective of this regulation is to determine which economic activities are considered environmentally sustainable in order to direct capital flows towards them, according to transparent criteria.

In accordance with the Taxonomy regulation and the procedures defined by the "Article 8" Delegated Act, three indicators based on the Group's consolidated financial statements are published below: the proportion of turnover, of capital expenditure ("CAPEX") and of operating expenditure ("OPEX") associated with economic activities considered, on the one hand, as eligible and, on the other hand, as aligned with the technical criteria of Taxonomy, as detailed in section 3.8.3.2 below.

For the first year of implementation, non-financial companies must only disclose:

- the proportion of their Taxonomy-eligible and Taxonomy non-eligible economic activities for the three aforementioned indicators, without disclosing Taxonomy-alignment information;

- indicators for fiscal year 2021 data without comparative information.

The EDF group has organised itself to be able to communicate information beyond the obligations required by the text by 31 December 2021, i.e. to communicate the eligible and aligned shares of its activities for the 3 indicators.
























Beside, the texts applicable as of 1 January 2022 do not cover nuclear power generation, which is the Group's main activity. They also do not cover gas-related activities. A specific Delegated Act for nuclear and gas was adopted on 2 February 2022, and still needs to go through a review process by the European Parliament and the Council of the EU, before final adoption and publication in the Official Journal of the EU, which could occur in the summer of 2022.

The Group has carried out a preliminary analysis of this text and presents below its initial conclusions regarding eligibility (see section 3.8.3.3). As this text was not in force on 1 January 2022, in the indicators presented below, both the nuclear and gas activities are presented in the category "not eligible under the texts in force" and are the subject of additional information integrating the expected effects of this new text (see section 3.8.3.4).

Due to the sometimes insufficiently precise nature of the European regulatory framework for the classification of activities and the definition of indicators, the Group has had to adopt assumptions and methods that are described in this document whenever they are material.

3.8.3.2 Definition of eligibility and alignment

The Taxonomy regulation creates a framework and principles for assessing the contribution of economic activities to the following six environmental objectives:

Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystem
 	 	     	   	    	   

In accordance with the Delegated Act adopted on 4 June 2021, an activity is considered **eligible** if it is included in the list of activities in Annexes I and II.

An activity can contribute to the climate goals:

- based on its own performance (for example, in the case of the EDF group: the production of electricity from renewable sources);
- when it directly enables the exercise of other sustainable activities. It is then qualified as an enabling activity (for example, in the case of the EDF group: the electricity transmission activity);
- if it supports the transition to a climate-neutral economy and there is no technologically and economically feasible low-carbon alternative. It is then qualified as transitional. This is the case for nuclear and gas activities in the Delegated Act adopted on 2 February and submitted to the European Parliament and the Council of the EU.

An eligible activity will be considered **aligned** if, in addition, it complies with the technical criteria of contributing substantially to one of the six environmental objectives (e.g. in relation to emission thresholds), if it meets the so-called "Do No Significant Harm" (DNSH) criteria, i.e. it does not significantly harm the other environmental objectives and, finally, if it is carried out in compliance with the minimum safeguards relating to human rights or fundamental labour rights.

3.8.3.3 Analysis of EDF group activities with regard to eligibility and alignment

3.8.3.3.1 Analysis of activities with regard to their eligibility under the regulations in force on 31 December 2021

3.8.3.3.1.1 Main EDF group activities eligible for the taxonomy

Under the previous definition, the following activities contribute substantially to mitigating climate change:

- electricity distribution (NACE codes D35.12 and D35.13): construction and operation of interconnected electricity distribution and transmission networks (4.91);
- electricity generation from renewable energy sources excluding hydro (NACE codes D35.11 and F42.22), which include:
 - electricity generation using solar photovoltaic technology (4.1 ⁽¹⁾),
 - electricity generation from onshore and offshore wind power (4.3 ⁽¹⁾),
 - electricity storage (4.10 ⁽¹⁾),
 - installation, maintenance and repair of renewable energy technologies (7.6 ⁽¹⁾).
- electricity generation from hydropower (NACE codes D35.11 and F42.22): construction and operation of power generation facilities using hydroelectric power plants (reservoir power plants, run-of-river power plants, and pumped storage power stations – 4.5; 4.10 ⁽¹⁾);
- district heating/cooling distribution, cogeneration of heat/cold and power from bioenergy (4.15; 4.20 ⁽¹⁾);
- energy efficiency and performance services, research and development that correspond to:
 - installation, maintenance and repair of energy efficiency equipment (7.3 ⁽¹⁾),
 - specialised services related to the energy performance of buildings (9.3 ⁽¹⁾),
 - research, development and innovation expenditures to reduce or avoid emissions (9.1 ⁽¹⁾).

3.8.3.3.1.2 Group activities not explicitly mentioned in the Delegated Act

Some of the Group's activities are not explicitly mentioned in the regulation but, after analysis, have been considered as contributing substantially to mitigating climate change because they can be linked to activities listed in Annex I of Delegated Act 2021/2139 of 4 June 2021. The following activities were considered eligible:

- **sale of electricity from Purchase Obligations:** this legislative and regulatory mechanism obliges EDF to purchase electricity produced by certain 100% renewable energy sources and to sell it to customers on the same basis as EDF's own production. As a producer with control over this electricity sold, the Group considers the sales eligible;
- **sale of electricity from renewable sources in long-term contracts** (PPA or Power Purchase Agreement) when the EDF group is the producer of the renewable electricity and sells it to third parties.

On the other hand, with regard to the aggregation activity: this activity consists of selling the electricity purchased from (renewable) electricity producers or from players with load-shedding capacities. Even though aggregation plays a key role in the development of renewable energy, and therefore in the mitigation of climate change, it was not selected as eligible because the core of the business model is similar to marketing, which is excluded from the Taxonomy.

3.8.3.3.1.3 Activities not eligible under current legislation

The activities below are those for which the Group has not identified a direct contribution to one or more objectives of the European Taxonomy and are not covered by Annexes I and II of the Delegated Act:

- marketing of electricity not produced by EDF or whose source of production is not eligible;
- production of energy from gas installations and marketing of gas;
- optimisation and trading;
- nuclear power generation and nuclear services;
- other services.

For this first year of implementation, the Group has excluded from the analysis the activities of certain entities that are not significant in terms of the indicators at the Group level, and the coverage rate is therefore over 97% for both turnover and CAPEX. The activities of entities that were not subject to detailed analysis are presented in "non-eligible".

3.8.3.3.2 Analysis of the alignment according to the regulations in force on 31 December 2021: Description of the method used for the substantial contribution criteria, the DNSH and the minimum guarantees

In order to assess the alignment of its activities, each Group entity has verified compliance with the criteria for substantial contribution to climate change mitigation.

For example, eligible district heating/cooling distribution using more than 50% renewable energy, 50% waste heat, 75% heat from co-generation, or 50% a combination of these types of energy or heat were considered aligned. Only a tiny fraction of the activities 4.5 "Generated from hydropower" do not meet the technical criteria for substantial contribution.

(1) Refers to the categories listed in Annex I of Delegated Act 2021/2139 of 4 June 2021.

When analysing **the technical and DNSH criteria**, EDF relies on its **Environmental Management System (EMS)**, its Sustainable Development policy, as well as its Ethics Charter that commits its entities to a precautionary approach, to acting responsibly and to developing technologies which respect the environment. Management of identified risks, including those associated with climate change, is fully integrated into the Group's global risk management process and internal control system. The most significant risks are covered in risk control plans in conjunction with the Group's Sustainable Development policy.

The Group's EMS covers the environmental objectives of the Taxonomy as described in the paragraphs below.

- The Group ensures that **its facilities are adapted to climate change**. The EDF group developed a climate incident plan in 2004, followed by a climate change adaptation strategy in 2010.

This document lays out the foundations of the Group's commitments in terms of adaptation, and identifies actions to be implemented across all business lines: evaluating the impacts of climate change on future and existing activities, adapting existing installations to make them less sensitive to climatic conditions and more resilient to extreme weather events, incorporating climate change scenarios in the design of new installations, and adapting the Group's solutions, internal operations, and expertise to encompass climate change.

All EDF group entities are required to take account of climate risks in mapping their risks, including both physical risks and "transition" risks. The entities most exposed to physical risks have climate change adaptation plans, which must be updated at least every 5 years.

In June 2021, the Executive Committee approved a new adaptation plan that will be deployed in the entities concerned.

- As a manager and major user of water resources, the EDF group is committed **to integrated and responsible water management**, both in terms of quantity and quality. Consequently, each energy-generating site will provide for, evaluate and report on the sustainability of its water use. The Group also ensures that water is shared within the regions in which it operates by fully taking into account the local water situation (multi-use under climate constraints).
- With regard to **waste management and the circular economy**, optimising the use of the natural resources consumed by the Group's value chain is an essential component of the Group's corporate responsibility.

The Group's action therefore focuses on three priorities: eco-social design, the functional economy and industrial ecology. The Group prevents and optimises the production of conventional waste by promoting reuse, recycling and recovery initiatives for products/equipment throughout its value chain: a customised "waste plan" is produced for all new construction sites to avoid the production of conventional waste and promote recycling and recovery.

The Group takes full responsibility for radioactive waste and, in France, uses procedures to decommission closed nuclear power plants that are completely safe and protect the environment. It optimises and manages the operating and decommissioning radioactive waste for which it is responsible and develops treatment processes to reduce the volume of stored waste.

- With regard to the **prevention and control of pollution**, when it is technically feasible, in order to reduce the pollution risks, the Group's entities have also implemented a programme to eliminate or substitute certain chemical substances with more environmentally-friendly products. This work focuses as a priority on CMR (carcinogenic, mutagenic, or toxic for reproduction) substances or those considered subject for concern.

Nuclear safety is the Group's top priority and a major, ongoing concern for the Group throughout the entire cycle, from procurement of fuel to decommissioning and waste management. It is based on technical and organisational specifications aimed at preventing a nuclear accident, and in the hypothetical case of such an accident, at limiting the consequences thereof.

- **Protection and restoration of biodiversity and ecosystem** is also a major challenge for the EDF group. The action taken by the Group is structured around the following priorities: reducing the contribution of its operations to major biodiversity pressures, recreating spaces and conditions promoting biodiversity, improving and sharing knowledge, strengthening governance and raising awareness of biodiversity-related issues.

In 2020, the Group renewed its commitment to biodiversity through two voluntary schemes supported by the French government: *Entreprises engagées pour la biodiversité – act4nature France* (Companies committed to biodiversity – act4nature France), a corporate biodiversity scheme run by the Office français de la biodiversité (French Biodiversity Office) and "Act4nature".

The DNSH criteria were analysed for each activity.

For example, the following audits were conducted to assess the alignment of the electricity distribution business:

- confirmation of compliance with the technical criterion of interconnection to the European grid or new connections involving more than 67% of installations emitting less than 100gCO₂e/kWh;
- confirmation of facility resiliency to validate the criterion of not harming climate change adaptation;
- verification of the existence of a waste management plan to validate the criterion of not harming the transition to the circular economy;
- confirmation of compliance with international IFC guidelines and electromagnetic pollution regulations to validate the criterion of not harming the prevention of pollution;
- verification of the existence of studies and measures attesting to respect of the criterion of not harming the preservation of biodiversity.
- The Group's compliance with the **minimum safeguards** criterion is based on the implementation of human rights commitments and on the deployment of the "Human Rights and Fundamental Freedoms, Health and Safety, Environment and Business Ethics: EDF group commitments and requirements" guidelines ⁽¹⁾. It is based on principles of action that apply to all of the Group's activities, and which aim, as part of an approach to progress, to carry out in particular:
 - initial and ongoing screening and management of environmental and societal impacts and risks, including those caused by operations as part of its business relationships;
 - organisation, throughout the world, of transparent dialogue and consultations for each new project. EDF strives to implement its commitments in the early stages of its investment processes, including in its business relationships by requiring its suppliers and subcontractors to comply with CSR requirements for operations related to their joint business relationships, with a specific focus on the rights of local and indigenous communities and vulnerable groups;
 - systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff). These reports are evaluated and, if necessary, remedial measures are taken.

This public document applies to EDF and the companies it controls ⁽²⁾. As far as Enedis is concerned, the subsidiary has drawn up its own vigilance plan to meet the requirements of French Act 2017-399 of 27 March 2017.

Following the analysis of the technical criteria, DNSH criteria and minimum guarantees, almost all of the Group's activities qualified as eligible are also qualified as aligned.

(1) Reference framework available on the EDF website <https://www.edf.fr/edf/dispositif-alerte-groupe>

(2) Excluding Enedis, the distribution network operator, a subsidiary managed in compliance with the rules of management independence, as defined in the French Energy Code.

3.8.3.3.3 Analysis of activities with regard to their eligibility under the complementary delegated act of 2 February 2022

The complementary Delegated Act for nuclear and gas activities was adopted on 2 February 2022 by the European Commission. Subject to the procedure before the Parliament and the Council, it will enter into force from 2023.

In view of their significance for the Group, a preliminary analysis has been carried out to determine the expected impact of this new text on eligibility indicators for the Taxonomy (see section 3.8.3.4). The data presented may change if the analyses, market positions, and interpretations finally adopted differ from the Group's provisional conclusions.

3.8.3.3.3.1 Nuclear activities

The complementary Delegated Act defines three **eligible** nuclear activities. They concern only activities carried out in European Union countries (excluding the United Kingdom) and countries that have chosen to make nuclear energy an energy of the future (excluding Belgium):

- Research, development, demonstration and deployment of innovative reactors that produce energy from nuclear processes with minimal waste from the fuel cycle (4.26 ⁽¹⁾). The activities related to the SMR and EPR 2 projects are at this stage placed under heading 9.1 of the Delegated Act of 4 June 2021 but could also be considered eligible under this heading 4.26. They represent 1% of total CAPEX;
- projects authorised no later than 2045 by the competent authorities for the construction and safe operation of "best available technologies" nuclear reactors (covers the production of electricity, heat and hydrogen, as well as the upgrading of these reactors). For the Group, these activities concern the Flamanville 3 power plant currently under construction (4.27 ⁽¹⁾);

- projects authorised no later than 2040 by the competent authorities to extend the operating life of existing reactors (4.28 ⁽¹⁾).

This last activity was analysed by taking into account operation and maintenance activities (regulatory controls, maintenance programmes, etc.), modifications, replacements of large components, and operations that comply with the generic ASN notices received (900MWe level) or to be received by 2040 (1,300MWe and 1,450MWe levels) and with the technical requirements that allow the French nuclear power plants to continue operating beyond 40 years. All the nuclear power plants in operation are considered eligible in the pro-forma indicators provided below.

Regarding the alignment of these nuclear activities to the Taxonomy, the scope of the technical criteria is under review.

3.8.3.3.3.2 Gas activities

This text also includes 3 activities under **gas** as a transitional activity:

- electricity generation from fossil gaseous fuels (4.29 ⁽¹⁾);
- high-efficiency co-generation of heat/cold and power from fossil gaseous fuels (4.30 ⁽¹⁾);
- the production of heat/cold from fossil gaseous fuels in an efficient district heating and cooling system (4.31 ⁽¹⁾).

To date, due to the criteria applicable to their classification as transition activities, particularly in terms of maximum emissions (gCO₂/kWh), all of the Group's gas activities would remain non-eligible under the Taxonomy.

3.8.3.4 Taxonomy indicators

Delegated Act 2021-4987 on Taxonomy defines the indicators to be presented.

The definitions may not be sufficiently precise. The main interpretations and conventions resulting from our analysis of the Delegated Act for each indicator are detailed in the following sections (3.8.3.4.1, 3.8.3.4.2, 3.8.3.4.3).

Summary of the distribution of activities with regard to the Taxonomy Delegated Act applicable as of 31 December 2021:

Economic activities/2021 data	Share of CAPEX	Share of turnover	Share of OPEX
Eligible and aligned activities	40%	32%	27%
Eligible but non-aligned activities	3%	1%	-
Nuclear power generation activity (EU and non-EU)	48%	28%	41%
Other non-eligible activities (including gas)	9%	39%	32%

Summary of the distribution of activities with regard to their eligibility by integrating the complementary Delegated Act on nuclear and gas

The Taxonomy indicators presented below are *pro forma* indicators that include the expected effects of the complementary Delegated Act relating to nuclear and gas activities, if adopted as it stands by the European Parliament and on the basis of the analyses conducted by the Group to date:

Economic activities/2021 data	Share of CAPEX	Share of turnover	Share of OPEX
Eligible activities (including nuclear)	66%	56%	66%
Non-eligible activities (including nuclear power outside the EU, and gas)	34%	44%	34%

3.8.3.4.1 Analysis of the "CAPEX" investment indicator

Definition of the indicator and calculation method (numerator/denominator)

The "CAPEX" ratio referred to in Article 8.2(b), of regulation (EU) 2020/852 is calculated using:

- **in the denominator:** all investments known as "CAPEX_T", including gross additions to property, plant and equipment, intangible assets and rights of use

(IFRS 16 Leases), including those resulting from business combinations (acquisition of a subsidiary);

- **in the numerator:** capital expenditures **related to:**
 - an eligible activity: CAPEX related to assets or processes associated with Taxonomy-eligible (or -aligned) activities,
 - a CAPEX plan whose objective is to create or transform an activity that will be Taxonomy-eligible or -aligned,
 - individually eligible investments that are not related to a core business (not significant for the Group).

(1) Refers to the activity codes listed in the complementary Delegated Act of 2 February 2022.

The following table provides a reconciliation between the net investments reported in the 2021 Operating and Financial Review (see note 5.1.4) and the Taxonomy CAPEX_T:

<i>(in millions of euros)</i>	2021
Net investments	15,725
Deduction of items excluded from the definition of Taxonomy	(2,024)
Change in payables on acquisition of fixed assets	(143)
Investment grants	(536)
Other of which effects of deconsolidation	(1,345)
Items to be included in Capex_T as defined in the Taxonomy	1,011
Of which increase in user fees (leases)	789
Effect of changes in the scope of consolidation	222
CAPEX_T	18,760

Calculation methods - specific points

Supporting assets such as IT systems have been considered aligned when they relate to entities whose overall activities have been classified as aligned. For entities with a complex allocation of support functions between aligned and non-aligned activities, support assets are classified as non-aligned. It should be noted that the eligibility analysis follows an identical methodology by analogy.

Breakdown of CAPEX_T by activity according to the Taxonomy

With regard to the texts in force on 31 December 2021 (without taking into account the complementary Delegated Act on nuclear and gas)

Economic activities	CAPEX <i>(in millions of euros)</i>	CAPEX ratio
A.1 Aligned activities		
Electricity distribution ⁽¹⁾	4,636	25%
Renewable energies ⁽²⁾	2,007	11%
Electricity production by hydropower ⁽³⁾	296	1%
Others ⁽⁴⁾	532	3%
Total aligned activities	7,471	40%
A.2. Eligible non-aligned activities		
Acquisition and ownership of buildings and other	482	3%
Total eligible-non-aligned activities	482	3%
Total eligible activities	7,953	43%
B. Non-eligible activities		
Nuclear power generation activity	9,078	48%
Other non-eligible activities	1,729	9%
Total non-eligible activities	10,807	57%
TOTAL CAPEX_T	18,760	

(1) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(2) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(3) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(4) Other activities include activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as well as the activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.

With regard to the texts in force on 31 December 2021 and the complementary Delegated Act (*pro-forma* data)

Economic activities	CAPEX (in millions of euros)	CAPEX Ratio
A.1 Eligible activities		
Nuclear power generation activity ⁽¹⁾	4,386	23%
Electricity distribution ⁽²⁾	4,636	25%
Renewable energies ⁽³⁾	2,007	11%
Acquisition and ownership of buildings	462	2%
Electricity production by hydropower ⁽⁴⁾	301	2%
Others ⁽⁵⁾	547	3%
Total eligible activities	12,339	66%
B. Non-eligible activities		
Nuclear power generation activity	4,692	25%
Other non-eligible activities (including gas)	1,729	9%
Total non-eligible activities	6,421	34%
TOTAL CAPEX_T	18,760	

(1) This activity corresponds to activities 4.26. Pre-commercial stages of advanced technologies with minimal waste from the fuel cycle, 4.27. Construction and safe operation of new nuclear power plants, for the generation of electricity or heat, including for hydrogen production, using best-available technologies, 4.28 Electricity generation from nuclear energy in existing installations, as described in the complementary Delegated Act on nuclear and gas activities.

(2) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(3) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(4) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(5) Other activities include activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as well as the activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.

3.8.3.4.2 Analysis of the "Turnover" indicator

Definition of the indicator and calculation method (numerator/denominator)

The turnover ratio referred to in Article 8(2)(a) of regulation (EU) 2020/852 is calculated as the share of net turnover derived from products or services associated with Taxonomy-eligible or Taxonomy-aligned economic activities (numerator) divided by net turnover (denominator).

"Turnover_T" corresponds to the total amount of non-Group turnover under IAS 1, i.e. IFRS 15 turnover from contracts and rents received under IFRS 16.

For the Group, this definition corresponds to the amount of turnover reported in the consolidated financial statements, excluding Trading turnover (see note 5.1.2 of the consolidated financial statements in section 6.1).

Calculation methods - Specific points

In France, the EDF group manages its generation in an integrated manner based on its generating facilities and the upstream-downstream balance. Accordingly, the turnover recorded has been allocated on the basis of the volumes produced by the various production channels, based on the published electricity balance sheet (see section 5.1.4.1.2.1).

Breakdown of turnover_T by activity according to the Taxonomy

With regard to the texts in force on 31 December 2021 (without taking into account the complementary Delegated Act on nuclear and gas)

Economic activities	Turnover (in millions of euros)	Turnover ratio
A.1 Aligned activities		
Electricity distribution ⁽¹⁾	16,192	19%
Renewable energies ⁽²⁾	5,390	6%
Electricity production by hydropower ⁽³⁾	2,664	3%
Heating/cooling networks, Cogeneration of heat/cold and power from bioenergy ⁽⁴⁾	1,759	2%
Energy efficiency and performance services ⁽⁵⁾ and others	1,062	2%
Total aligned activities	27,067	32%
A.2. Eligible non-aligned activities		
Heating/cooling networks, Cogeneration of heat/cold and power from bioenergy	174	0%
Electricity production by hydropower	81	0%
Total eligible-non-aligned activities	255	1%
Total eligible activities	27,322	33%
B. Non-eligible activities		
Nuclear power generation activity	23,813	28%
Other non-eligible activities	33,326	39%
Total non-eligible activities	57,139	67%
TOTAL TURNOVER_T	84,461	

(1) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(2) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(3) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(4) This activity includes activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as described in the annexes to the Delegated Acts.

(5) This activity includes activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.



With regard to the texts in force on 31 December 2021 and the complementary Delegated Act (pro-forma data)

Economic activities	Turnover (in millions of euros)	Turnover ratio
A.1 Eligible activities		
Nuclear power generation activity	19,955	24%
Electricity distribution ⁽¹⁾	16,192	19%
Renewable energies ⁽²⁾	5,390	6%
Electricity production by hydropower ⁽³⁾	2,745	3%
Heating/cooling networks, Cogeneration of heat/cold and power from bioenergy ⁽⁴⁾	1,933	2%
Energy efficiency and performance services ⁽⁵⁾	709	1%
Others ⁽⁶⁾	353	1%
Total eligible activities	47,277	56%
B. Non-eligible activities		
Nuclear power generation activity	3,858	5%
Other non-eligible activities (including gas)	33,326	39%
Total non-eligible activities	37,184	44%
TOTAL TURNOVER_T	84,461	

(1) This activity corresponds to activities 4.26. Pre-commercial stages of advanced technologies with minimal waste from the fuel cycle, 4.27. Construction and safe operation of new nuclear power plants, for the generation of electricity or heat, including for hydrogen production, using best-available technologies, 4.28 Electricity generation from nuclear energy in existing installations, as described in the complementary Delegated Act on nuclear and gas activities

(2) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(3) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(4) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(5) This activity includes activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as described in the annexes to the Delegated Acts.

(6) This activity includes activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.

3.8.3.4.3 Analysis of the "OPEX" indicator

Definition of the indicator and calculation method (numerator/denominator)

The "OPEX" ratio referred to in Article 8(2)(b) of regulation (EU) 2020/852 is calculated by dividing the numerator by the denominator.

The denominator covers, in accordance with the provisions of the text, direct non-capitalised costs related to research and development, building renovation measures, short-term lease (not accounted for under IFRS 16), maintenance and repairs, as well as any other direct expenditure related to the day-to-day servicing of assets of property, plant and equipment that are necessary to ensure the continuous and efficient operation of these assets.

The numerator is equal to the share of operating expenses included in the denominator which:

- is related to an already eligible activity: OPEX related to assets or processes associated with Taxonomy-aligned activities;
- is part of an OPEX plan whose objective is to create/expand an activity aligned to the Taxonomy;
- are individually eligible OPEX_T or purchases of goods or services related to activities aligned with the Taxonomy, but which are not part of the Company's core business or individual measures to align target activities.

All OPEX falling within the scope of the Taxonomy are included under the headings "Other external consumption" and "Personnel expenses" (net of inventories and capitalised production) in the Group's income statement, with the exception of expenses relating to the reworking of welds at the Flamanville 3 power plant currently under construction (see note 7 to the consolidated financial statements). Under these headings, only the types of expenses specified above have been taken into account in the analysis, based on general accounting or cost accounting where necessary.

Calculation methods - Specific points

Under "Other expenses relating to the day-to-day maintenance of property, plant and equipment", the Group has included in the OPEX of the Taxonomy the personnel expenses and purchases related to the maintenance and upkeep of production assets. This excludes operating expenses related to production itself.

In contrast, when calculating the *pro forma* indicator taking into account the effects of the complementary Delegated Act, OPEX related to nuclear operations correspond to installation monitoring expenses and are therefore included in OPEX in the Taxonomy as maintenance expenses for production assets.

Expenditures for support functions directly related to maintenance and upkeep have been included in Taxonomy OPEX.

In the case of the hydropower business and the electricity distribution business, expenses relating to concession fees have been excluded from the calculation of operating expenses.

Breakdown of OPEX_T by activity according to the Taxonomy regulation

With regard to the texts in force on 31 December 2021 (without taking into account the complementary Delegated Act on nuclear and gas)

Economic activities	OPEX (in millions of euros)	OPEX ratio
A.1 Aligned activities		
Electricity distribution ⁽¹⁾	960	11%
Heating/cooling networks ⁽²⁾ and Energy efficiency and performance services ⁽³⁾	413	5%
Renewable energies ⁽⁴⁾	411	4%
Electricity production by hydropower ⁽⁵⁾	345	4%
Others ⁽⁶⁾	282	3%
Total aligned activities	2,411	27%
A.2. Eligible non-aligned activities		
Heating/cooling networks, Cogeneration of heat/cold and power from bioenergy	41	0%
Electricity production by hydropower	24	0%
Total eligible-non-aligned activities	65	0%
Total eligible activities	2,476	27%
B. Non-eligible activities		
Nuclear power generation activity	3,737	41%
Other non-eligible activities	2,873	32%
Total non-eligible activities	6,610	73%
TOTAL OPEX_T	9,086	

(1) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(2) This activity includes activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as described in the annexes to the Delegated Acts.

(3) This activity includes activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.

(4) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(5) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(6) Corresponds mainly to the activity 9.1 Research, development and innovation as described in the annexes to the Delegated Acts.

With regard to the texts in force on 31 December 2021 and the complementary Delegated Act (pro-forma data)

Economic activities	OPEX (in millions of euros)	OPEX ratio
A.1 Eligible activities		
Nuclear power generation activity ⁽¹⁾	3,533	39%
Electricity distribution ⁽²⁾	960	11%
Renewable energies ⁽³⁾	411	4%
Electricity production by hydropower ⁽⁴⁾	369	4%
Heating/cooling networks ⁽⁵⁾ and Energy efficiency and performance services ⁽⁶⁾	454	5%
Others ⁽⁷⁾	282	3%
Total eligible activities	6,009	66%
B. Non-eligible activities		
Nuclear power generation activity	204	2%
Other non-eligible activities (including gas)	2,873	32%
Total non-eligible activities	3,077	34%
TOTAL OPEX_T	9,086	

(1) This activity corresponds to activities 4.26. Pre-commercial stages of advanced technologies with minimal waste from the fuel cycle, 4.27. Construction and safe operation of new nuclear power plants, for the generation of electricity or heat, including for hydrogen production, using best-available technologies, 4.28 Electricity generation from nuclear energy in existing installations, as described in the complementary Delegated Act on nuclear and gas activities

(2) This activity corresponds to activity 4.9. Transmission and distribution of electricity as described in the annexes to the Delegated Acts.

(3) This activity includes activities 4.3. Electricity generation from wind power, 4.1. Electricity generation using solar photovoltaic technology and 4.10. Storage of electricity as described in the annexes to the Delegated Acts.

(4) This activity corresponds to activity 4.5. Electricity generation from hydropower as described in the annexes to the Delegated Acts.

(5) This activity includes activities 4.15. Heating/cooling networks and 4.20. Cogeneration of heat/cold and power from bioenergy as described in the annexes to the Delegated Acts.

(6) This activity includes activities 9.3. Professional services related to the energy performance of buildings and 7.3. Installation, maintenance and repair of energy efficiency equipment as described in the annexes to the Delegated Acts.

(7) Corresponds mainly to the activity 9.1 Research, development and innovation as described in the annexes to the Delegated Acts.

3.8.4 Report of one of the Statutory Auditors, appointed as independent third party, on the non-financial statement

This is a free English translation of the report by one of the Statutory Auditors issued in French and is provided solely for the convenience of English-speaking readers. This report should be read in conjunction with, and construed in accordance with, French law and professional standards applicable in France.

For the year ended 31 December 2021

To the Annual General Meeting,

In our capacity as Statutory Auditor of EDF SA (hereinafter the "Company"), appointed as independent third party ("third party") and accredited by the French Accreditation Committee (COFRAC), under number 3-1048 (Cofrac Inspection Accreditation, no. 3-1048, scope available at www.cofrac.fr), we have conducted procedures to express a limited assurance conclusion on the historical information (observed or extrapolated) in the consolidated non-financial statement, prepared in accordance with the Company's procedures (hereinafter the "Guidelines"), for the year ended 31 December 2021 (hereinafter the "Information" and the "Statement", respectively), presented in the Group management report pursuant to the legal and regulatory provisions of Articles L. 225-102-1, R. 225-105 and R. 225-105-1 of the French Commercial Code (*code de commerce*).

It is also our responsibility to express, at the request of the Company and outside the scope of our accreditation, a reasonable assurance conclusion on the fact that some information selected by the Company and presented in the Statement has been prepared, in all material aspects, fairly in accordance with the Guidelines.

Conclusion of limited assurance on the consolidated non-financial statement in accordance with Article L.225-102-1 of the French Commercial Code (*code de commerce*)

Based on our procedures as described in the section "Nature and scope of procedures" and the evidence we have obtained, no material misstatements have come to our attention that cause us to believe that the non-financial statement does not comply with the applicable regulatory provisions and that the Information, taken as a whole, is not fairly presented in accordance with the Guidelines.

Conclusion of reasonable assurance on selected information included in the Statement

In our opinion, the following information selected by the Company and identified by the sign ✓ within the Statement has been prepared fairly, in all material aspects, in accordance with the Guidelines:

- Workforce as of 31 December 2021 and breakdown by age and gender;
- EDF group direct greenhouse gas emissions (scope 1);
- Carbon intensity: specific CO₂ emissions due to electrical generation;
- Water intensity: water consumed / electricity generated by fleet;

Preparation of the consolidated non-financial statement

The absence of a generally accepted and commonly used reference framework or established practices on which to base the assessment and measurement of the Information enables the use of different but acceptable measurement techniques that may impact comparability between entities and over time.

Accordingly, the Information must be read and interpreted with reference to the Guidelines, the material elements of which are available on the Company's website.

Limits inherent in the preparation of the information relating to the Statement

The Information may be subject to uncertainty inherent to the state of scientific and economic knowledge and the quality of external data used. Some information is sensitive to the choice of methodology and the assumptions or estimates used for its preparation and presented in the Statement.

Responsibility of the Company

The Board of Directors is responsible for:

- selecting or determining the appropriate criteria for the preparation of the Information;
- preparing a Statement pursuant to legal and regulatory provisions, including a presentation of the business model, a description of the main non-financial

risks, a presentation of the policies implemented with respect to these risks as well as the outcomes of these policies, including key performance indicators and the information set-out in Article 8 of Regulation (EU) 2020/852 (Green taxonomy);

- implementing such internal control as it determines is necessary to enable the preparation of Information that is free from material misstatement, whether due to fraud or error.

The Statement has been prepared by applying the Company's Guidelines as referred to above.

Responsibility of the Statutory Auditor appointed as independent third party

Based on our work, our responsibility is to express a limited assurance conclusion on:

- the compliance of the Statement with the requirements of Article R. 225-105 of the French Commercial Code;
- the fairness of the information provided pursuant to part 3 of sections I and II of Article R. 225-105 of the French Commercial Code, i.e. the outcomes of policies, including key performance indicators, and measures relating to the main risks, hereinafter the "Information."

As it is our responsibility to issue an independent conclusion on the Information prepared by management, we are not authorised to participate in the preparation of the Information, as this could compromise our independence.

It is not our responsibility to provide a conclusion on:

- the Company's compliance with other applicable legal and regulatory provisions (particularly with regard to the information set-out in Article 8 of Regulation (EU) 2020/852 (Green taxonomy), the duty of vigilance and the fight against corruption and tax evasion);
- the fairness of information set-out in Article 8 of Regulation (EU) 2020/852 (Green taxonomy);
- the compliance of products and services with the applicable regulations.

Applicable regulatory provisions and professional guidance

We performed the work described below in accordance with Articles A. 225-1 *et seq.* of the French Commercial Code, the professional guidance issued by the French Institute of Statutory Auditors (*Compagnie Nationale des Commissaires aux Comptes*) relating to this engagement and acting as the verification programme and with the international standard ISAE 3000 (revised).

Independence and quality control

Our independence is defined by Article L. 822-11-3 of the French Commercial Code and French Code of Ethics for Statutory Auditors (*Code de déontologie*). In addition, we have implemented a system of quality control including documented policies and procedures aimed at ensuring compliance with applicable legal and regulatory requirements, ethical requirements and the professional guidance issued by the French Institute of Statutory Auditors (*Compagnie Nationale des Commissaires aux Comptes*) relating to this engagement.

Means and resources

Our work engaged the skills of nine people between September 2021 and February 2022 and took a total of about twenty weeks.

To assist us in conducting our work, we referred to our corporate social responsibility and sustainable development experts. We conducted around fifty interviews with people responsible for preparing the Statement.

Nature and scope of procedures

We planned and performed our work taking account of the risk of material misstatement of the Information.

We consider that the procedures conducted in exercising our professional judgement enable us to express a limited assurance conclusion:

- We familiarized ourselves with the activities of all companies in the consolidation scope and the description of the principal risks;

- We assessed the suitability of the Guidelines with respect to their relevance, completeness, reliability, neutrality and clarity, taking into account, where appropriate, best practices within the sector;
 - We verified that the Statement covers each category of information stipulated in section III of Article L. 225-102-1 governing social and environmental affairs, respect for human rights and the fight against corruption and tax evasion;
 - We verified that the Statement provides the information required under Article R.225-105 II of the French Commercial Code where relevant with respect to the principal risks, and includes, where applicable, an explanation for the absence of the information required under Article L.225-102-1 III, paragraph 2 of the French Commercial Code;
 - We verified that the Statement presents the business model and a description of the principal risks associated with the activities of all the consolidated entities, including where relevant and proportionate, the risks associated with their business relationships, their products or services, as well as their policies, measures and the outcomes thereof, including key performance indicators associated to the principal risks;
 - We referred to documentary sources and conducted interviews to:
 - assess the process used to identify and confirm the principal risks as well as the consistency of the outcomes, including the key performance indicators used, with respect to the principal risks and the policies presented, and
 - corroborate the qualitative information (measures and outcomes) that we considered to be the most important presented in Appendix 1 and for which our work was carried out on the consolidating entity;
 - We verified that the Statement covers the consolidated scope, i.e. all companies within the consolidation scope in accordance with Article L. 233-16, with the limits specified in the Statement.
 - We obtained an understanding of internal control and risk management procedures implemented by the Company and assessed the data collection process aimed at ensuring the completeness and fairness of the Information;
 - For the key performance indicators and other quantitative outcomes that we considered to be the most important presented in Appendix 1, we implemented:
 - analytical procedures that consisted in verifying the correct consolidation of collected data as well as the consistency of changes thereto;
 - substantive tests, on a sample basis and using other selection methods, that consisted in verifying the proper application of definitions and procedures and reconciling data with supporting documents. These procedures were conducted for a selection of contributing entities presented in Appendix 2 and covered between 9% and 100% of the consolidated data selected for these tests.
 - We assessed the overall consistency of the Statement based on our knowledge of the entire Company.
- The procedures conducted in a limited assurance review are substantially less extensive than those required to issue a reasonable assurance opinion in accordance with the professional guidelines of the French National Institute of Statutory Auditors (*Compagnie Nationale des Commissaires aux Comptes*); a higher level of assurance would have required us to carry out more extensive procedures.
- Pursuant to the request of the Company, we performed additional work with the aim of providing a reasonable assurance conclusion on the following Information, otherwise identified by the sign √ within the Statement:
- Workforce as of December 31, 2021 and breakdown by gender and age;
 - EDF group direct greenhouse gas emissions (scope 1);
 - Carbon intensity: specific CO₂ emissions dues to electrical generation;
 - Water intensity: water consumed / electrical generated by fleet;
- The work carried out was of the same nature as that described in the section on limited insurance above, but more in-depth, particularly regarding:
- Analytical procedures that consisted in verifying the correct consolidation of collected data as well as the consistency of changes thereto;
 - Substantive tests, on a sample basis that consisted in verifying the proper application of definitions and procedures and reconciling data with supporting documents.
- The selected sample represents between 65% and 80% of the information identified with the sign √.

Paris-La Défense, 17 February 2022

One of the Statutory Auditors,

Deloitte & Associés

Christophe Patrier
Partner, Audit

Catherine Saire
Partner, Sustainable Development



Appendix 1

Selected qualitative information

Environmental Information

- **Soil and groundwater management** (Prevention of soil and groundwater impacts and management plans)

Societal Information

- **Energy poverty** (Fight against energy poverty; Understanding of energy poverty; Payment assistance; Support action; Preventive actions)
- **Ethics, compliance, and human rights training schemes** (Anti-corruption; Harassment and discrimination; Financial ethics; Integrity and transparency of the wholesale energy market; Breaches of competition law; Human rights)
- **Environment, nuclear safety, radiation protection** (Environmental protection; A constant nuclear safety procedure; The control system; Whistleblowing system; Significant events regarding safety; Radiation protection)

Selected quantitative information

Social key performance indicators and outcomes

Level of assurance

- **Workforce as of 31/12/2021 and breakdown by age and gender** **Reasonable**
- Gender balance index: percentage of women in the Management Committees of the Group's entities **Limited**
- Percentage of employees who have taken part in a skills development initiative **Limited**
- Number of fatal accidents connected to business-specific risks - Employees and providers **Limited**
- Global Lost Time Incident Rate (LTIR) - Employees and providers **Limited**
- Accident severity rate - Employees **Limited**

Societal key performance indicators and outcomes

Level of assurance

- Proportion of executives who have completed the anti-corruption training program **Limited**
- Annual rate of projects for which a dialogue and consultation procedure is engaged (in accordance with the Equator Principles) **Limited**
- Annual rate of procurement from SMEs in France **Limited**
- Achievement rate of supporting actions backed by EDF, encouraging relocation and maintaining nuclear industry skills ("France Relance" Programme) **Limited**
- Achievement rate of EDF commitments towards French Responsible Digitalization Institute (INR) **Limited**
- Nuclear safety: Number of significant level 2 events on the INES scale **Limited**
- Number of visits on digital consumption monitoring platforms **Limited**
- Number of smart meters installed **Limited**

Environmental key performance indicators and outcomes

Level of assurance

- **EDF group direct greenhouse gas emissions (scope 1) ⁽¹⁾** **Reasonable**
- **Carbon intensity: specific CO₂ emissions due to electrical generation** **Reasonable**
- **Water intensity: water consumed / electricity generated by fleet** **Reasonable**
- EDF group indirect greenhouse gas emissions (scope 2) ⁽¹⁾ **Limited**
- EDF group indirect greenhouse gas emissions (scope 3) ⁽¹⁾ **Limited**
- Emissions from electricity purchased and sold to end customers **Limited**
- Emissions from gas sold to end customers **Limited**
- Installed net renewable electricity generating capacities **Limited**
- Deployment rate of the framework guidelines on carbon offset solutions within the entities concerned **Limited**
- Deployment rate of new climate change adaptation plans within concerned entities **Limited**
- EDF group's Electric Vehicles rate in the fleet of light vehicles **Limited**
- Avoided CO₂ emissions thanks to sales of innovative goods and services **Limited**
- Implementation rate of innovative solutions encouraging multifunctional land use **Limited**
- Achievement rate of "Act4nature international" commitments **Limited**
- Radioactive waste from operations – France: volume of long-lived high and intermediate level solid radioactive waste **Limited**
- Radioactive waste from operations – UK: volume of low-level radioactive solid waste generated **Limited**
- Very-Low Level radioactive Waste (VLLW) from decommissioning and associated industrial activities - Group in France **Limited**
- Low and Intermediate Level radioactive Waste (LLW and ILW) from decommissioning and associated industrial activities - Group in France **Limited**
- Very-Low Level solid radioactive Waste - EDF **Limited**
- Short-Lived Low and Intermediate Level solid radioactive Waste - EDF **Limited**

Environmental key performance indicators and outcomes
Level of assurance

• Annual rate of conventional waste directed towards a waste recovery industry	Limited
• Nuclear fuel loaded in reactor	Limited

(1) The verification rates and coverage rates for indicators relating to greenhouse gas emissions for the Group's scopes 1, 2 and 3 are presented in Appendix 3.

Appendix 2

Selected contributing entities

Within EDF SA	<ul style="list-style-type: none"> • EDF SA head office • Division Combustible Nucléaire (DCN): Head office • Division Production Nucléaire (DPN): Head office; Plants: nuclear power plants of Chooz and Golfech • Division Thermique Expertise et Appui Industriel Multi-métiers (DTEAM): Thermal power plant in Martigues • Statistiques-optimisation DATA (SoDATA): Head office • Direction des Projets Déconstruction-Déchets (DP2D): Head office • Unité Technique Opérationnelle (UTO): Head office
Within EDF Production Électrique Insulaire (EDF PEI)	<ul style="list-style-type: none"> • Plant: Thermal power plant of Port-Est (La Réunion)
Within Enedis	<ul style="list-style-type: none"> • Enedis head office • Direction Régionale Provence Alpes du Sud
Within Dalkia	<ul style="list-style-type: none"> • Dalkia head office • Subsidiaries: CRAM; Dalkia EN • Regional Directions: Direction régionale Est; Direction régionale Nord; Direction régionale Ile de France; Direction régionale Méditerranée; Direction régionale Centre Est;
Within EDF Energy	<ul style="list-style-type: none"> • EDF Energy head office • Plants: Nuclear power station of Heysham 1; Nuclear power station of Heysham 2
Within EDF Renouvelables	<ul style="list-style-type: none"> • EDF Renouvelables USA; EDF Renouvelables Canada
Within Edison	<ul style="list-style-type: none"> • Edison head office
Within Mekong Energy Company (MECO)	<ul style="list-style-type: none"> • Plant: Thermal power plant of Phu My 2.2
Within EDF Norte Fluminense	<ul style="list-style-type: none"> • Plant: Norte Fluminense Thermal Power Plant
Within Framatome	<ul style="list-style-type: none"> • Plant: Romans



Appendix 3

EDF group's verified greenhouse gas emissions assessment

Verified greenhouse gas emissions Summary of the 2021 GHG assessment	Tons of CO ₂ equivalent verified	Level of assurance and representation of the selected sample (%)
100% of the direct scope 1 greenhouse gas emissions	27 MtCO ₂ e	Reasonable 67%
100% of the indirect scope 2 greenhouse gas emissions	0,3 MtCO ₂ e	Limited 74%
100% of the indirect scope 3 greenhouse gas emissions	102 MtCO ₂ e	Limited 22%

3.9 Vigilance Plan

3.9.1 The EDF group's CSR commitment and its duty of vigilance framework

EDF has a long track record of running a responsible business, based on the values of respect, solidarity and responsibility, promoting sustainable solutions for individuals and the environment.

EDF's *raison d'être* has been modified to read "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development" and this statement was added to its articles of association at the General Shareholders' Meeting held on 7 May 2020. The Group's *raison d'être* is broken down into 16 CSR commitments ⁽¹⁾, which are ranked and grouped into four key issues: carbon and climate neutrality, preserving the planet's resources, well-being and solidarity, and responsible development of the EDF group's activities.

Legal Framework

French Act No. 2017-399 of 27 March 2017 on the Duty of Vigilance of parent companies and ordering companies introduced the obligation, in Article L. 225-102-4 of the French Commercial Code, to draw up and implement a Vigilance Plan.

This plan must include "reasonable vigilance measures to identify risks and prevent serious violations of human rights and fundamental freedoms, the health and safety of individuals, and the environment" that may result from the activities of the company and its controlled subsidiaries, as well as those of suppliers or subcontractors with whom it has an established business relationship, when these activities are tied to that relationship.

It must also include five measures:

1. risk mapping to identify, analyse and prioritise risks;
2. procedures for regular evaluation of the situation of controlled subsidiaries, subcontractors and suppliers based on risk mapping;
3. appropriate risk mitigation or serious harm prevention actions;
4. a mechanism for reporting and collecting information on the existence or realisation of risks;
5. a system for monitoring the measures implemented and evaluating their effectiveness.

The Group's Vigilance Plan sets out these five measures as follows:

- 3.9.1. The EDF group's CSR commitment and its duty of vigilance framework
- 3.9.2 Governance, steering and stakeholder involvement
- 3.9.3 Main characteristics of EDF as regards the "Duty of Vigilance" law
- 3.9.4 Methodology regarding Group risk mapping
- 3.9.5 Major improvements of the EDF group's vigilance plan in 2021
- 3.9.6 Salient risks and risk prevention and mitigation measures
 - 3.9.6.1 Human Rights and Fundamental Freedoms
 - 3.9.6.2 Environment
 - 3.9.6.3 Health & Safety
 - 3.9.6.4 Identifying salient risks
- 3.9.7 Group whistleblowing system
- 3.9.8 Monitoring procedure

The Group's framework relating to its commitments and requirements with respect to the environment, human rights, and health and safety

EDF's Vigilance Plan was determined within the framework of the UN Guiding Principles on Business and Human Rights, OECD Guiding Principles, the fundamental conventions of the International Labour Organisation and UN International Bill of Human Rights.

In this context, the Group has published on its website its duty-of-care standards in a document entitled "Human rights and fundamental freedoms, Health and safety, Environment, and Business ethics: the EDF group's commitments and requirements". This set of standards brings together the commitments and requirements of the EDF group (EDF and the companies it controls, see section 3.9.3 "Main characteristics of EDF as regards the Duty-of-Care Act") and the fundamental requirements with regard to its business relationships in terms of respect for human rights and fundamental freedoms, environmental protection, guaranteeing the health and safety of individuals, and business ethics (see section 3.9.5 "Major improvements to the EDF group's Vigilance Plan in 2021 – Creation, promotion and publication of a set of Duty-of-Care standards").

This set of standards refers to all the Group's public documents and internal policies, including:

- mandatory Group procedures binding on all controlled entities ⁽²⁾: risk management and internal control, governance of subsidiaries and holdings, project management, ethics and compliance, CSR, health and safety, procurement;
- internal documents made public: Ethics Charter, code of conduct Ethics and Compliance, Sustainable Development Charter for Suppliers, Global Framework Agreement on Corporate Social Responsibility (CSR);
- external sources: UN Global Compact, UN Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises, WBCSD CEO Guide to Human Rights, Conventions of the International Labour Organisation (ILO) guaranteeing fundamental principles and rights at work and combatting for the elimination of discrimination, Declaration on the Rights of the Child, Declaration on the Elimination of All Forms of Discrimination against Women, Global reporting Initiative (GRI), Supplier Relations and Responsible Procurement Label (RF&AR).

(1) Corporate Social Responsibility.

(2) While respecting the independence of regulated infrastructure managers.

EDF's Vigilance Plan reports on the various steps taken for each of the Group's CSR issues and commitments throughout chapter 3 of this document as follows:

Salient risks related to the duty of vigilance			Stakes and commitments of the EDF Group	
Field	Type of risk	Risk	Descriptions of the 2021 mitigations and actions in the different sections of the DPEF	
Human rights and fundamental freedoms	Transverse	Risks related to harassment and discrimination	sections 3.3.3 Equality, diversity and inclusion and 3.3.4 Energy poverty and social innovation	sections 3.4.1 Dialogue and consultation with stakeholders and 3.3.2.4 Whistleblowing system
	Activities and projects	Risk of infringement of the rights of communities, indigenous peoples and vulnerable groups: these risks are linked in particular to land issues and population displacements or to consultations with indigenous populations that may prove insufficient given the complexity of the consultation process with indigenous populations (or ethnic minorities) or the management of this process in whole or in part carried out by an administration thus limiting EDF's control over this risk.	section 3.3.2.3. Human rights	
	Activities and projects	Risk of infringement of workers' rights, including risks related to decent working conditions on the Group's construction sites.	section 3.3.2.3. Human rights	
	Activities and projects	Risks associated with the use of security forces for projects near conflict zones or security regimes.	section 3.3.2.3. Human rights	
Environment	Transverse	Climate impact : the climate change and greenhouse gas emission.	section 3.1 Carbon neutrality and the climate	
	Transverse	EDF impact on air, water, soils, biodiversity and waster production.	section 3.2 Preserving the planets' ressources	
Health-Security	Employees and subcontractors	Work-related accidents, work-related diseases (asbestos, chemicals, ionizing radiation and noise);	section 3.3.1 Health and safety for all	
	Employees and subcontractors	Musculoskeletal disorders, anxiety-depressive disorders, including stress.	section 3.3.1 Health and safety for all	
	Consumers and residents	The safety of nuclear and hydraulic facilities.	sections 3.3.1.1 Nuclear safety and 3.3.1.2 Hydropower safety	
	Consumers and residents	Air quality, noise and acoustic nuisance	sections 3.3.1.5 Air quality and 3.3.1.4 Health and safety of consumers	
Suppliers	Purchase category	IT and electronic services and materials regarding human rights risks in relation to the supply chain.	sections 3.4.2.3 Contribution to development through purchasing and 3.3.2.3.4 Implementation of human rights commitments	
	Purchase category	Work and maintenance services in an industrial environment regarding the increased safety risk.	section 3.4.2.3 Contribution to development through purchasing	
	Purchase category	Decommissioning /depollution services regarding environmental risk (waste production).	section 3.4.2.3 Contribution to development through purchasing	
	Specific	In 2021, the risks of human rights and in particular of forced labour in connection with the supply chain were clarified in the areas of procurement of IT and instrumentation & control, textiles and solar panels regarding forced labour risks.	sections 3.4.2.3 Contribution to development through purchasing and 3.3.2.3.4 Implementation of human rights commitments	

3.9.2 Governance, steering and stakeholder involvement

EDF has strengthened its oversight of the Vigilance Plan with the appointment, in December 2020, of a Group Duty-of-Care Compliance Officer by two members of the Executive Committee: the Group Corporate Secretary and the Group Executive Director in charge of Innovation, Corporate Responsibility and Strategy. This officer is responsible for the development, deployment and coordination of the plan and its application within the Group.

The Vigilance Plan and the resulting actions are validated by the CSR Strategy Committee chaired by the Group's Chairman, and submitted to the Corporate Responsibility Committee, a Committee of the Board of Directors dedicated to social and environmental responsibility issues.

The Vigilance Plan is managed in collaboration with the Legal Department and the Sustainable Development Department within a Steering Committee and a Strategic Committee that also includes the Human Resources Department, the Purchasing Department, the Risk Department, the International Department, the Ethics and Compliance Department; the Export Control and International Sanctions Department, and the representative of a subsidiary with particularly exposed activities. The Strategic Committee defines the orientations and objectives of the Vigilance Plan in a collegial manner, based on proposals from the Steering Committee. It ensures that these objectives are achieved and may redefine them according to the operational progress reported by the Steering Committee.

The deployment and coordination of the Vigilance Plan is based on a network of Duty-of-Care Officers appointed in each Group entity concerned.

Stakeholder association

Dialogue with stakeholders is a major part of EDF's culture. It forms the basis of our cooperation with our stakeholders.

The Global Framework Agreement on Corporate Social Responsibility signed by EDF in 2018 and extended for two years on 29 November 2021 with the Group's trade unions and two international trade union federations (IndustriAll and ISP) states that EDF's Vigilance Plan will be "developed and set up in association with the Company stakeholders, including workers' representative organisations (see section 3.5.3.1.1 "Global Social Responsibility Agreement").

Since 2018, the Committee for Dialogue on Social Responsibility (CDRS), made up of representatives of all the signatories of the agreement, has been working on numerous topics related to the Duty of Vigilance (health and safety, exercise of the Group's responsibility in the context of international projects, impacts of the pandemic, etc.) and on the actions to be implemented to roll out and improve the Group's Vigilance Plan. For example, in 2021, CDRS members learned from its meetings about the progress of the Vigilance Plan, and also were shared the draft duty-of-care framework ("Human Rights and Fundamental Freedoms, Health and Safety, Environment, Business Ethics: the EDF group's Commitments and Requirements"), which had been submitted to them for comment. A training day in November 2021 dedicated to the Duty of Vigilance was co-organised by the global trade union federations and the Group's management, during which participants were able to discuss concrete cases and benefit from a demonstration of the new e-learning training module now accessible to all employees (see section 3.9.5 "Major improvements of the EDF group's Vigilance Plan in 2021").

Externally, EDF participated in discussions with other companies, lawyers, NGOs, and trade union federations within the framework of the "*Entreprises pour les droits de l'homme*" (Businesses for Human Rights, EDH⁽¹⁾) non-profit organisation, in order to openly exchange on the expectations of all stakeholders, practices and improve Vigilance Plan preparation processes.

In November 2021, EDF also took part in a peer review organised by Global Compact, bringing together other groups subject to the law, and personalities from the world of non-profits and research.

3.9.3 Main characteristics of EDF as regards the "Duty of Vigilance" law

The EDF group is an integrated energy company engaged in activities involving risks in three fields where the Duty of Vigilance applies. EDF is active in all areas of the electricity industry and some areas of the gas industry: power generation using nuclear, renewable and thermal energies; electricity transmission and distribution; sales; energy services; energy trading (see section 1.4 "Description of the Group's activities").

Main countries of activity

The Group's activities are mainly located in OECD countries. Countries considered to be "higher-risk countries" receive special care, including in terms of relations with partners.

Within the Group, EDF Renewables is an entity that develops a significant number of projects in a large number of countries (present in more than 20 countries) for operation, but also for Development and Sale of Structured Assets (DSSA). Consequently, several geographical areas are concerned, the main ones being (% of net installed capacity in solar and wind power):

North America	42%
Europe	27%
South America	12%
China and India	11%
Israel	4%
Saudi Arabia, Egypt and United Arab Emirates	3%
South Africa	1%

Suppliers and subcontractors

The scope of suppliers and subcontractors managed by the Group Purchasing Department represents approximately 11,000 suppliers. Over 97% of purchases are made in France and 98.5% in Europe. Suppliers of certain subsidiaries or suppliers involved in international projects are subject to special vigilance measures. Because the Group's activities are mainly in the industrial field, EDF exercises upstream vigilance, with regard to any risk of violation of persons' rights or risk to their health (employees, service providers, local residents, local communities and customers) or risk to the environment prior to making investment decisions, particularly to build, operate, maintain or dismantle facilities.

Scope of the Vigilance Plan

The scope of the Vigilance Plan covers EDF's activities, the activities of subsidiaries it controls⁽²⁾, as well as the activities of its suppliers and subcontractors with which the Group has established commercial relations to the extent their activities are related to those relations.

The Organisation of the Group is detailed in section 1.2.1 "Organisation of the Group".

Dalkia and Framatome subsidiaries with a headcount of over 5,000 employees are integrated in the plan, together with all French and foreign subsidiaries.

RTE and Enedis, respectively the French power transmission and distribution system operators, are independently managed subsidiaries, and therefore publish their own Vigilance Plans.

(1) e-dh.org

(2) Subsidiaries integrated into the scope of consolidation using the full consolidation method pursuant to Article L. 233-16 II of the French Commercial Code (in France and abroad) (see note 3 to the consolidated financial statements).

3.9.4 Methodology regarding Group risk mapping

The process for identifying and prioritising risks used to develop the Vigilance Plan is based on two complementary approaches: Group risk mapping, which includes several risks related to the duty of vigilance, and additional risk mapping, specifically focused on the entities most exposed because of their activity and/or their location.

Under the Group approach described in section 2.1 “Risk management and control of activities”, each Group entity conducts a risk mapping exercise, under the responsibility of management, using a risk typology designed to cover all categories of risk, whether internal or external, operational or strategic, to which the Group is exposed.

It is made up of 5 successive steps: Risk identification, risk assessment, prioritisation, control through the definition of an action plan, managing the action plan which includes monitoring the action plan’s deployment, and measuring its effectiveness.

Risk identification

In order to reasonably ensure that the main risks are being identified, a separate approach for each business process and each asset is combined with a separate approach for each major risk type. In addition, feedback, events, incidents, and near-misses are taken into consideration as a source of risk identification, as well as the results of audits. The identification of risks is the result of a discussion between the main actors: Managers, experts and stakeholders.

Risk assessment and prioritisation

The identified risks are qualitatively prioritised according to:

- their impact, *i.e.* their potential criticality, assessed using multiple criteria, including the assessment of the impact on the physical or human environment;
- their probability of occurrence, *i.e.* its degree of likelihood evaluated over a relevant time horizon, estimated on the basis of the history of the activity, feedback, or internal or external expertise;
- their level of risk control, *i.e.* the efficiency of the actions implemented.

The main purpose of the general risk mapping exercise is to define and implement action plans (prevention, protection, mitigation etc.) to reduce the impact of the risks and/or risk probability.

Group risk governance

The EDF group’s risk map is based on the entities’ risk maps, internal control self-assessments, and cross-analyses of feedback from operational and functional entities.

The Group Risk Management Department identifies and assesses Group-level risks and draws up a Group risk map, which is validated by the Risk Committee chaired by the Group’s Chairman and then presented to the Board of Directors’ Audit Committee.

How Group risk assessment shaped the Vigilance Plan in 2021

Through this approach, the main risks presented in section 2.2 “Risks to which the Group is exposed” have been identified, at the level of the EDF group.

Several of these risks are of strategic importance for the Vigilance Plan:

- ethics or compliance risk (see section 2.2 – 1D “Ethics or compliance violations”): since 2019, this risk has included a “duty-of-care” component, implementing a Group action programme and requiring Group entities to report back on their own action in this;
- adaptation to climate change – physical risks and transition risks (3B): this risk specifically includes a component focused on the impact of the Group’s operations on the climate (see section 3.1.3.2.3 “Scenario-based approach to verify corporate resilience”);
- industrial safety violations and impact on environmental assets including biodiversity (4G), with a special focus on nuclear safety (5C) and hydropower safety (4E);
- management of large and complex industrial projects (including EPR projects) (4A): this risk includes a component relating to the potential impact of projects on human rights, the environment and health and safety;
- operational continuity of supply chains and contractual relationships (4B): this risk specifically includes vigilance-based measures during the contractualisation and contract monitoring stages.

The risks specific to the Duty of Vigilance are detailed by area in section 3.9.6 “Salient risks and risk prevention and mitigation measures”.

3.9.5 Major improvements of the EDF group’s vigilance plan in 2021

Early in 2021, an inventory, review, and diagnosis of the Group’s internal processes was carried out in order to measure the Vigilance Plan’s efficiency and how far its deployment had progressed. Several projects and actions were initiated as part of a continuous improvement process:

Creation, promotion and publication of a set of Duty-of-Care standards

In March 2021, EDF drew up a set of guidelines listing the commitments of the Group (EDF and its controlled subsidiaries) and the fundamental requirements for its business relationships in terms of human rights and fundamental freedoms, environmental protection, protection of personal health and safety and business ethics.

The Group has summarised its duty-of-care commitments in these standards, and spells out its requirements for its partners, financiers, suppliers, and subcontractors.

This document, submitted to the members of the CDRS ⁽¹⁾ (see section “3.9.2 Governance, steering and stakeholder involvement”), was signed by the Chairman of the EDF group. It is available in French and English on edf.fr website (https://www.edf.fr/sites/default/files/contrib/groupe-edf/engagements/2021/rse/edfgroup_rse_referentiel-ddv-2021_fr.pdf).

Better integration of the Duty of Vigilance into the investment process

Consideration of the Duty of Vigilance and the associated Group standards is included in each analysis of projects presented to the Commitments Committee of the Group Executive Committee (CECEG). In concrete terms, this takes the form of identifying the risks associated with the projects, both for the activities developed and for the supplier relationships envisaged within the framework of the project (see section 3.9.6 “Salient risks and risk prevention and mitigation measures – Global actions to prevent and mitigate risks relating to the Duty of Vigilance”).

This identification will be facilitated by the construction of a grid, to be made available in 2021, which will allow for an analysis of projects that are consistent with the Group’s *raison d’être*, CSR commitments, and guidelines, as well as with international standards. This grid takes into account environmental, health and safety, human rights, and ethical dimensions.

Reliability of country risk analysis

The Group has developed an in-house country profiling tool to assess a country’s context in terms of risks related to the duty of vigilance. It gathers the values of eight indicators (such as the Gender Gap Index or the Children’s Rights in the Workplace Index) for more than 180 countries covering the three Duty-of-Care themes (Human Rights, Environment, Health and Safety) as well as the country’s socio-economic situation.

(1) Committee for Dialogue on Social Responsibility (CDRS).

To complete this tool, the Group has also subscribed to Verisk Maplecroft® to have access to 13 human rights indices in order to refine and specify the human rights risks that the Group could face in the countries where it operates, purchases and develops.

Reinforced integration of the duty of vigilance in the purchasing process of the Group Purchasing Department

The Group Purchasing Department has carried out a review to assess the integration of the duty of vigilance in its contracting phases. In late 2021, the compliance commitment for bidders (which is mandatory to participate in the tender), covering the themes of corruption, money laundering, financing of terrorism, no conflicts of interest, and international sanctions, was finalised. Bidders now commit to comply with EDF's requirements relating to the French Duty-of-Care Act: To respect human rights and fundamental freedoms, to guarantee the health and safety of people in the workplace, to protect the environment, and to comply with the social and environmental regulations applicable to its activities (see section 3.4.2.3.2 "Sustainable and balanced relationships – Responsible purchasing processes"). The rest of this review will take place in 2022 and will contribute to improving the integration of the duty of vigilance at all levels of the contracting process.

Awareness-raising and training for Group employees and managers

In order to raise awareness among Group managers, a programme of internal "roadshows" was organised throughout the year for the Executive and Management Committees of the most exposed subsidiaries and departments. The

purpose of these roadshows is to reiterate the foundations and obligations of the law, the Group's dedicated organisation, as well as a presentation about ongoing litigation based on the duty of vigilance concerning an EDF Renewables project in Mexico (see section 3.9.6.1.2 "Main prevention, mitigation and monitoring measures implemented").

In addition to the network of Duty-of-Care Officers appointed in the relevant Group entities, closer coordination has been established between the various EDF internal networks relating to Sustainable Development (corporate and international activities), Ethics and Compliance, and Internal Control, in order to promote the duty of vigilance in all areas that may be exposed and/or contribute.

In September 2021, the Group developed an e-learning module dedicated to the duty of vigilance to raise awareness and help deploy the Group's compliance plan. The module, which aims to reach as many managers and project leaders as possible, is available in French and English. It provides a definition of the duty of vigilance, its scope of application, the actors involved and the associated obligations, and identifies the risks and remedial actions through concrete examples relating to the Group's activities. Details are also included on how the Group has organised its duty of vigilance and its whistleblowing process. By the end of December 2021, approximately 500 people have registered to take the module.

Increased visibility of the Vigilance Plan and its guidelines on the Group's website

In response to requests from stakeholders, the Group has redesigned the section of its website dedicated to the duty of vigilance in order to provide a quick overview of the Group's Vigilance Plan, the associated Standards and the organisation in place.

These actions in 2021 are part of a year-round improvement process based on a regularly reviewed action plan.

3.9.6 Salient risks and risk prevention and mitigation measures

Global actions to prevent and mitigate risks related to the duty of vigilance

Risk prevention and mitigation measures are implemented by each relevant entity by way of applying cross-functional and sectorial policies and using common Group methodology for risk control as a basis. This methodology provides a description of risk treatment action plans and an evaluation of their efficacy. Industrial projects are subject to a risk analysis within the scope of application of the duty of vigilance, taking into account their nature, size, technical features and location. For this purpose, environmental and social impact assessments are based on the most demanding international standards (mostly IFC, WB, ADB⁽¹⁾).

In addition, issues relating to the environment, personal health and safety and human rights are systematically addressed as part of the assessment process for projects submitted to the Group Executive Committee's Commitments Committee (CECEG) and to the Committee that validates the Group's international development projects, the International Business Development Committee (CBDI), in the form of an identification of the risks associated with projects, to ensure that EDF's commitments in this area are not overlooked.

In addition to these structural mitigation measures, in 2021 the Group reinforced all of these measures based on its Duty-of-Care action plan, which is validated annually.

3.9.6.1 Human Rights and Fundamental Freedoms

3.9.6.1.1 Identifying salient risks

In the area of human rights and fundamental freedoms, the Group's ethics and compliance policy, which includes the duty of vigilance, has led the EDF group to implement an approach that results in the identification of key risks and associated mitigation measures, assessed according to the Group's activities and the countries where the Company and its subsidiaries operate.

Two categories of salient risks related to human rights and fundamental freedoms were identified:

- at the cross-cutting/global level: Risks related to harassment and discrimination;

- in the Group's international activities and projects, and in particular in geographical areas where local practices and situations, as well as legislation, are less demanding than the standards of OECD countries:

- risk of infringing on the rights of local communities:

These risks are linked to land issues and population displacements, or to the consequences of inadequate consultation of local communities, particularly indigenous ones,

- risk of infringement of workers' rights including risks related to decent working conditions at the Group's construction sites,

- risks related to the use of security forces for projects near conflict zones or security regimes.

3.9.6.1.2 Main prevention, mitigation and monitoring measures implemented

The implementation of human rights commitments is part of the deployment of the EDF's group Global Social Responsibility Agreement and of the Group's reference framework.

Preventing and dealing with any physical or psychological violence, intolerance or injustice in the workplace

Executives must take all necessary steps to prevent discrimination, harassment and physical and emotional abuse within their entities by striving to make employees aware of such risks. They must provide regular information about the Group whistleblowing system and take appropriate disciplinary action in the event of proven wrongdoing (see section 3.3.2.2.2 "Prevention of harassment and discrimination").

Combating sexism and all forms of discrimination

The EDF group is committed to developing concrete action to promote equality in the workplace and occupational and social integration for disabled people, combating sexism, violence and all forms of discrimination and developing support for parents. Among the many prevention actions described in section 3.3.3 "Equality, diversity and inclusion", the following major prevention and mitigation actions are carried out by the Group:

(1) IFC: International Finance Corporation. WB: World Bank. ADB: Asian Development Bank.

The EDF group and some of its subsidiaries have decided to apply for an international certification (GEEIS certification, renewable every four years) to assess the quality and relevance of their commitments to gender diversity and equality in the workplace. The certification was renewed in 2019 and, for the very first time, it was extended to all the Group's other fields of action in terms of diversity and inclusion. signing a GEEIS commitment charter, marking the Group's commitment to fighting stereotypes by deploying inclusive artificial intelligence without gender stereotypes in all business processes and environments.

The EDF group is committed to preventing and combating all forms of violence against women, in the workplace (sexism, harassment) and also domestic and family violence (support, guidance and job retention). The aim is to train and raise the awareness of managers and Human Resources personnel on the subjects of sexism and both moral and sexual harassment. Thus, with the help of the "ENERGIES mixité!" network, a new "sexism barometer" was set up in 2021, as part of the #StOpE multi-company initiative, of which EDF has been a member since the beginning. Operational implementation of such measures was carried out in partnership with the Company's medical and social teams and the "FIT, une femme un toit" association in particular. EDF has helped, assisted, supported and guided 102 employees who were victims of domestic violence over 2021.

The EDF group is committed to societal and professional integration of disabled people, with its 11th EDF agreement for equal rights and equal opportunity and the occupational integration of disabled people, entered into for the 2019-2022 period. The challenges change over time, such as digital matters ("digital accessibility at all stages of a project" e-learning course), which has been made a priority in the latest EDF disability agreements.

In order to prevent racial discrimination, the EDF group addressed the issue of its origins, and more specifically racism in the workplace, in a reference document for its managers and Human Resources Officers.

The EDF group has been committed to respecting religion in the workplace since 2008, and published a first set of guidelines in 2010 (updated in 2016), setting out guidelines for managers and HR officers to help them understand, analyse and act in compliance with the law.

EDF is also partner of *L'Autre Cercle* ⁽¹⁾ and Energyay associations ⁽²⁾, and has been a signatory of the LGBT charter since 2015. "Respect for different sexual orientations in the workplace" guidelines were published. EDF has also designed, in partnership with Energyay, a process to accompany and support transitioning employees within the Group. "Supporting transitioning employees at EDF – Respect for gender identity" guidelines were published.

A toll-free hotline for all employees of the Company, operating seven days a week, to allow employees to confide in someone and obtain advice on all harassment and discrimination issues; a support team (with internal and external skills) intervenes in investigations carried out when alerts are reported.

Preventing risks related to the Group's international activities and projects concerning violations of the rights of communities and workers and the use of security forces

The EDF group does not tolerate any infringement of human rights and fundamental freedoms, whether in its own activities or in those of its business relations when their activities are related to this relationship. All of the Group's commitments relating to human rights are described in section 3.3.2.3 "Human rights".

These commitments are implemented and based on the principles of action that apply to all Group operations such as:

1. screening, initial and ongoing, and management of environmental and societal impacts and risks, including those caused by operations under its business relationships;
2. organisation, throughout the world, of transparent, debated discussions and consultations for each new;
3. implementation and monitoring of these commitments and requirements is ensured under the Group's internal policies or agreements, in particular the CSR policy, the ethics and compliance policy, the purchasing policy, the health

and safety policy, the global CSR agreement, the Ethics Charter and the roll-out of the Vigilance Plan;

4. implementation of systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff).

Depending on the context of the project, a Human Rights Impact Assessment (HRIA) is conducted. It is based on the principles defined by the UN Guiding Principles on Business and Human Rights, as developed for example by the Danish Institute on Human Rights. These studies place the identification of impacted human rights at the centre of the analysis. They include an assessment of the state of human rights in the country as well as in the project area, a mapping of human rights-oriented stakeholders (listing "rights-holders" and "duty bearers"), an analysis of the project's impacts on these rights, and the development of mitigation measures. This type of study identifies the activities at risk according to their importance and sensitivity.

These studies are generally entrusted to national or international consultants specialising in the topic, and managed by EDF's internal CSR referents.

The conclusions of these studies are intended to be integrated into all development, construction, operation and end-of-life activities of the project, via an *ad hoc* management system (internal CSR policy, CSR contact and correspondents, contractual tools, audits and performance monitoring, reporting, etc.). They concern both affected communities and workers, the use of security forces, the whistleblowing system and the protection of whistleblowers, etc.

With regard to decent working conditions, external inspection and audit missions carried out on the sites of internationally financed projects (such as the Nachtigal project) enable the Group to detect breaches of the Group's commitments at each stage of the project's life.

At the level of the investment decision-making process, the consideration of human rights, through the Group's commitments framework, is integrated into each analysis of projects presented to the Group Executive Committee's Commitments Committee (CECEG), as well as to the Validation Committee for the Group's international development projects (CBDI). This takes the form of identifying the human rights risks associated with the projects, both for the activities developed and for the supplier relationships envisaged in the framework of the project. This identification will be facilitated by the construction of a grid, to be made available in 2021, which will allow for an analysis of projects that are consistent with the Group's *raison d'être*, CSR commitments, and guidelines, as well as with international standards. This grid takes into account environmental, health and safety, human rights, and ethical dimensions. All of the Group's human rights commitments and requirements are addressed, such as compliance with the ILO's fundamental conventions (on child labour, forced labour, freedom of association, discrimination), the rights of local communities, and health and safety conditions for the populations in question.

In operational terms, several projects are presented in section 3.3.2.3.4 "The implementation of human rights commitments" including:

- solar park development project in India:
During the development of EDF Renewables' solar park in Bap Tehsil, India, dialogue with local communities has enabled:
 - impact avoidance: A bypass road was built to avoid traffic disruption in the village,
 - impact mitigation: The plant was redesigned to preserve trees in accordance with local community requests,
 - impact compensation: Community investments have been made, such as the creation of a water basin in the village,
 - during the operational phase, dialogue and investment have continued: a social budget is devoted each year to programmes such as improving the sanitation of school buildings, and providing fans and sporting equipment to students and bicycles to the poorest villagers. The development of the project has also created employment opportunities for the people living in the area;

(1) *L'Autre Cercle* is an LGBT (Lesbian Gay Bi and Trans) association combatting discrimination in the workplace. www.autrecercle.org

(2) Energyay is the LGBT association for the electric and gas industries and their www.energyay.org

- hydropower project in Cameroon:

In addition to the EDF group's ethics alert system, projects are developing local complaint management systems to ensure that communities directly and indirectly impacted by the projects can raise their concerns and have them addressed. In line with international environmental and social standards, the Nachtigal Hydroelectric Project in Cameroon has had a mechanism in place since April 2015 to manage queries and complaints. They may be submitted in writing, orally or by proxy, in all local languages of the project area, as well as in the official languages of the country. Grievances are recorded in the project's query and complaint log. Once recorded, if the complaint relates to the project's commitments, activities, accountability or mandate, an investigation is initiated to determine the basis for the complaint. The project then proposes a treatment to the complainant. A mediation Committee can intervene if the complainant is not satisfied with the treatment applied. Finally, an appeals Committee can be called upon if the complainant is not satisfied with the solution proposed by the mediation Committee;

- in Myanmar:

EDF has been involved in projects since the beginning of the country's democratisation process in order to contribute to the electricity needs of the population, 40% of which cannot access it. The Group took part in a consortium dedicated to the development of the Shweli 3 hydroelectric project, as well as the development of Myanmar's first microgrid, without any government subsidies. On 1 February 2021, the Shweli 3 consortium decided to suspend the development of the project (including the activities of its subcontractors in the project), as it could no longer ensure respect for human rights;

- ongoing litigation in Mexico:

In 2018, an NGO referred the planned Gunaá Sicaru wind farm, managed by a subsidiary of EDF Renewables in Mexico, to the OECD's French national contact point (NCP). During the course of the OECD mediation process, the EDF group took part in two dialogue meetings with the plaintiffs and provided some responses to the concerns raised. The NCP closed the matter in spring 2020. The indigenous consultation process conducted by the Mexican authorities was suspended following the earthquake in 2018, and since 2020

due to the Covid-19 pandemic. The process is now about to enter the phase of deliberation by the indigenous community. Likewise, in December 2019, EDF responded to a formal notice for the same project sent pursuant to the French "Duty-of-Care" Act by that NGO and four individuals. EDF was then summoned on 13 October 2020 to appear before the Paris Court of Justice (*Tribunal judiciaire*) under the French "Duty-of-Care" Act. The applicants have asked the court to order changes to the Vigilance Plan produced by EDF to better address, in particular, the risks posed to the rights of indigenous communities and to order compensation for the damage caused by its failure to fulfil its duty of Vigilance. EDF has challenged these two applications. On 30 November 2021, the pre-trial judge rejected the non-profits' request for a precautionary suspension of the project as well as their request for an injunction against EDF's Vigilance Plan, due to the lack of a prior formal notice. The applicants appealed the judgment of the pre-trial judge. The Tribunal proposed mediation, which EDF accepted.

A website dedicated to the project is available in English and Spanish: <https://www.gunaá-sicaru.com/>.

3.9.6.2 Environment

3.9.6.2.1 Identifying salient risks

Group mapping of risks is performed based on the Group's line of industrial activities. Environmental risks are identified, assessed, and prioritised through the environmental management system (EMS) and the internal control system linked to Group risk management (see section 3.5.4.2 "Environmental management system (EMS)"). The identification of environmental risks is part of the Group's overall risk management system (see chapter 2 "Risk factors and control framework"). Each company draws up its own risk map, based on the Group's methodology, and defines action plans to reduce and limit its risks.

The 2021 risk mapping update reconfirmed the 2020 risk analysis and did not highlight new environmental risks. The main change concerns the observation of the effects of climate change with higher temperatures in summer and droughts increasing the pressure on both environments and some of the Group's business lines such as hydropower and nuclear activities.

The salient environmental risks are as follows:

Salient risks	Production activities most exposed
● Impact on the climate: climate change and GHG emissions.	Power and heat generation activities from fossil fuel
● The impacts of EDF's activities on the air, water and soil and the production of waste. ● Protection of biodiversity and services provided by ecosystems. ● The management of water resources.	Power generation activities (nuclear, thermal, hydropower, wind and solar power)

3.9.6.2.2 Main prevention, mitigation and monitoring measures implemented

To prevent and mitigate risks of serious harm to the environment, EDF relies on its Environmental Management System (SME) and its CSR policy to commit its entities to a precautionary approach and acting responsibly. The most significant risks are covered in risk control plans in conjunction with the Group's CSR policy.

In order to implement the environmental goals and related actions based on its CSR commitments and policy, the EDF group has set up a Group-wide environmental management mechanism using an Environmental Management System (EMS) (see section 3.5.4.2 "The environmental management system (EMS)"). This management system relies on EDF's governance bodies, which define the environmental guidelines and objectives to be achieved, in line with the expectations of external and internal stakeholders (see chapter 4 "Corporate governance" and section 3.5.2 "CSR governance bodies").

In accordance with the requirements of the CSR policy, each of the Group's entities ⁽¹⁾ is implementing an environmental management approach adapted to its own issues.

The EMS' operation is carried out by Group and business processes that allow for certification to stakeholders:

- controlling environmental risks and ensuring that the EDF group complies with regulations and its commitments: Each entity draws up and implements an environmental programme or action plan that takes into account the Group's commitments concerning it, its significant environmental aspects, and its regulatory obligations, considering its risks and opportunities;
- improving the efficiency of its organisations in a way that is appropriate to the issues at stake: Each entity is responsible for its own internal control, internal and external audits of its EMS, and interfaces with the Group EMS;
- mandatory non-financial reporting of the environmental activities of the entities: Each entity collects and communicates the required environmental information to the SDD.

The Group's EMS is certified by an external body, AFNOR, according to the international standard ISO 14001. All industrial sites are covered by an EMS, 87% of which are certified.

(1) Companies with industrial, operational (installation, operation, maintenance), engineering, distribution and marketing activities relating to goods and services

In 2021, the results of the certification audits conducted by AFNOR highlight the quality of the leadership, strategies and policies built in line with local issues and the needs and expectations of stakeholders. The auditors emphasize the Group's increased ambitions, particularly with regard to issues related to CO₂ and biodiversity, and note the progress made in controlling the environmental impacts of its businesses. These audits identified 14 minor non-conformities. Progress is still expected in terms of taking better account of the life-cycle perspective in the implementation of projects and practices (moving from control to avoidance), developing performance indicators rather than monitoring indicators, harmonising practices related to the control of suppliers and subcontractors, and strengthening risk management and the ability of sites to react at the level of certain subsidiaries.

Prevent impacts on the climate

The EDF group recognises the urgency of acting against climate change. It has aligned its ambitions with the Paris Climate Agreement, whose goal is to limit global warming to well below 2°C, preferably 1.5°C, relative to pre-industrial levels. The Group's CO₂ emission reduction trajectory has been validated by Science Based Targets. The EDF group has set up a dedicated governance structure in line with the best practices recommended by the Task Force on Climate-Related Financial Disclosure (TCFD). The Group's climate strategy, aligned with CAP 2030, is accompanied by four CSR commitments: An ambitious carbon trajectory, carbon-offsetting solutions, adaptation to climate change, and the development of electricity uses and innovative energy services, which form the EDF group's climate transition plan (see section 3.1.1 "Group carbon trajectory").

Group carbon trajectory

Carbon neutrality by 2050

The EDF group was one of the first businesses, way back in 2018, to set itself the goal of contributing to achieving carbon neutrality by 2050. This commitment was strengthened and clarified in March 2020. In practice, it involves:

- direct emissions: reducing the Group's direct greenhouse gas emissions to zero or virtually zero by 2050;
- indirect emissions: reducing indirect greenhouse gas emissions as much as possible within the framework of national policies;
- residual emissions: implementing negative-emission projects to offset the Group's residual emissions by 2050.

This covers emissions of all greenhouse gases for all Scopes (1, 2 and 3) and for all operations of the Group across the globe.

2030 targets recognised by the SBTi

In 2020, the EDF group set new targets to cut its greenhouse gas emissions by 2030, covering both its direct emissions (Scope 1) and its indirect emissions (Scopes 2 and 3). On 7 December 2020, these goals were confirmed to be in line with the "Well Below 2°C" trajectory by the Science Based Targets ⁽¹⁾ initiative, based on its recently-published methodology specially developed for the electrical sector ⁽²⁾. As a result, the EDF group is committed to the following 2030 goals:

- 50% reduction, on 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (i.e. not generated by it) to be sold to end customers;
- 28% reduction, from 2019 levels of emissions from combustion of gas sold to end customers (Scope 3).

In keeping with these targets validated by SBTi, the EDF group has decided to set the following additional 2030 targets: 25MtCO₂ for Scope 1 emissions in 2030 and a 28% reduction on 2019 levels of the emissions of the entire Scope 3 by 2030.

In order to reach these targets, a greenhouse gas emissions reduction trajectory has been developed for the three Scopes of the EDF group. This trajectory contains a 2023 milestone, with the following interim targets:

- 28 to 30MtCO₂e for the Group's Scope 1 emissions by 2023 (this range factors in the uncertain post-health crisis scenarios);
- 23% reduction, on 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (i.e. not generated by it) to be sold to end customers;
- 10% reduction, on 2019 levels for emissions associated with the combustion of gas sold to end customers and an 8% reduction for the entire Scope 3 of the Group.

These 2023 and 2030 targets for the Group's direct and indirect emissions were implemented through emission trajectories for all the Group's business lines and entities (see section 3.1.3 « EDF Climate Governance »).

Main measures implemented to achieve this ambitious goal:

By 2030, and in line with the CAP 2030 projects, the main actions enabling the EDF group to achieve these emission targets covering all three Scopes are as follows ⁽³⁾:



(1) Initiative launched in the wake of the Paris Agreement in 2015 by the following four organisations: CDP, UN Global Compact, World Resources Institute and World Wild Fund.

(2) "Setting 1.5°C aligned science based targets – quick start guide for electric utilities", CDP, June 2020.

(3) Note that Enedis is also experimenting with Local Zero Emission Generators (GE ZE), an alternative solution to conventional generators. The diesel engine is replaced by a battery or a hydrogen fuel cell, the use of which locally emits neither noise, nor CO₂, nor pollutants. These GE ZEs will supply customers during outages for works on the public electricity distribution network, while reducing the impact on the environment and maintaining the collection of local renewable energies connected to the network. They will contribute to the zero carbon objective.

Roadmap for reducing the Group's direct GHG emissions

THE GROUP'S DIRECT GHG EMISSIONS REDUCTION ROADMAP			
Topic	Action	URD Sections	Impact on the low-carbon trajectory *
Coal-fired closures	No more coal power generation by 2030.	3.1.1.3.1	~-60%
Replacement of fuel oil in island regions	Replacement of fuel oil in existing fossil-fuel fired facilities with lower carbon fuels (liquid biomass and possibly gas) as part of their Multi-Year Energy Programme (<i>Programmation pluriannuelle de l'énergie</i> , PPE).	3.1.1.3.2	~-15%
Greener heating networks	Greening of Group-managed heat networks: biomass, waste heat recovery, geothermal and ocean thermal energy conversion	3.1.1.3.3	~-10-15%
Limiting fossil fuel emissions	Application of strict criteria to the development of any new combined cycle gas turbine project by the Group, and reducing the use of existing resources following the increase in renewables.	3.1.1.3.5	~-5-10%
Emissions of SF ₆ and HFCs	Measures to manage and reduce uncontained SF ₆ emissions from electrical transmission and distribution systems as well as uncontained HFC emissions from air-conditioning units	3.1.1.3.6	< 1%
Consumption by the Group's facilities	Managing Group facility energy use	3.1.1.3.7	< 1%
The Group's vehicle fleet	Fully electrifying the EDF group's light vehicle fleet in accordance with the EV100 commitment	3.1.1.3.8	< 1%

* Contribution to the 25MtCO₂e decrease between 2017 and 2030 (50% reduction in Scope 1 emissions).

By 2030, and in line with the CAP 2030 projects, the main actions enabling the EDF group to achieve these carbon-free power generation targets are as follows:

Roadmap for increasing the Group's carbon-free output

Subjects	Equities	URD Sections
Grand carénage	Continued operation of France's nuclear power plants beyond 40 years thanks to the Grand Carénage programme	3.1.1.4.2
EPR	Commissioning of 5 EPRs by 2030 (FA3, HPC and TSH) and commitment to new EPR2s and an SMR	3.1.1.4.3
Development of renewables	Doubling of installed renewable energy capacity, including hydro, between 2015 and 2030, to reach 60GW net in 2030	3.1.1.4.4
Flexibility and management of intermittency	Development of electrical storage to improve system flexibility and management of the intermittency of non-controllable renewable energies	3.1.4.1.5

Reduction of the Group's indirect GHG emissions

Roadmap for reducing the Group's indirect GHG emissions

Subject	Action	URD Section	Impact on the carbon-free trajectory *
Emissions from electricity purchases for resale to end customers	Greening (use of renewable energy PPA's) of purchases of electricity for sale to end customers in countries where electricity has a high carbon intensity	3.1.4.2.3	~15%
Combustion emissions from gas sold to end customers (use of products sold)	Helping gas customers shift to energy savings, energy efficiency, and lower emissions through the Group's products and services, expertise and subsidiaries, in particular by promoting alternative solutions to fossil fuels	3.1.4.	~ 60%
Employee travel	Reducing emissions from employee travel, particularly in view of the roll-out of EDF group's new travel policy	3.2.4.3.3	< 1%
Investments	Divestment of non-controlled carbon assets		~25%

* Contributing to the achievement of the 28% reduction target for Scope 3 emissions between 2019 and 2030.

Prevent the impacts of EDF's activities on the air, water, soil, biodiversity and the production of waste

Group commitment to biodiversity

The EDF group has a long-standing commitment to minimising the impact of its activities on biodiversity through a dedicated policy. Today, this ambition is reflected in its commitment to two mechanisms (see section 3.2.1.1 "EDF group commitment and policy").

Biodiversity commitments 2020-2022	<p>In France: <i>Entreprises Engagées pour la Nature</i> (EEN) initiative led by the French Office for Biodiversity (OFB).</p> <p>Internationally: act4nature International initiative started by the French Association of Companies for the Environment (EpE).</p>	<ul style="list-style-type: none"> ● SMART Commitments (Specific Measurable Attainable Relevant and Time-bound). ● Commitment subjects: Reducing the contribution to IPBES pressures; strengthening and sharing scientific knowledge; awareness and governance.
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These commitments cover all of the Group's business lines, in all geographical areas and within the scope of operational activities that present biodiversity challenges.

Most pressures on biodiversity are strictly regulated. Most of these pressures are strictly regulated. The IPBES report in 2019 identifies five major pressure factors: change of land and sea use, overexploitation of resources, climate change, pollution and invasive alien species. EDF has developed its action programme to limit its impact on each of these factors (see section 3.2.1.3 "Group action"):

- reducing the contribution of its activities to these major pressures by integrating biodiversity issues throughout the engineering and operational phases, and as early as the product design phase, with a view to giving priority to avoidance and reduction and by reducing its footprint on natural resources (see section 3.2.1.3.1 "Reducing the activities' contribution to major pressure factors");
- recreating spaces and conditions that promote biodiversity (see section 3.2.1.3.2 "Recreating spaces and conditions conducive to biodiversity");
- preserving and restoring environments by managing the natural areas included in the Group's land holdings and by implementing positive ecological management (see section 3.2.1.3.3 "Improving and sharing knowledge");

The Group's commitment to protect and manage the natural resources impacted by its activities through responsible land management and integrated and sustainable water management:

The Group attaches great importance to land sobriety and wants to act responsibly with regard to the land it holds or uses under concession. In this context, the Group's entities are working to limit the artificialisation and sealing of soil, and to optimise and enhance the value of land in compliance with regulations, in particular by implementing innovative solutions to promote the multi-purpose use of land. The Group entities are committed to preventing the risks of pollution (see section 3.2.2 "Responsible land management").

As a manager of dams and reservoirs, and a major user of water resources, the EDF group works towards integrated and responsible water management. Water reservoirs held by EDF's large dams in mainland France enable the storage of over 7 billion cubic metres of water, representing 70% of all water artificially stored in France. The Group is committed to protecting and managing water in an integrated and sustainable manner, both in terms of quantity (see section 3.2.3.1 "Sustainability of water use") and quality, as well as sharing water within the territories in which it operates by fully taking into account the local water situation (multi-use) under climate constraints (see section 3.2.3.2 "Integrated and shared water management").

Regarding the impact on air quality, see section 3.3.1.5.2 "Improving air quality by supporting public initiatives in this area".

Group commitments concerning waste and circular economy

Optimising the use of the natural resources consumed by the Group's value chain is an essential component of the Group's corporate responsibility. The Group is committed to promoting a circular economy approach; avoiding the production of conventional waste ⁽¹⁾ and promoting the re-use, recycling and recovery of products/materials throughout the value chain; using this waste by reallocating uses

internally within the Company during new developments, or in approved recovery channels; and assuming its responsibilities with regard to radioactive waste (see section 3.2.4 "Waste and the circular economy").

3.9.6.3 Health & Safety

3.9.6.3.1 Identifying salient risks

The mapping of risks to the health and safety of employees and service providers is carried out by the Health and Safety Division, which is responsible for health and safety management, on the basis of risk analyses carried out by the Group's various entities and subsidiaries, in line with the Group's risk mapping system (see section 2.2.4- 4C "Health and safety risks in the workplace (employees and service providers)").

The salient risks are:

- occupational accidents, occupational illnesses (asbestos, chemicals, ionising radiation and noise);
- musculoskeletal diseases and anxiety-depressive disorders, including stress.

Salient risks are related to the operation of industrial facilities (see section 2.2.4 – Risk 4C – "Occupational health or safety violations (employees and service providers)").

The risks concerning consumers and local residents are linked to the operation of the industrial facilities (see sections 2.2.4- 4E "Hydraulic safety violations", 2.2.4- 4G "Industrial safety violations and impact on environmental assets and biodiversity", 2.2.5-5C "Nuclear safety violations during operation resulting from nuclear civil liability"). Those risks mainly concern:

- the safety of nuclear and hydraulic facilities;
- air quality, noise and acoustic pollution.

3.9.6.3.2 Main prevention, mitigation and monitoring measures implemented

Deployment of the Health and Safety Policy

To prevent and mitigate risks of serious harm to the health and safety of its employees and subcontractors working on its sites, the Group relies on a Health and Safety policy adopted in 2018 and updated in 2021. This Group policy applies to all the companies controlled by the EDF group, in all the countries in which EDF operates, and concerns both its employees and its subcontractors.

The priorities of the policy are primarily to eradicate serious and fatal accidents, and secondarily to reduce the number of accidents and to fight against absenteeism. The policy aims to anchor throughout the Group the foundation formed by the Group's 10 key rules and the BEST ("Building Excellence in Safety Together") health and safety management reference framework, enhanced with new practices that have proved their worth in several entities. This policy is accompanied by a roadmap that mobilises the Group's entities to achieve the objectives set. The Executive Committee reviews health and safety figures and monitors action plans regularly (see section 3.3.1.3.1 "Health and safety policy").

10 key rules were identified following an analysis of fatal accidents in the EDF group over the last 30 years. The review organised in February 2021 by the Health and

(1) With regard to food waste, EDF does not consider this information as being material. With respect to its materiality analysis, EDF does not consider information related to the amendments to Article L. 225-102-01 of the French Commercial Code on food shortages, respect for animal welfare and a responsible, fair and sustainable food supply as being material.

Safety Strategic Committee showed that 100% of the Group's scope had carried out a self-assessment of its health and safety management system according to the BEST reference framework.

When safety conditions related to key rules are not met, a "NoGo" must be activated to correct the situation before starting. In the same way, when unforeseen circumstances no longer allow the safety rules to be respected, a "safety STOP" should be marked. In order to ensure the continuous improvement loop, and to maintain risk awareness, High-Potential Events (HPE) are collected, analysed, and shared throughout the Group. Nearly 70% of these HPEs are near-misses or dangerous situations. Particular emphasis is placed on those related to the Group's 10 key rules. In 2021, the safety criterion of EDF's profit-sharing agreement focused on reducing the number of injuries from HPEs and developing analyses of these events.

The updated policy reinforces the progress made with our providers. Four action sheets or "assets" have been developed for this purpose. (see section 3.3.1.3.3 "Occupational accidents").

The Health and Safety Policy also sets a framework for progress on the subject of health. Progress is monitored through the evolution of the sickness absence indicator.

EDF is committed to improving the physical and psychological health of its employees at work: Both on-site and remotely. Making progress in this field requires the long-term involvement of medical teams, social workers, social partners, managers, prevention specialists and human resources managers in a multidisciplinary approach. This approach is illustrated by the social agreements that include a large part of health, such as the TAMA (*Travailler Autrement, Manager Autrement*) agreement, both for new forms of work and through the lessons learned from the health crisis. Managers are invited to be attentive to weak signals linked to isolation and remoteness for teams working remotely. Medical teams are encouraged to participate in vaccination campaigns (Covid, flu) launched by public authorities to protect our employees who wish to do so.

Awareness-raising activities are regularly organised to continue the prevention of cardiovascular risk, a major cause of death by heart attack, as well as the prevention of addictions, including the implementation of drug testing.

The operational departments' risk assessments take into account musculoskeletal disorders and exposure to noise, hazardous chemicals, ionising and electromagnetic radiation, and biological agents, depending on the nature of their activities, and they implement local measures to prevent occupational illness.

The prevention of psycho-social and socio-organisational risks is based on the use of the employee perception survey (MyEDF) read at all levels of the organisation according to the Gollac grid, providing a precise risk assessment highlighting the strengths of the organisation and team, as well as its weaknesses. This makes it possible to establish local action plans adapted to the situations encountered.

A range of services covering different fields: diagnostic assistance, training and also the management of complex situations or even post-traumatic stress situations is made available to the entities to accompany them.

On the other hand, the development of trust and accountability in the work teams gives them the opportunity to discuss the subject of their safety and health.

The EDF group has drawn up a guide for its entities so that they can develop the retention and return to work of employees who may have experienced health problems. This approach, which is based on the implementation of pre-return visits with medical teams and the holding of return interviews between employees and managers, is aimed at preventing the risk of losing a sense of belonging at work.

Safety of nuclear and hydropower facilities

The operational safety of nuclear facilities is taken into consideration from the initial design stage, and is regularly monitored, together with the implementation of an employee motivation policy and large-scale investment programmes. The Group's nuclear safety policy is incorporated into training for both EDF employees and subcontractors. Nuclear safety is subject to internal controls (annual reviews, internal control plans and nuclear inspection audits in France) and external controls (peer reviews between corporate members of WANO and OSART audits conducted by experts from the International Atomic Energy Agency (IAEA)). In France, the safety of nuclear facilities is controlled by the ASN. In the UK, the Office for Nuclear

regulation (ONR) is the independent safety regulator in the civil nuclear sector. It monitors compliance with safety rules, including for the transport of radioactive materials. The "EDF group Nuclear Safety" policy was redefined in 2021. For developments in nuclear safety, see in particular sections 1.4.1.2.2 "Environment, nuclear safety, radiation protection", 1.4.5.1.2 "Activities of EDF Energy" and 2.2.5 "Specific risks related to nuclear activities". Hydropower safety aims to limit risks of structural failure, risks relating to the operation of facilities during times of flooding, as well as watercourse flow variations during operation. The hydropower safety policy aims for a high level of safety and continuous improvement. For developments related to hydraulic safety, refer to section 1.4.1.3.1.3 "Hydropower safety".

Air quality, noise and light pollution

The Group is fulfilling its commitments by closing coal-fired power plants (see section 3.1.1.3.1 "Coal-fired power generation, currently representing 0.7% of the total power generation, to be reduced to 0 by 2030"). In parallel, the EDF group is continuing its process of modernising and improving the environmental performance of its thermal fleet, until it meets European best available techniques requirements. Regarding island systems, actions are taken to reduce NO_x on a case-by-case basis: optimising exhaust gas processing, or reducing the number of hours of operation for certain turbines. In Brazil, the emission levels of the Combined Gas Cycle power plant in Norte Fluminense are below its NO_x limit of 25 ppm, mainly due to the high level of equipment maintenance. Using its future exhaust gas processing system, the Edison CGC project in Italy, Marghera Levante (780MW with 63% efficiency), which should be commissioned in 2022, will emit a quantity of NO_x equivalent to 30% of the current facility's limit. EDF has developed historical and unique expertise in this area and joins forces with partners to propose solutions to improve air quality (see section 3.3.1.5.2 "Improving air quality by supporting public initiatives in this area" and 3.3.1.5.3 "improving the indoor air quality of buildings").

Noise and light pollution

With regard to noise pollution in particular, acoustic studies are carried out at the design stage and are included in the environmental impact studies. Acoustic measurement campaigns are run in the area surrounding nuclear power plants, at a rate of two sites per year.

EDF Renewables performs acoustic studies from the initial development phase of the wind turbines and the noise levels of turbines form part of the selection criteria for machinery. The same level of attention is given to noise pollution in the Group's international and French subsidiaries.

With regard to the action taken to prevent light pollution, Citelum has implemented a system of sensors to adjust the intensity of lighting on the road network based on traffic density and driving speeds, which also improves car safety.

3.9.6.4 Suppliers and subcontractors

3.9.6.4.1 Identifying salient risks

The salient risks relating to the duty of vigilance concerning suppliers are identified on the basis of a risk map covering all of EDF's purchasing categories within the scope of purchases covered by the Group Purchasing Department (DAG). The methodology factors in all the environment, working relations and working conditions, human rights, ethics and compliance aspects, and ultimately allows it to determine the level of residual risk and identify the action to be taken with the supplier (see section 3.4.2.3 "Contribution to development through purchasing").

This risk analysis covers approximately 11,000 suppliers who have a contract with EDF. More than 97% of its purchases are made in France, and 98.5% in Europe.

Risks are assessed per purchasing categories. The evaluation and prioritisation of risks is based on the activities of suppliers, and their geographical location is also a major factor in the assessment of risk.

Major risks have been identified in the various sectors of purchasing, mainly concerning safety, ethics, waste, the use of rare materials and human rights. 15% of the purchasing segments analysed are classified as having a major residual risk, 50% are classified as having a material residual risk and 35% are classified as having a low residual risk.

Among the categories of purchases analysed and classified as major residual risks, the most important categories in terms of amount are the following:

- IT and electronic services and materials concerning human rights risks in relation to the supply chain;
- work and maintenance services in industrial environments concerning the increased security risk;
- deconstruction/depollution services concerning the environmental risk (waste production).

Some smaller categories are also included, such as airline ticketing.

In 2021, the human rights risks related to the supply chain have been specified in the areas of textile purchasing, IT equipment, control/command and solar panels concerning the risks of forced labour.

3.9.6.4.2 Main prevention, mitigation and monitoring measures implemented

The Group's new supplier policy, adopted in October 2021, defines the shared principles that the senior managers of the various entities are responsible for implementing with regard to purchasing and contract management. It emphasises the Group's CSR requirements and sets out the Group's *raison d'être* and its commitments in terms of responsible purchasing, the use of companies employing disabled workers only, local presence, and supplier awareness. The Group's commitments and obligations to responsible purchasing are integrated into every stage of the purchasing process, including upstream, during the qualification of suppliers, as well as during the preparation of calls for tender.

Even when these mechanisms are not directly applied, the Group major department or subsidiaries use equivalent methods of commitment adapted to their specific industrial or geographic characteristics; they are detailed in section 3.4.2.3.2 "Sustainable and balanced relationships".

EDF's Group Purchasing Department takes CSR into account in its relations with its suppliers according to the principles of supplier commitments through:

- all bidders signing a compliance commitment (mandatory to participate in the tender); this commitment covers the following issues: corruption, money laundering, financing of terrorism, absence of conflicts of interest. Bidders undertake to comply with the requirements of the Duty-of-Care Act: To respect human rights and fundamental freedoms, to guarantee the health and safety of people at work, to protect the environment, and to comply with the social and environmental regulations applicable to its activities;
- the integration of CSR criteria in contracts, by including specific criteria in the specifications according to the risks identified for each type of contract, or to meet the Group's CSR ambitions, such as the use of companies employing disabled workers only, local presence, or the integration of SMEs in the supplier panel;
- the integration of a sustainable development clause covering environmental, human rights and health and safety commitments in the General Purchasing Conditions;
- always including a Sustainable Development Charter between EDF and its suppliers as an integral part of the contracts;
- development of Productivity Partnerships;
- monitoring supplier compliance with these principles (see section 3.4.2.3.3)

Supplier assessment

The monitoring of suppliers, which includes a CSR component, begins with an internal evaluation of the services they provide. Supplier monitoring is mainly carried out by the Division or Contract Management, which uses Performance Assessment Sheets and Supplier Assessment Sheets.

Document audits are completed by the supplier, and are always (and independently) checked by the AFNOR teams. The questionnaires cover all areas of CSR; some are tailored to take into account category-specific issues. In 2021, it is mainly the suppliers in the risk categories (mobility and service providers working on

nuclear sites) that have been questioned. It should be noted that suppliers were also interviewed at the request of Purchasing Category Managers (accommodations).

At the end of 2021, a special human rights questionnaire was developed with AFNOR and sent to all suppliers with a contract in force, in the purchasing categories mentioned in international reports on the non-compliance with human rights or expressly mentioned by these reports, in the fields of textiles, computer equipment, control devices, and IT. Regarding the purchase of solar panels, in 2021 EDF Renewables sent out a human rights questionnaire to its suppliers.

At the end of 2021, 3,000 suppliers were questioned using the Acesa platform, and nearly a thousand of them have been controlled. The assessments were "satisfactory" for 63% of the audited questionnaires. The suppliers to be assessed are mainly selected based on the supplier risk mapping and the needs of buyers and business lines, on the contracts in progress.

This tool makes it possible for purchasers and suppliers to share an approach of continuous improvement in Corporate Social and Environmental Responsibility.

These on-site audits cover all CSR aspects: environmental, social and ethical policies, commitments and practices. on-site supplier audits are conducted by external, independent providers. CSR audits are triggered on the basis of feedback on contract performance conditions, compiled by the Purchasing Category Managers in particular, and on supplier risk mapping.

These audits are designed to test the CSR commitments adopted and are conducted on site (head office or production site of the supplier or place of work at an EDF site).

In 2021, 52 on-site CSR audits were conducted, 67% of which were outside France. 60% had a "Satisfactory" rating, 34% an "Acceptable with Comment" rating and 6% an "Insufficient" rating, requiring supplier action plans. A large proportion of CSR audits were carried out as part of a call for tenders for the "workwear" category. Audited production sites that received "Insufficient" or "Unsatisfactory" overall ratings caused the applicant supplier to be excluded from the supply chain. The results of this specific campaign, carried out on sites mainly outside France, are quite heterogeneous. Best practices have been noted at several sites (voluntary certifications and labels, proactive employment/remuneration policy, good management of chemicals). However, the differences in compensation, working hours, and safety (lack of periodic verification of collective protection, inadequate PPE), including in Europe. Among the 2021 CSR audits, all of the Insufficient results relate to the textile category.

With regard to the audits carried out on other purchasing categories, the overall results show, in line with previous years, good management of operational risks in the area of safety and the environment, based in particular on critical certifications and a strong safety culture. Good practices and opportunities have been identified such as: Internal innovation challenge, improvement research in the fields of eco-design, and greenhouse gas reduction. Areas for improvement still relate to incorporating CSR criteria in the supply chains of the winning bidders themselves. Existing CSR policies and commitments are encountering trouble being adapted to the sites for implementation (training, responsible purchasing, etc.). EDF's requirements on these matters are still to be promoted in the audited companies.

Coal and uranium procurement

In the coal supply chain, EDF no longer has direct contractual relations with mining companies or the market, but remains an active supporter of Bettercoal ⁽¹⁾ – the initiative for responsible coal purchases of which EDF is a founding member. The operational approach is based on a code that sets out ethical, corporate and environmental principles and provisions relevant to mining companies. It takes into account general performance requirements, including management systems, and also performance requirements concerning: ethics and transparency, human and labour rights (such as the prevention of forced and child labour, the right to a decent wage), social issues, including health and safety, and the environment. JERA Trading, its supplier, is now a member of Bettercoal, thus increasing the initiative's influence in Asia. In 2021, 92% of the coal supplied by JERAT to the EDF group will come from Bettercoal operators, and 8% from North American operators.

(1) bettercoal.org/

Concerning uranium supply chain, clauses authorising the completion of audits and setting out EDF's requirements in terms of enforcement of the fundamental rights and main international standards by suppliers and subcontractors have been included in the contracts. The uranium mine audit system used by EDF since 2011 ensures that the ore is extracted and processed in good environmental, social and societal conditions (see section 3.4.2.3.3 "Coal and uranium supply chain").

This audit system ensures that the ore is extracted and processed in good environmental, social and societal conditions. The method and the evaluation grid were developed with WNA (World Nuclear Association). This method is based on international standards, including "The World Nuclear Association's Sustaining Global Best Practices in Uranium Mining and Processing: Principles for Managing Radiation, Health and Safety, and Waste and the Environment", "The Global Reporting Initiative's (GRI)", "Sustainability reporting Guidelines & Mining and Metals Sector Supplement" and "The International Council on Mining and Metals' (ICMM) Sustainable Development Framework". The issue of safety, which is

particularly critical in mining (process safety), consists of a standardised framework recognised by all those involved in the sector. It takes into account the issues of human rights and fundamental freedoms (human rights, whistleblowing register, rights of indigenous peoples and radiation protection) and also the environment, in the broadest sense of that term (water, diversity, waste, site clean-up after extraction). Every year, EDF carries out mine audits through internal means (2 audits per year). The reports present the main strengths, recommendations and suggestions. The most common ones relate to health and safety (wearing personal protective equipment such as gloves or goggles), the display of safety instructions, monitoring accidents, performing radiological controls, monitoring environmental footprint (specifically carbon emissions) and proposals relating to well-being in the workplace. Audit recommendations are included in the continuous improvement plans and action plans. The 2021 audit programme, after being suspended in 2020 due to the global pandemic, resumed in August 2021 in remote mode and in October 2021 with the implementation of an on-site audit.

3.9.7 Group whistleblowing system

Scope

The EDF group whistleblowing system consists of a single reporting system for all wrongdoing reported under the Sapin II Act and the "Duty-of-Care" Act as well as wrongdoing reported by employees alleging harassment and discrimination.

This Group system benefits all Group entities, except for Enedis and RTE ⁽¹⁾, which have their own whistleblowing system.

Whistleblowing system

Whistleblowers may choose to use the Group whistleblowing system or the other channels available to them (manager, human resources, staff representatives, local ethics and compliance officers, mediators etc.).

The Group whistleblowing system, managed from an independent platform, may be accessed at any time via the EDF group website (<https://www.bkms-system.com/bkwebanon/report/clientInfo?cin=5edf6&c=-1&language=fr>), in French, English, Italian, Portuguese, Dutch and Mandarin, in France or abroad. The whistleblower can report in the language of their choice.

In order to comply with the requirements of the Sapin II and Duty-of-Care Acts, EDF has taken appropriate measures to guarantee the strict confidentiality of the

personal data of whistleblowers, of those implicated or cited, and of the facts reported, in particular by setting up a whistleblowing system hosted on a dedicated, secure external platform.

The EDF group ethics and compliance whistleblowing system allows Group employees and external staff (temporary workers, service provider employees, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.), as well as third parties, to report wrongdoing of which the EDF group or its staff are the culprits or victims.

See section 3.3.2.4 for details on how the whistleblowing system works.

Whistleblowing alerts in 2021

In 2021, within the Group (via the Group system or any other channel), 247 admissible alerts were recorded (including 39 in the Group alert system). 157 were about incidents occurring in France and 90.95 related to EDF and 152 to Group subsidiaries. 47% of cases reported relates to harassment/discrimination. In 2021, 71% of the alerts handled were sufficiently detailed to result in corrective action or disciplinary sanctions (in particular, 14 dismissals following proven acts of harassment-discrimination). In 33% of the cases where the facts were not proven, action to improve the relevant processes was still taken.

3.9.8 Monitoring procedure

The Group's vigilance mission is committed to developing the Vigilance Plan's monitoring system as part of a continuous improvement process. This system is based on the operational action plan, which is monitored by the Steering Committee. This action plan is regularly presented to the CDRS (see section 3.9.2 "Governance, steering and stakeholder involvement").

The assessment of the system is included in the annual internal control plan, and a dedicated risk sheet on due diligence has been drawn up and implemented. Annual reports from all Group entities are analysed to identify areas of concern within the

Group. Following the analysis in 2021, an essential requirement for progress was decided by COMEX to improve the deployment of the duty of vigilance in the Group, which led to the creation of the dedicated e-learning module (see section 3.9.5 "Major improvements of the EDF group's Vigilance Plan in 2021").

The Indicators, which enable the effectiveness of the Group's prevention and mitigation measures to be assessed, are summarised and available on the Group's website: <https://www.edf.fr/groupe-edf/agir-en-entreprise-responsable/rapports-et-indicateurs/indicateurs-extra-financiers#indicateurs-es>.

(1) Distribution network operator Enedis and transmission operator RTE are managed independently.



95.2%

INDIVIDUAL
ATTENDANCE RATE OF
DIRECTORS IN 2021

6.6

EQUITY RATIO/
AVERAGE
REMUNERATION ⁽²⁾

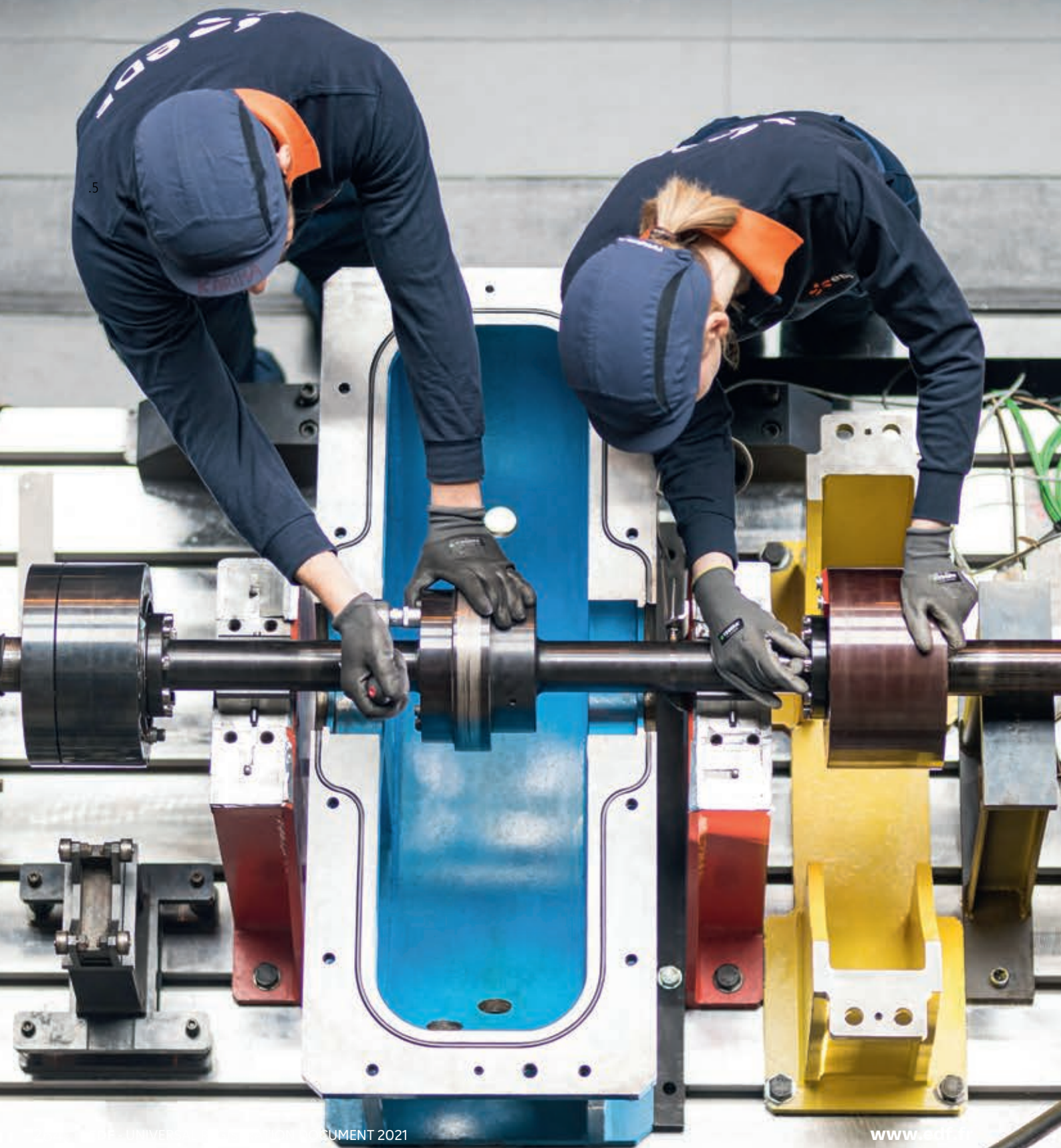
69%

EMPLOYEE
ENGAGEMENT
INDEX ⁽³⁾

22,000

EMPLOYEES
PARTICIPATING IN THE
CLIMATE COLLAGES

- (1) The "Fresque du Climat" ("the Climate Collage") Association was created at the end of 2018 by Cédric Ringenbach. Its aim is to accelerate the rapid dissemination of the workshops and the "Climate Collage" educational tool to raise awareness and understanding among all audiences of the threat posed by climate change.
- (2) Ratio between the level of remuneration of the Chairman and Chief Executive Officer and the average remuneration of EDF employees (see section 4.6.1.1 "Remuneration policy applicable to the Chairman and Chief Executive Officer").
- (3) "My EDF group" internal engagement survey (see section 3.3 "Well-being and solidarity").





4 CORPORATE GOVERNANCE

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4.1 Corporate Governance Code

EDF adheres to the AFEP-MEDEF Code, which is the Corporate Governance Code to which the Company refers, in accordance with Article L. 22-10-10 of the French Commercial Code, subject to the specific laws and regulations applicable to EDF.

These specific laws and regulations, in accordance with EDF's status as a French State-owned company and in particular the application to the Company of Order no. 2014-948 of 20 August 2014 and its implementing texts, and Decree no. 53-707 of 9 August 1953, are detailed in this Universal Registration Document and relate specifically to:

- the composition of the Board of Directors (see section 4.2.1 "Members of the Board of Directors");

- the terms and conditions for the appointment of the Chairman and Chief Executive Officer of EDF and the method of exercising Executive Management (see section 4.2.2.2 "Appointment and powers of the Chairman and Chief Executive Officer" and section 4.2.2.4 "Balance of powers"); and
- the terms and conditions for setting the remuneration of the Chairman and Chief Executive Officer (see section 4.6.1.1 "Remuneration policy applicable to the Chairman and Chief Executive Officer").

In addition to the aforementioned specific laws and regulations, the table below sets out the AFEP-MEDEF Code recommendations that are not applied by the Company and the related explanations:

AFEP-MEDEF Code recommendation	Company's position	Explanation	Section of the Universal Registration Document
Holding of Company shares by Directors Recommendation no. 20: <i>"[...] the Director should personally be a shareholder and, by virtue of the provisions in the by-laws or the internal regulations, hold a minimum number of shares that is significant in relation to the compensation awarded to them. If he or she does not hold these shares when assuming office, he or she should use his or her compensation to acquire them."</i>	The Company's articles of association and the Board's internal Rules of Procedure do not require Directors to hold a minimum number of shares significant in relation to the remuneration they receive for their term of office.	In accordance with the law of 26 July 1983, the Directors representing the employees receive no remuneration for their term of office. Furthermore, the remuneration received for their term of office by Directors recommended by the French State, who are civil servants, is paid to the French State budget. Directors appointed on the recommendation of the French State who are not civil servants may only receive 85% of the remuneration due to them, the remainder being paid to the French State budget. Finally, the Chairman of the Board of Directors does not receive any remuneration for his or her term of office as Director. Given the wide range of situations, the Board has not established a rule on the holding of the Company's shares. Furthermore, each Director must act in the Company's best interests, irrespective of the number of Company shares they hold in their personal capacity.	See sections 4.6.3 ("Total remuneration of Directors") and 4.5 ("Shareholding by corporate officers and trading in EDF securities by corporate officers and executives").
Requirement for corporate officers to hold shares Recommendation no. 23: <i>"The Board of Directors defines a minimum number of registered shares that the company officers must retain through to the end of their term of office. [...] Until this objective regarding the holding of shares has been achieved, the company officers will devote a proportion of exercised options or awarded performance shares to this end as determined by the Board."</i>	The Board of Directors has not prescribed regulations for the holding by the Chairman and Chief Executive Officer of a minimum number of the Company's shares.	The Chairman and Chief Executive Officer does not receive any remuneration for his or her term of office as Director. His or her remuneration is limited in accordance with Decree no. 53-707 of 9 August 1953 amended by Decree no. 2012-915 of 26 July 2012. Finally, the Company has not put in place a stock and/or performance stock option plan in favour of the Chairman and Chief Executive Officer. Accordingly, it was decided not to implement this recommendation. Furthermore, the executive corporate officer must act in the Company's best interests, irrespective of the number of Company shares he or she holds in his or her personal capacity.	See sections 4.6.2 ("Total remuneration of the Chairman and Chief Executive Officer"), and 4.6.4 ("Stock options – Bonus shares").
Rules for the distribution of remuneration paid to Directors for their term of office Recommendation no. 21.1: The method of distribution of this remuneration "should take account, in such ways as it shall determine, of the directors' actual attendance at meetings of the Board and committees, and the amount shall therefore consist primarily of a variable portion."	A significant but not preponderant share of the remuneration paid to Directors for their term of office is dependent upon actual attendance by the Directors of the Board and Committee meetings.	Special distribution rules have been adopted, which take account in particular of the level of responsibilities and the time spent by the Directors on their duties. Although the variable share of remuneration paid for the term of office, which compensates the actual presence of Directors is not preponderant, the Company considers that it is nonetheless significant, insofar as it accounts for 50% of the total amount allocated and that, as is recommended by the AFEP-MEDEF Code, it is commensurate with the level of responsibilities assumed by the Directors and with the time, which they must devote to their duties.	See sections 4.6.3 ("Total remuneration of Directors")

4.2 Members and functioning of the Board of Directors

18

Directors*

59.8
Years old
MEAN AGE

41.7%
INDEPENDENT
DIRECTORS**

14
MEETINGS

95.2%
ATTENDANCE
RATE

6 Directors appointed by the Shareholders' Meeting



Jean-Bernard LEVY
Chairman and Chief Executive Officer
P



Nathalie COLLIN
Deputy Managing Director and Managing Director of the Consumer and Digital Division of La Poste Group
▲



Bruno CREMEL
General Partner and Deputy Chief Executive Officer of Partech
▲



Colette LEWINER
Professional Director
▲ P



Claire PEDINI
Senior Vice-President Human Resources and Digital Transformation for the Saint-Gobain Group
▲ P



Philippe PETITCOLIN
Corporate Director
▲

5 Directors appointed by the Shareholders' Meeting on recommendation from the French State



Véronique BÉDAGUE-HAMILIUS
Deputy Chief Executive Officer of the Nexity group
■



François DELATTRE
Secretary General of the French Ministry for Europe & Foreign Affairs
■



Gilles DENOYEL
Chairman of the Board of Directors of Dexia
P



Marie-Christine LEPETIT
Head of the Inspectorate General of Finance at the Ministry for the Economy, Finance and Recovery
P



Michèle ROUSSEAU
Chair of the Board of Directors of the Bureau de Recherches Géologiques et Minières
■

6 Directors elected by the employees



Claire BORDENAVE
Employee Director sponsored by the CGT trade union
■



Karine GRANGER
Employee Director sponsored by the CGT trade union
■



Sandrine LHENRY
Employee Director sponsored by the Force Ouvrière trade union
■



Jean-Paul RIGNAC
Employee Director sponsored by the CGT trade union
■



Vincent RODET
Employee Director sponsored by the CFTD trade union
■



Christian TAXIL
Employee Director sponsored by the CFE-CGC trade union
■

1

Director – representative of the French State



Martin VIAL
Commissioner of the French State Shareholdings Agency at the Ministry Economy and the Ministry for Public Action and Accounts
■

- Member of the Committee
- P Chairman of the Committee
- Audit Committee
- Strategy Committee
- Appointments, Remuneration & Governance Committee
- Nuclear Commitments Monitoring Committee
- Corporate Responsibility Committee
- ▲ Independance within the meaning of AFEP-MEDEF Code criteria

* Composition of the Board on the filing date of this universal registration document

** Excluding Directors elected by the employees

4.2.1 Members of the Board of Directors

In accordance with Order no. 2014-948 of 20 August 2014 regarding governance and trading in French State-owned companies, EDF is administered by a Board of Directors consisting of three to eighteen members, including members appointed by the Shareholders' Meeting, others appointed upon recommendation of the French State in accordance with Article 6 of the Order, a French State Representative chosen by the Minister for the Economy from the Civil Service in accordance with Article 4 of the Order, and one third employee representatives elected in accordance with the provisions of the law of 26 July 1983 ⁽¹⁾.

On the date of filing of this Universal Registration Document, the Board of Directors comprises eighteen members:

- eleven Directors appointed by the Shareholders' Meeting, including five on recommendation of the French State;
- six Directors elected by the employees;
- one Representative of the French State.

The Government Commissioner ⁽²⁾ and Head of the French State General Economic & Financial Supervisory Mission to the Company ⁽³⁾ and the Secretary of the Central Social & Economic Committee attend the meetings of the Board of Directors in an advisory capacity only.

Between 1 January 2021 and the date of filing of this Universal Registration Document, the following amendments and events have intervened in the membership of the Board of Directors (see the table below disclosing personal information concerning the Directors):

First name, surname	Director/Category	Event	Date of Event
François Delattre	Director appointed by the Shareholders' Meeting on recommendation of the French State	Renewal of the term of office	Shareholders' Meeting of 6 May 2021
Marie-Christine Lepetit	Director appointed by the Shareholders' Meeting on recommendation of the French State	Renewal of the term of office	Shareholders' Meeting of 6 May 2021
Colette Lewiner	Director appointed by the Shareholders' Meeting	Renewal of the term of office	Shareholders' Meeting of 6 May 2021
Michèle Rousseau	Director appointed by the Shareholders' Meeting on recommendation of the French State	Renewal of the term of office	Shareholders' Meeting of 6 May 2021
Laurence Parisot	Director appointed by the Shareholders' Meeting	Expiry of the term of office	06 May 2021
Nathalie Collin	Director appointed by the Shareholders' Meeting	Appointment	Shareholders' Meeting of 22 July 2021
Jacky Chorin	Director elected by the employees, sponsored by the FO trade union	Resignation	28 July 2021
Sandrine Lhenry	Director elected by the employees, sponsored by the FO trade union	replacing Jacky Chorin*	28 July 2021

* Article 16 of Act No. 83-675 of 26 July 1983 on the democratisation of the public sector provides that the candidates coming on a list immediately after the last elected candidate are called upon to replace the representatives elected on this list whose seat would become vacant for any reason whatsoever.

Véronique Bédague-Hamilius having announced her intention to resign from her position as director with effect at the end of the General Meeting called to approve the financial statements for the year ended 31 December 2021, the Board of Directors, meeting on 14 March 2022, decided, upon recommendation of the Appointment, Remuneration and Governance Committee, to propose to the

General Meeting called for 12 May 2022 the appointment of Delphine Gény-Stephann as director for a term of three years, by way of exception to the statutory term of office of 4 years for directors, in order to maintain the staggered renewal of the Board of Directors (see section 4.2.2.1 "Term of office of Directors – Staggered renewal of the Board").

Diversity policy

Feminisation of the Board of Directors and governing bodies

In accordance with Articles L. 225-18-1 and L. 22-10-3 of the French Commercial Code and the Order of 20 August 2014, EDF is subject to the regulations relating to the balanced representation of women and men on Boards of Directors and Supervisory Boards and the Company must comply with a proportion of no less than 40% of Directors of each gender on the Board, excluding Directors representing employees. On the date of filing of this Universal Registration Document, EDF's Board of Directors includes nine women, including three of the Directors elected by employees. Women thus make up 50% of the Board members taken into consideration to calculate this percentage (i.e. excluding Directors representing employees), and of the Board members as a whole.

Moreover, in accordance with the recommendations of the AFEP-MEDEF Code, during its meeting held on 16 December 2020, the Board of Directors defined a policy of gender balance for the management bodies applicable to the Company, hence enabling the goals of the Group's Diversity plan (*Plan Ambition Mixité*) adopted by the Executive Committee on 18 November 2019 ⁽⁴⁾ to be implemented within EDF and providing for several commitments aimed at removing the "glass ceiling" for women executives in terms of membership of Executive Committees and senior management positions. Within the Company, the objectives set by the Board are as follows:

- 30% of women on the Management Committees by 2023;
- 30% of women executives and future executives by 2025.

To meet these objectives, EDF's Executive Management shall adapt the objectives to the proportion of women executives in each of the Company's divisions and will pursue the action plans undertaken to:

- hire women executives at a higher rate than their proportion recorded in engineering schools;
- offer succession plans for each management position to include male and female candidates;

(1) The employee representatives referred to in Paragraph I of Article 7 of the Order of 20 August 2014 are subject, for their election and their status, to the same provisions as those applicable to employee representatives of companies subject to the law of 26 July 1983 (chapters II and III of section II of the law).

(2) Article 15 of the Order of 20 August 2014.

(3) This remit exercises the French State's economic and financial supervision of EDF, in accordance with Article 8 of Decree no. 55-733 of 26 May 1955. It may exercise extensive supervisory procedures.

(4) This Diversity Ambition has been updated in 2021, see section 3.3.3.1.1 « Reinforcing the Group commitment ».

- carry out an annual “women’s people review” for managers and future managers.

In addition, EDF shall promote the participation and visibility of women in public interventions in all areas of the Group’s activities.

The Board thus reviewed, at its meeting on 21 September 2021, the measures put in place by EDF and noted the company’s results in implementing this policy of gender balance in the governing bodies applicable to the Company. The Board has observed in particular that, within the company’s scope, the women proportion in the Management Committees reached 28.8% at 31 December 2020, representing a 2.7 point increase between 2018 et 2020, that considering the 10% functions with the highest responsibility, women accounted for 29.6% of the workforce at 31 December 2020, all statute combined (see below), versus 27.5% in 2018 and that women accounted for 28% of the managers and future managers of the company. The Board has also noted that for each management position, succession plans include male and female candidates and that the EDF group’s talents identification process ease the detection and evaluation of the Group’s talents and contribute to breaking the glass ceiling. Lastly the Board also took note of the new enhanced women’s empowerment targets, set out for the Group by the Executive Committee in July 2021, from 36% to 40% for all the Group’s professional categories by 2030, with a milestone of 33% in 2026

With regard to the results in terms of gender diversity in the 10% functions with highest responsibility (Article L. 22-10-10 of the French Commercial Code), women accounted for 29.5% ⁽¹⁾ of the Company’s 10% most senior positions at 31 December 2021, compared with 29,6 % at 31 December 2020 (see section 3.3.3.1 “Workplace equality”).

The table below presents the criteria of the diversity policy defined by the Board of Directors:

Criteria	Company’s position	Objectives
Age of Directors	The Directors appointed by the Shareholders’ Meeting are between 56 and 76 years old, with an average age of 62.4 years. The average age is 59.8 years for the Board as a whole.	The Board took the view that the age of the candidates is not a determining factor in the choice of candidates for the position of Director and that the Board members’ average age is satisfactory, while remaining mindful of the threshold of one-third of Directors over the age of 70*.
Gender parity	The Board comprises 50% women, excluding employee Directors, on the entire Board.	The Board deemed that the current rate of women on the Board is satisfactory, without excluding the possibility of changing this rate, upwards or downwards, in the event of changes in the composition of the Board, in compliance with the legal thresholds.
Professional experience and complementarity of profiles	The Board brings together a variety of profiles and skills (see below the tables presenting the skills of the members of the Board).	The Board has noted that the Directors have significant experience in areas of expertise related to EDF’s activities and strategy, which is likely to favour their deployment, and that their profiles complement each other satisfactorily. The Board also decided to examine the possibility of further strengthening the Board’s skills in the areas of general management of large companies and the energy sector, as suggested by the Directors during the external review conducted in 2020. This criterion was taken into consideration by the Board when it proposed the appointment of Nathalie Collin to the General Meeting on 22 July 2021.
Nationality	The Board of Directors does not include any Directors of foreign nationality, but has to date a significant proportion of members with international experience.	The Board reserves the right to further develop the international expertise of the Board in future appointments of Directors, as suggested by the Directors in the external audit in 2020 and the internal audit in 2021.
Independence	The Board has 5 independent directors, i.e. 41.7% of the 12 Directors taken into account to establish this calculation (excluding Directors representing employees).	The Board considered that the proportion of independent directors on the Board, which is higher than the recommendations of the AFEP-MEDEF Code, is satisfactory. The Board confirmed the objective of maintaining this proportion and at least respecting the objective of one-third of independent directors recommended by the AFEP-MEDEF Code for companies with a controlling shareholder.

* Article L. 225-19 of the French Commercial Code stipulates that in the absence of an express provision in the articles of association concerning an age limit applicable to Directors, the number of Directors over the age of 70 May not exceed one-third.

Other diversity criteria

In accordance with the AFEP-MEDEF Code recommendations and Article L. 22-10-10 of the French Commercial Code, the Board of Directors periodically reviews the desirable balance in its membership and that of the Committees it creates, particularly in terms of the percentage of independent directors and diversity. It defines a diversity policy applied to members of the Board with respect to criteria such as age, gender or professional qualifications and experience.

Based on the opinion of the Committee in charge of governance issues, the Board of Directors’ meeting of 14 February 2019 had defined a diversity policy and objectives that take into account the Group’s strategy, so that the membership of the Board would promote implementation of the policy. In order to achieve a good balance in its membership, in connection with the Group’s strategy and the remits entrusted to it, the Board considered that priority should be given to the search for skills and experience commensurate with the issues facing it and a complementarity of profiles.

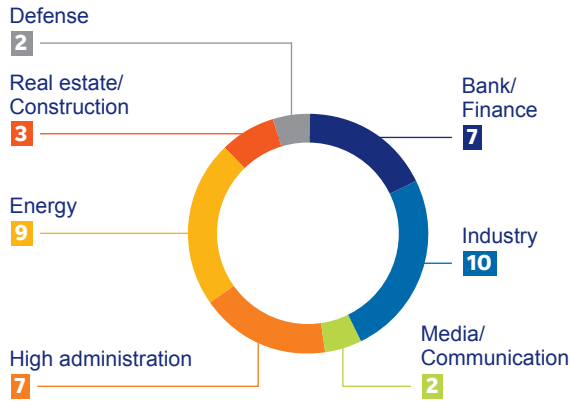
This policy was reviewed and updated by the Board of Directors at its meeting held on 17 February 2021, in the context of the expiry of the terms of office of five Directors at the end of the Shareholders’ Meeting of 6 May 2021 and taking into account the expectations expressed by the Directors during the 2020 independent review of the Board of Directors (see section 4.2.2.6 “Evaluation of the functioning of the Board of Directors and its Committees”).

(1) This percentage is calculated for functions with the highest responsibility from a sample of approximately 6,000 people, representing 10% of the Company’s workforce (statutory employees) at 31 December 2021, which includes executives and senior managers. Within the scope of EDF SA’s senior management, the percentage of women at 31 December 2021 was 23.95% (see section 3.3.3.1.2 “Results in 2021”).

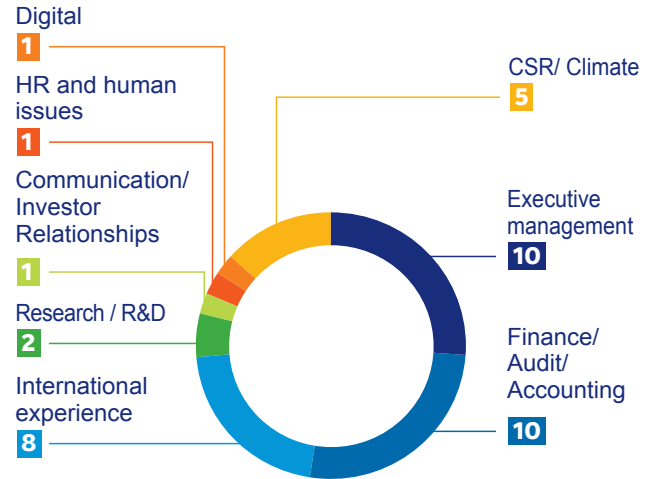
Business skills of the members of the Board of Directors

The tables below present the mapping of the business skills in specific sectors or functions of all members of the Board of Directors as at 31 December 2021:

Sector expertise by type of skill



Functional expertise by type of skill



Information regarding the Directors

The table below summarises the main information concerning the members of the Board of Directors as at the date of filing of this Universal Registration Document.

SUMMARY PRESENTATION OF THE BOARD OF DIRECTORS

	PERSONAL INFORMATION				EXPERIENCE	ROLE WITHIN THE BOARD				ATTENDANCE TO COMMITTEES				
	Age	Gender	Nationality	Number of shares	Number of mandates in listed companies (incl. EDF)	Independence	Date of first appointment	Term of office shall expire on	Seniority in the Board (in years)	Audit Committee	Strategy Committee	Appointments, Remuneration and Governance Committee	Nuclear Commitments Monitoring Committee	Corporate responsibility Committee
Directors appointed by the Shareholders' Meeting														
Jean-Bernard Lévy Chairman and Chief Executive Officer	66	M	French	0	3		23/11/2014	SM 2023 ⁽¹⁾	7.15					
Nathalie Collin	57	F	French	0	1		22/07/2021	SM 2025 ⁽²⁾	> 1					
Bruno Crémel	56	M	French	0	1		16/05/2019	SM 2023 ⁽³⁾	2.67					
Colette Lewiner	76	F	French	2,038	4		11/04/2014	SM 2025	7.76					
Claire Pedini	56	F	French	0	1		12/05/2016	SM 2023	5.68					
Philippe Petitcolin	69	M	French	10	2		16/05/2019	SM 2023	2.67					
Directors appointed by the Shareholders' Meeting on recommendation OF the French State														
Véronique Bédague-Hamilius	58	F	French	0	1		18/12/2019	SM 2023	2.08					
François Delattre	58	M	French	0	1		28/06/2019	SM 2025	2.55					
Gilles Denoyel	67	M	French	0	2		16/05/2019	SM 2023	2.67					
Marie-Christine Lepetit	60	F	French	0	1		07/05/2012	SM 2025	9.69					
Michèle Rousseau	64	F	French	0	1		30/09/2016	SM 2025	5.29					
Director – Representative of the French State														
Martin Vial	68	M	French	0	3		09/09/2015	20/11/2022	6.35					
Directors elected by the employees														
Claire Bordenave	59	F	French	0	1		23/11/2019	22/11/2023	2.15					
Karine Granger	54	F	French	25	1		23/11/2019	22/11/2023	2.15					
Sandrine Lhenry	47	F	French	34	1		28/07/2021	22/11/2023	> 1					
Jean-Paul Rignac	59	M	French	0	1		01/11/2007	22/11/2023	14.21					
Vincent Rodet	56	M	French	289	1		23/11/2019	22/11/2023	2.15					
Christian Taxil	46	M	French	1,437	1		23/11/2014	22/11/2023	7.15					

(1) Jean-Bernard Lévy's term of office as Chairman and CEO will end in March 2023. His term of office as a Director will expire at the end of the General Meeting of Shareholders called to approve the financial statements for the 2022 fiscal year.

(2) SM 2025: Shareholders' Meeting called to approve the financial statements for the 2024 fiscal year.

(3) SM 2023: Shareholders' Meeting called to approve the financial statements for the 2022 fiscal year.

■ Member of the Committee.

P Chairman of the Committee.

▲ Independence within the meaning of the AFEP-MEDEF Code criteria.

Personal information on Directors, as well as information on their terms of office, are shown in the table below and are provided as at 15 January 2022, unless otherwise stated.

DIRECTORS APPOINTED BY THE SHAREHOLDERS' MEETING

Jean-Bernard LÉVY, 66 years old

Position held within the Company

Chairman and Chief Executive Officer since 27 November 2014 ⁽¹⁾

Date of appointment to the Board

23 November 2014

Last re-elected

16 May 2019 ⁽²⁾

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022 ⁽³⁾

Other position(s)

Chairman of the Strategy Committee

Shares held

0

Nationality

French

A former student of the École Polytechnique (graduating in 1973) and Telecom Paris Tech, Jean-Bernard Lévy began his career at France Télécom in 1979 as a works engineer at the Angers Division. In 1982, he became responsible for managing executive managers and HR budgets at the registered office, then assistant to the Head of HR. In 1986, he was appointed Technical Advisor to the office of Gérard Longuet, Minister for Postal Services and Telecommunications. From 1988 to 1993, Jean-Bernard Lévy managed the telecommunications satellite activity of Matra Espace, now Matra Marconi Space. From 1993 to 1994, he managed the office of Gérard Longuet, Minister for Industry, Postal Services and Communications and Foreign Trade. In 1995, he was appointed Chairman and Chief Executive Officer of Matra Communication. In 1998, he joined Oddo & C^o as Chief Executive Officer and then Managing Partner. In summer 2002, Jean-Bernard Lévy joined Vivendi. He served as its Chief Executive Officer until April 2005 and became Chairman of its Executive Board from April 2005, until June 2012. From December 2012 to November 2014, he was Chairman and Chief Executive Officer of the Thales defence and aerospace group. Jean-Bernard Lévy has been EDF's Chairman and Chief Executive Officer since 27 November 2014.

Other offices and positions held

Position held within the Company

- Chairman and Chief Executive Officer of EDF

Office/Position	Title	Country	
Chairman and Chief Executive Officer	EDF	France	L
Director	Edison	Italy	G/L
Director	EDF Energy Holdings	UK	G
Director	EDF Renewables	France	G
Chairman of the Board of Directors	EDF group Foundation	France	G
Director	Dalkia	France	G
Chairman of the Supervisory Board	Framatome	France	G
Non-voting Director	Société Générale	France	L
Director and Chairman of the Governance, Nominations and Sustainable Development Committee	Faurecia	France	L
Chairman and Director as the representative of Électricité de France	Conseil Français de l'Énergie (i.e. French Energy Council)	France	
Chairman	Eurelectric	France	
Chairman	FIPA – Fondation Innovations pour les Apprentissages (Innovative Apprenticeship Foundation)	France	
Chairman	Usine Extraordinaire Foundation	France	
Director	AX – Association des anciens élèves et diplômés de l'École polytechnique (Association of alumni and graduates of the École Polytechnique)	France	
Director	Cercle de l'industrie	France	
Director	Paris Europlace	France	
Director	France Industrie	France	
Director	Global Sustainable Electricity Partnership	Canada	
Non-voting Director	Fondation Jean-Jacques Laffont – Toulouse School of Economics	France	

Expired offices held outside the Company over the past five years

In France

- Director of Société Générale
- Member and representative of EDF for the Haut Comité pour la transparence et l'information sur la sécurité nucléaire (i.e. French High Committee for Transparency and Information on Nuclear Safety)

Other countries

- Deputy Chairman of the Board of Directors of Eurelectric
- Chairman of the Board of Directors of EDF Energy Holdings

(1) Jean-Bernard Lévy was appointed temporary Chairman and Chief Executive Officer effective 23 November 2014, by ministerial decision of 21 November 2014.

(2) Jean-Bernard Lévy was appointed EDF's temporary Chairman and Chief Executive Officer effective 16 May 2019, by ministerial decision of 16 May 2019. He was appointed as the Company's Chairman and Chief Executive Officer by decree of the President of the Republic of France of 22 May 2019.

(3) Jean-Bernard Lévy's term of office as Chairman and CEO will end in March 2023. His term of office as a Director will expire at the end of the General Meeting of Shareholders called to approve the financial statements for the 2022 fiscal year.

G: EDF group company – L: listed company.

VERONIQUE BEDAGUE-HAMILIUS, 58 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting on recommendation of the French State

Date of appointment to the Board

18 December 2019

Expiry of current term of office

Ordinary Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Corporate Responsibility Committee

Shares held

0

Nationality

French

A graduate of the Paris Institute of Political Studies (IEP), ESSEC business school and a former student at the French National School of Administration (ENA), Véronique Bédague-Hamilius has been Deputy Chief Executive Officer of Nexity since 19 May 2019. She joined Nexity group in 2017 as General Secretary and member of the Executive Committee. She was previously Deputy Managing Director of Nexity (non-company representative) in charge of the Corporate and Public Sector Customer Division since 2019, then of the Institutional Customer Division since July 2020. She has also been Chair of Nexity'Entreprise since November 2021. She has also been Chair & Chief Executive Officer of Nexity Immobilier d'Entreprise since March 2018. Before joining the Nexity group, Véronique Bédague-Hamilius pursued a career as a senior civil servant. This included time as an economist at the International Monetary Fund in Washington between 1994 and 1997, an advisor to the French Minister for the Economy, Finance and Industry, Laurent Fabius, from 2000 to 2002, CFO of the City of Paris from 2002 to 2007, General Secretary of the City of Paris under Bertrand Delanoë from 2008 to 2014 and Chief of Staff to the Prime Minister, Manuel Valls, from 2014 to 2016.

Other offices and positions held**Principal position held outside the Company**

- Chief Executive Officer of Nexity Group

Office/Position ⁽¹⁾	Title	Country
Chief Executive Officer	Nexity	France
Chair of the Board of Directors	Nexity Immobilier d'Entreprise	France
Chair	Nexity Logement	France
Deputy Chief Executive Officer	Villes et Projets	France
Chair	SIG 30 Participations	France
Deputy Chief Executive Officer	VP PARTICIPATIONS	France
Director	Edouard Denis Développement	France
Member of the Supervisory Board	Aegide	France
Member of the Board of Directors	FSIF – Fédération des Sociétés Immobilières et Foncières	France

Expired offices held outside the Company over the past five years**In France**

- Chief Executive Officer of Nexity Property Management
- Chairman of the Board of Directors of Nexity Property Management
- Chief Executive Officer of Nexity Immobilier d'Entreprise
- Chairman of Neximmo 78
- Chief Executive Officer of SIG 30 Participations
- Director of the Nexity Corporate Foundation
- Member of the Strategy Committee of Bureaux à partager

(1) Ms. Bédague-Hamilius also holds various offices within the Nexity group as legal representative of Nexity group entities. She is the legal representative of: Villes et Projets in SNC Aménagement Charras; SIG 30 Participations in Sari Investissements, SAS Eco-Campus A Chatillon, Aquedus, SAS Bagneux Briand, SAS Bagneux Victor Hugo, and in a number of programme support companies in the form of simplified joint stock companies, civil companies or general partnerships.

NATHALIE COLLIN, 57 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

Ordinary Shareholders' Meeting of 22 July 2021

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2024

Other position(s)

Member of the Audit Committee

Shares held

0

Nationality

French

Nathalie Collin holds a master's degree in business law and taxation from the University of Panthéon-Assas Paris 2 and is a graduate of ESSEC. She was a consultant at Arthur Andersen from 1987 to 1990 and from 1992 to 1993. Appointed CFO of the Cité Mondiale des Vins et Spiritueux from 1990 to 1992, she became France CFO of Interleaf in 1993, then Europe CFO and Executive Vice-President Finance of Interleaf in 1995. From 1997 to 2009, she held various positions within EMI Music France, becoming Chairman of the Management Board in 2002. Co-Chairman of the Libération Management Board from 2009 to 2011, then CEO of the Le Nouvel Observateur group from 2011 to 2014, she joined the La Poste group in 2014, where she was Deputy CEO in charge of Digital and Communication, before being appointed CEO of the group's consumer and digital branch in March 2021. Nathalie Collin was a member of the French Economic, Social and Environmental Council (Conseil économique social et environnement) and the French National Digital Council (Conseil national du numérique) up to 2021. She has been a Director of Geopost and EDF since July 2021.

Other offices and positions held**Principal position held outside the Company**

- Deputy CEO and CEO of the Consumer and Digital Division of La Poste Group

Office/Position	Title	Country
Deputy Chief Executive Officer	La Poste	France
Director	Geopost	France

Expired offices held outside the Company over the past five years**In France**

- Director of La Banque Postale
- Director of the SNCF

BRUNO CREMEL, 56 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Audit Committee

Shares held

0

Nationality

French

A graduate of the École centrale de Paris, the Paris Institute of Political Studies (IEP), and the French National School of Administration (ENA – General Finance Inspection), Bruno Crémel started his career as an Inspector of Public Finances, before joining the French Ministry for the Economy, Finance, and Industry as head of the Public Banks and Insurance Office, State Participations Department, where in particular he coordinated the privatisation of several public banks and insurance companies. From 1998 to 2000, he was Strategic Planning Director at the Kering group as a member of the Executive Committee, then Chairman of the Management Board of PPR Interactive. From 2000 to 2002, he was Chief of Staff for Laurent Fabius, Minister for the Economy, Finance and Industry. From 2002 to 2006, Bruno Crémel was Chief Executive Officer of FNAC. From 2006 to 2012, he was General Partner and member of the Executive Committee of LBO France investment fund, where he oversaw in particular the acquisitions of Maisons du Monde and Promovacances. He was appointed Chairman and Chief Executive Officer of Darty France in 2012. He joined the Partech investment fund in May 2014 as a General Partner and has been Deputy Chief Executive Officer since May 2016.

Other offices and positions held**Principal position held outside the Company**

- General Partner and Deputy Chief Executive Officer of Partech Partners

Office/Position	Title	Country
Deputy Chief Executive Officer	Partech Partners	France
Chairman	Partech Growth GP	France
Chairman	Partech Growth II Holding	France
Chairman of the Board of Directors	Artaris	France
Director	Evaneos	France
Member of the Strategy Committee	Rouje	France
Director	Sendinblue	France
Director	Made.com	United Kingdom
Director	M-Files	Finland
Member of the Supervisory Board	Exporo	Germany
Director	Studocu	The Netherlands

Expired offices held outside the Company over the past five years

In France

- None

François DELATTRE, 58 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting on recommendation of the French State

Date of appointment to the Board

28 June 2019

Last re-elected

6 May 2021

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2024

Other position(s)

Member of the Strategy Committee

Shares held

0

Nationality

French

A graduate of the Paris Institute of Political Studies (IEP) and the National School of Administration (ENA), François Delattre began his career in 1989 as Second Secretary at the French Embassy in Germany. After spending two years at the Strategic Affairs & Disarmament Department of the French Ministry for Foreign Affairs from 1991 to 1993, he became a Special Advisor in Defence and European & Transatlantic Security in the office of the Minister of Foreign Affairs, Alain Juppé in 1993, before being given responsibility for these issues within the diplomatic team of the President of the French Republic, Jacques Chirac, from 1995 to 1998. He was appointed Head of the Press and Communication Service at the French Embassy in Washington in 1998, Deputy Chief of Staff to the Minister of Foreign Affairs, Dominique de Villepin in 2002 and then Consul General in New York in 2004. French Ambassador to Canada from 2008 to 2011, and to the United States from 2011 to 2014, he was appointed Permanent Representative of France to the United Nations in September 2014. He has been General Secretary of the French Ministry of Europe & Foreign Affairs since 1 July 2019.

Other offices and positions held**Principal position held outside the Company**

- Secretary General of the French Ministry for Europe & Foreign Affairs

Office/Position	Title	Country
Director	Orano	France
Director	Agence nationale des titres sécurisés (i.e. French national agency of secure shares)	France
Director	Commission de récolement des dépôts d'Œuvres d'art (i.e. French commission for the verification of the registration of works of art)	France
Director	National School of Administration (ENA)	France
Director	Institut français	France
Director	Office français de protection des réfugiés et apatrides (i.e. French Office for the Protection of Refugees and Stateless Persons)	France
Director	Sorbonne Abou Dhabi	France
Director	Institut des hautes études de défense nationale (i.e. French high national defence study institute)	France
Member of the Board of Directors	Fondation nationale des sciences politiques (FNSP) (i.e. the French National Foundation of Political Science)	France

Expired offices held outside the Company over the past five years

In France

- Director of France Médias Monde

GILLES DENOYEL, 67 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting on recommendation of the French State

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Chairman of the Nuclear Commitments Monitoring Committee

Shares held

0

Nationality

French

A graduate as a General Engineer from Mines ParisTech Engineering School, former student at the Paris Institute of Political Studies (IEP) and the National School of Administration (ENA), Gilles Denoyel was appointed Inspector of Public Finances at the Ministry for the Economy & Finance in 1981 before joining the Treasury Department in 1985, where he was successively in charge of the CIRI (Interministerial Committee for Industrial Restructuring), the Financial Markets Bureau, the Insurance Sub-Directorate and, ultimately, the privatisation programme. In 1996, he joined the CCF group as Chief Financial Officer, then General Secretary in charge of Strategy and Operations, then Senior Executive Vice-President in charge of Finance: in this capacity, he played a significant part in the integration of CCF into the HSBC group. In 2004, he was appointed Director Deputy Chief Executive Officer, successively in charge of central functions, asset management and insurance, and then of all risk and control functions and relations with regulatory authorities. From 2015 to 2017, he was HSBC's International Institutional Relations President for Europe. He was also Chairman of the group of banks under foreign control in France from 2006 to 2016 and Treasurer of the Association française des banques (i.e. French banking association) from 2004 to 2016. Gilles Denoyel has been Chairman of the Board of Directors of Dexia and Dexia Crédit Local since May 2018, and a member of the Supervisory Board of Memo Bank and of Rothschild & Cie since January 2018 and May 2020 respectively.

Other offices and positions held**Principal position held outside the Company**

- Chairman of the Board of Directors of Dexia and Dexia Crédit Local

Office/Position	Title	Country
Chairman of the Board of Directors	Dexia	Belgium
Chairman of the Board of Directors	Dexia Crédit Local	France
Member of the Supervisory Board	Memo Bank	France
Member of the Supervisory Board	Rothschild & Cie	France L

Expired offices held outside the Company over the past five years**In France**

- None

G: EDF group company – L: listed company.

Marie-Christine LEPETIT, 60 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting on recommendation of the French State

Date of appointment to the Board

7 May 2012

Last re-elected

6 May 2021

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2024

Other position(s)

Chair of the Audit Committee and member of the Nuclear Commitments Monitoring Committee

Shares held

0

Nationality

French

A former student of the École Polytechnique and the National School of Administration (ENA), Marie-Christine Lepetit joined the Inspectorate General of Finances in 1987, where she held auditing and advisory positions. In 1991, she was recruited by Jean Lemierre to the Directorate General for Tax in order to introduce management control. In 1995, she was in charge of work review at the tax law department before joining the office of the Prime Minister, Alain Juppé, as technical advisor in tax matters and macroeconomic studies then taxation and SMEs from 1995 to 1997. She continued her career at the General Directorate for Tax, working to improve service quality (pre-filled tax returns, remote procedures, certification). Appointed Director of Tax Law at the Ministry for the Economy and Finance in 2004, in this capacity she pushed through tax reforms from 2004 to 2012. At the same time, she co-chaired the working group on reform of the financing of social welfare in 2006 and co-signed the report by the conference of experts on the "energy-climate contribution" chaired by Michel Rocard. She also sat on the Local Authorities Reform Committee chaired by Edouard Balladur as Executive Director and was a member of the Public Life Renewal and Ethics Commission chaired by Lionel Jospin. She has been Head of the Inspectorate General of Finances since March 2012, and now reports to the Minister for the Economy, Finance and Recovery.

Other offices and positions held**Principal position held outside the Company**

- Head of the Inspectorate General of Finance at the Ministry for the Economy, Finance and Recovery

Office/Position	Title	Country
Member of the Risks & Internal Control Committee	Fondation des apprentis d'Auteuil (i.e.: Auteuil Apprenticeship Foundation)	France
Director	Paris Institute of Political Studies (IEP)	France

Expired offices held outside the Company over the past five years**In France**

- None

Colette LEWINER, 76 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

11 April 2014

Last re-elected

6 May 2021

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2024

Other position(s)

Chair of the Appointments, Remuneration & Governance Committee, Member of the Nuclear Commitments Monitoring Committee

Shares held

2,038 ⁽¹⁾

Nationality

French

A former student of the École Normale Supérieure and holder of an *Agrégation* degree in physics and Doctorate in science, Colette Lewiner joined Électricité de France in 1979. In 1989 she created the Development and Commercial Strategy Division, accordingly becoming the first woman appointed Executive Officer at EDF. From 1992 to 1998, she was Chair and Chief Executive Officer of SGN, a nuclear engineering company and subsidiary of AREVA. In 1998, she joined Caggemini to create then manage until June 2012 the Global Energy and Utilities sector. Since July 2012, she has been, as Manager of Cowin, a Consultant in the energy field. Non-executive Chair of TDF (SAS) from 2010 to 2015, she has been a member of the Académie des technologies (French National Academy of Technologies) since 2002. She is a Director of the Bouygues group and the Getlink and CGG companies.

Other offices and positions held**Principal position held outside the Company**

- Professional Director

Office/Position	Title	Country	
Director	Bouygues	France	L
Director	Getlink (formerly Eurotunnel)	France	L
Director	CGG	France	L

Expired offices held outside the Company over the past five years**In France**

- Director of Ingenico
- Director of Nexans

(1) Shares held directly and through the corporate mutual profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

G: EDF group company – L: listed company.

Claire PEDINI, 56 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

12 May 2016

Date of re-election

7 May 2020

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Chair of the Corporate Responsibility Committee and member of the Appointments, Remuneration & Governance Committee

Shares held

0

Nationality

French

Claire Pedini is a graduate of the HEC business school and holds a Master's degree in Media Management from the ESC Paris business school. In 1988, she joined Total as Corporate Controller. She assumed responsibility for Total's admission to trading on the New York Stock Exchange in 1991, and became Head of Financial Communication in 1992, Executive Manager of Media Relations in 1994 and Head of the New Information Technologies Department in 1997. In 1998, she joined Alcatel as Chief of Financial Communication, becoming successively Head of Financial Communication and Institutional Relations in 2001, Deputy Chief Financial Officer in 2004, Executive Manager of Human Resources and Corporate Communications in 2006, during which year she became a member of the Executive Committee, Head of Human Resources, Corporate Communications and Real Estate in 2007, and Executive Vice-President of Alcatel-Lucent, Human Resources and Transformation Manager in 2009. Claire Pedini was a Director of Arkema from 2010 to 2016. Since June 2010, she has served as Senior Vice-President in charge of Human Resources for the Saint Gobain Group. She has been Senior Vice-President, Human Resources and Digital Transformation since January 2019.

Other offices and positions held**Principal position held outside the Company**

- Senior Vice-President Human Resources and Digital Transformation for the Saint-Gobain Group – Member of the Executive Committee of Saint-Gobain

Office/Position	Title	Country
None		

Expired offices held outside the Company over the past five years**In France**

- None

PHILIPPE PETITCOLIN, 69 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Strategy Committee and Member of the Audit Committee

Shares held

10

Nationality

French

A graduate in Mathematics and graduate of the CPA Paris business school, Philippe Petitcolin began his career as Export Manager for Europrim, and then became Export Zone Manager for the Alcatel-Alstom subsidiary, Filotex. In 1982, he was appointed Aeronautical Sales Manager for Chester Cable in the United States. He returned to Filotex as Export Manager in 1984. In 1988, he joined Labinal as Deputy Sales Manager before being appointed Sales and Marketing Manager of the Aeronautical Systems Division, where he became General Manager in 1995. From 1999 to 2001, he became Head of Labinal's Filtrauto Division, which he combined with the roles of Chief Executive Officer and Head of Friction Materials following the takeover of Filtrauto by Valeo. In May 2001, he took on the position of Chief Executive Officer of Labinal (now Safran Electrical & Power), and became Chairman and Chief Executive Officer in November 2004. In 2006, he was appointed Chairman and Chief Executive Officer of Snecma (now Safran Aircraft Engines). From 2011 to 2013, he was appointed Chairman and Chief Executive Officer of Safran's defence and security activities as well as Chairman and Chief Executive Officer of Safran Electronics & Defense. From July 2013 to July 2015, he was Chairman and Chief Executive Officer of Safran Identity & Security. He was appointed Director and Chief Executive Officer of Safran in April 2015, up until 31 December 2020. He is now Chairman of the Board of Directors of KNDS, Director of Pernod Ricard and member of the Supervisory Board of Diot-Siaci.

Other offices and positions held**Principal position held outside the Company**

- Corporate Director

Office/Position	Title	Country
Chairman of the Board of Directors	KNDS	The Netherlands
Director	Pernod Ricard	France L
Member of the Supervisory Board	Diot Siaci	France

Expired offices held outside the Company over the past five years**In France**

- Director and Chief Executive Officer of Safran
- Director of Suez

Other countries

- Director of Belcan Corporation (United States)

G: EDF group company – L: listed company.

Michèle ROUSSEAU, 64 years old**Position held within the Company**

Director appointed by the Shareholders' Meeting on recommendation of the French State

Date of appointment to the Board

30 September 2016

Last re-elected

6 May 2021

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2024

Other position(s)

Member of the Nuclear Commitments Monitoring Committee and of the Corporate Responsibility Committee

Shares held

0

Nationality

French

A graduate of Mines ParisTech Engineering School and General Mining Engineer, Michèle Rousseau began her career at the Nord-Pas de Calais DRIRE (i.e. Regional Directory for Industry, Research and the Environment) as Head of the Environment Division. She went on to join the Ministry of the Environment where she was responsible for waste, and later the Ministry of Industry where she held the post of Deputy Head of the Nuclear Installation Safety Directorate with responsibility for oversight of EDF's nuclear plant. She then moved to the ANVAR (i.e. French research and innovation agency), as Deputy General Manager where she conducted policies supporting innovative projects driven by SMEs, and later moved to the French Ministry of Economy, Finance and Industry as Head of the Demand and Energy Markets Department. Here, she was tasked in particular with developing a new legislative and regulatory framework in the wake of the opening up of European electricity and gas markets and expanding energy conservation and renewable energies. Michèle Rousseau subsequently returned to the Ministry of Ecology and Sustainable Development, where she held the positions of Secretary General and, in 2008, General Manager, Deputy Commissioner General for Sustainable Development, with particular responsibility for implementing the Grenelle Environment initiative. In 2011, she was appointed General Manager of the Seine-Normandie Water Agency before returning in 2016 to the General Council for Environment and Sustainable Development, where she was Chair of the Haut-de-France Regional Environmental Authority (MRAe). Michèle Rousseau has been the Chair of the Bureau de recherches géologiques et minières (i.e. French Geological Survey institution) since 2017, and Director of the ANR (i.e. French national agency for investigation).

Other offices and positions held**Principal positions held outside the Company**

- Chair of the Board of Directors of the Bureau de recherches géologiques et minières – BRGM

Office/Position	Title	Country
Chair of the Board of Directors	Bureau de recherches géologiques et minières – BRGM	France
Director	Agence nationale de la recherche (ANR)	France

Expired offices held outside the Company over the past five years**In France**

- Director of the Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture (IRSTEA)

DIRECTOR – REPRESENTATIVE OF THE FRENCH STATE

Martin VIAL, 68 years old

Position held within the Company

Director – Representative of the French State

Date of appointment to the Board

9 September 2015

Last re-elected

21 November 2018

Expiry of current term of office

20 November 2022

Other position(s)

Member of the Appointments, Remuneration & Governance Committee and the Strategy Committee

Shares held

0

Nationality

French

Graduate of the ESSEC business school and the École nationale supérieure des postes et télécommunications, Martin Vial began his career as Postal Services and Telecommunications Director at the Financial Division of the General Postal Directorate. In 1986, he joined the Treasury Division at the Ministry for the Economy and Finance. From 1988 to 1993, he was successively Technical Advisor, Deputy Manager then Head of the offices of the Minister for Postal Services and Telecommunications and Space, the Minister for Equipment, Housing, Transport and Space, and finally the Minister for Postal Services and Telecommunications. In 1993, Martin Vial was appointed Chairman and Chief Executive Officer of Aéropostale, airline company and joint subsidiary of Air France, La Poste and TAT, and he was elected Chairman of the Chambre syndicale du transport aérien (French air transport union) and Fédération nationale de l'aviation marchande (French national commercial aviation union). At the end of 1997, he became Chief Executive Officer of the La Poste Group. In September 2000, he was appointed Chairman of La Poste Group and at the same time Deputy Chairman of the Caisse Nationale de Prévoyance (CNP). Martin Vial joined the French National Audit Office in September 2002 as Chief Advisor. From 2003 to 2014, he was Chief Executive Officer of the Europ Assistance Group, a world leader in the ground handling services market and Director and Chief Executive Officer of Europ Assistance Holding. He also chairs several Boards of Directors of companies in the Europ Assistance group. In January 2015, he founded Premium Care, a company which provides assistance to the elderly. Commissioner of the French State Shareholdings since August 2015, Martin Vial is a Director of Renault, Bpifrance and Air France.

Other offices and positions held**Principal position held outside the Company**

- Commissioner of the French State Shareholdings Agency

Office/Position	Title	Country	
Director	Renault	France	L
Director	Air France KLM	France	L
Director	Bpifrance	France	

Expired offices held outside the Company over the past five years**In France**

- Director of Thales

G: EDF group company – L: listed company.

DIRECTORS ELECTED BY THE EMPLOYEES

Claire BORDENAVE, 59 years old

Position held within the Company

Director elected by the employees

Date of appointment to the Board

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Corporate Responsibility Committee

Shares held

0

Nationality

French

A graduate from ESSEC business school and holder of 2-year Master's degree from INSTN (i.e. French Institute for Nuclear Science and Technology), Claire Bordenave began her career in the electrical and gas industries at Gaz de France's Economic & Sales Directorate in 1988 as a business engineer. She was responsible for project development and negotiation in France and internationally, as well as strategic and economic studies. She is currently in charge of studies at the EDF group Strategy Division, and has been a member of the French Higher Energy Council since 2011 and of the Economic, Social and Environmental Council since 2018. Claire Bordenave is sponsored by the CGT trade union.

Other offices and positions held**Position held within the Company**

- Senior Analyst at the EDF group Strategy Division

Office/Position	Title	Country	
Council member	Conseil économique, social et environnemental (CESE) (i.e. French Economic, Social & Environmental Council)	France	
Member	Conseil supérieur de l'énergie	France	

Expired offices held outside the Company over the past five years

- Chair of the Île-de-France Regional Economic, Social & Environmental Council's Environment & Energy Transition Committee
- Director of the CNIEG

KARINE GRANGER, 54 years old**Position held within the Company**

Director elected by the employees

Date of appointment to the Board

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Nuclear Commitments Monitoring Committee, Appointments, Remuneration & Governance Committee, and Strategy Committee

Shares held

25

Nationality

French

A graduate of the *institut universitaire de technologie du Creusot*, Karine Granger began her career in 1987 at the SAT SAGEM optronic and aeronautical laboratory, then continued her professional experience with the GEC ALSTOM Group before joining EDF in 1992 at the Thermal Engineering Centre. In 2004, she was seconded to EDISON to build a combined cycle gas turbine power plant in Calabria. On her return to France, she was responsible for estimating the investment costs at the Hydraulic Engineering Centre. For this purpose, she set up and managed a network of estimators at the Engineering Production Division, all segments included. In 2014, she was appointed Chief Executive Officer of EDF Cameroon as part of a public-private partnership to develop a 420MW hydraulic project. She was appointed by the French Prime Minister as Advisor on Foreign Trade for France in Cameroon in 2016. On her return to France, Karine Granger became Energy Advisor at the FNME CGT with responsibility for industrial issues. In 2020, she also obtained the Company Director Certificate jointly issued by the IEP (*i.e.* French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). She is also a member of the Conseil supérieur de l'énergie, and of the Conseil économique social et environnemental (French Economic, Social and Environmental Council; CESER) for the Auvergne-Rhône-Alpes Region. Karine Granger is sponsored by the CGT trade union.

Other offices and positions held**Position held within the Company**

- EDF Hydro Operational Management Control project manager

Office/Position	Title	Country
Member	Conseil supérieur de l'énergie	France
Council member	CESER Auvergne-Rhône-Alpes	France

Expired offices held outside the Company over the past five years

- None

Sandrine LHENRY, 47 years old**Position held within the Company**

Director elected by the employees

Date of appointment to the Board

28 July 2021

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Audit Committee, Strategy Committee, and Corporate Responsibility Committee

Shares held

34

Nationality

French

A graduate of the Conservatoire national des arts et métiers (CNAM) and holding a Master's II HR & CSR degree from the Institut d'administration des entreprises (IAE) Paris Sorbonne, Sandrine Lhenry began her career in the Electricity and Gas Industries (IEG) in 1999 at EDF Gaz de France Distribution in the customer service field. From 2014 to 2017, she was in charge of industrial relations for the electricity and gas industries within the leadership team of the FO Energies et Mines national federation, before becoming Deputy Secretary General of the federation from 2017 to 2020. She is currently in charge of CSR missions in Enedis's Communication & CSR Department. Sandrine Lhenry is sponsored by FO.

Other offices and positions held**Position held within Group**

Project Manager, CSR Department, Enedis.

Office/Position	Title	Country
None		

Expired offices held outside the Company over the past five years

- Alternate member of the High Energy Council (*i.e.* Conseil supérieur de l'énergie)

Jean-Paul RIGNAC, 59 years old**Position held within the Company**

Director elected by the employees

Date of appointment to the Board

1 November 2007

Last re-elected

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Audit Committee

Shares held

0

Nationality

French

Holder of a doctorate in Energy from the Institut national polytechnique in Toulouse, Jean-Paul Rignac joined EDF in 1991. He served as Secretary of EDF Research & Development's Joint Generation Committee for five years. He is a research engineer at EDF's Research & Development Division (EDF Lab Les Renardières Centre), and currently works on energy efficiency in the heating/air-conditioning/air quality of industrial buildings and clean rooms. Jean-Paul Rignac is sponsored by the CGT trade union.

Other offices and positions held**Position held within the Company**

- Research Engineer at the EDF Research and Development Division

Office/Position

None

Title**Country****Expired offices held outside the Company over the past five years**

- None

VINCENT RODET, 56 years old**Position held within the Company**

Director elected by the employees

Date of appointment to the Board

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Strategy Committee, Audit Committee, Nuclear Commitments Monitoring Committee, and Corporate Responsibility Committee

Shares held289 ⁽¹⁾**Nationality**

French

Holder of an advanced graduate diploma (DESS) in Organisational Sociology from Lyon II University, Vincent Rodet began his career in 1987 as an energy movement computer specialist (RTE), and then joined the consultancy service in 1995, which then worked for both EDF and Gaz de France. From 2007 to 2014, he was EDF SA CFDT Central Trade Union Representative and EDF group CFDT Coordinator. In this capacity, he was a member of the France Group Committee and the European Committee. From 2014 to 2018, he led the CFDT delegation, with responsibility for social dialogue within the Electrical and Gas Industries Division. As a member of the French National Nuclear Industry Strategy Committee (CSFN) in 2018, he contributed to work on reconsolidation of the nuclear industry and more broadly oversaw the Multi-year Energy Programme (PPE) process for the CFDT trade union. In 2020, he obtained the Company Director Certificate jointly issued by the IEP (i.e. French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). Vincent Rodet is sponsored by the CFDT trade union.

Other offices and positions held**Position held within the Company**

- HR Operator Manager, Special duties at the Industrial Professionalisation & Performance Unit (UPI)

Office/Position

Member

Director

Title

Comité stratégique de la filière nucléaire (CSFN)

Board of Directors of the Caisse centrale d'activité sociales (i.e. central social activity fund (CCAS)).

Country

France

France

Expired offices held outside the Company over the past five years

- None

(1) Shares held through the corporate mutual profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

Christian TAXIL, 46 years old**Position held within the Company**

Director elected by the employees

Date of appointment to the Board

23 November 2014

Last re-elected

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Audit Committee and Strategy Committee

Shares held1,437 ⁽¹⁾**Nationality**

French

Holder of an Executive MBA diploma from the ESCP Europe School and alumnus of the École des Mines in Douai, Christian Taxil began his career in 1999 at EDF Gaz de France Distribution in customer, local authority and concession management positions. From 2004 to 2008, he was responsible for labour relations in the electricity and gas industries within the management team of the Fédération CFE-CGC Énergies union. In 2008, he joined the EDF group Audit Division before being elected, from June 2009 to September 2014, General Secretary of the Fédération CFE-CGC Énergies union. He is currently Key Accounts Manager within the Sales and Marketing Division of Dalkia. In 2018, he obtained the Company Director Certificate jointly issued by the IEP (French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). Christian Taxil is sponsored by the CFE-CGC trade union.

Other offices and positions held**Position held within Group**

- Key Accounts Manager within the Sales and Marketing Division of Dalkia

Office/Position

None

Title**Country****Expired offices held outside the Company over the past five years****In France**

- Elected representative of the Bureau du Syndicat mixte d'électricité, de gaz et de télécommunications du Val-d'Oise (SMDEGTVO)

(1) Shares held through the corporate mutual profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

4.2.2 Functioning of the Board of Directors

The internal Rules of Procedure <https://www.edf.fr/groupe-edf/edf-en-bref/gouvernance/conseil-dadministration> of the Board of Directors determine the principles for its operation and the terms and conditions according to which the Board and its Committees fulfil their duties. It defines the role and powers of the Chairman and Chief Executive Officer. These internal Rules of Procedure are regularly updated, particularly to take into account the changes in legislation and regulations and changes to the AFEP-MEDEF Code (see section 4.1 "Corporate Governance Code").

4.2.2.1 Term of office of Directors – Staggered re-election of the Board

EDF's articles of association set the term of office of Directors to four years (see section 4.2.1 "Members of the Board of Directors").

In accordance with the provisions of Article 2 of decree no. 2014-949 of 20 August 2014 implementing the Order of 20 August 2014, the Representative of the French State is appointed for a term equal to the term of office of the members of the Board of Directors, i.e. for a four-year term.

Pursuant to Article 13 of EDF's articles of association, the Board of Directors, excluding Directors elected by the employees and the Representative of the French State appointed by decree, shall be renewed by rotation periodically in such a way that half (rounded to the nearest whole number) of the Directors elected by the Shareholders' Meeting be renewed every two years and that the Board be completely renewed, with respect to the members concerned, at the end of each four-year period. Pursuant to these provisions, the Shareholders' Meeting held on 6 May 2021 renewed Marie-Christine Lepetit, Colette Lewiner, Michèle Rousseau and François Delattre's terms of office as Directors for a period of four years (see section 4.2.1 "Members of the Board of Directors").

The Directors appointed by the Shareholders' Meeting can be dismissed at any time by an Ordinary Shareholders' Meeting. In accordance with Articles 12 and 25 of the Law on the Democratisation of the Public Sector, the Directors elected by the employees can be individually dismissed for gross negligence in the exercise of their office by order of the President of the Tribunal de Grande Instance (High Court) delivered at summary proceedings upon application from the majority of the members of the Board. However, in the event that serious dissent disrupts the management of the Company, dismissal pronounced by the Shareholders' Meeting can be extended to the employee representatives. The Representative of the French State ceases his duties by resigning or if he loses the capacity by virtue of which he was appointed; he can be replaced at any time for the remainder of the term of office.

4.2.2.2 Appointment and powers of the Chairman and Chief Executive Officer

In accordance with the option provided for in Article 18 of the Order of 20 August 2014, EDF's articles of association state that the Chairman of the Board of Directors undertakes the Executive Management of the Company and holds the title of Chairman and Chief Executive Officer.

The Chairman and Chief Executive Officer of EDF is appointed by decree of the President of the French Republic, on the recommendation of the Board of Directors. He may be dismissed by decree in accordance with Article 20 of the Order of 20 August 2014. In accordance with the provisions of Article 13 of the French Constitution, the Chairman is appointed on the recommendation of the Permanent Committees of the French National Assembly and Senate. At the end of this process, Jean-Bernard Lévy was re-elected as EDF's Chairman and CEO by decree of 22 May 2019.

In case of vacation of the office of Chairman and Chief Executive Officer, Article 21 of the Order of 20 August 2014 provides that the French State may appoint someone to the role temporarily until the appointment of the new Chairman and CEO. In accordance with this provision, Jean-Bernard Lévy was appointed, by ministerial decision of 16 May 2019, temporary Chairman and Chief Executive Officer of the Company from 16 May 2019 until 22 May 2019.

Subject to the specific legal provisions governing public sector companies and the powers specifically reserved by law or by the articles of association to the Board of

Directors or to Shareholders' Meetings, and the limits on the powers of the Chairman and Chief Executive Officer provided for by the internal Rules of Procedure of the Board of Directors as internal rules (see section 4.2.2.3 "Powers and duties of the Board of Directors" below), the Chairman and Chief Executive Officer is vested with the most extensive powers to act on behalf of the Company under all circumstances, within the limits of the corporate purpose. The Chairman and Chief Executive Officer organises and supervises the work of the Board of Directors and reports to the Shareholders' Meeting. They oversee the proper running of the Company's bodies and, in particular, ensure that the Directors are capable of fulfilling their duties.

4.2.2.3 Powers and duties of the Board of Directors

The Board of Directors meets as often as required by the interest of the Company, in accordance with applicable statutory and regulatory provisions. Furthermore, in accordance with the Board's internal Rules of Procedure, the Directors meet once a year to discuss the strategy of the Company and of the Group as part of a strategic seminar. Moreover, the internal rules for the Board of Directors provide that a meeting is to be held each year without the attendance of the Chairman and Chief Executive Officer (executive session), and this meeting shall be chaired by the Chair of the Appointments, Remuneration & Governance Committee.

The Board of Directors determines the Company's business policies and ensures their implementation, in accordance with its corporate interest, taking into consideration the corporate and environmental issues for its business and the Company's *raison d'être*, adopted in 2020 (see Chapter 1 "The group, its strategy and activities" and section 1.3.2 "Priorities of the CAP 2030 strategy"), whose roll-out throughout the Group will be closely monitored. It defines the major strategic, economic, financial and technological policies for the Company and the Group. Subject to powers expressly attributed to the Shareholders' Meetings and within the limit of the Company's corporate purpose, the Board may consider any question relating to the proper running of the Company and regulates, through its deliberations, on any such issue.

The Board deliberates, after examination by the competent Committee or Committees, as the case may be, on the annual budget, the medium-term plan, any significant operation falling outside the Company's announced strategy, the corporate strategic plan presenting the actions to be implemented by the Company or the Group in order to comply with the objectives of the multi-year energy programme (see section 7.1.6.2 "Public service in France"), the Group's strategy relating to the nuclear fuel cycle, gas and renewable energies and the public service contract (see section 7.1.6.2 "Public service in France"). It regularly examines, in connection with the strategy defined by it, opportunities and risks such as financial, legal, operational, social and environmental risks, as well as the measures taken as a consequence. In this context it examines in particular the risks and opportunities relating to climate change and their impact on the Group's strategy and its activities and assets.

The Board ensures the implementation by the Company of a programme for the prevention and detection of corruption and influence-peddling and a non-discrimination and diversity policy, particularly in terms of balanced representation of women and men with the Company's governing bodies (see section 4.2.1 "Members of the Board of Directors"). In accordance with the provisions of Article L. 225-37-1 of the French Commercial Code, the Board of Directors deliberates annually on the Company's policy in terms of equal access to employment and equal pay and defines the Company's strategic aims submitted to the EDF Central Social & Economic Council in accordance with Article L. 2312-17 and Article L. 2312-19 of the French Labour Code.

Under its internal Rules of Procedure, the Board of Directors is competent to authorise, where appropriate, in accordance with the governance of the Group's listed companies, the following transactions prior to their implementation:

- external growth transactions (investments, mergers and acquisitions), divestments, organic growth transactions, as well as stock exchange transactions, carried out by the Company or by one of its subsidiaries, which represent overall financial exposure for the Company or the Group exceeding €350 million; this threshold falls to €150 million for transactions not in line with the Company's or the Group's strategic policies;
- coherent and inseparable industrial programmes of investments or works on existing assets, by the Company or one of its subsidiaries, exceeding €350 million per programme;
- real estate transactions, carried out by the Company or one of its subsidiaries, exceeding €200 million;
- certain financial transactions (long-term borrowings, debt management, securitisation or hedging transactions) whenever they exceed €5 billion (or the

equivalent in any other currency);

- contracts and agreements (supplies, work or services) into by the Company involving amounts, including any necessary subsequent amendments, exceeding €350 million, or between €200 million and €350 million if these contracts relate to a new strategic policy or a new business line for the Group;
- long-term contracts for the purchase or sale of energy, CO₂ emission credits and quotas, by the Company or by one of its subsidiaries, for annual volumes or amounts exceeding 10TWh for electricity, 20TWh for gas (detailed information must also be provided on long-term gas purchase or sale agreements greater than 5TWh and less than 20TWh following the meeting of the Board of Directors) and €250 million for coal, fuel oil, and CO₂ emission credits and quotas;
- strategic agreements to be entered into by the Company constituting firm and irrevocable commitments relating to cooperation or partnerships with one or more foreign partners, in the nuclear industry involving significant transfers of intellectual property or technologies on the Group's part and constituting major issues for the Group.

The Board of Directors determines the framework for the policy for the constitution, management and risk management of assets for hedging EDF's nuclear commitments, specifically ruling on asset/liability management and asset allocation strategy. If the Nuclear Commitments Monitoring Committee issues a negative opinion on a plan to invest in unlisted assets for dedicated assets, the Board has sole authority to authorise the aforementioned plan (see section 4.2.3.2 "Nuclear Commitments Monitoring Committee").

In accordance with Article L. 311-5-7 of the French Energy Code, the Government Commissioner may oppose the investment decisions, the realisation of which would be inconsistent with the objectives of the strategic plan prepared by the Company

or with those of the multi-year energy programme (see section 7.1.6.2 "Public service in France").

4.2.2.4 Balance of powers

EDF's articles of association state that the Chairman of the Board of Directors is assumes the Executive Management of the Company and holds the title of Chairman and Chief Executive Officer. The "non-separated" Executive Management structure is therefore set out in the Company's articles of association.

Each year, when evaluating the functioning of the Board of Directors and the Committees, the Board of Directors assesses the organisation and balance of powers as set out in the Board's Rules of Procedure, and in particular the limitations they place on the powers of the Chairman and Chief Executive Officer (see section 4.2.2.3 "Powers and duties of the Board of Directors" above). The Board has so far considered that the current arrangement ensures a satisfactory balance, in the interest of the Company, between the executive corporate officer and the Board of Directors, while preserving the necessary flexibility, efficiency and responsiveness with regard to the administration and management of the Company (see section 4.2.2.6 "Evaluation of the functioning of the Board of Directors and its Committees").

The issue of the balance in the distribution of powers between the Chairman and CEO and the Board of Directors is also regularly discussed at the executive sessions (see section 4.2.2.3 "Powers and duties of the Board of Directors").

Lastly, the Appointments, Remuneration and Governance Committee is responsible for reviewing and giving its opinion on any situations of conflict of interest of which it is aware, or which might be reported to it, and for reporting on such conflicts to the Board of Directors (see section 4.2.3.5 "Appointments, Remuneration & Governance Committee").

4.2.2.5 Evaluation of Director independence

Total number of Directors	18
Number of independent directors	5
Percentage of independent directors*	41.7%

* Excluding Directors representing the employees.

The AFEP-MEDEF Corporate Governance Code recommends that, in companies with a controlling shareholder, the proportion of independent directors should be at least one third of the Board of Directors and specifies that Directors representing employees are not taken into account in making this calculation.

The table below reiterates the independence criteria stated by the AFEP-MEDEF Code:

Independence criteria
Criterion 1: Employee or corporate officer in the previous five years Must not be or have been within the previous five years an employee or executive officer of the Company, an employee, executive officer or Director of a company consolidated within the Company, an employee, executive officer or Director of the parent company of the Company or a company consolidated within this parent company.
Criterion 2: Cross Directorships Must not be an executive officer of a company in which the Company, directly or indirectly, holds a Directorship, or in which an employee appointed as such or an executive officer of the Company (currently in office or having held such office within the last five years) holds a Directorship.
Criterion 3: Significant business relationships Must not be a customer, supplier, commercial banker, investment banker or consultant of significance to the Company or its Group or for which the Company or its Group represents a significant portion of its activity. The evaluation of the significance or otherwise of the relationship with the Company or its Group must be discussed by the Board and the quantitative and qualitative criteria that led to this evaluation must be clarified in the annual report.
Criterion 4: Family ties Must not be related by close family ties to a corporate officer.
Criterion 5: Auditor Must not have been an Auditor of the Company within the previous 5 years.
Criterion 6: Period of office exceeding 12 years Must not have been a Director of the Corporation for more than 12 years. Loss of the status of independent Director occurs on the date of the 12th anniversary.
Criterion 7: Variable remuneration or performance-based remuneration Must not receive variable remuneration in cash or securities or any remuneration related to the performance of the Company or the Group.
Criterion 8: Major shareholders A Director representing a major shareholder of the corporation or its parent company may be considered independent, provided this shareholder does not participate in the control of the Company. Nevertheless, beyond a 10% threshold in capital or voting rights, the Board shall systematically question the status of independent by taking into account the structure of the Company's capital and the existence of a potential conflict of interest.

Evaluation of Director independence

The Board of Directors annually reviews the individual situation of the Directors with regard to the independence criteria provided in the AFEP-MEDEF Code. It may also be called upon to make a decision during the year in the event of a change in the membership of the Board or the status of a Director justifying a review of his or her independence.

At the meeting on 9 February 2021, the Appointments, Remuneration & Governance Committee (see section 4.2.3 "Board of Directors' Committees") examined the individual situations of Directors, taking into account the independence criteria provided for by the AFEP-MEDEF Code. At its meeting of 17 February 2021, the Board of Directors carried out the annual assessment of Director independence and confirmed the classification as independent directors of Ms Lewiner, Ms Pedini, Mr Crémel, Mr Petitcolin, and Ms Parisot, whose term of office expired on 6 May 2021.

The Board of Directors, meeting on 15 June 2021, reviewed the specific situation of Nathalie Collin, whose appointment as Director was submitted to the General Meeting convened on 22 July 2021, with regard to the independence criteria provided for by the AFEP-MEDEF Corporate Governance Code and noted that she could be classified as an independent Director.

At its meeting on 8 February 2022, the Appointments, Remuneration & Governance Committee examined the situation of Directors, taking into account the independence criteria provided for by the AFEP-MEDEF Code.

The Committee noted that Jean-Bernard Lévy, due to his capacity as Chairman and Chief Executive Officer, and therefore Executive Officer cannot be considered as an independent Director (criterion no. 1).

The Directors appointed on the recommendation of the French State in accordance with Article 6 of order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding "represent", by virtue of this text, "the interests of the French State as shareholder". In view of the criteria set by the AFEP-MEDEF Code, these Directors cannot be considered as independent (criterion no. 8). The same holds true for the Representative of the French State appointed pursuant to the provisions of Article 2 of the Order of

20 August 2014, in his capacity as representative of EDF's majority shareholder (criterion no. 8).

Finally, Directors representing employees are not subject to an assessment, in accordance with the recommendations of the AFEP-MEDEF Code.

With respect to business relationships, the Appointments, Remuneration & Governance Committee examined the situation of Ms. Collin, Lewiner and Pedini and Mrs. Crémel and Petitcolin with regard to criterion no. 3 provided for by the AFEP-MEDEF Code. In particular, the Committee examined any business ties that might exist between the Company and companies in which these Directors hold offices or senior management positions, as well as groups to which they belong, on a quantitative level, *via* the importance of any business relations existing between the Company and these companies, their groups, and sales between them recorded in the course of the 2021 fiscal year, and on a qualitative level (Director's position in the companies in question, nature of business relations, any economic dependence, exclusivity, etc.). Based on their findings, none of the companies, in which Ms. Collin, Lewiner and Pedini and Mrs. Crémel and Petitcolin hold offices or management posts, nor any of the groups to which these companies belong, could be classified as a significant client, supplier, business banker, financing banker or consultant of the EDF group, nor could EDF be considered a significant client or supplier of these companies or their groups. Following these analyses, the Committee therefore concluded that there were no significant business ties involving these Directors.

After consulting the Committee, the Board of Directors assessed the individual situation of Ms. Collin, Lewiner and Pedini and Mrs. Crémel and Petitcolin at its meeting on 17 February 2022 and confirmed their independence in accordance with the independence criteria set out in the AFEP-MEDEF Code. The Board deemed that none of these Directors had any relations with the Company, its Group or its management that might compromise the exercise of their freedom of judgement.

On the date of filing this Universal Registration Document, the Company's Board of Directors therefore features five independent directors out of the twelve taken into account to make the calculation in accordance with the AFEP-MEDEF Code, *i.e.* a proportion of 41.7%, higher than one third of the Directors as recommended by the AFEP-MEDEF Code.

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The table below presents the situation of the Directors classified as independent taking into account the criteria provided for by the AFEP-MEDEF Code:

	Criterion no. 1	Criterion no. 2	Criterion no. 3	Criterion no. 4	Criterion no. 5	Criterion no. 6	Criterion no. 7	Criterion no. 8	Final classification
Nathalie Collin	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Bruno Crémel	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Colette Lewiner	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Claire Pedini	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Philippe Petitcolin	✓	✓	✓	✓	✓	✓	✓	✓	Independent

✓: Means that the criterion is satisfied.

4.2.2.6 Evaluation of the functioning of the Board of Directors and its Committees

In accordance with the provisions of the AFEP-MEDEF Code, the Board's internal Rules of Procedure provide that the Appointments, Remuneration & Governance Committee shall supervise annually an evaluation of the functioning of the Board of Directors and propose areas for improvement. Once a year, therefore, the Board shall dedicate one item on its agenda to this evaluation and shall hold a discussion on its functioning and that of its Committees in order to improve its efficiency and ensure in particular that important issues are appropriately prepared and discussed.

Every three years, this evaluation is conducted by an independent external consultant under the supervision of the Appointments, Remuneration & Governance Committee.

External evaluation 2020

The last external evaluation was carried out in 2020 by an independent board under the guidance of the Appointments, Remuneration and Governance Committee, through in-depth interviews with each of the Directors, based on a questionnaire and interview guide developed by the independent consultant in conjunction with the Chair of the Committee. The individual contribution of each Director to the work of the Committee was evaluated, which resulted in individual and confidential feedback being issued by the consultant to each Director.

The conclusions of this evaluation were examined at a meeting of the Appointments, Remuneration and Governance Committee, and then submitted to the Board in December 2020.

The results of this 2020 external evaluation showed that the Directors believe that:

- the quality of the work of the Board and its Committees has continued to improve in recent years;
- the Board was working in a professional and committed manner;
- the quality of all Directors and the diversity of opinions represented were appreciated;
- the dynamics of the discussions, based in particular on the commitment of the members, were constructive; and finally;
- the functioning and organisation of the work of the Board and its Committees are rigorous and adapted to the complexity of the Company.

Among the areas for improvement identified by the Directors are:

- actions aimed at prioritising the work of the Board, by continuing to discuss on a selection of the subjects addressed;
- a better contribution to the monitoring of the Group's major operating risks; and
- further strengthening the contribution of the Board and the Committees on structural subjects, notably by strengthening the Board's skills in the areas of senior management of large companies, in the energy sector and possibly internationally.

Annual evaluation 2021

The 2021 annual evaluation was conducted internally using an anonymous questionnaire completed by the Directors, including both closed questions, enabling statistical monitoring of the answers, and open questions, enabling Directors to give detailed answers, provide qualitative observations, propose changes, and share their expectations for the 2022 fiscal year. The conclusions of this evaluation were examined at a meeting of the Appointments, Remuneration and Governance Committee on 25 November 2021, and then submitted to the Board on 15 December 2021.

In particular, the following emerged from the results of the 2021 evaluation:

- the general operation of the Board (number of meetings, availability and quality of issues treated, work programme, general level of information) was deemed to be satisfactory, as was the quality of the discussions and the dynamics of the exchanges within the Board, which some felt were improving;
- the Directors felt that the quality of the work carried out by the Board Committees and the reports made on it contribute effectively to the Board's decision-making;
- the 2021 strategy seminar and the associated programme were unanimously welcomed;
- the Directors consider the balance of powers between the Chairman and CEO and the Board, as set out in the rules of procedure, to be balanced and appropriate;
- the increased expertise of the Board in 2021, particularly in the areas of general management of large companies in 2021, was welcomed; and the Directors considered that the appointments made in recent years had enriched the exchanges and increased the dynamics of the Board.

The areas for improvement identified include strengthening the monitoring of decisions taken by the Board and of major operational risks. In addition to these two issues, the Directors placed strategy, monitoring of performance and value creation, and monitoring of the financial situation and trajectory among the top priorities for 2022. Finally, some Directors reiterated their wish to see foreign Directors appointed to the Board.

4.2.2.7 Information and training of Directors - Digitalisation

The Chairman and Chief Executive Officer ensures that the Directors have the necessary information for them to carry out their remit. This information is provided to them as soon as possible to enable them to carry out their remit in the best conditions.

Under the Board's internal Rules of Procedure, it periodically receives information on the financial, cash management and off-balance sheet commitments position of the Company and the Group, and on the performance of the Company's principal subsidiaries at the time of presentation of the annual and half yearly financial statements, in addition to the purchasing and human resources policy. The Board of Directors is also regularly informed of changes to the Company's markets, competitive environment and the main challenges facing the Company, including in the field of corporate social, societal and environmental responsibility.

A document reviewing the Group's current major business sectors, market trends and the economic, financial and institutional context is regularly submitted to the Board of Directors. The Company also provides them with quarterly monitoring of key indicators concerning EDF and the Group, and more generally with any useful information between Board meetings, if the importance or the urgency of the matter so requires.

The Directors may supplement this information by means of meetings with the principal executives of the Company or Group, including without the Chairman being present, to discuss issues on the Board's agenda.

Finally, each Director may receive additional training in the specific characteristics of the Company and the Group, their business activities and their field of activity, as well as in specific themes falling within the remit of the Committees of which they are members. Information meetings may also be organised on complex matters or issues of major strategic importance, together with any training requested by the Directors.

Since 2016, the Board of Directors has been using a digital platform, which allows for the smooth, swift and secure availability of Board and Committee files. The Board also uses a secure videoconferencing tool for its meetings when they are held remotely.

4.2.2.8 Obligations and duties of Directors

The internal Rules of Procedure of the Board of Directors state that its members are subject to obligations such as: acting in all circumstances in the corporate interest of the Company, informing the Board of situations of conflict of interest (see also section 4.4.1 "Conflicts of interest"), and refraining from contributing to the discussions and voting on any decision in which there might be a conflict of interest, fulfilling the obligation of confidentiality, carrying out their term of office with diligence and commitment, and complying with the EDF Stock Exchange code of ethics.

The Directors and the Chairman and Chief Executive Officer are required to inform the Board immediately of any agreement entered into by the Company, in which they hold a direct or indirect interest, or which might be entered into through an intermediary.

In addition to the right to obtain disclosure of the documents and information necessary to perform their work, the Directors also have a duty to request the information they deem essential to the proper exercise of their duties.

Under the internal Rules of Procedure, each Director undertakes to ensure that his or her status complies with the French Commercial Code and the AFEP-MEDEF Code recommendations on plurality of offices and to keep the Board informed of offices they hold in other companies. The Chairman and Chief Executive Officer is also required to inform the Board of Directors before accepting an appointment in a listed company.

4.2.2.9 Activity of the Board of Directors in 2021

	2021	2020
Number of meetings	14*	9*
Average attendance rate	95.2%	96.3%
Average duration of the meetings	2 hours and 56 minutes	3 hours and 27 minutes

* In addition to this number of meetings, a one-day strategy seminar was held, as well as two workshops, one dedicated to the climate and the other to the challenges and prospects of the capacity obligation mechanism.

The table below shows the individual attendance rate of Directors over the 2021 fiscal year at the meetings of the Board and its Committees:

Individual attendance rate of Directors in 2021	Board of Directors	Audit Committee	Nuclear Commitments Monitoring Committee	Strategy Committee	Corporate Responsibility Committee	Remuneration & Appointments, Governance Committee
Jean-Bernard Lévy	100%			100%		
Véronique Bédague-Hamilius	64%				50%	
Claire Bordenave	100%				50%	
Jacky Chorin ⁽¹⁾	100%	100%		100%	100%	
Nathalie Collin ⁽²⁾	100%	100%				
Bruno Crémel	93%	100%				
François Delattre	86%			100%		
Gilles Denoyel	100%		100%			
Karine Granger	93%		100%	100%		100%
Marie-Christine Lepetit	100%	100%	100%			
Sandrine Lhenry ⁽³⁾	100%	100%		100%	100%	
Colette Lewiner ⁽⁴⁾	100%	100%	100%			100%
Laurence Parisot ⁽⁵⁾	100%			n/a	50%	
Claire Pedini	100%				100%	100%
Philippe Petitcolin	93%	80%		100%		
Jean-Paul Rignac	100%	100%				
Vincent Rodet	93%	100%	100%	100%	100%	
Michèle Rousseau ⁽⁶⁾	100%		100%		n/a	
Christian Taxil	93%	100%		100%		
Martin Vial	100%			100%		80%

n/a: not applicable.

(1) Director whose term of office expired on 28 July 2021.

(2) Director whose term of office, as well as her duties on the Audit Committee, took effect on 22 July 2021.

(3) Director whose term of office, as well as her duties on the Audit Committee, the Strategy Committee and the Corporate Responsibility Committee, took effect on 28 July 2021.

(4) Director who ceased to be a member of the Audit Committee as of 22 July 2021.

(5) Director whose term of office ended on 6 May 2021, the first meeting of the Strategy Committee having been held on 12 May 2021.

(6) Member of the Corporate Responsibility Committee since 4 November 2021, the last meeting of the Committee having been held on 28 October 2021.

Activity in 2021

In 2021, the Board of Directors reviewed and/or authorised, in addition to numerous files related to the Company's ordinary business, the progress of the Hinkley Point C, Flamanville 3, Sizewell C projects and the Excell plan (see section 1.4.1.1.1 "The excell plan"), the financing arrangements for the new nuclear reactor programme in France as well as the commission contract for the turbo-generator sets for this programme, various EDF Renewables projects including the final investment decision for the Courseulles-sur-Mer offshore wind project, the Group's gas strategy, the opening up of the capital of Edison Renewables to a financial investor (see section 1.4.5.2.3.1 "Electricity generation"), the situation of the UK nuclear plant and of EDF Energy Nuclear Generation, the climate strategy and the EDF group's carbon trajectory, the Group's adaptation to climate change in relation to the main physical climate risks, the mobilisation of the Group's stakeholders on the climate and the issue of sustainable finance, the situation of the French nuclear plant in view of the winter of 2021-2022, the update of the reference note on the policy for the constitution, management and control of the financial risks of the dedicated assets (see section 4.2.3.2 "Nuclear Commitments Monitoring Committee") and the policy on

securing the financing of nuclear costs, the responses to EDF's Central Social and Economic Committee in the context of the dialogue between this body and the Board of Directors on the strategic direction for the Company, the update of the diversity policy applicable to Directors, the remuneration policy for the Chairman and Chief Executive Officer and the Directors submitted to the General Meeting of 6 May 2021 pursuant to Article L. 22-10-8 of the French Commercial Code, the draft settlement agreement between EDF and AREVA aimed at resolving all disputes between EDF and AREVA relating to the Framatome acquisition contract signed in 2017 and to their commercial relations prior to the acquisition, the progress of the Nuward project (see section 1.4.1.1.3.2 "Other New Nuclear projects"), the proposed disposal of a residential property portfolio of the Group, and the Group's ethics and compliance system.

The Board held extraordinary meetings to discuss the submission of the Group's technical and commercial tender for the Indian Jaitapur project (see section 1.4.1.1.3.2 "Other New Nuclear projects"), EDF's proposal to the Government for a new reactor programme in France, and the proposed sale of the Group's stake in CENG (see section 1.4.5.3.4.1 "Nuclear activities in the United States").

Furthermore, the Directors meet once a year to discuss the strategy of the Company and of the Group as part of a strategic seminar. During the strategic seminar held in 2021, the Board discussed energy and climate policies in Europe, the strategy the acceleration in offshore wind power, the growth drivers of the Customers, Services and Territories Division and the Group's digital strategy.

The Board of Directors also held a workshop in May 2021 dedicated to the issues and prospects of the capacity obligation mechanism.

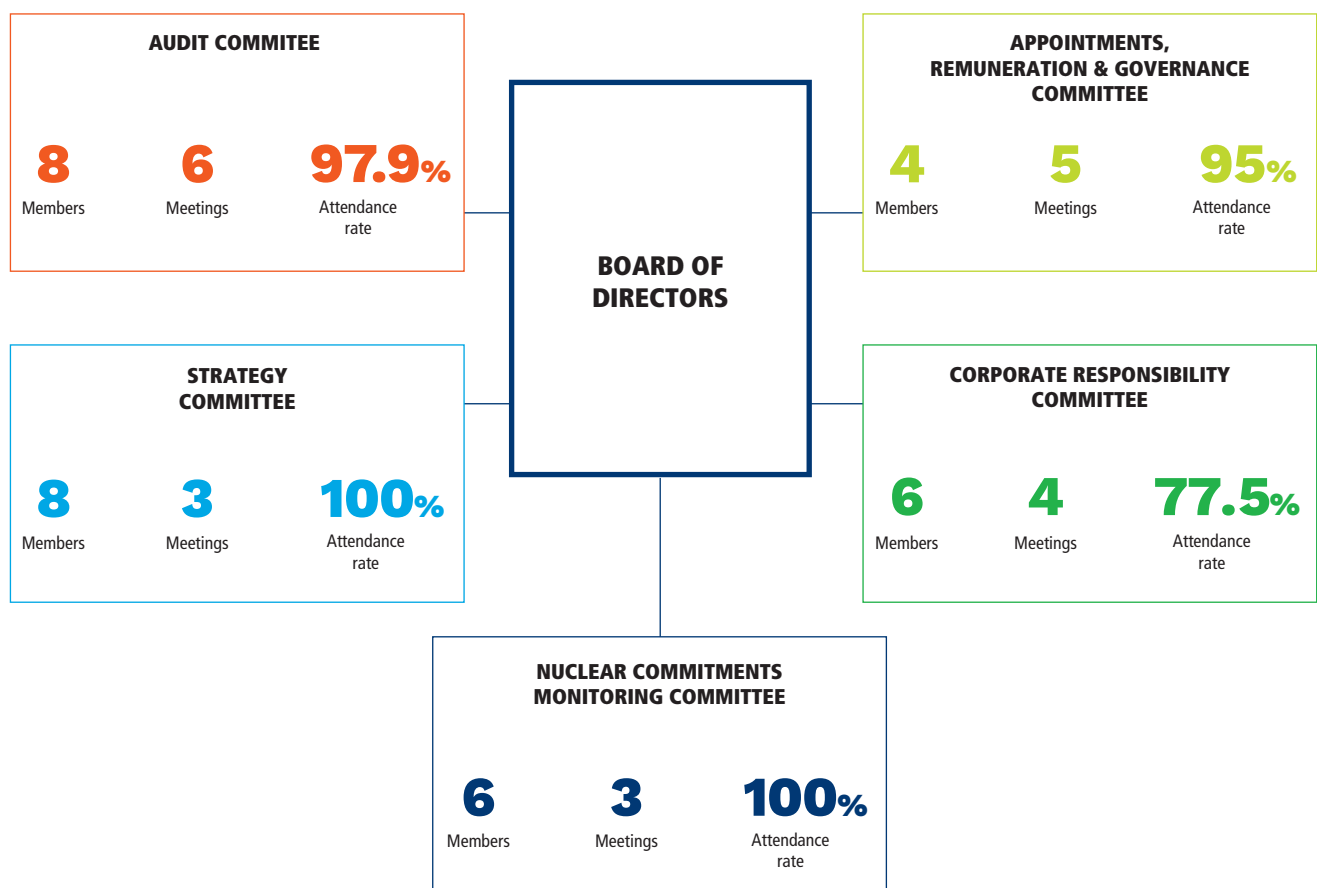
In November 2021, a dedicated climate workshop was held, during which the Directors carried out the Climate Collage (see section 3.1.3.5.2 "Innovation and collective intelligence focused on climate action"), making the EDF Board the first Board of a French company to have undergone the exercise. Directors also discussed with two climate negotiation experts the outcome of COP 26 in Glasgow and the progress that could be made in focusing the multilateral process and the commitments of the countries towards a limiting global warming to 1.5°C by mid-century. This workshop was organised at the initiative of the Chair of the Corporate Responsibility Committee and the Board of Directors' Climate Officer as part of the

Board's annual work programme on climate issues, defined before the start of each financial year. This approach is part of EDF's governance of climate-related issues, which aims to raise climate issues to the highest level of the Company and to strengthen the Board's involvement in and commitment to all climate-related issues, in line with EDF's *raison d'être*. In this context, the Board takes climate change issues into account in all its work and in defining EDF strategy, and reviews the risks and opportunities related to climate change, as well as the impacts of climate change on the Group and its activities.

Finally, under the internal Rules of Procedure of the Board of Directors, a meeting is to be held each year with all the Directors except the Chairman and Chief Executive Officer (executive session), which is chaired by the Chair of the Appointments, Remuneration & Governance Committee (see section 4.2.2.3 "Powers and duties of the Board of Directors"). An executive session was held during the 2021 fiscal year. On this occasion, the Directors discussed, in particular, their assessment of the Chairmanship and leadership of the Board by the Chairman and CEO, areas where the Board's operation is satisfactory and possible areas for improvement, and finally the role and contribution of the Directors.

4.2.3 Board of Directors' Committees

Presentation of the Committees ⁽¹⁾



To perform its duties, the Board of Directors has created five Committees to examine and prepare certain projects before they are presented to the Board. These specialised Committees are: the Audit Committee, the Nuclear Commitments Monitoring Committee, the Strategy Committee, the Corporate Responsibility Committee, and the Appointments, Remuneration & Governance Committee.

The membership, operation and duties of the Committees are governed by the internal Rules of Procedure of the Board of Directors.

The Committees comprise at least three Directors chosen by the Board, which appoints the Chair of each Committee. The Company's articles of association provide that each Committee should include at least one Director representing the employees.

As at the date of this document, the Chairs of the Board Committees were as follows:

- Jean-Bernard Lévy for the Strategy Committee;
- Marie-Christine Lepetit for the Audit Committee;
- Gilles Denoyel for the Nuclear Commitments Monitoring Committee;
- Claire Pedini for the Corporate Responsibility Committee;
- Colette Lewiner for the Appointments, Remuneration & Governance Committee.

(1) Data relating to the 2021 fiscal year, except for data relating to the membership of the Committees, which are data as at the date of filing of this Universal Registration Document.

The Government Commissioner and the Head of the French State General Economic and Financial Supervisory Mission to the Company may attend the meetings of these Committees. The Government Commissioner may be represented in these Committees.

The work of the Committees is organised within a programme prepared for the year. Meetings are recorded in the form of written minutes, and the Committee Chair gives an oral report at the following meeting of the Board of Directors.

The Board's internal Rules of Procedure provide that the Committees shall meet in sufficient time before the Board meeting, the agenda of which includes consideration of matters falling within their remit.

The Committees may invite Company executives, including the Chairman and Chief Executive Office, to attend their meetings. They may also invite other parties to

attend, whether employed by the Company or not, having informed the Chairman and Chief Executive Officer in advance and on the condition that they report such attendance to the Board. The Committees may also, having informed the Chairman and Chief Executive Officer, have recourse to technical studies and external on issues falling within their remit, at the Company's expense, provided that they report this to the Board.

In 2021, the Committees held a total of 21 meetings. The average overall attendance rate of the Committees was 94.1%. The average rates of attendance per Committee are provided under Sections 4.2.3.1 to 4.2.3.5 below.

For the individual attendance rates for the Directors to the Committees meetings, see section 4.2.2.9 "Activity of the Board of Directors in 2021".

4.2.3.1 Audit Committee

Membership

In accordance with the provisions of Article L. 823-19 of the French Commercial Code and the recommendations of the AFEP-MEDEF Code, the Audit Committee does not include any Chairman and Chief Executive Officer and includes more than two-thirds of independent members.

The table below outlines the membership of the Committee on the date of filing of this Universal Registration Document.

Members of the Audit Committee

Marie-Christine Lepetit	Chair	Director appointed by the Shareholders' Meeting on recommendation of the French State
Bruno Crémel	Member	Independent Director appointed by the Shareholders' Meeting
Nathalie Collin ⁽¹⁾	Member	Independent Director appointed by the Shareholders' Meeting
Sandrine Lhenry ⁽²⁾	Member	Director elected by the employees
Philippe Petitcolin	Member	Independent Director appointed by the Shareholders' Meeting
Jean-Paul Rignac	Member	Director elected by the employees
Vincent Rodet	Member	Director elected by the employees
Christian Taxil	Member	Director elected by the employees

(1) Ms Collin has been a member of the Audit Committee since 22 July 2021.

(2) Ms Lhenry has been a member of the Audit Committee since 28 July 2021.

Number of members	8
Number of independent directors	3
Percentage of independent directors*	75%

* Excluding Directors representing the employees.

Article L. 823-19 of the French Commercial Code provides that at least one member of the Committee must have specific skills in financial or accounting matters and must be independent in accordance with the criteria defined and made public by the Board of Directors. Furthermore, Article 16.1 of the AFEP-MEDEF Code recommends that all members of the Audit Committee have financial or accounting skills, that the re-election of the Chair of the Committee be specifically examined by the Board and finally, that the proportion of independent directors on the Board be at least two-thirds, excluding Directors representing employees.

The Board of Directors' meeting following the Shareholders' Meeting of 16 May 2019, had re-examined the membership of the Committee, taking account of changes to the membership of the Board. Regarding the Audit Committee, the Board had noted in particular that Ms. Lepetit, whose re-election as Chair of the Audit Committee was proposed, and Mr. Crémel, have specific financial and accounting skills in accordance with the criteria recommended by the Autorité des marchés financiers (AMF, French Financial Markets Authority) in its report on the Audit Committee of 22 July 2010. The Board therefore found that Mr. Crémel meets the criteria regarding both skills and independence set out in Article L. 823-19 of the French Commercial Code (see section 4.2.2.5 "Evaluation of Director independence").

After receiving the opinion of the Appointments, Remuneration and Governance Committee, at their meeting of 17 February 2021 the Board of Directors appointed Mr Petitcolin as a member of the Audit Committee and noted that he has expertise in financial and accounting matters. Mr. Petitcolin also meets both the criteria regarding skills and independence set out in Article L. 823-19 of the French Commercial Code (see section 4.2.2.5 "Evaluation of Director independence").

Lastly, after consultation with the Appointments, Remuneration and Governance Committee, the Board of Directors' meeting held on 15 June 2021 decided, subject

to her appointment as a Director by the General Meeting of 22 July 2021, to appoint Ms Collin as a member of the Audit Committee and noted that she has expertise in financial or accounting matters. Ms. Collin also meets both the criteria regarding skills and independence set out in Article L. 823-19 of the French Commercial Code (see Section 4.2.2.5 "Evaluation of Director independence").

Duties

Under the supervision of the Board of Directors, the Audit Committee carries out the duties entrusted to it in accordance with Article L. 823-19 of the French Commercial Code. In accordance with this article, the Audit Committee is tasked with the following duties in particular:

- monitoring the process of preparing financial information and making any recommendations to guarantee its integrity;
- monitoring the effectiveness of the internal control, risk management and internal audit systems, regarding procedures relating to the preparation and processing of accounting and financial information;
- monitoring the performance of the duties of the Statutory Auditors, ensuring their independence, and approving the provision of the services referred to in Article L. 822-11-2 of the French Commercial Code.

In fulfilling its duties, it examines and gives its opinion to the Board of Directors, in particular on:

- the Company's financial position, the medium-term plan and the budget;
- the preliminary and consolidated annual and half-yearly financial statements and related financial reports;
- the monitoring of risks and internal control (mapping of Group risks and methods of detection, anticipation and management of risks in all areas,

including social, environmental and climate change risks, organisation and evaluation of internal control processes); in this context, it ensures, in conjunction with the Corporate Responsibility Committee, the existence of programmes for the internal control and management of the main risks in terms of ethics, compliance, and corporate responsibility;

- the audit (annual audit programme, main findings and corrective actions, action plans, monitoring of their implementation);
- monitoring of the Statutory Auditors (coordination of the auditor selection procedure, monitoring of the fulfilment of their duties, taking account, where applicable, of the findings and conclusions of the Haut Conseil du Commissariat aux comptes (i.e. French High Council of Auditors), verification of compliance by the Statutory Auditors with the conditions of independence provided for in the applicable laws, opinion on the amount of fees, approval of the provision by the Statutory Auditors of services other than the certification of accounts in accordance with a procedure approved by the Board of Directors on 3 November 2016);

- financial aspects of external growth or divestment activities, which are particularly significant (see section 4.2.2.3 "Powers and duties of the Board of Directors");
- policies in terms of insurance, energy market risks and risk of bankruptcy of the Group's counterparties.

The examination of the financial statements by the Committee is accompanied by a presentation by the Statutory Auditors underlining the bases for the preparation of the financial statements, the applicable accounting frame of reference, the audit approach implemented and the conclusions of their auditing work or limited review. In addition to the meetings of the Audit Committee devoted to examining the annual and half-yearly financial statements, the Statutory Auditors also attend all meetings devoted to risk monitoring, internal control and auditing.

For the purposes of its work, the Committee regularly meets the Statutory Auditors, Executive Management, Corporate Finance, Group Risk Management and Internal Auditing.

Activity in 2021

The table below presents the statistical data relating to the 2020 and 2021 fiscal years:

	2021	2020
Number of meetings	6	5
Average attendance rate	97.9%	97.1%
Average duration of the meetings	2 hours and 39 minutes	3 hours and 7 minutes

In 2021, the Audit Committee examined the half-year and annual financial statements and the related financial reports, the presentation by the Statutory Auditors of their 2021 audit plan and the key points of their findings following their work, the recommended interim dividend for the 2021 fiscal year, the review of the value of assets in preparation for closing the 2021 accounts, off-balance sheet commitments, updating risk mapping, the risk control and monitoring methods and improvement initiatives identified, the audit programme, the summary of internal audits, the follow up of the implemented action plans, an annual summary of the Group's energy market and counterparty risks, the annual financial management and financial risk control mandate, the management of cyber security risks, a review of acquisitions and depreciations recorded on assets controlled by the Group

between 2008 and 30 June 2021, as well as feedback on the extreme climatic event that occurred in Texas in February 2021.

In 2021, in accordance with the procedure approved by the Board of Directors of EDF on 3 November 2016, the Committee authorised the Statutory Auditors and the members of their network to provide services other than the certification of the financial statements and it was informed on a half-yearly basis of the services provided as part of the pre-approval process under the terms of this procedure.

The Committee did not have recourse to any technical studies or external advice on issues falling within its remit during the 2021 fiscal year.

4.2.3.2 Nuclear Commitments Monitoring Committee

Membership

The table below outlines the membership of the Nuclear Commitments Monitoring Committee on the date of filing of this Universal Registration Document:

Membership of the Nuclear Commitments Monitoring Committee

Gilles Denoyel	Chairman	Director appointed by the Shareholders' Meeting on recommendation of the French State
Karine Granger	Member	Director elected by the employees
Marie-Christine Lepetit	Member	Director appointed by the Shareholders' Meeting on recommendation of the French State
Colette Lewiner	Member	Independent Director appointed by the Shareholders' Meeting
Vincent Rodet	Member	Director elected by the employees
Michèle Rousseau	Member	Director appointed by the Shareholders' Meeting on recommendation of the French State

Number of members	6
Number of independent directors	1
Percentage of independent directors*	25%

* Excluding Directors representing the employees.

Duties

The Nuclear Commitments Monitoring Committee (NCMC) was created by Article 9 of Decree no. 2007-243 of 23 February 2007 on the securing of the financing of long-term nuclear costs. It is tasked with monitoring the assessment of nuclear liabilities and changes in the related provisions, issuing an opinion on issues relating to the governance of dedicated assets, the rules for asset-liability matching and on strategic allocation, as well as examining the results of the management of assets constituted by the Company and verifying the compliance of such management with the rules on constituting, managing, and controlling the financial

risks of dedicated assets. It provides the Board with an opinion on the internal control procedure for the financing of the costs of decommissioning nuclear facilities, spent fuel management and disposal of radioactive waste, as set out in Article L. 594-1 of the French Environmental Code.

Decree No. 2020-830 of 1 July 2020, which amended Decree No. 2007-243 of 23 February 2007, requires the establishment of an independent control function for the assessment of nuclear liabilities, responsible in particular for issuing an opinion on the assessment of nuclear liabilities and their provisional timetable, the consistency of the methods and data concerning the assessment of nuclear

liabilities and the policy on securing the financing of these liabilities. This Nuclear Liabilities Assessment Control Function (FCECN) has been created within the Company and is assigned to the General Secretary (see section 2.2.5 "Specific risks related to nuclear activities", paragraph 5B – "Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments"). The opinions issued by the Nuclear Liabilities Assessment Control Function are forwarded to its parent authority, to the departments with operational responsibility for the assessment of nuclear liabilities, to the NCMC and the Board of Directors.

Furthermore, the Committee relies on the works of the Nuclear Commitments Financial Expertise Committee (NCFEC) which comprises independent experts

appointed by the Board ⁽¹⁾, whose duty is to assist the Company and its corporate bodies with matters relating to asset-liability matching and the management of dedicated assets.

Finally, the Committee issues an opinion prior to any investment in unlisted dedicated assets for any project exceeding a unit amount of €400 million as well as for any project (excluding real estate) exceeding a unit amount of €200 million resulting in full consolidation of the target investment by the Company. In the event that the Committee issues a negative opinion on an investment plan, the Board of Directors has sole authority to authorise the aforementioned plan.

Activity in 2021

	2021	2020
Number of meetings	3	3
Average attendance rate	100%	100%
Average duration of the meetings	2 hours and 53 minutes	3 hours and 11 minutes

In 2021, the Committee reviewed in particular the hedge position and discount rate of the nuclear provisions, the performance of the listed and unlisted dedicated asset portfolios, the implementation of the strategic allocation included in the reference note on the policy on the constitution, management and control of the financial risks of dedicated assets and changes to this strategic allocation before its submission to the Board for approval, the result of the work on the measurement of the carbon footprint of the portfolio of dedicated assets and the associated climate risk and on a first approach to taking into account the climate risk in the ALM study of dedicated assets, the letter updating the three-year report on securing the financing of nuclear expenses and the report on internal control included therein, the monitoring of risks related to dedicated assets, the progress of the implementation of the Nuclear Liabilities Assessment Control Function, EDF policy

on securing the financing of nuclear liabilities within the framework of Decree No. 2020-830 of 1 July 2020 before it is submitted to the Board for approval, the state of progress of the decommissioning programme for first generation nuclear power plants and the projects for the Industrial Geological Storage Centre (CIGEO) and the Facility for the Conditioning and Storage of Activated Waste (ICEDA) (see section 1.4.1.1.2.3 "Issues relating to the nuclear activity").

The Statutory Auditors attend all the meetings of the Nuclear Commitments Monitoring Committee.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2021 fiscal year.

4.2.3.3 Strategy Committee

Membership

The table below outlines the membership of the Committee on the date of filing of this Universal Registration Document. The Directors who are not members of the Strategy Committee attend all of its meetings.

Membership of the Strategy Committee

Jean-Bernard Lévy	Chairman	Chairman and Chief Executive Officer, Director appointed by the Shareholders' Meeting
François Delattre	Member	Director appointed by the Shareholders' Meeting on recommendation of the French State
Karine Granger	Member	Director elected by the employees
Sandrine Lhenry*	Member	Director elected by the employees
Philippe Petitcolin	Member	Independent Director appointed by the Shareholders' Meeting
Vincent Rodet	Member	Director elected by the employees
Christian Taxil	Member	Director elected by the employees
Martin Vial	Member	Representative of the French State.

* Ms. Lhenry is a member of the Strategy Committee since 28 July 2021.

Duties

The Strategy Committee examines and/or issues an opinion to the Board of Directors on the Company's major strategic orientation and, specifically, on the corporate strategic plan setting out the actions to be implemented in order to comply with the objectives of the multi-year energy programme (see section 7.1.6.2 "Public service in France"), the Company's strategic objectives drawn up with a

view to the consultation of the EDF Central Social and Economic Committee, the public service contract (see section 7.1.6.2 "Public service in France"), the strategic agreements, alliances and partnerships, as well as the research and development policy.

Activity in 2021

	2021	2020
Number of meetings	3	3
Average attendance rate*	100%	96.3%
Average duration of the meetings	3 hours and 30 minutes	3 hours and 13 minutes

* Attendance rate calculated based on the members of the Committee alone (furthermore, all the members of the Board may attend these meetings).

(1) The current members of the NCFEC were re-elected or appointed on 19 November 2019 for three years by the Board of Directors after consultation with the NCMC.

In 2021, the Committee reviewed in particular the Group's new health and safety policy, the strategic plan, the industrial and commercial issues and the results and outlook for Framatome, the forecast supply and demand balance for the winters of 2021-2022 and 2022-2023, the Group's strategy for new nuclear power worldwide, the EDF group's innovation strategy and operations, the progress of

CAP 2030, the main assumptions of the medium-term plan for 2022-2024, and the performance of, outlook and environmental challenges for EDF Renewables.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2021 fiscal year.

4.2.3.4 Corporate Responsibility Committee

Membership

The table below outlines the membership of the Corporate Responsibility Committee on the date of filing of this Universal Registration Document:

Members of the Corporate Responsibility Committee

Claire Pedini	Chair	Independent Director appointed by the Shareholders' Meeting
Véronique Bédague-Hamilus	Member	Director appointed by the Shareholders' Meeting on recommendation of the French State
Claire Bordenave	Member	Director elected by the employees
Sandrine Lhenry ⁽¹⁾	Member	Director elected by the employees
Vincent Rodet	Member	Director elected by the employees
Michèle Rousseau ⁽²⁾	Member	Director appointed by the Shareholders' Meeting on recommendation of the French State

(1) Ms. Lhenry has been a Member of the Corporate Responsibility Committee since 28 July 2021.

(2) Ms. Rousseau has been a Member of the Corporate Responsibility Committee since 4 November 2021.

Number of members	6
Number of independent directors	1
Percentage of independent directors*	33.33%

* Excluding Directors representing the employees.

Duties

In connection with the Group's strategy the Corporate Responsibility Committee examines the Group's commitments and policies, as well as their implementation, in terms of ethics, compliance, and corporate responsibility. It examines the way in which the Company takes account of issues relating to climate change. In conjunction with the Audit Committee, it ensures the existence of programmes to identify and manage the main risks in these fields and to comply with legal and regulatory provisions.

As part of its duties, it examines particularly the factors constituting the declaration of extra-financial performance included in the management report in accordance with the French Commercial Code, in conjunction with the Audit Committee, the annual ethics and compliance report, the EDF mediator's annual report, as well as the annual reports from the French Inspector General for Nuclear Safety and Radiation Protection and the Inspector for Hydropower Safety.

The Committee submits an opinion to the Board on EDF's policy on gender, professional and salary equality between women and men and on the way in which the Company implements a non-discrimination and diversity policy, particularly in terms of balanced representation of women and men in governing bodies.

In accordance with best market practice and stakeholder expectations with regard to the governance of climate issues, the Company has further strengthened its climate governance in 2020 by appointing a Climate point person to the Board of Directors. In addition to the missions already entrusted to the Board, the Corporate Responsibility Committee and the Audit Committee in terms of monitoring the risks and opportunities related to climate change, the Chair of the Corporate Responsibility Committee has been designated as Climate point person to the EDF's Board of Directors. As Climate point person, in line with EDF's *raison d'être*, the Chair of the Committee is responsible for:

- ensuring, in conjunction with the Chairman of the Board of Directors and the Executive Committee's Climate point person (see section 3.1.3 "EDF Climate governance"), that the Board of Directors identifies all the impacts of climate change for the Group and that the Board's work and the strategy it defines incorporate such climate change issues;
- regularly informing the Board of the Company's climate strategy, after presentation to the Corporate Responsibility Committee by the Climate point person of the Executive Committee;
- ensuring, in conjunction with the Chairman of the Board, that the Corporate Responsibility Committee and the Board regularly review the implementation of the Group's carbon neutrality trajectory adopted by the Executive Committee;
- understanding, in the context of the Corporate Responsibility Committee's duties, how the Group applies the recommendations of the Taskforce on Climate related Financial Disclosures (TCFD) (see sections 3.1.3.2 "Implementation of Task Force on Climate-related Financial Disclosures (TCFD) recommendations" and 3.1.3 "EDF's Climate Governance") and reports on climate-related risks.

In November 2021, a dedicated climate workshop was held for the Board of Directors at the initiative of the Climate point person, as part of the Board's annual work programme on climate issues, as defined with the Chairman and CEO before the start of each fiscal year (see section 4.2.2.9 "Activity of the Board of Directors in 2021"). This approach is part of EDF's governance of climate-related issues, which aims to raise climate issues to the highest level of the Company and to strengthen the Board's involvement in and commitment to all climate-related issues.

The Committee may submit any opinions, proposals and recommendations to the Board of Directors in fields falling within its remit.

Activity in 2021

	2021	2020
Number of meetings	4	4
Average attendance rate	77.5%	95.8%
Average duration of the meetings	1 hour and 40 minutes	2 hours and 23 minutes

In 2021, the Committee reviewed in particular the 2020 non-financial performance statement included in the 2020 management report, the presentation of the Stakeholder Council (see section 3.4.1.1.1 "EDF, a policy of dialogue and consultation"), the 2020 reports of the Inspector General for Nuclear Safety and Radiation Protection and the Inspector for Hydraulic Safety, the results of the 2020 "My EDF group" survey, the 2020 report of the EDF Mediator, the policy of professional and salary equality between women and men and the assessment of

the implementation of Diversity programme (see section 3.3.3.1 "Workplace equality"), the Group's new health and safety policy and the annual health and safety assessment, EDF's policy and actions in terms of proximity and solidarity in its relationship with individual customers, the expectations of investors and EDF group's actions in terms of just transition.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2021 fiscal year.

4.2.3.5 Appointments, Remuneration & Governance Committee

Membership

The table below outlines the membership of the Appointments, Remuneration & Governance Committee on the date of filing of this Universal Registration Document.

Members of the Appointments, Remuneration & Governance Committee

Colette Lewiner	Chair	Independent Director appointed by the Shareholders' Meeting
Karine Granger	Member	Director elected by the employees
Claire Pedini	Member	Independent Director appointed by the Shareholders' Meeting
Martin Vial	Member	Representative of the French State.

Number of members	4
Number of independent directors	2
Percentage of independent directors*	66.67%

* Excluding Directors representing the employees.

Duties

In terms of appointments, the Committee submits its recommendations or proposals to the Board of Directors regarding the appointment of Directors by the Shareholders' Meeting. It oversees the selection process for potential candidates, may conduct its own research into candidates and may engage specialist consultants to assist in identifying potential candidates. It gives its opinion to the Board on proposed appointments to the Board Committees. It proposes to the Board the definition and updating of a diversity policy applied to Directors. It monitors the implementation of the policy and the results achieved. The Committee ensures the existence of succession plans in order to anticipate the succession, whether unforeseen or at the end of their term, of executive corporate officers and members of the Group's Executive Committee. The Chairman and Chief Executive Officer is involved in the Committee's work in the performance of this task, except with respect to work regarding his or her own succession.

With regard to remuneration, the Committee examines and gives an opinion on the corporate officer remuneration policy referred to in Article L. 22-10-8 of the French Commercial Code and on the principles and criteria used to determine and distribute all the factors comprising the Chairman and Chief Executive Officer's remuneration and benefits of all kinds. It submits this opinion to the Board for discussion. The Chairman of the Committee also submits this opinion for approval to the French Minister for the Economy. The Committee prepares its proposals

within the limits specified by Decree no. 2012-915 of 26 July 2012, which amended the Decree of 9 August 1953, relating to French State control of the remuneration of the executives of public companies, in accordance with which the Chairman and Chief Executive's annual remuneration must not exceed the gross ceiling of €450,000. The Committee submits to the Board its opinion on the remuneration policy of the Group's Executive Committee and the main executives, as well as on the amount and terms and conditions for the distribution of the sum set by the Shareholders' Meeting to be allocated to the Directors in return for their duties.

In terms of governance, the Committee oversees issues relating to corporate governance and ensures the implementation, within the Company's corporate bodies, of the principles and rules in the AFEP-MEDEF Code in particular. It may make proposals concerning changes in the operation or powers of the Board or its internal Rules of Procedure. Every year, it conducts a review of the operation of the Board and its Committees and every three years supervises the formal audit conducted by an independent external consultant. Each year, the Committee examines the individual situations of the Directors in accordance with the independence criteria defined by the AFEP-MEDEF Code and reports its findings to the Board. In the event of appointment of new members of the Audit Committee, it examines these members' expertise in the field of finance, accounting and statutory audit. It examines and gives its opinion on situations of conflicts of interest, of which it has become aware or which are reported to it, and reports such situations to the Board.

Activity in 2021

	2021	2020
Number of meetings	5	4
Average attendance rate	95%	100%
Average duration of the meetings	44 minutes	1 hour and 22 minutes

In 2021, the Committee reviewed the succession plan for all members of the Executive Committee, the remuneration policy for corporate officers (Chairman-CEO and Directors) submitted to the General Meeting of 6 May 2021 pursuant to Article L. 22-10-8 of the French Commercial Code, the governance elements of the 2021 management report, the renewal of the term of office of four Directors in the context of the staggered renewal of the Board in view of the General Meeting of 6 May 2021 and the proposed appointment of a new female Director submitted to the General Meeting of 22 July 2021 (see section 4.2.1 "Composition of the Board of Directors"), the individual situation of Directors with regard to the independence

criteria provided for by the AFEP-MEDEF Code, the remuneration policy for EDF group executives (2020 assessment and 2021 developments), the strengthening of CSR criteria in the variable remuneration of executives, the conclusions of the 2021 internal audit of the Board and the Committees, the Gender Balance Ambition applied to EDF group executives (see section 3.3.3.1 "Workplace equality").

In 2021, the Committee used a specialised external consultant to assist it in the search for female candidates to succeed Ms Laurence Parisot, whose term of office ended on 6 May 2021.

4.3 Executive Management

The Chairman and Chief Executive Officer is assisted by an Executive Committee which includes representatives of all the Group's lines of business.

This Committee is a decision-making body, a forum for discussion and a consultative body on the operational and strategic issues for the Group. It examines all the substantive and current files of significance to the Group, tracks the operating objectives and results and contributes to the management and forecasting of the major challenges for the EDF group. It reviews and authorises significant projects, specifically the Group's investment or divestment projects for amounts which exceed certain thresholds, in accordance, where appropriate, with

the governance of the Group's listed subsidiaries. The Executive Committee meets each week.

In order to reinforce the examination and follow-up of projects, an Executive Committee Commitments Committee examines in-depth the most significant projects in terms of level of commitments or risks incurred before the Executive Committee makes its decision. No investment project may be submitted for review by the Board of Directors without having first been approved by this Committee.

On the date of filing of this Universal Registration Document, the Executive Committee comprises thirteen members and a Secretary. The list of members and their personal information appear below.

4.3.1 Members of the Executive Committee

On the filing date of this Universal Registration Document, the members of the Executive Committee were as follows:

Names	Duties
Jean-Bernard Lévy	Chairman and Chief Executive Officer
Marc Benayoun	Group Senior Executive Vice-President Customers, Services and Regions. He oversees Edison and gas activities
Bruno Bensasson	Group Senior Executive Vice-President, Renewable Energies, Chairman and Chief Executive Officer of EDF Renewables
Béatrice Buffon	Group Senior Executive Vice-President, International Division
Christophe Carval	Group Senior Executive Vice-President, Group Human Resources
Xavier Girre	Group Senior Executive Vice-President, Group Finance
Véronique Lacour	Group Senior Executive Vice-President Transformation and Operational Effectiveness
Cédric Lewandowski	Group Senior Executive Vice-President, Nuclear and Thermal
Alexandre Perra	Group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy
Simone Rossi	Group Senior Executive Vice-President, Chief Executive Officer of EDF Energy
Alain Tranzer	General Representative for Industrial Quality and Nuclear Skills
Pierre Todorov	Group Senior Executive Vice-President, Group General Secretary
Xavier Ursat	Group Senior Executive Vice-President, New Nuclear Projects and Engineering

Paul-Marie Dubée is the Group Senior Vice-President Secretary of the Executive Committee. He is Executive Coordinator, Government Relations.

4.3.2 Personal information on members of the Executive Committee

Marc Benayoun, 55 years old, a graduate of the École supérieure des sciences économiques et commerciales (ESSEC), began his career at Paribas Group in 1989, before joining the Boston Consulting Group in 1993. He became Associate Director at the Paris office in 2001 then at the Moscow office in 2008. During this period held a range of responsibilities, including the development of skills and business in the Company in the natural gas sector. In 2009, he joined the EDF group as Economics, Tariffs and Prices Director, in the Commerce Division. He was notably in charge of discussions related to changes in the French regulated electricity tariffs. In 2012, he became Director, Business Customers Market. In this role, he managed the project to end regulated electricity tariffs for companies and local communities, which resulted in EDF regaining its leadership position in a competitive environment. In 2016, Marc BENAYOUN was appointed Member of the Executive Committee of the EDF group, Gas and Italy. As such, he served as Chief Executive Officer of Edison, the third-largest Italian energy company. He also oversaw gas procurement activities for the EDF group, and managed its portfolio of long-term contracts for the transport of natural gas by pipeline and by sea (liquefied gas), as well as the assets needed to transport the gas to the delivery points. Since July 2019, Marc Benayoun has been Group Senior Executive Vice-President, Customers, Services and Regions. In this capacity, he heads the Commerce Division and supervises energy services related entities, including Dalkia. He is also a member of the EDF Trading Board of Directors, Chairman of the Edison Board of Directors and supervises the EDF group gas procurement platform based in Italy.

Bruno Bensasson, 49 years old, is a graduate of the École Polytechnique and École des Mines of Paris. He began his career in 1998 at the Autorité de sûreté nucléaire (French Nuclear Security Authority) as head of a Regional Division (Lower and Upper Normandy) then as the Chief of Staff of the CEO. From 2004 to 2006, he was the technical adviser responsible for the environment, new energies and

nuclear energy at the office of the French Minister for Industry, then technical adviser at the General Secretariat of the office of the President of the French Republic with responsibility for industry, the environment and transport. He joined SUEZ in 2007 as Director of Economic Studies in the Department of Development and Strategy. In 2011, he became a member of the Executive Committee of GDF SUEZ as Director for Strategy and Sustainable Development. He was appointed CEO of GDF SUEZ Energie France in early 2013 and, in July 2014, became Vice-President of GDF SUEZ Energie Europe responsible for development and renewable energy generation. Since 2016, he has been the CEO of Engie Africa. Since May 2018, Bruno Bensasson has been the EDF group Senior Executive Vice-President responsible for Renewable Energies and the Chairman and Chief Executive Officer of EDF Renewables. He is a Director of Luminus and EDF Trading.

Béatrice Buffon, 47 years old, is a graduate from both the École Polytechnique and the École nationale des ponts et chaussées. She began her career as Finance Manager at COGETHERM, an EDF subsidiary specialising in the development of Combined Heat and Power (CHP) projects. In 2001, she joined SIIF Energies, which later became EDF Renewables, where she would take up office as Project Manager in 2003. From 2007 to 2009, she undertook the functions of Deputy Executive Director of POWEO Energies Renewables. She returned to EDF Renewables in 2010 as Director of Development for large-scale, ground-mounted solar power projects; then in 2011, she became Director of Development for Offshore Wind Power France. In 2014, Béatrice Buffon became Executive Vice-President of EDF Renewables, responsible for renewable marine energies and a member of the EDF Renewables Executive Committee. She is a *Chevalier de l'Ordre national du mérite*. Since February 2020, she has been Group Executive Director responsible for EDF's International Division.

Christophe Carval, 61 years old, holds a degree in electrical engineering from HEI Lille engineering school, and joined the EDF group in 1982. He has held several management positions in Departmental, Regional and Inter-regional Units in the electricity and gas distribution sector. In 2007, he was appointed to head up the project to create and manage the new Shared Services Division of the EDF group, aiming at rationalising and professionalising this Division. He was the Director of Human Resources, Health & Safety and the Enedis Transformation project from 2014, where, he notably led projects to simplify the Company's structure into 25 Regional Divisions and to overhaul its governance system. Since July 2017, he has held the position of Group Senior Executive Vice-President, Human Resources Division. He is also Chairman of the Supervisory Board of Enedis and a member of the Supervisory Boards of RTE, CTE, Framatome and EDF Energy.

Xavier Girre, 53 years old, is a graduate of the HEC business school, the holder of a Master's degree in business law, a graduate of IEP (Paris Institute of Political Studies) and is an alumnus of ENA (French National School of Administration). Xavier Girre began his career at the French National Audit Office in 1995, before joining the Veolia Group in 1999 where he spent twelve years and notably held the positions of Group Risk and Auditing Director of Veolia Group, Deputy Chief Executive Officer in charge of Finance of Veolia Transportation and then of Veolia Environmental Services. From 2011 to 2015, he was Deputy CEO, Chief Financial Officer of La Poste Group and then Chairman of the XAnge Private Equity Supervisory Board. Xavier Girre joined EDF in 2015 as Chief Financial Officer for France, before being appointed to the EDF Executive Committee. He is also a Director of EDF Energy, EDF Renewables, Dalkia, Edison, Chairman of the Board of Directors of EDF Trading, a member of the Supervisory Board of Enedis, Chief Executive Officer of CTE, and Chairman of the Supervisory Board of RTE. Xavier Girre is, moreover, Director and Chairman of the Audit Committee of La Française des Jeux. He is also an independent Director of CNIM. Since March 2016, he has been Group Senior Executive Vice-President, Finance.

Véronique Lacour, 57 years old, holds a postgraduate diploma in Information Systems from the University of Paris I Panthéon Sorbonne. She started her career at Thales in 1987, where she gained solid experience in information systems, before taking up the position of Chief Information Officer for a new Division of Thales in 2004. Between 2007 and 2009, she managed its HR Information Systems Shared Services. She moved to Safran in 2009 where she held the position, first, of Chief Information Officer for Safran Aircraft Engines (formerly Snecma), and later, in 2013, Vice-President Improvement Initiatives, where she managed continuous improvement and transformation initiatives. She went on to become Vice-President Programs for Safran Analytics, and was involved in the creation of this new Big Data-focused entity as part of the Group's digital transformation strategy. Véronique Lacour joined EDF's Executive Committee on 1 December 2016, tasked with directing the Group's activities in the areas of information systems, purchasing, real property, consultancy, shared tertiary services and IT. Since 2016, she has been Group Senior Executive Vice-President, Transformation and Operational Effectiveness.

Cédric Lewandowski, 52 years old, is a graduate of the Paris Institute of Political Studies (IEP) and holds a postgraduate degree (DEA) in Geopolitics (Paris-VIII). Cédric Lewandowski began his career at EDF in 1998 as the Chief of Staff for the Chairman of EDF from 1998 to 2004; he then served as Director of the Electric Transport and Vehicles Division of Électricité de France from 2005 to 2008. He subsequently became Director of EDF Collectivités within EDF's Commerce Division from 2008 to 2012, Chairman of the Board of Directors of H4 from 2009 to 2012, Director of Safidi from 2009 to 2012 and Chairman of the Board of Directors of the Tiru Company from 2009 to 2012. He was then appointed Director of the Civil and Military Cabinet of the French Minister of Defence from May 2012 until July 2017. He held the position of EDF group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy from 2017 to 2019. He is Chairman of the Board of Directors of ES (Électricité de Strasbourg) and Governor of WANO's Main Governing Board. He has been Group Senior Executive Vice-President, Nuclear and Thermal since July 2019.

Alexandre Perra, 41 years old, is a graduate of the Institut d'études politiques de Paris in 2005 and holds a Master's degree in Modern Literature. Before working for EDF, he joined Thales in 2007, firstly working at the Strategy Department, before becoming Head of Group International Communications, then Head of Media Relations and finally being appointed Deputy Director of Group Communications in 2012. He joined EDF in November 2014 as Executive Director attached to the Chairman and CEO of EDF, in charge of executive coordination and governmental relations. He took part in the definition of the CAP 2030 company strategy, first

implemented in 2015 and was involved in the strategic issues of the Company. In 2017, Alexandre Perra prepared EDF's strategy in the field of electricity storage. In 2018, he led the Storage Plan. In 2017, he launched Project Y, which is still ongoing and mobilises young employees under the age of 35 to accelerate EDF's digital transformation. He is also a sponsor of Let's Talk Energy, the Group's collective intelligence programme promoting dialogue between employees to develop the strategy of the Company, its entities and subsidiaries. Alexandre Perra is a trustee of the EDF Foundation and a member of Franco-British Young Leaders, which he joined in 2017. He has held the position of EDF group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy since July 2019.

Simone Rossi, 53 years old, a graduate of the University of Bocconi (Milan) in Business Administration. Simone Rossi began his career as a consultant, firstly at KPMG Consulting in corporate finance, and then from 1996 at McKinsey & Company, where he mainly specialised in the sectors of energy, financial institutions, and information and communication technologies. In 2004, he joined Edison SpA in Milan (Italy) as Head of Strategy, before being promoted to become Director of Financial Control and Information Systems in 2007. At the end of 2009, he was appointed Chief Financial Officer of Constellation Energy Nuclear Group (CENG), a company based in Baltimore in the United States. He then became Chief Financial Officer of EDF Energy in April 2011. In March 2015, Simone Rossi was appointed EDF group Senior Executive Vice-President, International Division. Since 1 November 2017, he has been the Chief Executive Officer of EDF Energy and Group Senior Executive Vice-President of EDF.

Pierre Todorov, 63 years old, is a graduate of the École normale supérieure (Ulm) and the École nationale d'administration (ENA) and holder of an advanced teaching degree in philosophy. Pierre Todorov was an auditor then Counsel at the French Council of State from 1986 to 1990. He then joined Lagardère Group, where he held a range of responsibilities in the media branch, particularly serving as International Deputy Chief Executive Officer of Hachette Filipacchi. In 1997, he was appointed General Secretary of Accor Group, a position he held until 2008. Between 2008 and 2011, he was a partner in the law firm of Hogan Lovells LLP, and then joined PSA Peugeot Citroën in 2011, as General Secretary, a member of the Executive Management Committee. Pierre Todorov has been EDF group General Secretary and a member of the Executive Committee since February 2015.

Alain Tranzer, 55 years old, is a graduate engineer of the École Polytechnique and École des Mines of Paris. He began his career in 1991 with the PSA Group. After a period in ground liaison engineering, he successively held the positions of Sub-system Manager, Plant Quality Director, and Chief Engineer for the Peugeot 407, then Director of the Peugeot 208-2008 programme. He has thus acquired solid experience in the management of industrial projects, from design to industrialisation, and was awarded the Eurostar 2013 Project Leader of the Year prize by Automotive News Europe. In 2013, Alain Tranzer became responsible for the PSA Group's preliminary projects, the modular policy and complex projects involving autonomous, connected, electric and hybrid electric vehicles. From 2018 to 2020, he was Senior Vice-President of the PSA Group, responsible for the CO₂ programme and associated platforms and technological modules. In March 2020, he joined the EDF group to steer the implementation of the "Excell" plan, which aims to strengthen industrial quality, skills and governance of major nuclear projects, and was appointed General Representative for Industrial Quality and Nuclear Skills. He is a member of EDF Executive Committee.

Xavier Ursat, 55 years old, a graduate of the École Polytechnique and Télécom Paris. He joined EDF in 1991, first holding various positions in the hydraulic engineering department until 2002. He oversaw the construction of EDF's hydraulic engineering centres and contributed to international projects, especially in South America. From 2002 to 2005, he was a special advisor to EDF's Senior Executive Vice-President, Generation and Engineering. From 2005 to 2007, he was Assistant Director of the Alps Generation Unit in Grenoble and from 2007 to 2010, Director of the Southwest Generation Unit in Toulouse. From 2010 to 2015, he was successively Deputy Manager and Manager of the Hydraulic Generation & Engineering Division. He is Chairman of the French National Nuclear Industry Strategy Committee (CSFN – Comité stratégique de la filière nucléaire) and of GIFEN (Groupement des industriels français de l'énergie nucléaire, i.e. the French Nuclear Energy Industry Group), as well as Chairman of the Supervisory & Steering Committee of Edvance, and a member of the Supervisory Board of Framatome. He is also Honorary Governor of the World Water Council. Since March 2015, Xavier Ursat has been Group Senior Executive Vice-President, New Nuclear Projects and Engineering.

4.4 Conflicts of interest and interests of corporate officers and executives

4.4.1 Conflicts of interest

To the Company's knowledge, on the date of filing of this Universal Registration Document, there were no potential conflicts of interest involving EDF between the duties of the members of the Company's Board of Directors and Executive Management and their private interests or other duties (regarding the rules applicable to the members of the Board of Directors in terms of conflicts of interest, see section 4.2.2.8 "Obligations and duties of Directors").

Subject to the specific legal and regulatory provisions applicable to the membership of the Company's Board of Directors (see section 4.2.1 "Members of the Board of Directors"), to the Company's knowledge, no arrangements or agreements have been entered into with shareholders, clients, suppliers or others under which a member of the Board of Directors or Executive Management has been appointed in this capacity.

To the Company's knowledge, no member of the Board of Directors has agreed to restrict for a fixed period of time his or her ability to sell his or her holdings in the Company's capital, except for the restrictions resulting from the EDF Stock Exchange code of ethics (see section 4.5.2 "Trading in Company securities"). In addition, corporate officers holding shares in mutual funds through the EDF group Corporate Savings Plan invested in EDF shares, or who have acquired shares from the French State within the legal framework of the privatisation, can be subject to the lock-in and non-transferability rules resulting from the provisions applicable to these transactions.

To EDF's knowledge, there are, moreover, no family ties between members of the administrative bodies or Executive Management.

4.4.2 Absence of convictions

To EDF's knowledge, no member of the EDF Board of Directors or Executive Management has been subject to a conviction for fraud, or a bankruptcy proceedings, receivership, liquidation or court-ordered administration during the past five years.

Following an investigation initiated by the Autorité des marchés financiers (AMF) (French Financial Markets Authority) in July 2016 into EDF's financial reporting since 1 July 2013, the AMF Board notified the Chairman and Chief Executive Officer of EDF of grievances on 5 April 2019. Jean-Bernard Lévy was cleared by a decision of the AMF Enforcement Committee on 28 July 2020, with this decision being final in this matter (see section 7.1.5 "Disputes"). Michèle Rousseau was also fined by the Court of Budgetary and Financial Discipline on 4 September 2018 for having, in

her capacity as Chief Executive Officer of the Seine-Normandie Water Agency, granted aid, which was deemed to be irregular, to a water treatment plant. To the best of EDF's knowledge, no other Director has been subject to any official public accusation or sanction issued by statutory or regulatory authorities during the last five years.

Moreover, to EDF's knowledge, no member of the EDF Board of Directors or Executive Management has been prevented by a court from serving as a member of an administrative, management or supervisory body of an issuer or from participating in the management or direction of an issuer's affairs during the past five years.

4.4.3 Service contracts

EDF's corporate officers did not enter into any service contract with the Company or any of its subsidiaries pursuant to which they would be entitled to any kind of benefits.

4.5 Shareholding by corporate officers and trading in EDF securities by corporate officers and executives

4.5.1 Shareholding in EDF by Directors

As at 31 December 2021, the members of the Board of Directors of the Company, whose terms of office are ongoing as at 31 December 2021, held a total of 3,833 shares. The table below details the number of EDF shares held individually by these Directors as at 31 December 2020 and 31 December 2021:

	Number of EDF shares held as at 31/12/2021	Number of EDF shares held as at 31/12/2020
Karine Granger	25	25
Colette Lewiner ⁽¹⁾	2,038	1,969
Sandrine Lhenry ⁽¹⁾	34	0
Philippe Petitcolin	10	10
Vincent Rodet ⁽²⁾	289	2,905
Christian Taxil ⁽²⁾	1,437	1,360
TOTAL	3,833	6,269

(1) Shares held directly and through the corporate mutual profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

(2) Shares held through the corporate mutual profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

Directors whose terms of office are ongoing as at 31 December 2021 and which are not included in the above table, hold no EDF shares.

4.5.2 Trading in Company securities

Since 2006, the EDF group has adopted a set of principles and rules applicable to trading in shares in EDF or listed EDF group subsidiaries. These rules have been compiled into a code of ethics which is regularly updated.

At the same time as this Code was distributed, awareness campaigns on stock exchange rules were launched for Group employees, specifically regarding precautions and obligations relating to the holding of inside information and the black-out periods during which permanent or temporary insiders, including third parties acting in the name or on behalf of the Group, and, more specifically regarding black-out periods, all persons performing executive duties within the Group, are required to refrain from trading Company securities or other related financial instruments.

The code of ethics also notes the obligations imposed on executives, high-level managers as well as persons closely linked to them to declare to the AMF and to the Company trades in EDF securities or other related financial instruments that they

make on their own behalf. Indeed, under the terms of Article 19 of MAR, specified in Article 223-22 A of the AMF general regulations, the executives of companies with shares listed for trading on a regulated market must declare trades in Company securities to the AMF and to the Company within three working days of their completion, when the combined amount of these trades exceeds the sum of €20,000 for the current calendar year.

Pursuant to the AMF general regulations ⁽¹⁾, the EDF Board of Directors must mention in its annual report to the Shareholders' Meeting trades trading, which has been declared by executives and similar persons ⁽²⁾ over the past fiscal year.

Vincent Rodet declared to the AMF and the Company the sale of 2,396.75 shares of the EDF equity fund of the Group Savings Plan carried out during the 2021 fiscal year, for a total amount of €32,135.61. No other trades in EDF securities were declared to the AMF or to the Company during the 2021 fiscal year by the members of the Board of Directors and the Company's Executive Committee.

4.6 Remuneration and benefits of corporate officers – Remuneration policy

As indicated in section 4.1 ("Corporate Governance Code"), the Company adheres to the AFEP-MEDEF Code subject to the specific legislative and regulatory requirements applicable to it.

This section provides details of the total remuneration and benefits of any kind paid during the fiscal years 2020 and 2021 or granted in respect of the same fiscal years to the corporate officers by the Company and the companies included in the Company's consolidation scope within the meaning of Article L. 233-16 of the French Commercial Code (see section 4.6.2 for the Chairman and Chief Executive

Officer and section 4.6.3 for the Directors). The tables in sections 4.6.2 and 4.6.3 below were drawn up in accordance with the format recommended by the AFEP-MEDEF Code of Corporate Governance and the AMF's position-recommendation no. 2021-02.

Pursuant to Article L. 22-10-8 of the French Commercial Code, this section also presents the policy for the remuneration of corporate officers established by the Board of Directors (see section 4.6.1 below), which will be submitted to the Shareholder's Meeting to be held on 12 May 2022.

(1) Article 223-26 of the AMF general regulations.

(2) At EDF, staff "similar to executives" are the members of the Company's Executive Committee.

4.6.1 Remuneration policy

Pursuant to Article L. 22-10-8 of the French Commercial Code, the Board of Directors establishes the remuneration policy for corporate officers.

In accordance with article 22-10-16 and article 22-10-17 of the French Commercial Code, the items comprising the remuneration of the Chairman and Chief Executive Officer are set by the Company's Board of Directors on the recommendation from the Appointments, Remuneration & Governance Committee and submitted for approval by the French Minister for the Economy after consultation with the relevant Ministers (see section 4.2.3.5 "Appointments, Remuneration & Governance Committee"). The remuneration of the Chairman and Chief Executive Officer must comply with the limits provided for by Decree no. 2012-915 of 26 July 2012 on State control over the remuneration of executives

of public companies, which amended the Decree of 9 August 1953 and sets a ceiling on his gross remuneration of €450,000.

The Appointments, Remuneration and Governance Committee also issued its opinion to the Board regarding the rules and procedures for allocating the sum set by the Shareholder's Meeting pursuant to Article L. 225-45 of the French Commercial Code, to be allocated to Directors as remuneration for their work.

At the Shareholders' Meeting of 6 May 2021, the five resolutions on the remuneration and the remuneration policy for EDF's Directors and Officers (from Resolution 7 to 11) were adopted by a very large majority, with more than 99.9% of votes in favour.

4.6.1.1 Remuneration policy applicable to the Chairman and Chief Executive Officer

After consulting the Appointments, Remuneration and Governance Committee which met on 8 February 2022, the Board of Directors approved at its meeting on 17 February 2022 the remuneration policy described below for the Chairman and Chief Executive Officer:

Components of the remuneration	Amounts paid during the 2021 fiscal year	Amounts allocated for the 2021 fiscal year	Policy for the fiscal year 2022
Fixed remuneration	450,000€	450,000€	On recommendation of the Appointments, Remuneration and Governance Committee, the Board of Directors which met on 17 February 2022 decided to maintain the annual fixed gross remuneration of the Chairman and Chief Executive Officer at €450,000 for fiscal year 2022. This fixed annual remuneration, which corresponds to the ceiling provided for by the Decree of 9 August 1953, has remained unchanged since Mr. Lévy's appointment as Chairman and Chief Executive Officer of EDF in 2014.
Variable remuneration	none	none	none
Multi-year variable remuneration	none	none	none
Possibility of deferring or repaying the variable remuneration	n/a	n/a	n/a
Exceptional remuneration	none	none	none
Stock options, performance shares or other long-term benefits	none	none	none
Remuneration for serving as a Director	n/a	n/a	The Chairman and Chief Executive Officer does not receive any remuneration for his or her term of office as Director.
All types of benefits	3,660	3,660	Benefit corresponding to the provision of a company car that the Board has decided to maintain for the 2022 fiscal year.
Signing allowance	none	none	none
Severance pay or end-of-service allowance	none	none	none
Non-competition clause	none	none	none
Supplementary pension scheme	none	none	none
Remuneration paid or granted by a company included in the scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code	none	none	none

n/a: not applicable.

As the remuneration of the Chairman and Chief Executive Officer is set at the ceiling set by the decree of 9 August 1953 and does not include a variable portion, its determination is not based on criteria related to the Company's performance.

Ratio of equity ⁽¹⁾ and changes in remuneration 2017-2021

In accordance with article 22–10-9 of the French Commercial Code, the table below shows the change over the past five years in the ratio between the level of remuneration of the Chairman and Chief Executive Officer and the average remuneration on a full-time equivalent basis of EDF employees (other than corporate officers and the Chairman and Chief Executive Officer), and the ratio between the level of total remuneration of the Chairman and Chief Executive Officer and the median remuneration on a full-time equivalent basis of EDF employees (other than corporate officers and the Chairman and Chief Executive Officer), as well as the organic changes in Group EBITDA over the same period.

	2021	2020	2019	2018	2017
Remuneration of the Chairman and CEO ⁽¹⁾	453,660	453,660	453,660	452,868	452,868
Changes in the remuneration of the Chairman and Chief Executive Officer ⁽²⁾	0%	0%	0.2%	0%	0%
Equity ratio/Average remuneration ⁽³⁾	6.6	6.6	6.8	7.1	7.1
Equity ratio/Median remuneration ⁽³⁾	7.2	7.2	7.4	7.7	7.9
Changes in average salary ⁽²⁾⁽⁴⁾	-0.2%	+2.87%	+3.66%	+0.98%	+1.43%
Changes in median salary ⁽²⁾⁽⁴⁾	-0.1%	+3.54%	+4.16%	+1.81%	+2.07%
Organic changes in the Group EBITDA ⁽²⁾	+11.3%	-2.70%	+8.40%	+11.30%	-14.80%

(1) The total remuneration of the Chairman and Chief Executive Officer includes his fixed salary and benefits in kind.

(2) Change observed in year N compared to year N-1.

(3) Salaries include the fixed salary, the variable portion and all bonuses, including those related to the status of the IEGs, as well as any benefits in kind.

(4) The change in average and median salary between fiscal years 2020 and 2021 is mainly due to the so-called Macron bonus, paid in 2020 and not renewed in 2021, and to the downward trend compared to 2020 in the amounts paid in 2021 under the profit-sharing agreement (see section 3.3.3.7.2 "Variable remuneration plans to boost performance").

The employees taken into account for the calculation of the above ratios are all the full-time equivalent employees of EDF in France, continuously present over the year 2021, i.e. approximately 60,000 employees, which represents all of EDF's employees in France and nearly 50% of the Group's employees in France.

4.6.1.2 Remuneration policy applicable to Directors

After receiving the opinion of the Appointments, Remuneration and Governance Committee at its meeting held on 8 February 2022, the Board of Directors, at its meeting held on 17 February 2022, approved the remuneration policy described below concerning the amount and distribution among the Directors of the sums paid to them in respect of their office pursuant to Article L. 225-45 and Article L. 22-10-14 of the French Commercial Code.

Budget and breakdown of remuneration paid to Directors in respect of their office

The Directors representing the employees hold office without remuneration in accordance with law no. 83–675 of 26 July 1983 concerning the democratisation of the public sector, and the Chairman and Chief Executive Officer receives no remuneration for his or her term of office as a Director.

Pursuant to Order no. 2014-948 of 20 August 2014, the remuneration granted, in respect of their office, to Directors appointed by the General Meeting on a proposal from the French State in accordance with Article 6 of the Order, and who are civil servants of the State, shall be paid in full to the State budget.

As regards other Directors appointed by the Shareholders' Meeting on recommendation of the French State and who are not civil servants, an Order of the French Minister for the Economy and Finance dated 5 January 2018 ⁽²⁾ states that the Company pays into the French State budget 15% of the remuneration allocated to them for their term of office, with the remaining 85% paid to the Director.

Regarding the Representative of the French State appointed in accordance with Article 4 of the Order of 20 August 2014, any remuneration that he/she is entitled to receive for the performance of his/her duties is paid to the State budget.

After receiving the opinion of the Appointments, Remuneration and Governance Committee, the Board of Directors submits to the General Meeting of Shareholders for approval a fixed annual sum to be allocated to the Directors in accordance with the allocation rules defined by the Board and presented in this remuneration policy. The Board met on 17 February 2022 and decided to submit to the General Meeting convened on 12 May 2022 an annual budget of €440,000 for fiscal year 2022.

The terms and conditions for the distribution of this annual budget, applicable since the 2011 fiscal year, were re-examined and confirmed by the Board of Directors on 17 February 2022. The total budget is distributed between a fixed portion and a variable portion, each representing half of the budget, distributed as follows:

- the fixed portion is shared equally among the Directors in question; 50% of the fixed annual portion is paid during the fiscal year, in which it is allocated and the remaining 50% at the beginning of the following fiscal year;
- the distribution of the variable portion among the Directors is established through the application of a variable coefficient depending on the type of meeting (Board or Committee) and depending on the particular positions held by each Director (Committee member or Chairman): a coefficient of 2 for the attendance of a Director at a meeting of the Board of Directors, a coefficient of 1 for the attendance of a Director as a member at a Committee meeting and a coefficient of 2 for Chairmanship of a Committee. The variable portion is divided by the total of the coefficients for the fiscal year in order to determine the unit value of the coefficient; the variable portion for a fiscal year is fully paid at the start of the following fiscal year.

It is not planned to pay any exceptional remuneration or other remuneration to the Directors during fiscal year 2022 by the Company or by a company included in the Company's scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code.

(1) Ratios were established in accordance with guidelines published by the AFEP.

(2) The provisions of the Order of 5 January 2018, amending the Order of 18 December 2014 in accordance with Article 6-V of the Order dated 20 August 2014, have been applicable since 1 February 2018. Prior to that, the Order of 18 December 2014 provided that the remuneration to be received by these Directors was paid in the amount of 30% to the Directors in question, with the remaining 70% paid into the French state budget.

4.6.2 Total remuneration of the Chairman and Chief Executive Officer

4.6.2.1 Remuneration of the Chairman and Chief Executive Officer

SUMMARY TABLE OF REMUNERATION AND OPTIONS AND SHARES ALLOCATED TO THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER – AMF TABLE NO. 1 ⁽¹⁾

(in euros)	2021 fiscal year	2020 fiscal year
Jean-Bernard Lévy, Chairman and Chief Executive Officer		
Remuneration allocated for the fiscal year (see details in table no. 2)	453,660	453,660
Valuation of multi-year variable remuneration allocated during the fiscal year	none	none
Valuation of options allocated during the fiscal year ⁽²⁾	none	none
Valuation of bonus shares allocated during the fiscal year ⁽²⁾	none	none
TOTAL	453,660	453,660

(1) Table 1 of AMF position-recommendation no. 2021-02.

(2) As shown in section 4.6.4, the Company has not implemented any stock options plans and the corporate officer receives no allocation of bonus shares.

The table below details the remuneration of all kinds paid to Jean-Bernard Lévy, Chairman and Chief Executive Officer, during the 2020 and 2021 fiscal years or owed for the 2020 and 2021 fiscal years.

SUMMARY TABLE OF THE REMUNERATION OF THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER – AMF TABLE NO. 2 ⁽¹⁾

(in euros)	2021 fiscal year		2020 fiscal year	
	Amounts due for the fiscal year	Amounts paid during the fiscal year	Amounts due for the fiscal year	Amounts paid during the fiscal year
Jean-Bernard Lévy, Chairman and Chief Executive Officer				
Fixed remuneration	450,000	450,000	450,000	450,000
Variable remuneration	none	none	none	none
Multi-year variable remuneration	none	none	none	none
Exceptional remuneration	none	none	none	none
Remuneration of the office of Director	none	none	none	none
Benefits in kind ⁽²⁾	3,660	3,660	3,660	3,660
TOTAL	453,660	453,660	453,660	453,660

(1) Table 2 of AMF position-recommendation no. 2021-02.

(2) This benefit corresponds to the provision of a company car.

4.6.2.2 Setting of the remuneration of the Chairman and Chief Executive Officer

Remuneration for the 2021 fiscal year

The Appointments, Remuneration & Governance Committee at its meeting of 9 February 2021 reviewed the policy regarding remuneration of the Chairman and Chief Executive Officer and decided to recommend to the Board of Directors that the principles and criteria for the determination of items comprising his remuneration be maintained for the 2021 fiscal year.

On recommendation from the Committee, the Board which met on 17 February 2021 decided to maintain the fixed annual remuneration of the Chairman and Chief Executive Officer for the 2021 fiscal year at €450,000 gross. The remuneration of the Chairman and Chief Executive Officer also includes benefits in kind corresponding to the provision of a company car.

Remuneration for the 2022 fiscal year

The Appointments, Remuneration & Governance Committee at its meeting of 8 February 2022 reviewed the policy regarding remuneration of the Chairman and Chief Executive Officer and decided to recommend to the Board of Directors that the principles and criteria for the determination of items comprising his remuneration be maintained for the 2022 fiscal year.

On recommendation from the Committee, the Board which met on 17 February 2022 decided to maintain the fixed annual remuneration of the Chairman and Chief Executive Officer for the 2022 fiscal year at €450,000 gross. The remuneration of the Chairman and Chief Executive Officer also includes benefits in kind corresponding to the provision of a company car.

4.6.2.3 Other items of remuneration

In 2021, Mr Jean-Bernard Lévy did not receive any remuneration for his duties as Director and Chairman of the Board of Directors of EDF. He also did not receive any remuneration for the positions held in companies controlled by EDF, or any remuneration of any kind whatsoever from the companies it controls.

The Company allocated no stock options to the Chairman and Chief Executive Officer in 2021 and no options were exercised during the fiscal year. Similarly, no bonus shares were allocated free of charge to the Chairman and Chief Executive Officer during the past fiscal year, and none became available.

Mr. Jean-Bernard Lévy did not receive any hiring bonus from EDF.

He does not benefit from any indemnities or benefits due or liable to be due for termination or modification of duties, nor from non-competition clause compensation, and has no employment contract or supplementary pension plan.

SUMMARY TABLE OF EMPLOYMENT CONTRACT, SUPPLEMENTARY PENSION, SEVERANCE PAYMENTS AND NON COMPETITION CLAUSE – AMF TABLEAMF NO. 11 ⁽¹⁾

Chairman and Chief Executive Officer *	Employment contract	Supplementary pension plan	Remuneration or benefits due or liable to be due for termination or modification of duties	Non-competition clause compensation
Jean-Bernard Lévy, Chairman and Chief Executive Officer	no	no	no	no

* Table 11 of AMF position-recommendation no. 2009-16.

4.6.3 Total remuneration of Directors**Remuneration allocated and paid to Directors in 2021**

The Shareholders' Meeting convened on 6 May 2021 approved, on the proposal of the Board of Directors, a fixed annual sum to be allocated to the Directors as remuneration for their term of office of €440,000 for the fiscal year 2021.

The terms and conditions for allocating this amount, which are reviewed annually by the Board of Directors when the remuneration policy for corporate officers is approved, have remained unchanged since fiscal year 2011 (see details in section 4.6.1.2 "Remuneration policy applicable to Directors").

Directors elected by employees, who do not receive remuneration for their duties as Directors, receive fixed and/or variable remuneration under their employment contracts with the Company.

No exceptional remuneration or other remuneration was paid to the Directors during fiscal year 2020 and 2021 or allocated for these fiscal years by the Company or by a company included in the Company's scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code.

The tables below show the gross amounts of remuneration allocated for the 2020 and 2021 fiscal years and paid during the 2020 and 2021 fiscal years to the members of the Board of Directors for their terms of office, in accordance with Article L. 225-45 and Article L. 22-10-14 of the French Commercial Code.

	2021 fiscal year		2020 fiscal year	
Directors whose terms of office are ongoing as at 31 December 2021	Remuneration granted for the fiscal year 2021 ⁽¹⁾	Remuneration paid during the fiscal year 2021 ⁽²⁾	Remuneration granted for the fiscal year 2020 ⁽¹⁾	Remuneration paid during the fiscal year 2020 ⁽²⁾
Véronique Bédague-Hamilius	31,436	37,857	37,857	10,761
Nathalie Collin ⁽³⁾	19,205	0	n/a	n/a
Bruno Crémel	40,149	40,000	40,000	34,628
François Delattre	35,792	35,000	35,000	28,191
Gilles Denoyel	41,238	40,714	40,714	34,628
Marie-Christine Lepetit	46,139	44,286	44,286	45,745
Jean-Bernard Lévy	n/a	n/a	n/a	n/a
Colette Lewiner	46,139	47,143	47,143	51,011
Claire Pedini	43,960	45,000	45,000	44,574
Philippe Petitcolin	39,059	33,571	33,571	28,191
Michèle Rousseau	39,604	38,571	38,571	37,553
Martin Vial	40,149	39,286	39,286	39,309
TOTAL (in euros)	422,870	401,428	401,428	354,591

n/a: not applicable.

(1) The remuneration allocated for a fiscal year includes the entirety of the fixed portion and the variable portion due for the fiscal year.

(2) The payments made during a fiscal year include 50% of the fixed portion and the entirety of the variable portion for the preceding fiscal year and 50% of the fixed portion for the current fiscal year.

(3) Director whose term of office began during the fiscal year 2021.

	2021 fiscal year		2020 fiscal year	
Directors whose term of office expired during the 2021 fiscal year	Remuneration granted for the fiscal year 2021 ⁽¹⁾	Remuneration paid during the fiscal year 2021 ⁽²⁾	Remuneration granted for the fiscal year 2020 ⁽³⁾	Remuneration paid during the fiscal year 2020 ⁽⁴⁾
Laurence Parisot	12,924	35,505	38,571	35,213
TOTAL (in euros)	12,924	35,505	38,571	35,213

n/a: not applicable.

(1) Payments made in 2021 include the fixed portion for the 2021 fiscal year, determined pro rata to the term of office in the 2021 fiscal year, as well as the variable portion for the 2021 fiscal year.

(2) Payments made in 2021 include 50% of the fixed portion and the entirety of the variable portion for the 2020 fiscal year, as well as the fixed portion due in respect of 2021 determined pro rata to the term of office in the 2021 fiscal year.

(3) The remuneration allocated for a fiscal year includes the entirety of the fixed portion and the variable portion due for the fiscal year.

(4) The payments made during a fiscal year include 50% of the fixed portion and the entirety of the variable portion for the preceding fiscal year and 50% of the fixed portion for the current fiscal year.

4.6.4 Stock options – Bonus shares

The Company has not implemented any stock options plans and the corporate officers receive no allocation of bonus shares ⁽¹⁾.

(1) With the exception of any Directors elected by the employees who may benefit from the systems implemented by the Company for the benefit of all its employees.

€18.3 billion

GROSS OPERATING
INVESTMENTS

~ 94%

OF INVESTMENTS IN
LINE WITH THE GROUP
CARBON TRAJECTORY

€661 million

R&D EXPENDITURE





5

THE GROUP FINANCIAL PERFORMANCE AND OUTLOOK

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5.1 Review of the financial situation and results 2021

5.1.1 Key figures

The financial information presented in this document is prepared from the EDF group's consolidated financial statements at 31 December 2021.

Impact of the Covid-19 pandemic: see note 1.4.3 to the 2021 consolidated financial statements "Consequences of the Covid-19 pandemic".

<i>(in millions of euros)</i>	2021	2020	Variation	Variation (%)	Organic variation (%)
Sales	84,461	69,031	15,430	22.4	21.6
Operating profit before depreciation and amortisation (EBITDA)	18,005	16,174	1,831	11.3	11.3
Operating profit (EBIT)	5,225	3,875	1,350	34.8	35.9
Income before taxes of consolidated companies	5,585	1,293	4,292	331.9	334.3
EDF net income	5,113	650	4,463	686.6	719.1
Net income excluding non-recurring items ⁽¹⁾	4,717	1,969	2,748	139.6	150.3
Net income excluding non-recurring items, adjusted for the remuneration of hybrid bonds	4,170	1,468	2,702	184	n.a
Group cash flow ⁽²⁾	(1,525)	(2,660)	1,135	42.7	n.a
Net indebtedness ⁽³⁾	42,988	42,290	698	1.6	n.a

n.a: not applicable

(1) Net income excluding non-recurring items is not defined by IFRS and is not directly visible in the Group's consolidated income statement. It corresponds to the Group's share of net income (EDF net income) excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax (see section 5.6 "Net income excluding non-recurring items").

(2) Group cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not comparable with indicators of the same name reported by other companies. It is equivalent to the operating cash flow less asset disposals, income taxes paid, net financial expenses disbursed, net allocations to dedicated assets, dividends paid in cash, and investments in the Hinkley Point C and Linky projects (see section 5). The 2020 figure is a pro forma figure.

(3) Net indebtedness is not defined in the accounting standards and is not directly visible in the Group's consolidated balance sheet (see section 5.1).

5.1.2 Economic environment

5.1.2.1 Market prices for electricity and the principal energy sources

5.1.2.1.1 Spot electricity prices in Europe ⁽¹⁾

	France	United Kingdom	Italy	Belgium
Average baseload price for 2021 (€/MWh)	109.2	137.6	125.7	104.1
Variation in average baseload prices, 2021/2020	+239.0%	+247.5%	+223.1%	+226.6%
Average peakload price for 2021 (€/MWh)	127.4	161.7	141.5	120.5
Variation in average peakload prices, 2021/2020	+227.0%	+250.6%	+216.4%	+218.0%

The comments below concern baseload prices.

In **France**, spot electricity prices rose by €77.0/MWh from 2020.

The significant increase in commodity prices during the second half of 2021 led to a substantial rise in the cost of fossil-fired electricity generation. The upturn in demand, partly driven by the economic recovery, especially in the second and fourth quarters, also contributed to this taut situation. The lower renewable energy output than in 2020 (-3.8% or -1.9TWh) was another factor.

In 2021, demand in France totalled 471TWh, up by 21.6TWh or +4.8% from 2020 due to lower average temperatures in 2021 and the smaller impact of the Covid-19 pandemic. In response to this growing demand, French power generation increased by 21.1TWh, with higher output by the nuclear plants (+25.2TWh), fossil-fired plants (+0.8TWh) and solar plants (+1.3TWh), while wind power and hydropower output were down by 3.2TWh and 3.3TWh respectively.

France's export balance for 2021 stood at 44.3TWh. Despite a rise in consumption, the high level of power generation kept this balance at the same level as last year. Exports were up by 7.9TWh to 86.5TWh. They were higher across all borders except

in the CWE ⁽²⁾ zone, where they retreated by 4.3TWh. Imports stood at 42.2TWh, up by 0.8TWh, with increases across all borders except from Italy (-0.03TWh) and Switzerland (-0.3TWh) where they registered a slight decrease.

In the **United Kingdom**, average spot electricity prices rose by €98.0/MWh compared to 2020. The rise was observed throughout the whole year, but more pronounced from September to the end of December. It is explained by a recovery in demand, higher generation costs for gas-fired electricity, and a downturn in renewable energy output across all of western Europe.

In **Italy**, average spot prices were up by €86.8/MWh from 2020. This increase illustrates the recovery in demand, and the importance of gas in the electricity mix in Italy, as gas prices rose significantly during the year while stocks were low at the start of the winter in Europe.

In **Belgium**, average spot prices increased by €72.2/MWh over 2020, again driven by high prices for gas, coal and CO₂, lower renewable energy output, a cold winter and a rise in demand.

(1) **France:** average previous day EPEXSPOT price for same-day delivery;
Belgium: average previous day Belpex price for same-day delivery;
United Kingdom: average previous day EDF Trading OTC price for same-day delivery;
Italy: average previous day GME price for same-day delivery.

(2) Central Western Europe.

5.1.2.1.2 Forward electricity prices in Europe ⁽¹⁾

	France	United Kingdom	Italy	Belgium
Average forward baseload price under the 2022 annual contract in 2021 (€/MWh)	95.5	96.0	96.9	86.0
Variation in average forward baseload price under the annual contracts, 2021/2020	+112.8%	+98.6%	+97.2%	+111.4%
Forward baseload price under the 2022 annual contract at 31 December 2021 (€/MWh)	249.54 ⁽¹⁾	174.96	169.33	159.96
Average forward peakload price under the 2022 annual contract in 2021 (€/MWh)	122.5	110.7	106.4	102.8
Variation in average forward peakload price under the annual contracts, 2021/2020	+111.7%	+102.3%	+92.4%	+98.2%
Forward peakload price under the 2022 annual contract at 31 December 2021 (€/MWh)	330.0 ⁽²⁾	211.15	198.73	197.93

(1) Final quoted price of the year for Cal+1 baseload, France, 29/12/2021.

(2) Final quoted price of the year for Cal+1 peakload, France 29/12/2021.

Average annual contract prices for baseload and peakload electricity showed a substantial increase all over Europe between 2020 and 2021, due to the rise in commodity prices (for gas, coal and CO₂).

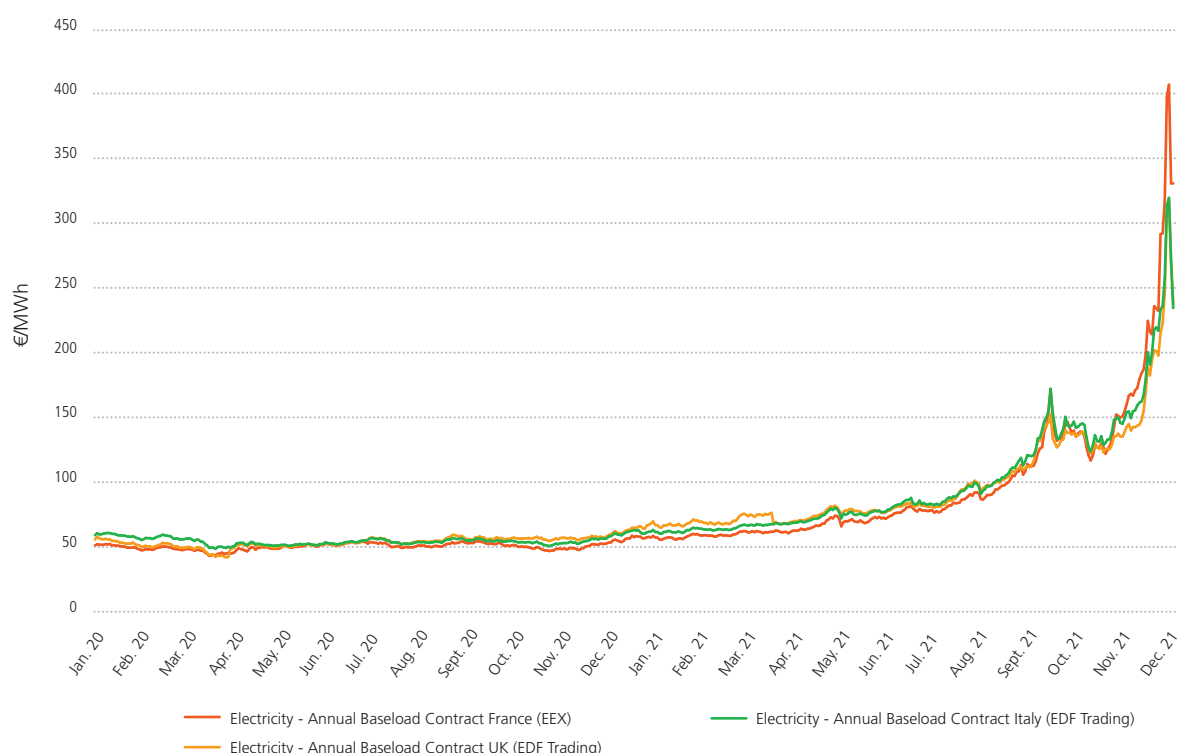
In **France**, the average annual contract baseload price for next-year delivery rose steadily over the whole year before a sharp increase in December, when it reached the monthly average of €256.5/MWh. A major factor in this rise was the very substantial increase in prices on the gas market, and to a lesser degree, CO₂ and coal prices, particularly in the second half of the year. This trend amplified in the last weeks of December due to anticipations of tension on the supply-demand balance following announcements of unavailability at certain nuclear plants. Electricity prices for next-year delivery thus reached record levels, peaking at €407.5/MWh on 22 December.

In the **United Kingdom**, the April Ahead contract baseload price for 1 April Y+1 to 31 March Y+2 increased by 98.6%. This price rose throughout the year and showed a leap in December following the increase in commodity prices.

In **Italy**, the +97.2% increase in the annual contract baseload price for next-year delivery reflects the rise in commodity prices. CO₂ prices remained volatile and followed an upward trend that affected electricity prices due to the high gas component in the Italian electricity mix.

In **Belgium**, the 111.4% increase in the annual contract baseload price for next-year delivery was particularly pronounced in the fourth quarter, due to the rise in commodity prices.

Principal forward electricity prices in Europe (baseload year ahead), in €/MWh



(1) **France and Germany**: average year-ahead EEX price;
Belgium and Italy: average year-ahead EDF Trading price;
United Kingdom: average ICE annual contract prices, April 2021 then April 2022 (in the UK, annual contract deliveries take place from 1 April to 31 March).

5.1.2.1.3 CO₂ emission quota prices ⁽¹⁾

The price of **emissions certificates** for delivery in December Y+1 stood at an average €54.0/t in 2021 (+115.0% or +€28.9/t vs 2020). The CO₂ quota price followed a robust upward trend throughout the year 2021.

CO₂ emission quota prices began the year in a favourable political environment, after the announcement in January that the United States would rejoin the Paris Agreement. Then on 14 July the European Union presented its proposals to cut EU greenhouse gas emissions by 55% by 2030, rather than the initial 40% target. Late

in the year, the German government's proposal to set a minimum carbon price reinforced the upward price trend.

As well as these developments, temperatures were lower than normal in April and greater use of fossil-fired power plants was necessary. From the third quarter onwards, gas prices soared among fears over the levels of European stocks, and this pushed up the output by coal-fired generation.

Finally, prices fluctuated with speculative position-taking, which also contributed to higher volatility in CO₂ quotas.

CO₂ emission quota prices in €/t for next-year deliveries in December (ICE)



5.1.2.1.4 Fossil fuel prices ⁽²⁾

	Coal (US\$/t)	Oil (US\$/bbl)	Natural gas (€/MWhg)
Average price for 2021	94.6	70.9	30.2
Average price variation, 2021/2020	+63.2%	+64.0%	+131.8%
Highest price in 2021	184.0	86.4	140.3
Lowest price in 2021	64.2	51.1	15.8
Price at 31 December 2021	99.3	77.78	50.0
Price at 31 December 2020	68.85	51.8	16.4

Coal prices for next-year delivery in Europe rose by +63.2% compared to 2020. In China, imports and higher production were not enough to cope with the increase in demand. Then gas prices soared, and coal-fired energy plants became competitive in a long-term perspective. In Europe, waves of cold weather drove countries to

rebuild their coal stocks. Finally, some coal-producing countries (Colombia, Russia, South Africa, Australia, Indonesia) had production problems due to social contests and unfavourable weather conditions.

(1) Average ICE prices for the annual contract, Phase III (2013-2020) and Phase IV (2021-2030).

(2) **Coal**: average ICE prices for delivery in Europe (CIF ARA) for the next calendar year (US\$/t);

Oil: ICE price for Brent crude oil barrel (front month) (US\$/barrel);

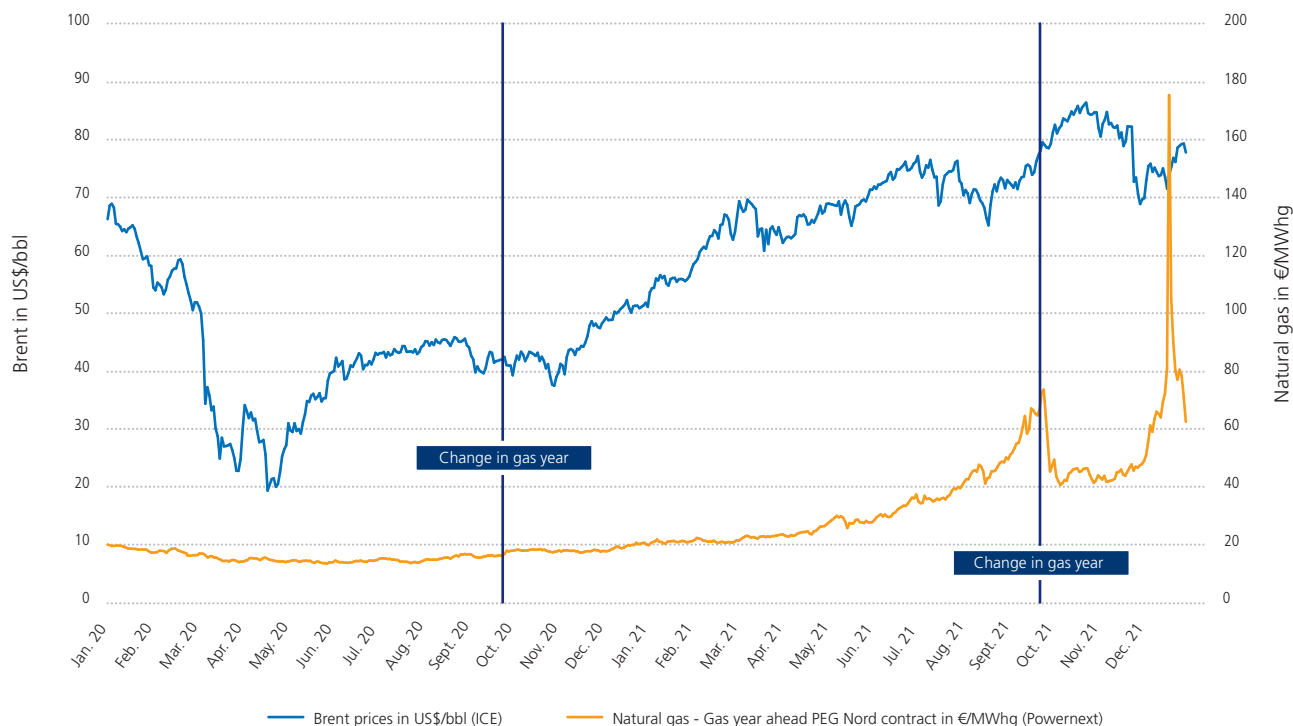
Natural gas: average ICE OTC prices, for delivery starting from October of the following year in France (PEG Nord – €/MWhg).

Oil prices were up by +64.0% compared to 2020 as demand rose significantly all over the world, driven by the resumption of normal economic activity and introduction of recovery plans in the United States and Europe. The rise in oil prices was limited by the OPEC+ countries' adjustment of production to the IEA ⁽¹⁾'s forecast worldwide demand.

The **annual gas contract** price for next-year delivery in the PEG zone increased by +131.8%. Lower temperatures in the spring brought gas stocks down in Europe. In

Asia, more extreme temperatures led to high gas consumption for heating and air conditioning. China imported more gas in a politically tense situation that drove it to halt imports of Australian coal. Uncertainties over gas supplies from Russia via Ukraine, or via NordStream 2, stoked tensions on the European market. Competition between European and Asian markets to attract LNG cargo ships also contributed to upward price trends. Finally, gas prices shot up in the early winter in response to announcements by the Russian President and geopolitical tensions in eastern Europe.

Natural gas and oil prices



5.1.2.2 Consumption of electricity and natural gas

5.1.2.2.1 Consumption of electricity and gas in France

Electricity consumption in France in 2021 showed a significant increase of 21.6TWh or +4.8% compared to 2020. This increase was mainly due to a weather effect (lower temperatures) of +15TWh, and the economic recovery after the Covid-19 pandemic (+6TWh). However, as 2020 was a leap year, there was a negative effect of 1.4TWh due to 2021 having one day less.

Gas consumption in France rose by 27.3TWh compared to 2020. This rise was principally driven by an increase in demand, except in the third quarter when it declined by 8.8TWh, as average temperatures in the second quarter were 0.3°C below normal and had pushed demand up by 21.7TWh. Also, episode of cold weather (in mid-February and the first fortnight of April) led to peaks in household consumption, while gas consumption by industrial sites was relatively stable.

5.1.2.2.2 Consumption of electricity and gas in the United Kingdom

Electricity consumption in the United Kingdom increased by 3% compared to 2020, mainly as a result of the economic recovery in 2021 after 2020 was affected by the Covid-19 pandemic.

Gas consumption in the United Kingdom also increased, by 5% compared to 2020, due to lower temperatures.

5.1.2.2.3 Consumption of electricity and gas in Italy

Electricity consumption in Italy ⁽²⁾ totalled 319.4TWh in 2021, up by 5.5% from 2020, essentially due to resumption of business activity after the Covid-19 crisis of 2020. This rise in demand was addressed by using thermal and wind power plants (especially in the final quarter when wind conditions were favourable). Net imports returned to their pre-pandemic level at 42.8TWh, an increase of 32.9% compared to 2020.

Domestic demand for natural gas in Italy ⁽³⁾ totalled 76.2bcm, 7.8% higher than in 2020, confirming the general resumption of economic activity after Covid-related restrictions were lifted. All segments registered an increase, with a particularly big rise in residential consumption (+10.2% compared to 2020), due to a colder winter in 2021 than in 2020.

(1) International Energy Agency.

(2) Source of data for Italy: unadjusted data and data provided by Terna, the Italian national grid operator, and adjusted by Edison.

(3) Sources of data for Italy: Ministry for Economic Development (MSE), Snam Rete Gas data adjusted by Edison on the basis of 1Bcm = 10.76TWh.

5.1.2.3 Sales tariffs for electricity and natural gas

In **France**, the “blue” regulated sales tariffs were raised:

- on 1 February 2021 by +1.93% excluding taxes (+1.61% including taxes) for residential customers and +3.23% excluding taxes (+2.61% including taxes) for non-residential customers;
- on 1 August 2021 by +1.08% excluding taxes (+0.48% including taxes) for residential customers and +0.84% excluding taxes (+0.38% including taxes) for non-residential customers.

In the **United Kingdom**, a cap on the variable gas and electricity tariffs for residential customers was introduced on 1 January 2019. It is updated every six months, mainly to take account of market price movements in the previous six months. This tariff set for the period 1 October 2021 to 31 March 2022 (a 12% rise) did not reflect the significant increase in supply costs caused by the rise in energy

prices, particularly gas prices, since September 2021. Consequently, Ofgem held a consultation on the price cap methodology, to make sure that energy prices adequately reflect the costs, risks and contingencies faced by suppliers.

On 4 February 2022 Ofgem announced a 54% increase in the energy price cap for the period 1 April – 30 September 2022. In view of this very large increase, the UK government announced consumer support measures totalling around £9 billion in the form of a £200 reduction on every household's October 2022 energy bill, to be repaid over 5 years, and other aids for the most vulnerable consumers.

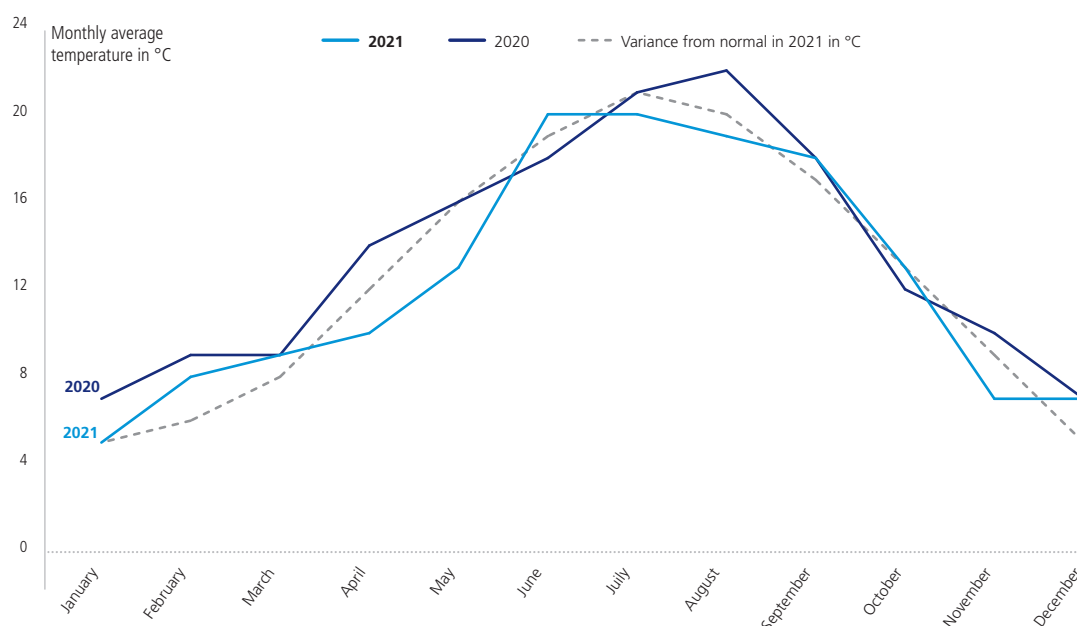
In **Italy**, the average PUN TWA (Single National Time Weighted Average) electricity tariff for 2021 was €125.5/MWh, up by 222.4% from 2020 (€38.9/MWh). This significant increase is explained by a substantial rise in demand associated with the post-Covid economic recovery, and higher thermal generation costs (gas and CO₂ quotas). The spot price for gas registered a significant increase of 342.8% over its 2020 level. The rise was accentuated by colder temperatures from May, which led to greater consumption of gas reserves.

5.1.2.4 Weather conditions: temperatures and rainfall

5.1.2.4.1 Temperatures in France

2021 was a relatively cool year, with an average temperature of 12.4°C (0.3°C below normal). This cooler weather was particularly noticeable in the months of May, July, August and November. Nonetheless, there were warmer episodes in 2021 in September, and in the winter (late January, late February, late March and late December).

Average monthly temperatures ⁽¹⁾ ⁽²⁾ in France



(1) Average temperatures recorded in 32 cities, weighted by electricity consumption

(2) Source: Météo France.

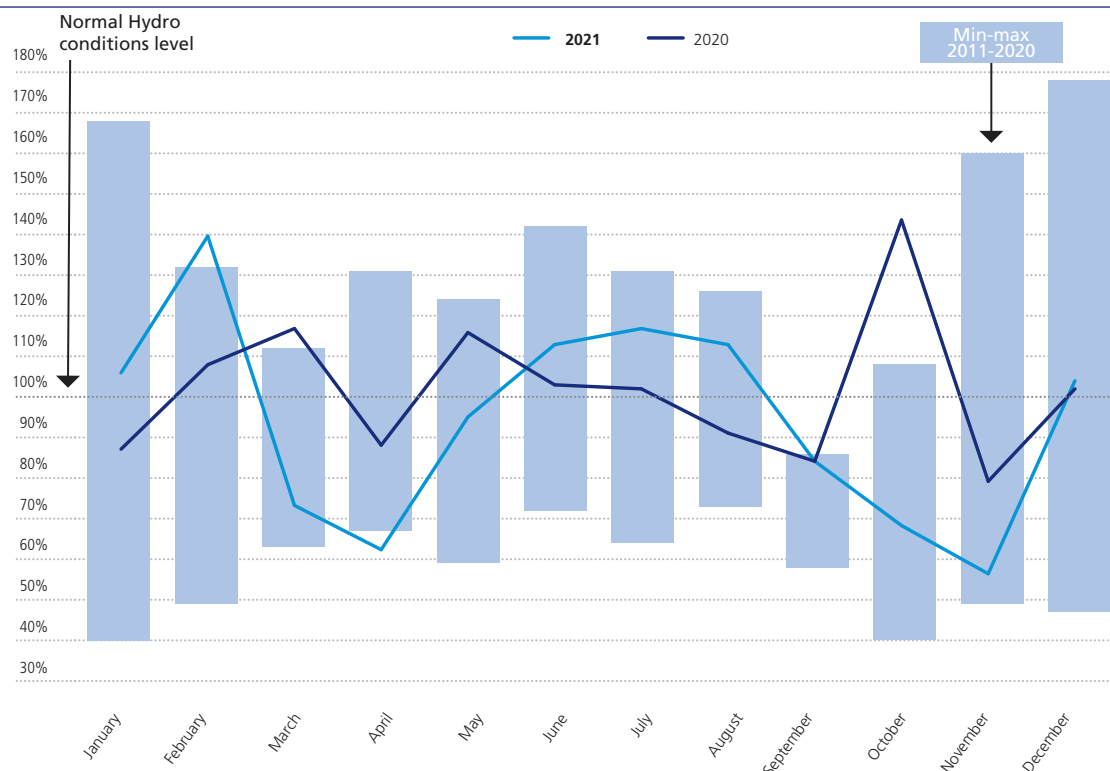
5.1.2.4.2 Rainfall in France

Rainfall in Europe was close to normal overall in 2021, although there were disparities between the South of Europe (Spain, south- France, Italy) which was drier than normal, and the East of Europe which registered surplus rainfall.

In **France**, the aggregate annual water flow coefficient was slightly below normal, with contrasting situations between the Northern half of the country (above normal) and the Southern half (below normal). There were pronounced differences between

individual months, particularly in the first quarter. In April, the water flow coefficient was the lowest in 50 years under the combined effect of a shortage of rain and the absence of thawing snow. The summer was marked by abundant rainfall in July and the absence of any heatwave. In the autumn, long dry spells resulted in decreasing water flow coefficients until the rain returned at the end of the year.

Hydrological conditions in France *



* Weekly monitoring of French reservoir levels by the EDF group's statistical observatory (Miréor project) as far as the coast.

5.1.3 Analysis of the business and the consolidated income statement for 2021 and 2020

Presentation and analysis of the consolidated income statement for 2021 and 2020 is broken down by business segment for sales and EBITDA (France – Generation and supply, France – Regulated activities, EDF Renewables, Dalkia, Framatome, United Kingdom, Italy, Other international and Other activities). EBIT (operating profit) and net income are analysed without any breakdown.

<i>(in millions of euros)</i>	2021	2020
Sales	84,461	69,031
Fuel and energy purchases	(44,299)	(32,425)
Other external purchases ⁽¹⁾	(8,595)	(8,461)
Personnel expenses	(14,494)	(13,957)
Taxes other than income taxes	(3,330)	(3,797)
Other operating income and expenses	4,262	5,783
Operating profit before depreciation and amortisation (EBITDA)	18,005	16,174
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(215)	(175)
Net depreciation and amortisation ⁽²⁾	(10,789)	(10,838)
(Impairment)/reversals	(653)	(799)
Other income and expenses	(1,123)	(487)
Operating profit (EBIT)	5,225	3,875
Cost of gross financial indebtedness	(1,459)	(1,610)
Discount effect	(2,670)	(3,733)
Other financial income and expenses	4,489	2,761
Financial result	360	(2,582)
Income before taxes of consolidated companies	5,585	1,293
Income taxes	(1,400)	(945)
Share in net income of associates and joint ventures	644	425
Net income of discontinued operations	(1)	(158)
CONSOLIDATED NET INCOME	4,828	615
EDF net income	5,113	650
EDF net income – continuing operations	5,114	804
EDF net income – discontinued operations	(1)	(154)
Net income attributable to non-controlling interests	(285)	(35)
Net income attributable to non-controlling interests – continuing operations	(285)	(31)
Net income attributable to non-controlling interests – discontinued operations	-	(4)

(1) Other external expenses are reported net of capitalised production.

(2) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

5.1.3.1 Sales

Sales amounted to €84,461 million in 2021, up by €15,430 million (+22.4%) from 2020. Excluding the effect of movements in exchange rates (-€238 million) and changes in the scope of consolidation (+€274 million), sales registered organic growth of +21.6%.

5.1.3.1.1 Change in Group sales and breakdown by segment

<i>(in millions of euros)</i>	2021	2020	Variation	Variation (%)	Organic variation (%)
Sales	84,461	69,031	15,430	22.4	21.6

The following table shows sales by segment, excluding inter-segment eliminations:

(in millions of euros)	2021	2020	Variation	Variation (%)	Organic variation (%)
France – Generation and supply ⁽¹⁾	33,182	28,361	4,821	17.0	17.0
France – Regulated activities ⁽²⁾	17,564	16,228	1,336	8.2	8.2
EDF Renewables	1,767	1,582	185	11.7	12.3
Dalkia	5,196	4,212	984	23.4	23.9
Framatome	3,362	3,295	67	2.0	1.9
United Kingdom	10,114	9,041	1,073	11.9	8.4
Italy	11,212	5,967	5,245	87.9	88.1
Other international	3,353	2,420	933	38.6	28.1
Other activities	3,905	2,127	1,778	83.6	84.2
Inter-segment eliminations	(5,194)	(4,202)	(992)	23.6	23.6
GROUP SALES	84,461	69,031	15,430	22.4	21.6

(1) Generation, supply and optimisation in mainland France, and sales of engineering and consulting services.

(2) Regulated activities comprise distribution in mainland France, which is carried out by Enedis, EDF's island activities and the activities of Électricité de Strasbourg. In mainland France, distribution network activities are regulated via the network access tariff TURPE (tarifs d'utilisation des réseaux publics d'électricité). Enedis is an independent EDF subsidiary as defined in the French Energy Code.

5.1.3.1.1.1 France – Generation and supply

Sales by the **France – Generation and supply** segment amounted to €33,182 million in 2021, up by €4,281 million (+17.0%) from 2020.

The “energy” portion of sales increased by €250 million, comprising a positive volume effect of €1,106 million driven largely by the 25.3TWh rise in nuclear power output, and a negative price effect of €856 million due to electricity purchases required to make up for output shortfalls at the end of 2021, which were made at very high prices.

Downstream market conditions had a positive effect estimated at €385 million on the change in sales. This increase primarily results from the re-invoicing of capacity guarantee purchases to final customers (+€519 million), despite the negative impact of loss of market shares (-€221 million).

Resales of electricity subject to purchase obligations were up by €2,656 million, mainly due to a rise in spot and forward market prices throughout the year, partly offset by a decline in volumes following the very windy year of 2020 (the effect on EBITDA was neutral because expenses relating to purchase obligations are compensated by the CSPE mechanism).

The results of sales subsidiaries and aggregators, and gas sales, also contributed +€1,530 million to the increase in sales.

Electricity generation

Nuclear power generation in France produced 360.7TWh in 2021, 25.3TWh more than in 2020. This increase is principally explained by better plant availability and much lower modulation of generation than in 2020, when demand was lower due to the Covid-19 pandemic. The fuller schedule for maintenance outages was offset by a lower number of unscheduled outages, unforeseen contingencies and prolongations.

Gross hydropower output stood at 41.8TWh ⁽¹⁾, down by 2.6TWh from 2020. This decrease is mainly explained by unfavourable hydrological conditions in 2021, although they had been better than historical averages in 2020 (see section 2.4 “Weather conditions: temperatures and rainfall”).

Thermal generation plants were used to produce 10.5TWh, an increase of 1.7TWh compared to 2020.

Sales volumes to final customers (a market segment that includes the local distribution firms and excludes foreign operators) rose slightly by 0.3TWh, including +9.7TWh attributable to weather effects.

EDF was a net seller on the wholesale markets to the extent of 69.5TWh, an increase of 15.6TWh from 2020 despite periods of energy purchases during the

year. The higher nuclear and fossil-fired power output was partly counterbalanced by lower hydropower output and lower volumes of purchase obligations. There was also an increase in sales to the ARENH scheme.

5.1.3.1.1.2 France – Regulated activities

Sales in 2021 by the **France – Regulated activities** segment amounted to €17,564 million, an increase of €1,336 million (+8.2%) compared to 2020.

For Enedis ⁽²⁾, the €1,138 million rise in sales was principally driven by colder weather in first-half 2021 than the mild weather of first-half 2020 (+€426 million), a favourable price effect (+€489 million) principally due to developments in the indexed adjustment to the TURPE 6 distribution tariff ⁽³⁾ and higher income from connections (+€159 million) following the impact of the Covid-19 pandemic in 2020.

Électricité de Strasbourg and SEI's sales rose by €202 million.

5.1.3.1.1.3 EDF Renewables

The **EDF Renewables** segment's sales totalled €1,767 million and registered an organic increase of €194 million (+12.3%) compared to 2020.

Sales of energy produced saw organic growth of 5.3% thanks to the increase in the volume output of wind and solar power, due to new facilities commissioned during the second half of 2020 and in 2021. The spell of extremely cold weather in Texas in the first quarter had no significant impact on EDF Renewables' sales but affected EBITDA because the company had to purchase energy at very high prices in order to honour its contractual commitments.

The distributed solar power business in the United States registered sales growth, reflecting the dynamic business environment in this sector (with no significant impact on EBITDA).

5.1.3.1.1.4 Dalkia

Sales by **Dalkia** amounted to €5,196 million for 2020, an organic increase of €1,006 million (+23.9%) compared to 2020.

This growth reflects the significant increase in gas prices (with no impact on EBITDA), the resumption of business activity (after work was suspended and services to industry and buildings were significantly scaled back in early 2020 due to the Covid-19 pandemic), and dynamic sales activity in France (in industrial refrigeration), and in the United Kingdom. Dalkia's sales also benefited from slightly colder-than-normal weather conditions in 2021 compared to the milder year of 2020.

(1) After deduction of pumped-storage hydropower volumes, hydropower production stood at 35.9TWh for 2021 (38.5TWh for 2020).

(2) Enedis is an independent EDF subsidiary as defined in the French Energy Code.

(3) Indexed adjustments to the TURPE 5 distribution tariff: +2.75% at 1 August 2020 and 0.91% at 1 August 2021.

5.1.3.1.1.5 Framatome

Framatome's sales amounted to €3,362 million in 2021, an organic increase of 1.9% over 2020. A significant portion of sales are made within the Group. This growth is explained by more sustained levels of business with the Group.

5.1.3.1.1.6 United Kingdom

Sales by the **United Kingdom** segment amounted to €10,114 million in 2021, an organic increase of €762 million (+8.4%) from 2020.

This rise is explained by higher electricity prices and the increase in volumes sold, reflecting the takeover of Utility Point and Green Network Energy customers (under the supplier of last resort mechanism). Cold weather in the first quarter and the 5% rebound in consumption by business customers also contributed to sales growth. These favourable developments were partly counterbalanced by a decrease in nuclear power output (-4TWh) and by lower realised sales prices for nuclear power due to purchases of energy at high prices.

5.1.3.1.1.7 Italy

The **Italy** segment's sales totalled €11,212 million in 2021, showing organic growth of €5,258 million (+88.1%) compared to 2020.

In the gas activities, sales were up as a result of rising prices on all markets (although the effect on the margin was limited). The recovery in sales volumes to business customers following the Covid-19 measures of 2020 and the colder winter than in 2020 also contributed to the increase in volumes.

In the electricity activities, despite lower sales volumes to industrial customers, sales also rose significantly due to the rise in prices.

5.1.3.1.1.8 Other international

The **Other international** segment principally covers operations in Belgium, the United States, Brazil and Asia (China, Vietnam and Laos). Sales by this segment in 2021 amounted to €3,353 million, an organic increase of €681 million (+28.1%) from 2020.

In **Belgium** ⁽¹⁾, sales registered organic growth of €474 million (+27.3%) compared to 2020, benefiting from higher electricity and gas prices, an increase in volumes sold to business, industrial and residential customers, and weather effects. The residential customer market is still intensely competitive. Annual indexed adjustments of contracts (particularly for residential customers), which are applied throughout the year, do not yet fully reflect the recent rise in electricity and gas

prices on the wholesale markets. Greater use was made of the thermal generation fleet, leading to an increase in system services. Wind power development continued, reaching net installed capacity of 591MWh ⁽²⁾ at end-2021.

In **Brazil**, there was an organic increase of €188 million (+39.7%) in sales, principally due to higher volumes sold on the market and the +28% adjustment in November 2020 of the Power Purchase Agreement (PPA) price attached to EDF's Norte Fluminense power plant, in line with the change in the ICMS tax ⁽³⁾ (which had no impact on EBITDA). The foreign exchange effect was unfavourable in 2021 (the Brazilian real declined against the euro).

In **Vietnam**, sales showed an organic increase of €18 million (+10%), in keeping with the rise in gas prices (on a pass-through basis, so there is no impact on EBITDA).

5.1.3.1.1.9 Other activities

Other activities comprise, among other entities, EDF Trading and the gas activities.

Sales by this segment amounted to €3,905 million in 2021, an organic increase of €1,791 million (+84.2%) from 2020.

- sales by the **gas activities** amounted to €1,860 million, an organic increase of €1,131 million compared to 2020, essentially explained by the favourable effect of the increase in prices on the wholesale gas market (+€772 million);
- **EDF Trading's** sales totalled €1,518 million, an organic increase of 67.7% compared to 2020. Trading activities performed very well in Europe and the United States, particularly as a result of very high volatility on the commodity markets, especially during the weather event in Texas during the first quarter.

5.1.3.2 EBITDA

The Group's consolidated EBITDA for 2021 amounted to €18,005 million, an organic increase of 11.3% from 2020.

This trend was also driven by the extremely positive performance in the trading business, by the significant improvements in Italy and in the French regulated activities, and by the reduction in production tax. However, outages and extended outages of nuclear reactors at the end of the year in France required the purchase of volumes on the market against a backdrop of a sharp rise in electricity prices. This had a strongly unfavourable impact. The United Kingdom was negatively impacted by the decrease in nuclear output and the sharp decline in realised nuclear prices stemming from substantial buybacks at high market prices.

(in millions of euros)	2021	2020	Variation	Variation (%)	Organic variation (%)
Sales	84,461	69,031	15,430	22.4	21.6
Fuel and energy purchases	(44,299)	(32,425)	(11,874)	36.6	35.3
Other external expenses	(8,595)	(8,461)	(134)	1.6	1.3
Personnel expenses	(14,494)	(13,957)	(537)	3.8	3.5
Taxes other than income taxes	(3,330)	(3,797)	467	(12.3)	(12.0)
Other operating income and expenses	4,262	5,783	(1,521)	(26.3)	(26.1)
EBITDA	18,005	16,174	1,831	11.3	11.3

5.1.3.2.1 Change in Group EBITDA and analysis

- The Group's **fuel and energy purchases** amounted to €44,299 million in 2021, an organic increase of €11,435 million (+35.3%) compared to 2020:
 - › in the **France – Generation and supply** segment, fuel and energy purchases showed an organic increase of €2,486 million (+18.8%) from 2020, principally due to a large volume of energy purchases at high prices;

- › in the **United Kingdom**, the organic increase of €1,824 million (+30.9%) in fuel and energy purchases principally relates to the unfavourable impact of rising market prices on energy purchases. Also, gas and electricity sales volumes were higher, notably after EDF took over insolvent suppliers' customer portfolios in application of the supplier of last resort mechanism, which made additional energy purchases necessary;
- › in **Italy**, the organic increase of €4,882 million (+111.8%) in fuel and energy purchases essentially reflects higher wholesale market prices and volumes for gas.

(1) Belgium comprises Luminus and EDF Belgium.

(2) Net capacity of Luminus. Gross installed wind capacity amounted to 658MW (588MW at 31 December 2020).

(3) Tax on Circulation of Merchandise and Services in Brazil.

- The Group's **other external expenses** amounted to €8,595 million, an organic increase of €108 million (+1.3%) compared to 2020:
 - ▶ in the **France – Generation and supply** segment, other external expenses registered an organic increase of €193 million (+8.3%). This increase mainly reflects the economic recovery for service activities, which were affected by the Covid-19 pandemic in 2020, and development of engineering projects;
 - ▶ in the **France – Regulated activities** segment, other external expenses showed an organic decrease of €102 million (-6.4%) compared to 2020, reflecting a higher level of capitalised production, in line with the level of network connection activity;
 - ▶ in the **United Kingdom**, there was an organic decrease of €191 million (-22.8%) in other external expenses after expenses for permanently shut-down power plants (Dungeness B) were transferred to the Nuclear Liability Fund. Changes to the pension system negotiated in 2021 generated an exceptional contribution, and a reduction in expenses;
 - ▶ **EDF Renewables** registered a €105 million (+17.7%) organic increase in other external expenses, principally due to growth in the distributed solar power business in the United States;
 - ▶ **Dalkia's** other external expenses showed an organic increase of €145 million (+8.4%), driven by the recovery of service activities and site work, which had been significantly affected by the Covid-19 pandemic in 2020.
- The Group's **personnel expenses** for 2021 totalled €14,494 million, an organic increase of €495 million (+3.5%) from 2020:
 - ▶ in the **France – Generation and supply** segment, personnel expenses registered an organic increase of €50 million (+0.8%) that mainly reflects the impact of higher salaries and pension expenses, which were partly offset by a decrease in workforce numbers;
 - ▶ in the **France – Regulated activities** segment, there was an organic increase of €47 million (+1.5%) in personnel expenses. Price effects on salaries were partly offset by the decrease in workforce numbers;
 - ▶ **EDF Renewables** registered a €55 million (+14.1%) organic increase in personnel expenses, principally explained by a rise in workforce numbers, notably due to growth in the development and construction businesses;
 - ▶ **Dalkia** saw an organic increase of €85 million (+7.9%) in personnel expenses, essentially driven by recovery in the service activities which had been affected by the Covid-19 pandemic in 2020, and a workforce increase to support business growth;
 - ▶ in the **United Kingdom**, personnel expenses rose by €67 million (+6.2%), largely due to the unfavourable impact of revised discount rates;
- **Taxes other than income taxes** amounted to €3,330 million in 2021, an organic decrease of €455 million (-12.0%) compared to 2020:
 - ▶ in the **France – Generation and supply** segment, the €393 million (-16.7%) organic decrease is mainly attributable to the lower generation taxes introduced under the national recovery plan;
 - ▶ in the **France – Regulated activities** segment, the €138 million (-14.5%) organic decrease is also explained by lower generation taxes.
- **Other operating income and expenses** generated net income of €4,262 million in 2021, an organic decrease of €1,510 million (-26.1%) compared to 2020.
 - ▶ in the **France – Generation and supply** segment, the €2,104 million organic decrease (-49.8%) in the income generated by other operating income and expenses is primarily attributable to a decrease in CSPE compensation (neutral impact on EBITDA), due to the rise in spot market prices;
 - ▶ in the **France – Regulated activities** segment, the €214 million (+15.2%) organic increase in the income generated by other operating income and expenses mainly resulted from an increase in CSPE for SEI under the mechanism to compensate for additional costs in French islands.

5.1.3.2.2 Change in consolidated EBITDA and analysis by segment

(in millions of euros)	2021	2020	Variation	Variation (%)	Organic Variation (%)
France – Generation and supply	7,394	7,412	(18)	(0.2)	(0.3)
France – Regulated activities	5,992	5,206	786	15.1	15.1
EDF Renewables	815	848	(33)	(3.9)	(3.7)
Dalkia	378	290	88	30.3	31.7
Framatome	310	271	39	14.4	18.5
United Kingdom	(21)	823	(844)	(102.6)	(108.0)
Italy	1,046	683	363	53.1	53.0
Other international	267	380	(113)	(29.7)	(22.9)
Other activities	1,824	261	1,563	n.a	n.a
GROUP EBITDA	18,005	16,174	1,831	11.3	11.3

n.a.: not applicable.

5.1.3.2.2.1 France – Generation and supply

The net impact on EBITDA of the 25.3TWh increase in nuclear output, combined with the 2.6TWh decline in hydropower output after the deduction of pumped volumes, is estimated at +€1,081 million.

Energy prices had a negative impact on EBITDA estimated at -€1,140 million, outages and extended outages at the end of the year having required purchases on the market at extremely high prices. In contrast, energy buybacks in 2020 were made at low prices.

The impacts on the downstream market were negative and estimated at -€249 million owing to a loss of customers, while capacity prices invoiced to customers had a favourable impact.

Furthermore, EBITDA benefitted from the reduction in production taxes as part of the recovery plan for an estimated €322 million.

5.1.3.2.2.2 France – Regulated activities

The substantial increase in EBITDA resulted primarily from an increase in distributed volumes, at 15.8TWh for an estimated €251 million, stemming from colder weather and following the impact of the health crisis in 2020. It also resulted from growth in the grid connection services activities, which made a positive contribution to EBITDA for an estimated €159 million.

The trend in prices had a positive effect estimated at €30 million, mainly owing to the positive trend in the TURPE ⁽¹⁾ indexation despite the negative effect of loss purchases against a backdrop of strong price increases on the market.

Furthermore, EBITDA benefitted from a €130 million reduction in production taxes as part of the recovery plan.

(1) Indexed adjustments to the TURPE 5 Distribution tariff: +2.75% and TURPE 5 Transmission: -1.08% at 1 August 2020 and TURPE 6 Distribution: +0.91% and TURPE 5 Transmission: +1.09% at 1 August 2021.

5.1.3.2.2.3 EDF Renewables

The extreme cold snap in Texas in the first quarter had a significant negative impact on production EBITDA estimated at -€95 million. EDF Renewables was obliged to buy back energy at very high prices to meet its contractual commitments and had to book an impairment for one of its fleet assets, leading to a negative impact on net income.

The production EBITDA also benefits from an increase (+1.6TWh) in volumes produced thanks to the capacities commissioned.

“Development & Sale of Structured Assets” made a favourable contribution to EBITDA, notably owing to disposals in the United States and Portugal.

Development costs increased, supporting the 27% growth in the portfolio of wind and solar projects of 73GW.

5.1.3.2.2.4 Dalkia

The strong EBITDA growth can be attributed primarily to the recovery in services and works following a first-half 2020 negatively impacted by the closure of numerous customer sites, the postponement of construction projects, and continued gains in performance in heating and cooling networks.

It is also explained by a very good rebound in the works and energy efficiency activities in the UK.

Sales development remained strong, particularly in greening and operation and maintenance of heating networks, with contracts won in Issoire, Puteaux and Monplaisir (Angers) for example.

5.1.3.2.2.5 Framatome

EBITDA rose sharply as a result of brisk activity at “Fuel” and “Primary Component” production plants and the lesser impact of the health crisis.

The “Installed base” activity, mainly in North America and France, also contributed favourably to EBITDA.

The action plan on structural costs also continues to contribute to EBITDA.

Order intake amounted to around €3.7 billion at end-2021 ⁽¹⁾, an improvement relative to 2020.

Framatome is developing its engineering expertise and expanding its Instrumentation and Control (I&C) capabilities with the acquisition of the I&C activity of Rolls-Royce ⁽²⁾.

5.1.3.2.2.6 United Kingdom

The extremely sharp decrease in EBITDA resulted mainly from a 4TWh downturn in nuclear output for an estimated -€198 million and from a substantial decrease in realised nuclear prices (-£12.6/MWh) stemming from a considerable volume of buybacks at high market prices, estimated at -€550 million.

Downstream activity was also impacted by the energy crisis in the United Kingdom. In particular, the contribution of the residential customer segment decreased as the rise in energy prices was not fully passed on in 2021 to customers with capped prices.

The acquisition of Green Network Energy's customers, on the one hand, the integration of Utility Point and Zog Energy clients' portfolio in accordance with the

supplier of last resort mechanism, on the other hand, have required additional purchases.

Business in the professional segment increased relative to 2020, the latter having been adversely affected by the health crisis.

5.1.3.2.2.7 Italy

The electricity activities reported EBITDA growth, in particular thanks to the improved use of CCGT (combined cycle gas turbines) and of ancillary services in an environment of highly volatile market prices. The contribution from renewable energy generation also increased, especially wind power, against a backdrop of high prices.

Gas business benefited from the capital gain generated from the disposal of Infrastrutture Distribuzione Gas (IDG), the surge in activity (impact of the health crisis) in the industrial customer segments and a colder weather in 2021 than in 2020.

Ebitda also benefited from the growth of the services activities.

The creation of Edison Renewables is to be marked with the entry of a new financial partner, which acquired a 49% stake in order to develop new generation capacities.

5.1.3.2.2.8 Other international

In Belgium ⁽³⁾, the decline in EBITDA resulted primarily from reduced wind farm production, linked to less favourable wind conditions compared with 2020, and purchases at high prices, particularly at the end of the year.

Net installed wind capacity increased to 591MW ⁽⁴⁾, up 7.8% compared with end-2020. Nuclear output is increasing. The improved availability of thermal plants helped to increase the services provided to the electric system.

After the slowdown in 2020 owing to the health crisis, service activities returned to growth and downstream activities held up well against a backdrop that continued to suffer from intense competition and extensions to social tariffs.

Luminus finalised the acquisition of around 330,000 customers from Essent Belgium, the Belgian gas and electricity supplier ⁽⁵⁾.

In **Brazil**, EBITDA increased in organic terms thanks to the increase in the price of the Power Purchase Agreement (PPA) relating to the EDF Norte Fluminense plant, by 28% in November 2020 and 7% in November 2021, as well as sales at high prices on the spot market.

5.1.3.2.2.9 Other activities

The increased EBITDA of gas activities resulted mainly from the revaluation of long-term contracts (with no cash effect) in line with the substantial improvement in medium- and long-term USA-Europe spreads and an improvement in the operational margins of the Group's gas businesses.

EDF Trading posted EBITDA of €1,200 million, up an organic 89.6% relative to 2020. This was an outstanding performance given the extreme volatility on the commodities markets.

The trend was also underpinned by the sale of real estate in France.

(1) At Framatome scope.

(2) See the Framatome press release of 8 November 2021.

(3) Luminus and EDF Belgium.

(4) Net capacity for Luminus. Gross installed wind capacity totaled 658MW at end-2021 (+11.9%).

(5) See the Luminus press release of 3 May 2021.

5.1.3.3 EBIT

The Group's **consolidated EBIT** for 2021 amounted to €5,225 million, up by €1,350 million (+34.8%) from 2020, or an organic increase of €1,393 million (+35.9%).

(in millions of euros)	2021	2020	Variation	Variation (%)
EBITDA	18,005	16,174	1,831	11.3
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(215)	(175)	(40)	(22.9)
Net depreciation and amortisation*	(10,789)	(10,838)	49	(0.5)
(Impairment)/reversals	(653)	(799)	146	(18.3)
Other income and expenses	(1,123)	(487)	(636)	130.6
EBIT	5,225	3,875	1,350	34.8

* Including net increases to provisions for replacement of concession assets.

5.1.3.3.1 Net changes in fair value on Energy and Commodity derivatives, excluding trading activities

The net changes in fair value on energy and commodity derivatives, excluding trading activities, decreased by €40 million compared to 2020, in line with EDF Trading's operations for EDF entities.

5.1.3.3.2 Net depreciation and amortisation

Net depreciation and amortisation was down by €49 million from 2020. The decrease principally concerns the **France – Generation and supply** segment (€164 million) and essentially reflects the impact of extension of the depreciation period of 1,300MWe-series power plants, which more than compensated for the additional depreciation and amortisation resulting from the increase in investments.

5.1.3.3.3 (Impairment)/reversals

Impairment recognised in 2021 amounted to €653 million, and mainly related to impairment of nuclear assets in the **United Kingdom** in view of the decision to

close down the Dungeness B plant early ⁽¹⁾. Smaller amounts of impairment were recognised in respect of **EDF Renewables'** photovoltaic plants, in view of a decree that reduced purchase tariffs from October 2021 for electricity generated by plants of over 250kWp in France for which the contracts were signed between July 2006 and August 2010.

5.1.3.3.4 Other income and expenses

Other income and expenses amounted to -€1,123 million for 2021, comprising:

- -€427 million for the **France – Generation and supply** segment, principally additional costs relating to repair work on penetration welds at the Flamanville 3 site, less the settlement indemnity from AREVA ⁽²⁾;
- -€437 million for the **Other international** segment, notably as a result of the sale of the 49.99% investment in CENG;
- -€212 million for the **United Kingdom** segment, mainly relating to the decision to shut down the Dungeness B plant early in 2021;
- -€155 million for the **Italy** segment, principally relating to litigation concerning the former company Montedison.

5.1.3.4 Financial result

(in millions of euros)	2021	2020	Variation	Variation (%)
Cost of gross financial indebtedness	(1,459)	(1,610)	151	(9.4)
Discount effect	(2,670)	(3,733)	1,063	(28.5)
Other financial income and expenses	4,489	2,761	1,728	62.6
FINANCIAL RESULT	360	(2,582)	2,942	N.A
n.a.: not applicable				

- The financial result for 2021 is financial income of €360 million, an improvement of €2,942 million compared to 2020. This change is explained by:
 - › a €1,728 million improvement in other financial income and expenses, driven mainly by the strong performance by the dedicated asset portfolio (+€1,521 million) (see section 5.1.5.1.6);
 - › the €1,063 million decrease in the discount expense charges, largely owing to the lesser decline in the discount rate for nuclear provisions in France between 2020 and 2021 than between 2019 and 2020;
- The discount rate used to calculate nuclear provisions at 31 December 2021 was 3.7%, assuming inflation of 1.7% (respectively 3.3% and 1.2% at 31 December 2020);
 - › a €151 million decline in the cost of gross financial indebtedness, attributable to refinancing operations in an environment of low interest rates.

(1) On 7 June 2021 EDF decided to move the Dungeness B AGR nuclear power plant in south-east England into the defueling phase.

(2) Settlement agreement signed on 29 June 2021 for a payment by AREVA to EDF of €563 million by 31 December 2021, in settlement of all the disputes between EDF and AREVA regarding the acquisition contract for Framatome signed in 2017, and their commercial relations prior to the acquisition.

5.1.3.5 Income taxes

Income taxes amounted to €1,400 million at 31 December 2021, corresponding to an effective tax rate of 25.09% (compared to a tax expense of €945 million at 31 December 2020, corresponding to an effective tax rate of 73.10%).

The €455 million increase in the Group's tax expense in 2021 essentially reflects the €4,292 million increase in net income before taxes, thanks to a good operating and financial performance (unrealised positions) generating an additional tax expense of €1,219 million. The increase also includes the favourable impact of deferred tax asset recognition in the United States and the tax revaluation of assets in Italy, partly mitigated by the unfavourable effect of the forthcoming increase in the UK income tax rate from 19% to 25% from 2023 (creating a larger negative effect than in 2020, when the rate was raised from 17% to 19%).

Regarding the tax revaluation of assets in Italy, special tax measures introduced in response to the Covid-19 pandemic allow Italian companies, by virtue of Article 110 of decree-law 104/2020, to realign the tax value of certain assets and goodwill with their accounting value in return for payment of a 3% tax. The Group's Italian companies opted to realign the tax value of certain tangible assets and goodwill 31 December 2021.

Finally, the income tax expense in 2020 was strongly affected by the unfavourable Council of State decision issued in December 2020 rejecting the tax-deductibility of certain long-term liabilities of EDF SA, a factor that had no equivalent in 2021.

After elimination of these non-recurring items (principally changes in unrealised gains and losses on the financial asset portfolio, impairment, restatements of the tax value of assets in Italy, the impact of changes in the UK tax rate and the sale of CENG), the effective current tax rate for 2021 is 21.3%, compared to 19.0% in 2020.

5.1.3.6 Net income excluding non-recurring items

The Group's net income excluding non-recurring items ⁽¹⁾ stood at €4,717 million in 2021, up by €2,748 million from 2020 (see note 19.1, "Net income excluding non-recurring items", to the 2021 consolidated financial statements).

5.1.3.7 EDF net income

EDF net income amounted to €5,113 million at end-2021, up €4,463 million. Apart from the considerable increase in net income excluding non-recurring items, the change includes the following after-tax items:

- the change in fair value of financial instruments for €1,152 million;
- income of €362 million corresponding to a payment as part of an agreement signed between EDF and AREVA on 29 June 2021;
- additional costs relating to repair work on the main secondary circuit welds at the Flamanville 3 EPR, totalling -€410 million, or an additional charge of -€140 million compared to 2020;
- costs related to the planned closure of Dungeness B, amounting to -€366 million. The latter includes the loss of value of the plant and the depreciation of fuel inventories and spare parts as well as the provisioning of penalties due under the capacity mechanism.



(1) EDF net income excluding non-recurring items, net changes in fair value on energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.

Amount of non-recurring items, net changes in fair value on energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax:

- -€1,480 million of impairment and other non-recurring items in 2021, compared to -€2,068 million in 2020;
- -€149 million of net changes in the fair value of energy and commodity derivatives (excluding trading activities) net of tax in 2021, compared to -€124 million in 2020;
- +€2,025 million of net changes in the fair value of debt and equity instruments in 2021, compared to +€873 million in 2020.

5.1.4 Net indebtedness, cash flows and investments

(in millions of euros)	2021	2020 ⁽⁵⁾	Variation	Variation (%)
EBITDA	18,005	16,174	1,831	11.3
Cancellation of non-monetary items included in EBITDA	(869)	328	(1,197)	n.a
Cash EBITDA	17,136	16,502	634	3.8
Change in working capital	(1,526)	(1,679)	153	(9.1)
Net investments ⁽¹⁾ (excluding Group disposals 2020-2022)	(15,725)	(14,145)	(1,580)	11.2
Other items including dividends received from associates and joint ventures	(98)	(17)	(81)	n.a
Operating cash flow ⁽²⁾	(213)	661	(874)	n.a
Asset disposals	2,847	187	2,660	n.a
Income taxes paid	(2,276)	(983)	(1,293)	n.a
Net financial expenses disbursed	(588)	(929)	341	(36.7)
Dedicated assets	(501)	(828)	327	(39.5)
Dividends paid in cash	(794)	(768)	(26)	3.4
Group cash flow ⁽³⁾	(1,525)	(2,660)	1,135	(42.7)
Issues of hybrid notes	1,235	2,074	(839)	(40.5)
Issues of OCEANE bonds	-	169	(169)	(100)
Redemption of hybrid notes	(267)	-	(267)	n.a
Other monetary changes	(776)	(49)	(727)	n.a
(Increase)/decrease in net indebtedness, excluding the impact of changes in exchange rate	(1,333)	(466)	(600)	n.a
Effect of change in exchange rates	(515)	445	(960)	n.a
Effect of other non-monetary changes	1,150	(1,126)	2,276	n.a
(Increase)/decrease in net indebtedness of continuing operations	(698)	(1,147)	716	(62.4)
(Increase)/decrease in net indebtedness of discontinued operations ⁽⁴⁾	-	(10)	10	n.a
Net indebtedness at beginning of year	42,290	41,133	1,157	2.8
NET INDEBTEDNESS AT END OF YEAR	42,988	42,290	698	1.6

(1) Net investments are operating investments and financial investments for growth, net of disposals. They also include net debts acquired or transferred in acquisitions or disposals of securities, investment subsidies received, and non-Group partner investments. They do not include the Group disposals for 2020-2022.

(2) Operating cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not directly comparable with indicators of the same name reported by other companies. This indicator, also known as Funds From Operations ("FFO"), is equivalent to net cash flow from operating activities, changes in working capital after adjustment where relevant for the impact of non-recurring effects, net investments (excluding Group disposals 2020-2022 and including HPC and Linky), and other items, including dividends received from associates and joint ventures.

(3) Group cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not directly comparable with indicators of the same name reported by other companies. It is equal to the operating cash flow defined in note (3) less asset disposals, income taxes paid, net financial expenses disbursed, net allocations to dedicated assets, and dividends paid in cash.

(4) After asset disposals, tax on benefits paid, net financial fees disbursed, net allocations to dedicated assets and dividends paid in cash.

(5) This corresponds to the net indebtedness of Edison's discontinued E&P operations.

(6) The published figures for 2020 include a €79 million reclassification between net financial expenses disbursed, dedicated assets and other non-monetary changes.

n.a.: not applicable.

5.1.4.1 Net indebtedness

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or securities with initial maturity of over three months that are readily convertible into cash and are managed according to a liquidity-oriented policy.

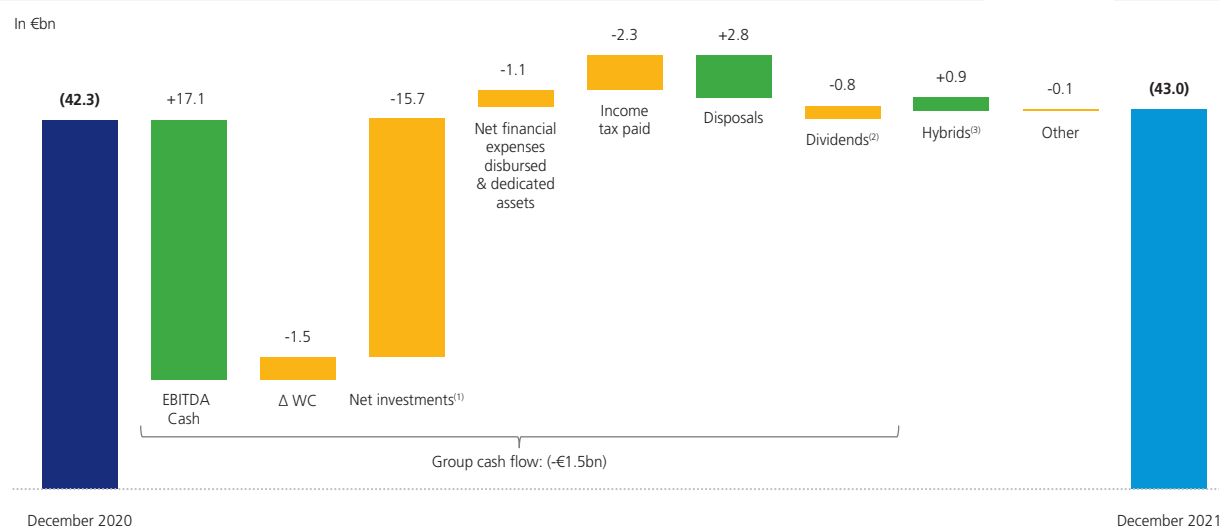
The Group's net indebtedness was €42,988 million at 31 December 2021. It stood at €42,290 million at 31 December 2020.

(in millions of euros)	31/12/2021	31/12/2020	Variation	Variation (%)
Loans and other financial liabilities	69,406	65,591	3,815	5.8
Derivatives used to hedge liabilities	(3,762)	(1,986)	(1,776)	(89.4)
Cash and cash equivalents	9,919	6,270	3,649	58.2
Debt and equity securities – liquid assets	(12,737)	(15,028)	2,292	15.2
Net indebtedness of assets held for sale	-	(17)	17	n.a
NET INDEBTEDNESS*	42,988	42,290	698	1.6

* Net indebtedness is not defined in the accounting standards and is not directly visible in the Group's consolidated balance

Net debt was limited to €43.0 billion on a strong performance in terms of cash EBITDA (€17.1 billion), completed disposals (€2.8 billion) and a social hybrid bond issue (€1.2 billion).

Change in net indebtedness between 31 December 2020 and 31 December 2021



NB: figures rounded up to the nearest whole number

(1) Net investments excluding Group disposals

(2) Dividends paid including hybrid bond remuneration

(3) Hybrid issue of €1.2bn and announced repayment of -€0.3bn.

5.1.4.2 Operating cash flow

The operating cash flow was -€213 million for 2021, compared to €661 million for 2020, a decrease of €874 million.

5.1.4.2.1 Cash EBITDA

EBITDA after adjustment for non-cash items amounted to €17,136 million, up by €634 million from 2020, principally due to the post-Covid business recovery, and:

- the increase in **Enedis'** gross margin delivery and non-delivery services;
- business growth in **Italy** (thermal power generation, sales, gas optimisation, renewable energies and services).

5.1.4.2.2 Change in working capital

Working capital deteriorated by -€1,526 million in 2021. This change is mainly explained by higher market prices in 2021, leading to an increase in margin calls in the optimisation/trading activities (-€1,931 million) and in the Group's operating working capital, principally driven by price movements at the end of the year (-€1,805 million on the net amount of trading receivables/payables). Conversely, the lower net expense for purchase obligations led to surplus CSPE compensation, which reduced EDF's receivable on the State (+€2,350 million impact on working capital).

5.1.4.2.3 Net investments

Net investments (excluding Group disposals 2020-2022 and including HPC and Linky) amounted to €15,725 million for 2021, up by €1,580 million from 2020 when investments were down because of the Covid-19 pandemic.

<i>(in millions of euros)</i>	2021	2020	Variation	Variation (%)
France – Generation and supply	5,338	5,484	(146)	(3)
France – Regulated activities	4,617	4,049	569	14
EDF Renewables	853	812	41	5
Dalkia	284	180	104	58
Framatome	381	219	162	74
United Kingdom	3,054	2,625	428	16
Italy	909	531	379	71
Other international	289	207	81	39
Other activities	-	38	(38)	-
NET INVESTMENTS	15,725	14,145	1,580	11

Net investments by the **France – Generation and supply** segment decreased by €146 million, notably due to lower nuclear maintenance expenses and schedule adjustments on the Flamanville 3 project.

Net investments by the **France – Regulated activities** segment (including Linky), were up by €569 million due to a noticeable rise in the number of connections, and the deferral to 2021 of certain work initially scheduled for 2020, as a result of the Covid-19 pandemic.

In the **United Kingdom**, net investments rose by €428 million due to the higher investments in the HPC project (+€477 million).

In **Italy**, net investments increased by €379 million, particularly due to acquisitions in the renewable energies sector, and development projects for new-generation thermal power plants.

The increase in net investments by the **Other International** segment is principally attributable to Luminus' acquisition of Essent.

Overall, the changes in dedicated assets comprise:

- allocations to reach full coverage of obligations;
- reinvestment of financial income (dividends and interest) generated by these assets;
- withdrawals of assets corresponding to the costs incurred over the period to meet long-term nuclear obligations falling within the scope of the Law of 28 June 2006;
- exceptional withdrawals proposed to the governance bodies in charge of managing dedicated assets when the value of the portfolio exceeds the amount of the obligations to be financed; such withdrawals must be validated by these bodies.

The net change of -€501 million in dedicated assets in 2021 corresponds to the second and third of these categories.

5.1.4.3 Group cash flow

Group cash flow for 2021 amounted to -€1,525 million, a clear improvement from 2020 when it was -€2,660 million.

5.1.4.3.1 Asset disposals

Asset disposals generated €2,847 million in 2021. They include the sale of E&P operations in Norway, the sale of the IDG gas distribution network and 49% of the renewables platform in Italy, the sale of the 49.99% stake in CENG in the United States, the sale of the West Burton B plant and the Pod Point IPO in the United Kingdom, as well as the sale of Dalkia Wastenergie and some real estate assets in France.

5.1.4.3.2 Dedicated assets

In compliance with the French Law no. 2006-739 of 28 June 2006 on the sustainable management of radioactive materials and waste, EDF has built up a portfolio of dedicated assets for secure financing of its long-term nuclear obligations (see section 5.1.5.1.6).

5.1.4.3.3 Dividends paid in cash

Dividends paid in cash during 2021 amounted to €794 million, comprising:

- the 2020 dividend (€36 million) and the interim 2021 dividend (€48 million) paid by EDF SA ⁽¹⁾;
- payments made in 2021 to bearers of perpetual subordinated bonds for the "hybrid note" issues (€547 million);
- dividends paid by Group subsidiaries to their minority shareholders (€163 million).

5.1.4.4 Effect of change in exchange rates

The foreign exchange effect (mainly the rise of the pound sterling and the US dollar against the euro ⁽²⁾) had an unfavourable impact of €515 million on the Group's net indebtedness in 2021.

5.1.4.5 Other non-monetary changes

Other non-monetary changes had an effect of €1,150 million in 2021, compared to -€1,126 million in 2020, and mainly comprise changes in the fair value of debt instruments and new leases (IFRS 16).

(1) The French State has opted for a scrip dividend for 2021 and 2022.

(2) The pound sterling rose by 7.0% against the Euro, from €1.112/£1 at 31 December 2020 to €1.190/£1 at 31 December 2021; the US dollar rose by 8.3% against the Euro, from €0.815/\$1 at 31 December 2020 to €0.883/\$1 at 31 December 2021.

5.1.4.6 Financial ratios

	2021	2020	2019
Net indebtedness/EBITDA	2.39	2.61	2.46
Net indebtedness/(Net indebtedness + equity)*	41%	43%	42%

* Equity including non-controlling interests.

5.1.5 Management and control of market risks

See section 2.2.2. "Management of financial and market risks" of the 2021 Universal Registered Document.

5.1.5.1 Management and control of financial risks

This section sets forth the policies and principles for management of the Group's financial risks defined in the strategic financial management framework (liquidity, interest rate, foreign exchange rate and equity risks), and the Group counterparty risk management policy set up by the EDF group. These principles apply only to EDF and operationally controlled subsidiaries or subsidiaries that do not benefit by law from specific guarantees of independent management such as Enedis. In compliance with IFRS 7, the following paragraphs describe the nature of risks resulting from financial instruments, based on analyses of sensitivities and credit (counterparty) risks.

An independent unit in the Group's Risk Division, the Financial Risks Control Department (*Département Contrôle des Risques Financiers et Investissements – CRFI*), is in charge of financial risk control at Group level, mainly by ensuring correct application of the principles of the strategic financial management framework (July 2015). It also has the task of carrying out a second-level check of the risk of counterparty default (methodology and organisation) for EDF entities and operationally controlled Group subsidiaries (excluding Enedis), and a first-level check of financing activities by EDF SA's trading room. The CRFI Department also carries out a second -level check of management activities concerning the dedicated asset portfolio.

The CRFI Department issues daily and weekly monitoring reports of risk indicators relevant to activities in EDF SA's trading room.

Regular internal audits are carried out to ensure controls are actually applied and are effective.

5.1.5.1.1 Liquidity position and management of liquidity risk

5.1.5.1.1.1 Liquidity position

At 31 December 2021, the Group's liquidities, consisting of liquid assets, cash and cash equivalents, totalled €22,656 million and available credit lines amounted to €13,039 million.

At 31 December 2021, the Group's loans and other financial liabilities maturing within one year totalled €15,072 million and included €3,632 million relating to bonds, including accrued interest not yet due. This amount also comprises the negative cash position (including €2,691 million for margin calls on derivatives) and the liability relating to lease obligations (see note 18.3 to the 2021 consolidated financial statements). The associated requirements may when necessary be funded by the Group's liquidities and available credit lines mentioned below, and other short-term resources mentioned below.

No Group company was in default on any borrowing at 31 December 2021.

5.1.5.1.1.2 Management of liquidity risk

The EDF group was able to meet its financing needs by conservative liquidity management and has obtained financing on satisfactory terms. On 26 May 2021, €1.25 billion of social hybrid notes were issued at the initial rate of 2.625%. On 23 November 2021, EDF issued a senior Green Bond for a total amount of €1.75 billion, with 12-year maturity and a fixed coupon of 1.000%, complemented on 30 November 2021 by a further issue of €100 million of senior Green Bonds, fungible with initial issue of 23 November 2021.

A range of specific levers are used to manage the Group's liquidity risk:

- the Group's cash pooling system, which centralises cash management for controlled subsidiaries. The subsidiaries' cash balances are made available to EDF SA in return for interest, so as to optimise the Group's cash management and provide subsidiaries with a system that guarantees them market-equivalent financial terms;
- centralisation of financing for controlled subsidiaries at the level of the Group's cash management department. Changes in subsidiaries' working capital are financed by this department through stand-by credit lines provided for subsidiaries, which may also be granted revolving credit from the Group;
- active management and diversification of financing sources used by the Group: the Group has access to short-term resources on various markets through programmes for French commercial paper (*billets de trésorerie*) and US commercial paper. For EDF, the ceilings for these programmes are €6 billion for French NEU CP commercial paper and \$10 billion for US commercial paper;
- transfer of bond liabilities to banking counterparties under cash repurchase agreements.

At 31 December 2021, the amount of the Group's commercial paper outstanding was €4,462 million for French commercial paper, and US\$730 million for US commercial paper. EDF has access to the world's main bond markets: the Euromarkets through its EMTN programme, which currently has a ceiling of €50 billion, particularly for euro and sterling issues; and the domestic markets used for stand-alone issues in US dollars (144A bonds), yen (Samurai bonds) and Swiss francs.

The average maturity of the Group's gross debt was 13.7 years at 31 December 2021, compared to 14.5 years at 31 December 2020.

At 31 December 2021, EDF SA had a total amount of €12,297 million in available credit facilities (syndicated credit and bilateral lines):

- a syndicated credit line of €4 billion that expires in December 2025. No drawings had been made on this syndicated credit line at 31 December 2021;
- a syndicated social credit facility of €1.5 billion, signed in December 2021, with initial maturity of three years (December 2024) and two 1-year extensions possible. No drawings had been made on this facility at 31 December 2021. The cost will be indexed on four Group ESG KPIs, with a particular focus on its social responsibility;
- bilateral lines representing an available amount of €6,397 million, with expiry dates extending to December 2026. The level of this available financing is reviewed very regularly to ensure the Group has sufficient backup credit facilities;
- credit lines with the European Investment Bank representing an available amount of €400 million. Five of these six credit lines were fully drawn at 31 December 2021, for amounts of €500 million, €225 million, €500 million, €250 million and €400 million.

EDF concluded on 15 March 2022⁽¹⁾ some bilateral term loans for a total amount of 10.25 billion euros⁽²⁾. These facilities have a maturity of 3 years and do not include any breakup cost in case of early repayment. These loans were concluded with a group of 9 banks. This transaction does increase the financial flexibility of the Group for the coming years.

Edison has notably a credit line with the European Investment Bank (available amount €300 million at 31 December 2021).

(1) See EDF's press release on 16 March 2022 "EDF signs for 10.25 billion euros of banking facilities".

(2) Part of which is in dollars.

5.1.5.1.2 Credit rating

At 15 March 2022, the financial rating agencies Standard & Poor's, Moody's and Fitch Ratings attributed the following long-term and short-term ratings to EDF group entities. These ratings were adjusted after the announcement on 13 January 2022 of measures concerning changes in regulated electricity tariffs and 2022 nuclear power output and after the release of annual results on 18 February 2022.

The Group's rating is likely to be affected by the risks described in Chapter 2, in particular in risk 1A: "Changes in public policies and the regulatory framework in France and Europe, particularly ARENH" and in risk 2D: "Risk of access to liquidity".

Company	Agency	Long-term rating	Short-term rating
EDF	Standard & Poor's	BBB/Negative outlook	A-2
	Moody's	Baa1/Negative outlook	P-2
	Fitch Ratings	BBB+/Negative outlook	F2
EDF Trading	Moody's	Baa3/Negative outlook	n.a.
EDF Energy	Standard & Poor's	BB/Negative outlook	B
	Moody's	Baa3/Negative outlook	n.a.
	Fitch Ratings	BBB-/Negative outlook	n.a.
Edison	Standard & Poor's	BBB/Negative outlook	A-2
	Moody's	Baa3/Negative outlook	n.a.

n. a. = not applicable.

5.1.5.1.3 Management of foreign exchange risk

Due to the diversification of its activities and geographical locations, the Group is exposed to the risk of exchange rate fluctuations, which may have an impact on the translation differences affecting balance sheet items, Group financial expenses, equity, net income and the IRR of projects.

To limit exposure to foreign exchange risks, the Group has introduced the following management principles:

- local currency financing: to the extent possible given the local financial markets' capacities, each entity finances its activities in its own functional currency. When financing is contracted in other currencies, derivatives may be used to limit foreign exchange risk;
- matching of assets and liabilities: the net assets of subsidiaries located outside the Euro zone expose the Group to a foreign exchange risk. The foreign exchange risk in the consolidated balance sheet is managed by market hedging

through debt issued or contracted in foreign currencies or use of financial derivatives. Hedging of net assets in foreign currencies complies with risk/return targets, and the hedging ratio varies depending on the currency. If no hedging instruments are available, or if hedging costs are prohibitive, the foreign exchange positions remain open and the risk on such positions is monitored by sensitivity calculations;

- hedging of operating cash flows in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are in their local currencies, with the exception of flows related to fuel purchases which are primarily in US dollars, and certain flows related to purchases of equipment, which concern lower amounts. Under the principles laid down in the strategic financial management framework, EDF and the main subsidiaries concerned by foreign exchange risks (EDF Energy, EDF Trading, Edison, EDF Renewables) are required to hedge firm or highly probable commitments related to these future operating cash flows.

As a result of the financing and foreign exchange risk hedging policy, the Group's gross debt at 31 December 2021 breaks down as follows by currency after hedging:

GROSS DEBT STRUCTURE AT 31 DECEMBER 2021, BY CURRENCY BEFORE AND AFTER HEDGING

31 December 2021 (in millions of euros)	Initial debt structure	Impact of hedging instruments*	Debt structure after hedges	% of debt
Borrowings in euros (EUR)	38,003	11,119	49,122	71%
Borrowings in US dollars (USD)	18,128	(12,910)	5,218	8%
Borrowings in pounds sterling (GBP)	10,018	2,410	12,428	18%
Borrowings in other currencies	3,257	(619)	2,638	4%
TOTAL DEBT	69,406	-	69,406	100%

* Hedges of liabilities and net foreign investment.

The table below presents the impact on equity of a variation in exchange rates on the Group's gross debt at 31 December 2021:

EXCHANGE RATE SENSITIVITY OF THE GROUP'S GROSS DEBT

31 December 2021 (in millions of euros)	Debt after hedging instruments converted into Euros	Impact of a 10% unfavourable variation in exchange rates	Debt after a 10% unfavourable variation in exchange rates
Borrowings in euros (EUR)	49,122	-	49,122
Borrowings in US dollars (USD)	5,218	522	5,740
Borrowings in pounds sterling (GBP)	12,428	1,243	13,671
Borrowings in other currencies	2,638	264	2,902
TOTAL DEBT	69,406	6,941	76,347

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Due to the Group's hedging policy for foreign exchange risk on the Group's gross debt, the income statement of companies controlled by the Group is marginally exposed to foreign exchange rate risk.

The table below sets forth the foreign exchange position relating to net assets in foreign currencies of the Group's subsidiaries.

NET ASSET POSITION

31 December 2021* (in millions of currency units)	Net assets	Bonds	Derivatives	Net assets after management
USD	4,075	1,450	1,997	628
CHF (Switzerland)	21	-	21	-
PLN (Poland)	281	-	153	128
GBP (United Kingdom)	21,049	5,435	4,825	10,789
BRL (Brazil)	1,471	-	-	1,471
CNY (China)	10,615	-	6,610	4,005

* Net assets as at 31 December 2021; bonds and derivatives as at 31 December 2021. The net positions shown exclude certain non-significant exposures.

The above table shows the assets of the Group's foreign subsidiaries in foreign currencies, adjusted for changes in the fair value of cash flow hedges and of debt and equity instruments recorded in equity, and changes in the fair value of financial instruments recorded in income

The following table sets forth the risk for equity of foreign exchange losses on net assets in foreign currencies of the Group's principal subsidiaries at 31 December 2021, assuming unfavourable, uniform exchange rate variations of 10% against the Euro. Net assets are converted at the closing rate and impacts are reported in absolute value.

EXCHANGE RATE SENSITIVITY OF NET ASSETS

(in millions of currency units)	At 31 December 2021			At 31 December 2020		
	Net assets after management into currency	Net assets after management converted into Euros	Impact on equity of a 10% variation in exchange rates	Net assets after management into currency	Net assets after management converted into Euros	Impact on equity of a 10% variation in exchange rates
USD	628	554	55	1,923	1,567	157
CHF (Switzerland)	-	-	-	2	2	-
PLN (Poland)	128	28	3	132	29	3
GBP (United Kingdom)	10,789	12,840	1,284	10,678	11,877	1,188
BRL (Brazil)	1,471	233	23	1,371	215	22
CNY (China)	4,005	557	56	11,026	1,374	137

The foreign exchange risk on debt and equity securities is mostly concentrated in EDF's dedicated asset portfolio, which is detailed in section 5.1.5.1.6.

The foreign exchange risk associated with short-term investments and operating liabilities in foreign currencies remains under control for the Group at 31 December 2021.

5.1.5.1.4 Management of interest rate risk

The exposure of the Group's net indebtedness to interest rate fluctuations covers two types of risk: a risk of change in the net financial expenses on floating-rate financial assets and liabilities, and a risk of change in the value of financial assets invested at fixed rates. These risks are managed by monitoring the floating-rate

portion of net indebtedness, defined by reference to the risk/return for net financial expenses, taking into consideration expected movements in interest rates.

Some of the debt is variabilised and the Group may use interest rate derivatives for hedging purposes.

The Group's debt after hedging instruments at 31 December 2021 comprised 70% at fixed rates and 30% at floating rates.

A 1% uniform annual rise in interest rates would generate an approximate €205 million increase in financial expenses at 31 December 2021, based on gross floating-rate debt after hedging.

The average cost of Group debt (weighted interest rate on outstanding amounts) was 2.06% at 31 December 2021.

STRUCTURE AND INTEREST RATE SENSITIVITY OF GROUP DEBT

31 December 2021 (in millions of euros)	Initial debt structure	Impact of hedging instruments	Debt structure after hedging	Impact on income of a 1% variation in interest rates
Fixed rate	64,335	(15,434)	48,901	-
Floating rate	5,071	15,434	20,505	205
TOTAL	69,406	-	69,406	205

Concerning financial assets, the table below presents the interest rate risk on the floating-rate notes (FRN) held by EDF, and their sensitivity to interest rate risks (impact on net income).

INTEREST RATE SENSITIVITY OF FLOATING-RATE INSTRUMENTS

31 December 2021 (in millions of euros)	Value	Impact on income of a 1% variation of interest rates	Value after a 1% variation in interest rates
FLOATING-RATE INSTRUMENTS	370	(4)	366

The Group's interest rate risk notably relates to the value of the Group's long-term nuclear obligations (see note 15 to the 2021 consolidated financial statements) and its pension and other specific employee benefit obligations (see note 16 to the 2021 consolidated financial statements), which are adjusted to present value using discount rates that depend on interest rates for various time horizons, and debt securities held for management of the dedicated assets set aside to cover these obligations (see section 8.1.6).

5.1.5.1.5 Management of equity risk

Coverage of EDF's nuclear obligations

Analysis of the equity risk is presented in section 5.1.5.1.6.

Coverage of employee benefit obligations for EDF SA and EDF Energy

Assets covering EDF's employee benefit liabilities are partly invested on the international and European equities markets. Market trends therefore affect the value of these assets, and a downturn in equity prices would lead to a rise in balance sheet provisions.

32.3% of the assets covering EDF SA's employee benefit obligations were invested in equities at 31 December 2021, representing an amount of €4.2 billion of equities.

At 31 December 2021, the two pension funds sponsored by EDF Energy (EDF Energy Pension Scheme and EDF Energy Group Electricity Supply Pension Scheme) were merged into the British Energy pension fund (British Energy Generation Group) which was renamed EDF group (EDFG). This fund is invested to the extent of 10.1% in equities and equity funds (excluding diversified growth funds), representing an amount of £1,114 million of equities.

5.1.5.1.6 Management of financial risk on EDF SA's dedicated asset portfolio

Dedicated assets have been built up progressively by EDF since 1999 for secure financing of its long-term nuclear obligations. The Law of 28 June 2006, codified in France's Environment code (Articles L. 594-1 to 14) and its implementing regulations defined the provisions that are not related to the operating cycle, and must therefore be covered by dedicated assets. They are listed in note 15.1.2 to the 2021 consolidated financial statements, "EDF's dedicated assets".

The dedicated asset portfolio is managed under the supervision of the Board of Directors and its advisory committees (Nuclear Commitments Monitoring Committee (CSEN), Audit Committee).

A Nuclear Commitments Financial Expertise Committee (CEFEN) exists to assist the company and its governance bodies on questions of matching assets and liabilities and asset management. The members of this Committee are independent of EDF.

Governance and management principles

The governance principles setting forth the structure of dedicated assets, and the relevant decision-making and control processes for their management, are validated by EDF's Board of Directors under a policy for ensuring secure financing of nuclear expenses, in compliance with the regulations. These principles also lay down rules for the asset portfolio's structure, selection of financial managers, and the legal, accounting and tax structure of the funds.

Strategic asset allocation is based on asset/liability reviews carried out to define the most appropriate target portfolio for financing long-term nuclear expenses. Strategic allocation is validated by EDF's Board of Directors and reviewed every three years unless circumstances require otherwise. A new strategic allocation was validated in 2021 to reflect changes in fixed income markets. The target allocation consists of a yield portfolio, a growth portfolio and a fixed-income portfolio, respectively accounting for 30%, 40% and 30% of the total portfolio. The yield portfolio consists of real estate assets and infrastructure assets; the growth portfolio consists of equities and equity funds (both listed and unlisted); the fixed-income portfolio consists of bonds, debt funds (both listed and unlisted), and cash. These portfolios are managed by EDF Gestion (formerly the Listed Asset Management Division) and by EDF Invest.

The allocation policy between growth assets and fixed-income assets was developed by the Operational Management Committee ⁽¹⁾ on the basis of the economic and financial outlook for each market and geographical area, a review of market appreciation in different markets and market segments, and risk analyses produced by the Financial Risks Control department.

At 31 December 2021, the total value of the portfolio was €37,454 million compared to €33,848 million in 2020. Changes in dedicated assets in 2021 are described in note 15.1.2.1 to the 2021 consolidated financial statements, and details of their realisable value and book value are also presented in note 15.1.2.2.

Content and performance of edf's dedicated asset portfolio

(in millions of euros)	31/12/2021			31/12/2020		
	Share of portfolio	Stock market or realisable value	Performance for 2021	Share of portfolio	Stock market or realisable value	Performance for 2020
Yield assets	21.1%	7,908	17.1%	19.0%	6,420	2.3%
Growth assets	40.9%	15,320	22.6%	40.5%	13,692	10.3%
Fixed-income assets	38.0%	14,226	-0.7%	40.5%	13,736	4.1%
TOTAL DEDICATED ASSETS	100%	37,454	11.9%	100%	33,848	5.9%

(1) Internal Committee and permanent body for evaluation, consultation and operational decision-making for dedicated asset management.

Dedicated assets' exposure to risks

EDF is exposed to equity risks, interest rate risks and foreign exchange risks through its dedicated asset portfolio.

The market value of the listed equities in EDF's dedicated asset portfolio was €14,801 million at 31 December 2021. The volatility of the listed equities at the same date was 10.93% based on 52 weekly performances, compared to 26.6% at 31 December 2020. Applying this volatility to the value of listed equity assets at 31 December 2021, the Group estimates the annual volatility of the equities portion of dedicated assets at €1,618 million.

At 31 December 2021, the sensitivity of the listed bonds (€13,011 million) was 5.3, i.e. a uniform 100 base point rise in interest rates would result in a €685 million decline in market value. This sensitivity was 5.5 at 31 December 2020.

Assessment of the expected rate of return on dedicated assets

In compliance with the applicable regulations, based on the target allocation for dedicated assets stated above, studies to simulate the expected rate of return for the next few years, particularly the next twenty years (a horizon close to the duration of nuclear provisions) show with high probability that the average projected rate of return is higher than the 3.7% discount rate used to calculate nuclear provisions at 31 December 2021 (see note 15.1.1.5 to the 2021 consolidated financial statements).

The average annualised performance of dedicated assets since 2004, the year when their value first exceeded €1 billion, was 6.5% at 31 December 2021.

Currently valid dispensations and prescriptions granted by the administrative authority, in application of articles D. 594-6 and D. 594-7 of the Environment Code

EDF received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

In addition, Cyclife, an EDF subsidiary, has received a prescription from the administrative authority to reach a coverage ratio of at least 100% by 31 December 2022. In order to comply with this requirement, allocations to cover assets may be made in 2022 (see note 17.1 to the 2021 consolidated financial statements).

5.1.5.1.7 Management of counterparty/ credit risk

Counterparty risk represents the potential loss the EDF group would sustain in the event of future default by its counterparty. The Group has a counterparty risk management policy which applies to EDF and all operationally controlled subsidiaries. This policy sets out the governance associated with monitoring for this type of risk, and organisation of the counterparty risk management and monitoring. The policy also involves quarterly consolidation of the Group's exposures. The Financial Risks Control (CRFI) department closely monitors Group counterparties (daily review of alerts, special cautionary measures for certain counterparties).

The table below gives details, by rating category, of the EDF group's consolidated exposure to counterparty risk. At 30 September 2021, 89% of the Group's exposure concerned "investment grade" counterparties, mainly due to the predominance of exposures generated by the cash and asset management activity, as most short-term investments concern low-risk assets.

	Good credit rating	Poor credit rating	No internal rating	Total
At 31/03/2021	91%	8%	1%	100%
At 30/09/2021	89%	10%	1%	100%

The exposure to counterparty risk by nature of activity is distributed as follows:

	Purchases	Insurance	Distribution and sales	Cash and asset management	Fuel purchases and energy trading	Total
At 31/03/2021	6%	1%	9%	76%	8%	100%
At 30/09/2021	7%	1%	10%	62%	20%	100%

Exposure in the energy trading activities is concentrated in EDF Trading, where each counterparty is assigned a limit that depends on its financial robustness. A range of methods are used to reduce counterparty risk at EDF Trading, primarily position netting agreements, cash-collateral agreements and establishment of guarantees from banks or affiliates.

For counterparties dealing with EDF's trading room, the CRFI department has drawn up a framework specifying counterparty authorisation procedures and the methodology for calculation of allocated limits. The level of exposure can be consulted in real time and is systematically monitored on a daily basis. The suitability of limits is reviewed without delay in the event of an alert or unfavourable development affecting a counterparty. Only banking, sovereign and corporate counterparties with good credit ratings are authorised, for limited amounts and maturities.

5.1.5.2 Management and control of energy market risks

5.1.5.2.1 Energy market risk policy

Through its Generation and supply activities, the EDF group has operations on deregulated energy markets, principally in Europe, which expose it to price variations on the energy market that can significantly affect its financial statements.

Consequently, the Group has an "energy market" risk policy for all energy commodities, applicable to EDF and entities over which it has operational control.

The purpose of this policy is to:

- define the general framework for management of energy market risks, governing the various Group entities' asset portfolio management activities (energy generation, optimisation and sale), and trading for EDF Trading;
- define the responsibilities of asset managers and traders, and the various levels of control of activities;

- implement a coordinated Group-wide hedging policy that is coherent with the Group's financial commitments;
- consolidate the exposure of the various entities operationally controlled by EDF on the structured energy-related markets.

The Group Risk Division presents an annual report on the implementation of this policy to the Board of Directors' Audit Committee.

At entities not operationally controlled by EDF, the risk management framework is reviewed by the governance bodies.

5.1.5.2.2 Organisation of risk control and general risk hedging principle

The process for controlling energy market risks for entities operationally controlled by the Group is based on:

- a governance and market risk exposure measurement system, clearly separating management and risk control responsibilities;
- an express delegation to each entity, defining hedging strategies and establishing the associated risk limits. This enables the Executive Committee to set out and monitor an annual Group risk profile consistent with the financial objectives, and thus direct operational management of energy market risks over market horizons (generally three years).

The basic principle of current hedging policy is:

- netting of upstream/downstream positions; wherever possible, sales to final customers are hedged by internal sales;
- gradual closing of most positions before the end of the budget year, based on a predefined hedging trajectory ⁽¹⁾ that captures an average price.

For electricity generated in France, EDF is exposed to very high uncertainty over its net exposure due to the fact that the ARENH scheme is optional and uncertainty regarding possible changes to the relevant regulations (the risk that the ceiling for volumes made available could be raised to 150TWh under the Energy and Climate law adopted in 2019). Since the volumes subscribed are only known shortly before the delivery period, EDF is obliged to use assumptions for ARENH subscriptions. EDF thus remains subject to risks that the assumptions may not correspond to reality, such that during the year it could find itself obliged to sell reserved volumes that in the end were not actually subscribed, or conversely to purchase volumes sold before the ARENH bids took place on the assumption that there would be no subscriptions. Also, on 13 January 2022 the French government announced that EDF would have to sell an additional 20TWh to competitors under the ARENH scheme for the period 1 April to 31 December 2022 at the price of €46.2/MWh. The practicalities of its implementation remain to be defined in detail, but this decision exposes EDF to a risk of loss equivalent to the difference between the market price of volumes purchased on the wholesale markets and the price of €46.2/MWh.

The energy risk control process involves Group management and is based on a risk indicator and measurement system incorporating escalation procedures in the event risk limits are exceeded.

The Group's exposure to energy market risks through operationally controlled entities is reported quarterly to the Executive Committee. The control processes are regularly evaluated and audited.

5.1.5.2.3 Principles for operational management and control of energy market risks

The principles for operational management and control of energy market risks for the Group's operationally controlled entities are based on strict segregation of responsibilities for managing those risks, distinguishing between management of assets (generation and supply) and trading.

The operators of generation and supply assets are responsible for implementing a risk management strategy that smoothes the impact of energy market risks on the variability of their financial statements (the accounting classifications of the hedges used are described in note 18.7 to the 2021 consolidated financial statements, "Derivatives and Hedge accounting"). However, they are still exposed to structural price trends to the extent of volumes that are not yet hedged, and uncertainties over volumes (relating to the ARENH system, generation plant availability, and customer consumption). In view of the controls of the nuclear fleet announced on 13 January 2022, and announcements of additional ARENH volumes, the volume risk in France is particularly high for 2022.

For operationally controlled entities in the Group, positions on the energy markets are taken predominantly by EDF Trading, which as the Group's trading entity executes most of the Group's purchase/sale orders on the wholesale markets. Consequently, EDF Trading is subject to a strict governance and control framework, particularly the European regulations on trading companies.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options (regardless of the accounting classification applied at Group level). Its exposure on the energy markets is strictly controlled through daily limit monitoring overseen by the subsidiary's management and by the division in charge of energy market risk control at Group level. Automatic escalation procedures also exist to inform members of EDF Trading's Board of Directors of any breach of risk limits (value at risk limit) or losses (stop-loss limits). Value at Risk (VaR) is a statistical measure of the potential maximum loss in market value on a portfolio in the event of unfavourable market movements, over a given time horizon and with a given confidence interval ⁽²⁾. Specific Capital at Risk (CaR) limits are also used in certain areas (operations on illiquid markets, long-term contracts and structured contracts) where VaR is difficult to apply. The stop-loss limit stipulates the acceptable risk for the trading business, setting a maximum level of loss in relation to the trading margin over a rolling three-month period. If these limits are exceeded, EDF Trading's Board of Directors takes appropriate action, which may include closing certain positions.

In 2021, EDF Trading's commitment on the markets was subject to a VaR limit of €35 million from 1 January to 31 October, then €70 million from 1 November, a CaR limit for long-term contracts and a CaR limit for operations on illiquid markets of €250 million each throughout the year, and a stop-loss limit of €180 million from 1 January to 31 October, then €210 million from 1 November.

In an extremely volatile market environment, the VaR and stop-loss limits were exceeded during the second half of 2021, triggering the procedures defined for such situations. Both indicators had returned below their limits at 31 December 2021.

For an analysis of fair value hedges of the Group's commodities, see note 6 to the 2021 consolidated financial statements. For details of commodity derivatives, see note 18.7.4 to the 2021 consolidated financial statements.

(1) The risk management frameworks, which are approved annually by the Group for each entity with exposure to energy market risks, may include acceleration or deceleration plans allowing departures from these trajectories if predefined price thresholds are exceeded. Since these plans do not comply with the general principle of gradual hedging, they can only be applied under strict conditions.

(2) EDF Trading estimates the VaR by a "Monte Carlo" method, which is based on volatilities and historical correlations measured using observed market prices over the 40 most recent business days. The VaR limit applies to the total EDF Trading portfolio.

5.2 Post balance sheet events

- **Exceptional regulatory measures to limit tariff increases in 2022** ⁽¹⁾
 - Additional allocation of 20TWh of ARENH volumes ⁽²⁾ for 2022;
 - 12-month postponement to February 2023 of part of the price increase relative to 2022 ⁽³⁾.
- **Nuclear**
 - Outages or extended outages of nuclear reactors owing to the detection of defaults on pipes in the safety injection system;
 - French nuclear output estimate updated to 295 -315TWh for 2022 ⁽⁴⁾ and 300 -330TWh for 2023 ⁽⁵⁾.
- Signature of an exclusive agreement with GE to acquire part of GE Steam Power's nuclear activities ⁽⁶⁾, excluding the American continent.
- **Announcements by the French President on 10 February 2022 in Belfort**
 - Support to the French nuclear sector:
 - launch of a construction program of 6 EPR2 reactors and potentially 8 more
 - extended operations for all reactors except for safety issues
 - development of the French SMR programme, including €500 million for NUWARD™
 - Acceleration in renewable energy development (solar, offshore and onshore wind and hydro);
 - Confirmation of the growing role of low-carbon electricity in France's climate ambition, in a context of reduction in energy consumption.

● 2022

- EDF draw attention to the 2022 EBITDA. Starting from a 2021 base of €18bn, this figure will include:
 - around €6bn improvement in price effect,
 - around -€8bn related to exceptional regulatory measures ⁽⁷⁾,
 - around -€11bn linked to nuclear output reduction,
 - and other effects due to the Group's performance,

These estimates, which are highly sensitive to market prices, are presented for illustrative purposes ⁽⁸⁾ and are based on current information that the Group has currently available.

● Launch of an action plan

As announced on 13 January 2022 ⁽⁹⁾, EDF presented to its Board of Directors' meeting on 17 February 2022 an action plan aimed at strengthening its balance sheet structure in the context of the events of early 2022.

This plan aims at pursuing the Group's strategy, which is based on a balanced mix of nuclear and renewable energies, develops energy efficiency services and provides its customers with even more innovation.

In order to finance this strategy, EDF notified its intention to:

- Submit as soon as possible to the Board of Directors, and subject to market conditions, a proposed rights issue with preferential subscription rights leading to the issuance of approximately 510 million new shares for an amount of approximately €2.5 billion, including issue premium ⁽¹⁰⁾;
- Propose an option to receive a script dividend ⁽¹¹⁾ for fiscal years 2022 and 2023;

The French State, EDF's largest shareholder, has indicated its position to the Board of Directors on the two points above, which will be communicated separately.

- Carry out additional disposals of around €3 billion ⁽¹²⁾ over 2022 -2024.

5.3 Subsequent events to closing of accounts

After the accounts were closed, the financial ratings were updated by the rating agencies (see update in section 5.1.5.1.2).

On 12 March 2022, the Government published the decree⁽¹³⁾ and orders relating to the additional allocation of 20 TWh of ARENH volumes for 2022. The impact on the Group's 2022 EBITDA outlook has been updated accordingly (see EDF's press release of 14 March 2022). Following the publication of the ARENH decree and orders, EDF is studying all possibilities to preserve its interests.

In addition, the Ukrainian conflict and related geopolitical tensions could have consequences of all kinds for the Group (see Chapter 2, section 2.2 "Risks to which the Group is exposed").

(1) See the press release of 13 January 2022 and note 23 to the 2021 consolidated financial statements.

(2) ARENH: Regulated access to historic nuclear power. Attribution of an additional 20TWh for the period 1 April to 31 December 2022 at €46.2/MWh.

(3) For regulated sales tariffs to residential customers, "blue" tariffs and all customers (both residential professional) located in non-interconnected zones.

(4) See the press release of 13 January 2022 and 7 February 2022.

(5) See the press release of 11 February 2022.

(6) See the press release of 10 February 2022.

(7) This amount includes an estimate of the impact of the tariff postponement on the 2022 cashflow amounting to approximately €1.5bn, based on market prices at 31 December 2021.

(8) Base on the assumption of 31 December 2021 forward prices for 2022.

(9) See the press release of 13 January 2022 "Exceptional measures announced by the French government".

(10) Base on, purely for illustrative purpose, a reference share price of €8 per share and a discount in line with market practice.

(11) Target payout ratio of net income excluding non-recurring items (adjusted for the remuneration of hybrid bonds accounted for in equity) for 2022 and 2023 of 45-50%.

(12) Signed or completed disposals: impact on the Group's economic debt reduction (S&P definition).

(13) Decret no 2022-342 dated 11 March 2022.

5.4 Changes in market prices at end February 2022

Spot (current for next day) electricity prices in France in January/February 2022 averaged at €199.3/MWh base load and €230.6/MWh peak load, rising strongly compared to January/February 2021 prices, which were €54.5/MWh base load and €66.1/MWh peak load. This increase can be explained by the coal, gas and CO₂ prices rise despite a higher wind power generation compared to January/February 2021. For the same reasons, German spot prices have rose. These prices averaged at €149.3/MWh base load and €182.9/MWh peak load, up by €98.4/MWh and €121.2/MWh respectively from January/February 2021.

At the end of February 2022, the prices of French yearly contracts for base load and peak load delivery in 2023 were €176.9/MWh and €294.8/MWh respectively. A year earlier, forward electricity prices for delivery in France in 2022 closed at a base load price of €53.4/MWh and a peak load delivery of €66.3/MWh. This rise in prices is mainly due to the rise in gas, coal and CO₂ prices.

In January/February 2022, spot gas prices on the French market averaged at €80.5/MWh, up by €61.4/MWh compared to the same period in 2021. This increase reflects a tighter supply-demand balance in Europe during the winter. Indeed, due to the strong Asian demand linked to the economic recovery, LNG cargoes have favoured the Asian market. European stocks, way below average levels at the beginning of January, continued to decrease and are at their lowest level of the decade. Moreover, this tension on the gas market is growing very strongly due to the Russian-Ukrainian conflict. Indeed, as Russian gas imports represent nearly 40% of the European supply, the gas market reacted strongly to the fear of a shortage of commodities following the sanctions against Russia. The United Kingdom announced at the end of February that it was banning Russian ships from its ports, without explicitly banning Russian cargoes. Finally, Germany announced in the same breath that it would accelerate its restocking to 80% by the beginning of October, thus contributing to the rise in gas prices. At the end of February, LNG flows remained significant and Russian gas flows relatively constant.

At the end of February 2022, the price of Brent was \$101.0/bbl, up \$34.9/bbl compared with the end of February 2021. In a tight market environment, prices were basically supported by a supply contraction. Indeed, despite OPEC+

announcements in early January that planned an increase in global oil production of 400,000 barrels per day for the seventh consecutive month, a Bloomberg agency study indicated that some countries of the cartel, such as Nigeria and Libya were not able to meet their production commitments. Protests in Kazakhstan, a major producer and OPEC+ member, against gas prices increase were a further threat to supply which also contributed to the upward movement, although no production facilities were affected. On the demand side, the effects of the omicron variant were more limited than those of the delta variant on consumption. Locked in a bullish dynamic, the price of oil responded in mid-January successively to the IEA's publication which raised its forecast of the 2022 Brent price by almost \$5/bbl, and to the unconvincing speech of the FED Chairman to the Senate to limit the dollar inflation. Finally, the escalation of tensions on the Russian-Ukrainian border has reinforced the markets' fear of a conflict where Russia would stop its oil exports, which would push up the price of a barrel.

The price of coal for delivery in Europe in 2023 ended February 2022 at \$215.9/t, up by \$147.3/t compared to the 2022 contract closed at the end of February 2021. It has continued its rise at the beginning of 2022, which began in 2021, due to energy crisis last October on the price of gas. With gas prices continuing to soar in early 2022, Europe still needs more coal to rebuild its stocks which reached their lowest level over 10 months in late January. This tension in the coal market has been exacerbated by difficulties in transporting Russian coal by rail and the escalation of tensions between Russia and Ukraine since late January. As a reminder, Russia exports 60% of its coal to Europe which in the event of voluntary or accidental cuts between the parties, could have significant consequences for Europe's coal supply.

The price of the CO₂ emission certificate for delivery in December 2022 closed the month of February 2022 at €82.2/t, up by €44.9/t compared to the closing price in February 2021 for delivery in December 2021. The price of the CO₂ emission certificate initially rose to close at €96.9/t on 8 February, its highest level ever. It then stabilized at around €90/t before falling sharply as Russia's threats against Ukraine increased. At the end of February, the price of carbon stood at €82.2/t, down €7.0/t over one month and €14.7/t from its all-time

5.5 Outlook

The Ukrainian conflict and related geopolitical tensions could have all kinds of consequences that could impact the Group's outlook.

For 2022

EBITDA will be affected by the following items, compared to a 2021 EBITDA of €18 billion:

- **price increase** between 2021 and 2022: the Group's hedging policy (see § 5.1.5.2.2), the price levels observed over the hedging periods, and the prices in December of the cropped ARENH volumes following the result of the ARENH auction of last November have a favourable estimated impact on the EBITDA, all other factors being equal, of around €6 billion.
- **Exceptional regulatory measures** designed to limit the rise in price for 2022⁽¹⁾:
 - The texts (Decree and Orders) implementing these measures were published on 12 March. The Decree provides that eligible suppliers, in order to benefit from the additional ARENH volumes over the period from 1 April to 31 December 2022 at the price of €46.2/MWh, will have to sell EDF the same volume that will be transferred to them by EDF under this additional allocation, at a price equal to the average of the wholesale forward prices recorded between 2 and 23 December 2021, for electricity delivery in mainland France in 2022, i.e. €257/MWh. The CRE will distribute the additional ARENH volumes between the suppliers, in the same way as the one that was followed for the delivery period started on 1 January 2022. This decision sets the purchase price for EDF of the additional ARENH volumes of 20 TWh which will have to be made available to suppliers in 2022. This additional allocation of ARENH volumes is taken into account in setting the residential regulated tariff (TRV) and will have an impact on EDF's market offers.
 - The margin in €/MWh on the residential regulated tariff (TRV) was fixed by CRE deliberation on 18 January 2022.
 - Finally, in order to comply with the commitment to limit the tariff increase at 4% incl. VAT applying to the residential and "blue professional" regulated tariffs customers, as well as to all professional customers from non-interconnected zones, it is planned to postpone a portion of the 2022 tariff increase over a 12-month period starting from 1 February 2023, in accordance with the Finance Act 2021-1900 of 30 December 2021 for 2022.

The impact of these regulatory measures⁽¹⁾ on the Group's EBITDA for 2022 had been estimated, for illustrative purposes, at approximately -€8.4 billion⁽²⁾ based on market prices at 31 December 2021. On the basis of the terms and conditions defined in the Decree published on 12 March 2022, and given the information available to the Group, the estimated impact on the Group's EBITDA for 2022 has been re-evaluated at approximately -€10.2 billion⁽³⁾.

- **The decrease in French nuclear output**, given the outages or extended outages of reactors due to the detection of stress corrosion phenomena on portions of the pipes connected to the main primary circuit (including the safety injection system - SIS)⁽⁴⁾.

The output would thus decrease from 360.7TWh in 2021 to a range between 295 and 315TWh⁽⁵⁾ in 2022, i.e. a lower output between 65.7TWh and 45.7TWh. Given the current Group's hedging policy, which consists of being fully hedged at the beginning of a given year, the Group will have to buy back significant volumes on the market and will thus be exposed to market prices. The assessment of the financial consequences is also sensitive to the outage schedule of the different power plants.

The impact on the Group's 2022 EBITDA of the decrease in output compared to 2021 was estimated, at the time of the release of annual results and for

illustrative purposes, at approximately -€11 billion on the basis of the 2022 forward price of 31 December 2021. Also by way of illustration, based on the information available to the Group and on forward prices for 2022 as of 11 March 2022, the estimated impact of the decrease in output on the Group's EBITDA for 2022 is reassessed at approximately -€16 billion.

At the date of filing of this document, the Group is awaiting the position from the investigation carried out by the French Nuclear Safety Authority on the evidence of stress corrosion and the corrective measures considered.

- The 2022 EBITDA evolution of the Group's other segments.

Given the uncertainties linked to the evolution of prices and nuclear output, the Group has not given any financial guidance for 2022 on the release of the results on 18 February 2022. Since then, uncertainties have broadened, particularly as a result of the Ukrainian conflict (see section 2.2 "Risks to which the Group is exposed").

EDF presented an action plan to its Board of Directors, meeting on 17 February 2022, aimed at strengthening its balance sheet structure in the context of the events of early 2022⁽¹⁾.

EDF notified its intention to:

- submit as soon as possible to the Board of Directors, and subject to market conditions, a proposed rights issue with preferential subscription rights leading to the issuance of approximately 510 million new shares for an amount of approximately €2.5 billion, including issue premium⁽⁶⁾.
- propose an option to pay a scrip dividend for the fiscal years 2022 and 2023⁽⁷⁾ as well as for the 2021 fiscal year.

The French State, EDF's largest shareholder, has confirmed its full support for the Company's action plan⁽⁸⁾. In particular, the State confirmed that it will subscribe, as a well-informed shareholder, to the announced capital increase with preferential subscription rights guaranteed up to its share of the capital. The State has also indicated that it will extend its current commitment to receive a scrip 2021 dividend for the 2022 and 2023 fiscal years, as it will be proposed by the Company to its shareholders.

- carry out disposals of around €3 billion over the years 2022 - 2023 - 2024⁽⁹⁾.

For 2023

The Group's financial targets for 2023 are:

Net financial debt / EBITDA: ~ 3x

Adjusted net debt / adjusted EBITDA⁽¹⁰⁾: 4,5x to 5x.

These financial ambitions reflect the following structuring assumptions:

- a 2023 nuclear output between 300 and 330 TWh⁽¹¹⁾. This estimate takes into account in particular:
 - a heavy industrial programme⁽¹²⁾ with 44 reactor outages for maintenance and inspection, including six ten-yearly inspections, plus two scheduled outages starting in 2022 that will continue into 2023;
 - the continuation of the control and repair programme on the pipes potentially affected by the stress corrosion phenomenon, which is still ongoing.

The output schedule has not been precisely revised.

(1) See press release of 13 January 2022 "Exceptional measures announced by the French government".

(2) This amount includes an estimate of the impact of the tariff deferral on the 2022 cashflow amounting to approximately -€1.5 bn.

(3) This amount includes an estimate of the impact of the tariff deferral on the 2022 cashflow amounting to approximately -€0.9 bn.

(4) ASN information note of 24 February 2022 (<https://www.asn.fr/l-asn-informe/actualites/phenomene-de-corrosion-sous-contrainte-l-asn-demande-a-edf-d-approfondir-ses-analyses>).

(5) See press release of 7 February 2022 « EDF updates its 2022 French nuclear output estimate ».

(6) On the basis, for illustrative purposes, of a reference price of 8 euros per share and a discount in line with market practice.

(7) Target payout ratio of net income excluding non-recurring items (adjusted for the remuneration of hybrid bonds accounted for in equity) for 2022 and 2023 of 45-50%.

(8) See the press release of the Ministry of the Economy, Finance and Recovery of 18 February 2022 "The State fully supports EDF's financial securing action plan".

(9) Signed or completed disposals: impact on the adjusted net debt according to S&P definition.

(10) As per current S&P methodology.

(11) See press release of 11 February 2022 "EDF updates its 2023 French nuclear output estimate".

(12) Based on EDF estimates and awaiting the position from the investigation carried out by the French Nuclear Safety Authority on the evidence of stress corrosion and the corrective measures considered.

- a market price assumption for the forward price for the calendar 2023 of €202/MWh;
- no renewal of the 2022 exceptional regulatory measures. The volume and price assumption for ARENH is therefore 100TWh and €42/MWh.

EDF emphasises the importance of the uncertainties that weigh on the level of nuclear output in France, on price trends and on the liquidity of the energy markets, particularly for 2022 and 2023. Other risks mentioned in Chapter 2 are likely to affect its ability to achieve its targets.

To date, ambitions are confirmed for 2023. However, in the current situation, the impacts of the Ukrainian conflict and associated geopolitical tensions on all-kind risks are difficult to quantify.

Furthermore, **in his speech on 10 February 2022 in Belfort, the President of the French Republic confirmed the growing role of low-carbon electricity in France's ambition to reduce French greenhouse gas emissions by 55% by 2030 compared to 1990 and to achieve carbon neutrality by 2050. The President of the Republic has therefore announced:**

- A strong strategy to boost nuclear energy in France, notably with:
 - › the launch of a construction programme of six new EPR2 reactors and studies for eight additional EPR2, which will mobilise in particular massive public funding of several tens of billions of euros, even if the precise terms of this funding remain to be defined;

- › the continued operation of all existing French reactors, except for safety reasons (this extension of the operating period is therefore done without giving up any of the obligations in terms of nuclear safety), and in particular the need for EDF to study the conditions for an extension beyond 50 years, in conjunction with the Nuclear Safety Authority;
- › The development of small modular reactors (SMR), as well as innovative reactors allowing to close the fuel cycle and to produce less waste, with an additional intervention of the State up to €500 million for the NUWARD™ project currently carried out by EDF⁽¹⁾.
- Acceleration in renewable energy development (solar, offshore and onshore wind and hydro).

The scale and variety of the risks the Group is facing, particularly in an extremely volatile market context, with regulatory measures having a significantly negative impact on the Company, affected by the Ukrainian conflict and related geopolitical tensions and by the analyses and works the Group has to perform on the French nuclear fleet in relation to the stress corrosion phenomena recently identified, could have all kinds of consequences, including the arising of new risks or the aggravation of existing risks, likely to make it necessary to take additional measures to achieve the Group's financial objectives. The Group may not even be able to meet these targets. In the current situation, the impacts of the Ukrainian conflict and associated geopolitical tensions on all-kind risks are difficult to quantify.

⁽¹⁾ It should be noted that this project is currently the subject of a €50m subsidy from the French government as part of the France Recovery Plan (France Relance).



€8.75 billion

OF GREEN BONDS
ISSUED SINCE 2013

€19 billion

GREEN AND
SUSTAINABLE
FUNDING ⁽¹⁾

6.5 MtCO₂/year

AVOIDED THANKS TO
THE PROJECTS FUNDED
BY THE GREEN BONDS
⁽²⁾

72%

OF GROUP'S CREDIT
FACILITIES INDEXED
TO CSR CRITERIA

(1) Including credit facilities.

(2) Net estimated forecast data.



6 FINANCIAL STATEMENTS

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6.1 Consolidated financial statements at 31 December 2021

The Group's consolidated financial statements for the year ended 31 December 2021, prepared under IAS-IFRS, are presented below. They will be submitted for approval at the General Shareholders' Meeting to be held on 12 May 2022.

Consolidated income statement

<i>(in millions of euros)</i>	<i>Notes</i>	2021	2020
Sales	5.1	84,461	69,031
Fuel and energy purchases	5.2	(44,299)	(32,425)
Other external expenses ⁽¹⁾		(8,595)	(8,461)
Personnel expenses	5.3	(14,494)	(13,957)
Taxes other than income taxes		(3,330)	(3,797)
Other operating income and expenses	5.4	4,262	5,783
Operating profit before depreciation and amortisation	5	18,005	16,174
Net changes in fair value on energy and commodity derivatives, excluding trading activities	6	(215)	(175)
Net depreciation and amortisation ⁽²⁾		(10,789)	(10,838)
(Impairment)/reversals	10.8	(653)	(799)
Other income and expenses	7	(1,123)	(487)
Operating profit		5,225	3,875
Cost of gross financial indebtedness	8.1	(1,459)	(1,610)
Discount effect	8.2	(2,670)	(3,733)
Other financial income and expenses	8.3	4,489	2,761
Financial result	8	360	(2,582)
Income before taxes of consolidated companies		5,585	1,293
Income taxes	9	(1,400)	(945)
Share in net income of associates and joint ventures	12	644	425
Net income of discontinued operations	3.2	(1)	(158)
CONSOLIDATED NET INCOME		4,828	615
EDF net income		5,113	650
EDF net income – continuing operations		5,114	804
EDF net income – discontinued operations		(1)	(154)
Net income attributable to non-controlling interests		(285)	(35)
Net income attributable to non-controlling interests – continuing operations		(285)	(31)
Net income attributable to non-controlling interests – discontinued operations		-	(4)
Earnings per share (EDF share) in euros:	14.7		
Basic earnings per share		1.46	0.05
Diluted earnings per share		1.36	0.05
Basic earnings per share of continuing operations		1.46	0.10
Diluted earnings per share of continuing operations		1.36	0.10

(1) Other external expenses are reported net of capitalised production costs.

(2) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

Consolidated statement of comprehensive income

(in millions of euros)	Notes	2021			2020		
		EDF net income	Net income attributable to non-controlling interests	Total	EDF net income	Net income attributable to non-controlling interests	Total
Consolidated net income		5,113	(285)	4,828	650	(35)	615
Fair value of cash flow hedges							
Fair value of cash flow hedges – gross change	18.7.5	(3,292)	(33)	(3,325)	(711)	(8)	(719)
Fair value of cash flow hedges – tax effects		779	8	787	210	3	213
Fair value of net investment hedges							
Fair value of net investment hedges – gross change	18.7.5	(673)	-	(673)	661	-	661
Fair value of net investment hedges – tax effects		(83)	-	(83)	(30)	-	(30)
Change in fair value of debt instruments							
Gross change in fair value of debt instruments	18.1.2	(346)	-	(346)	20	-	20
Related tax effect		101	-	101	10	-	10
Translation adjustments – controlled entities		1,935	606	2,541	(1,425)	(430)	(1,855)
Share in net income of associates and joint ventures – items that can be recycled to profit and loss		(80)	-	(80)	(561)	-	(561)
Gains and losses recorded in equity with recycling		(1,659)	581	(1,078)	(1,826)	(435)	(2,261)
Change in fair value of equity instruments							
Gross change in fair value of equity instruments	18.1.2	15	1	16	(34)	(4)	(38)
Related tax effect		-	-	-	-	-	-
Change in actuarial gains and losses on post-employment benefits							
Gross change in actuarial gains and losses on post-employment benefits	16.1.3	1,144	263	1,407	(983)	80	(903)
Related tax effect		(421)	(89)	(510)	(220)	(18)	(238)
Share in net income of associates and joint ventures – items that cannot be recycled to profit and loss		(83)	-	(83)	(109)	-	(109)
Gains and losses recorded in equity with no recycling		655	175	830	(1,346)	58	(1,288)
Total gains and losses recorded in equity		(1,004)	756	(248)	(3,172)	(377)	(3,549)
CONSOLIDATED COMPREHENSIVE INCOME		4,109	471	4,580	(2,522)	(412)	(2,934)
Comprehensive income of continuing operations		4,110	471	4,581	(2,368)	(408)	(2,776)
Comprehensive income of discontinued operations	3.2.2	(1)	-	(1)	(154)	(4)	(158)



Consolidated balance sheet

Assets

<i>(in millions of euros)</i>	<i>Notes</i>	31/12/2021	31/12/2020
Goodwill	10.1	10,945	10,265
Other intangible assets	10.2	10,221	9,583
Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets	10.3	98,237	92,600
Property, plant and equipment operated under French public electricity distribution concessions	11	62,132	60,352
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	10.5	6,881	6,858
Investments in associates and joint ventures	12	8,084	6,794
Non-current financial assets	18.1	55,609	47,615
Other non-current receivables	13.3.4	2,092	2,015
Deferred tax assets	9.3	1,667	1,150
Non-current assets		255,868	237,232
Inventories	13.2	16,197	14,738
Trade receivables	13.3	22,235	14,521
Current financial assets	18.1	39,937	23,532
Current tax assets		544	384
Other current receivables	13.3.4	16,197	6,918
Cash and cash equivalents	18.2	9,919	6,270
Current assets		105,029	66,363
Assets classified as held for sale	3.2	69	2,296
TOTAL ASSETS		360,966	305,891

Equity and liabilities

<i>(in millions of euros)</i>			
Capital	14	1,619	1,550
EDF net income and consolidated reserves		48,592	44,083
Equity (EDF share)		50,211	45,633
Equity (non-controlling interests)	14.6	11,778	9,593
Total equity	14	61,989	55,226
Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores	15	62,067	58,333
Provisions for employee benefits	16	21,716	22,130
Other provisions	17	5,442	5,374
Non-current provisions		89,225	85,837
Special French public electricity distribution concession liabilities	11.2	48,853	48,420
Non-current financial liabilities	18.3	56,543	55,899
Other non-current liabilities	13.5	4,816	4,874
Deferred tax liabilities	9.3	2,401	3,115
Non-current liabilities		201,838	198,145
Current provisions	15, 17 and 16.1	6,836	5,827
Trade payables	13.4	19,565	11,900
Current financial liabilities	18.3	45,014	17,609
Current tax liabilities		446	215
Other current liabilities	13.5	25,248	16,861
Current liabilities		97,109	52,412
Liabilities related to assets classified as held for sale	3.2	30	108
TOTAL EQUITY AND LIABILITIES		360,966	305,891

Consolidated cash flow statement

(in millions of euros)	Notes	2021	2020 ⁽¹⁾
Operating activities			
Consolidated net income		4,828	615
Net income of discontinued operations		(1)	(158)
Net income of continuing operations		4,829	773
Impairment/(reversals)		653	799
Accumulated depreciation and amortisation, provisions and changes in fair value		10,488	13,310
Financial income and expenses		(89)	785
Dividends received from associates and joint ventures		467	433
Capital gains/losses		(67)	(185)
Income taxes		1,401	945
Share in net income of associates and joint ventures		(644)	(425)
Change in working capital	13.1.3	(1,526)	(1,679)
Net cash flow from operations		15,512	14,756
Net financial expenses disbursed		(588)	(929)
Income taxes paid		(2,276)	(983)
Net cash flow from continuing operating activities		12,648	12,844
Net cash flow from operating activities relating to discontinued operations		-	98
Net cash flow from operating activities		12,648	12,942
Investing activities:			
Acquisitions of equity investments, net of cash acquired		(165)	(126)
Disposals of equity investments, net of cash transferred		1,154	498
Investments in intangible assets and property, plant and equipment	10.7	(17,606)	(16,007)
Net proceeds from sale of intangible assets and property, plant and equipment		264	54
Changes in financial assets		1,776	2,718
Net cash flow from continuing investing activities		(14,577)	(12,863)
Net cash flow from investing activities relating to discontinued operations		-	(104)
Net cash flow from investing activities		(14,577)	(12,967)
Financing activities:			
Transactions with non-controlling interests ⁽²⁾		2,076	1,019
Dividends paid by parent company	14.3	(84)	-
Dividends paid to non-controlling interests		(163)	(267)
Purchases/sales of treasury shares		(3)	5
Cash flows with shareholders		1,826	757
Issuance of borrowings	18.3.2.1	6,943	6,601
Repayment of borrowings	18.3.2.1	(5,161)	(7,062)
Issuance of perpetual subordinated bonds and OCEANES	14.4 and 14.5	1,235	2,243
Payments to bearers of perpetual subordinated bonds	14.4	(547)	(501)
Funding contributions received for assets operated under concessions and investment subsidies		677	534
Other cash flows from financing activities		3,147	1,815
Net cash flow from continuing financing activities		4,973	2,572
Net cash flow from financing activities relating to discontinued operations		-	19
Net cash flow from financing activities		4,973	2,591
Net cash flow from continuing operations		3,044	2,553
Net cash flow from discontinued operations		-	13
Net increase/(decrease) in cash and cash equivalents		3,044	2,566
CASH AND CASH EQUIVALENTS – OPENING BALANCE		6,270	3,934
Net increase/(decrease) in cash and cash equivalents		3,044	2,566
Currency fluctuations		180	(162)
Financial income on cash and cash equivalents		38	35
Other non-monetary changes ⁽³⁾		387	(103)
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	18.2	9,919	6,270

(1) The published figures for 2020 include a €79 million reclassification from "Net financial expenses disbursed" to "Changes in financial assets".

(2) Contributions via capital increases, or capital reductions and acquisitions of additional interests or disposals of interests in controlled companies. In 2021, this item includes an amount of €1,304 million relating to CGN's payment for the capital increases by NNB Holding Ltd (for the Hinkley Point C project) and Sizewell C Holding Co., an amount of €865 million relating to the sale of 49% of Edison Renewables and an amount of €(276) million relating to the acquisition of 70% of E2i Energie Speciali. In 2020, this item includes an amount of €998 million relating to CGN's payment for the capital increases by NNB Holding Ltd (for the Hinkley point C project) and Sizewell C Holding Co..

(3) Other non-monetary changes include €281 million resulting from reclassification at 1 January 2021 of debit positions on margin calls relating to derivatives, which were previously netted and included in other financial liabilities (see the "Other changes" line in note 18.3.2.1).



Change in consolidated equity

Details of the change in equity between 1 January and 31 December 2021 are as follows:

<i>(in millions of euros)</i>	Capital	Treasury shares	Translation adjustments ⁽¹⁾	Fair value adjustment of financial instruments (OCI with recycling) ⁽²⁾	Other consolidated reserves and net income ⁽³⁾	Equity (EDF share)	Equity (non-controlling interests)	Total equity
EQUITY AS PUBLISHED AT 31/12/2019	1,552	(64)	1,037	(1,198)	45,139	46,466	9,324	55,790
Gains and losses recorded in equity	-	-	(1,908)	82	(1,346)	(3,172)	(377)	(3,549)
Net income	-	-	-	-	650	650	(35)	615
Consolidated comprehensive income	-	-	(1,908)	82	(696)	(2,522)	(412)	(2,934)
Payments on perpetual subordinated bonds	-	-	-	-	(501)	(501)	-	(501)
Issuance/Redemption of perpetual subordinated bonds and OCEANES (see notes 14.4 and 15)	-	-	-	-	2,207	2,207	-	2,207
Dividends paid	-	-	-	-	-	-	(271)	(271)
Purchases/sales of treasury shares	-	1	-	-	-	1	-	1
Capital decrease by EDF (see note 14.1)	(2)	53	-	-	(51)	-	-	-
Other changes ⁽⁴⁾	-	-	-	-	(18)	(18)	952	934
EQUITY AT 31/12/2020	1,550	(10)	(871)	(1,116)	46,080	45,633	9,593	55,226
Gains and losses recorded in equity	-	-	1,699	(3,358)	655	(1,004)	756	(248)
Net income	-	-	-	-	5,113	5,113	(285)	4,828
Consolidated comprehensive income	-	-	1,699	(3,358)	5,768	4,109	471	4,580
Payments on perpetual subordinated bonds	-	-	-	-	(547)	(547)	-	(547)
Issuance/Redemption of perpetual subordinated bonds (see notes 14.4)	-	-	-	-	972	972	-	972
Dividends paid	-	-	-	-	(1,599)	(1,599)	(163)	(1,762)
Purchases/sales of treasury shares	-	(4)	-	-	-	(4)	-	(4)
Capital increase by EDF (see note 14.1)	69	-	-	-	1,446	1,515	-	1,515
Other changes ⁽⁵⁾	-	-	-	-	132	132	1,877	2,009
EQUITY AT 31/12/2021	1,619	(14)	828	(4,474)	52,252	50,211	11,778	61,989

(1) Changes in translation adjustments amount to €1,699 million at 31 December 2021. This variation is mainly due to the appreciation of the pound sterling and to a smaller degree the US dollar against the euro.

(2) Changes in reserves recorded in OCI (Other Comprehensive Income) with recycling are shown in the Statement of Comprehensive Income. They correspond to the effects of fair value adjustments of debt securities and financial instruments hedging cash flows and net foreign investments, and amounts recycled to profit and loss in respect of terminated contracts and debt instruments transferred.

(3) Fair value changes recorded in OCI with no recycling are presented in this column.

(4) In 2020, "Other changes" in equity (non-controlling interests) include the effect of capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co. amounting to €998 million.

(5) In 2021, "Other changes" in equity (non-controlling interests) include the effect of capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co. amounting to 1,304 million.

In 2021, "Other changes" in equity (EDF share) also include:

- adjustment of prior year provisions for post-employment employee benefits, amounting to €49 million net of tax, resulting from application of the IFRIC decision on attribution of benefits (see note 1.2.3);
- reclassification of net book values for previously capitalised configuration and customisation costs on SaaS (software as a service), amounting to €(64) million net of tax, following the IASB's confirmation of the IFRIC decision on recognition of these costs (see note 1.2.4).

"Other changes" in equity (EDF share and non-controlling interests) also include the effect on equity of transactions with minority shareholders in the form of acquisitions and disposals not entailing a change of consolidation method (sale of 49% of Edison Renewables, acquisition of 70% of E2i and the IPO by PodPoint, see note 3.1.1).

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Notes to the consolidated financial statements

Électricité de France (EDF or the "Company") is a French *société anonyme* governed by French law, and registered in France (22-30, avenue de Wagram, 75008 Paris).

The consolidated financial statements reflect the accounting position of the Company and its subsidiaries (which together form the "Group") and the Group's interests in associates, joint arrangements classified as joint operations, and joint ventures, for the year ended 31 December 2021.

The Group is an integrated energy operator engaged in all aspects of the energy business: power generation (nuclear power, hydropower, wind and solar power, thermal energy, etc.), transmission, distribution, supply, trading, energy services, production of equipment and fuel assemblies, and reactor services.

The Group's consolidated financial statements at 31 December 2021 were prepared under the responsibility of the Board of Directors and approved by the Directors at the Board meeting held on 17 February 2022. They will become final after approval at the General Shareholders' Meeting to be held on 12 May 2022.

Note 1 Group accounting policies

1.1 Declaration of conformity and Group accounting policies

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements at 31 December 2021 are prepared under the presentation, recognition and measurement rules set out in the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2021. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and SIC and IFRIC interpretations.

The Group has not opted for early application of standards and interpretations that were not yet mandatory in 2021.

1.2 Changes in accounting standards

The parent company's functional currency is the Euro. The Group's financial statements are presented in millions of euros.

The accounting and valuation methods applied by the Group in the consolidated financial statements at 31 December 2021 are identical to those used in the consolidated financial statements at 31 December 2020, with the exception of the changes presented below in notes 1.2.1, 1.2.2, 1.2.3 and 1.2.4. Information is also given on the standards, amendments and interpretations adopted by the European Union that are applicable from 1 January 2022 (note 1.2.5).

For purposes of clarity, the accounting principles and methods used are now described in individual notes to the financial statements.

1.2.1 Interest Rate Benchmark Reform – Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 (phase 2)

These amendments were adopted on 13 January 2021 and have been applicable since 1 January 2021.

The principal interest rates concerned that are used by EDF are the Eonia, the Libor USD and the Libor GBP.

The modification of effective interest rates resulting from the reform is applied prospectively, there is no significant impact on profit and loss and the hedging relationships for the instruments concerned are continued.

This reform has no significant impact on the Group's net income for 2021, and its effects are mainly operational (renegotiation of contracts, fallback provisions, information system upgrades).

Due to its long-term fixed-rate borrowing position (see note 18.3.3.3), the Group's exposure is essentially concentrated in interest rate derivatives that are used to swap fixed-rate debt to floating rates. On these instruments, the reference rate curves for collateral agreements have been modified, replacing the Eonia by the Ester. Following adjustment of the value of the derivatives, receipt of cash compensation of €22 million was recognised.

The Group adhered to the ISDA Fallback protocol in November 2021 and the Libor GBP was replaced by the Sonia for all the derivatives concerned from 1 January 2022.

For the USD Libor, the transition operations will take place in line with the end date for its publication *i.e.* by 30 June 2023.

1.2.2 Covid-19-Related Rent Concessions – Amendment to IFRS 16

Application of the "Covid-19-Related Rent Concessions" amendment has been extended for one year (for payments up to 30 June 2022 at the latest). This allows lessees benefiting from "payment holidays" or temporary rent reductions as a direct result of the Covid-19 pandemic to record the impact directly in profit and loss.

This amendment has no impact on the Group's financial statements.

1.2.3 IFRIC decision: "Attributing benefit to Periods of service" (IAS 19)

In May 2021, the IASB approved the IFRIC's agenda decision concerning attribution of benefits earned under post-employment benefit plans.

This decision principally concerns retirement indemnities in France paid under the IEG (electricity and gas sector) benefit plans. The corresponding commitments amounted to €941 million at 31 December 2020 for the two segments "France – Generation and supply activities" and "France – Regulated activities" (see note 16.2.2).

Modification of the benefit attribution method led to a €(67) million reduction before tax in benefit commitments at 1 January 2021, recognised in equity ("Other changes").

1.2.4 IFRIC decision on SaaS contracts (IAS 38)

In April 2021, the IASB confirmed the position taken by the IFRIC in March 2021 following its tentative agenda decision of December 2020 on recognition of configuration and customisation costs on a software provided under a SaaS (Software as a Service) contract. The matter was put on the agenda due to the diversity of practices observed. The IFRIC agenda decision states that in most cases, in application of IAS 38, these costs should be treated as expenses, not intangible assets, since the entity does not control the software and the configuration/customisation activities do not generate a resource that is controlled by the customer independently of the software.

In application of this decision, configuration and customisation costs for SaaS which were previously capitalised were restated at 1 January 2021, with a corresponding adjustment of €(88) million before tax to equity (in "Other changes"). Configuration and customisation costs incurred in 2021 on such contracts are included in "Other external expenses".

1.2.5 Standards adopted by the European Union and applicable for financial years beginning on or after 1 January 2022

Amendments to IAS 16 "Property, Plant and Equipment: Proceeds before Intended Use"

From 1 January 2022, the proceeds from sales of items produced by an asset that has not yet been commissioned will no longer be deducted from the cost of the asset. These proceeds and the related costs will be included in profit and loss.

The Group will be concerned *via* its projects for construction of energy generation plants.

Amendments to IAS 37 "Onerous Contracts – Cost of Fulfilling a Contract"

These amendments define the costs that must be taken into consideration when assessing whether a contract is onerous.

The Group does not anticipate any material impact as a result of application of these amendments.

Other standards, amendments and interpretations

The Group does not anticipate any material impact in connection with the following amendments:

- “Annual improvements – 2018-2020 cycle”;
- amendments to IFRS 3 “Reference to the Conceptual Framework”.

1.3 Basis for preparation of the financial statements

1.3.1 Valuation

The consolidated financial statements are prepared on a historical cost basis, with the exception of assets acquired and liabilities assumed through business combinations, and of certain financial instruments, which are stated at fair value.

1.3.2 Translation methods

1.3.2.1 Functional currency

An entity's functional currency is the currency of the economic environment in which it primarily operates. In most cases, the local currency is the functional currency. But for some entities, a functional currency other than the local currency may be used when it reflects the currency used in the principal transactions.

1.3.2.2 Translation of the financial statements of foreign companies whose functional currency is not the Euro

The financial statements of foreign companies whose functional currency is not the Euro are translated as follows:

- balance sheets are translated into Euros at the closing rate;
- income statements and cash flows are translated at the average rate for the period;
- resulting differences are recognised in equity under the heading “Translation adjustments”.

Translation adjustments affecting a monetary item that is an integral part of the Group's net investment in a consolidated foreign company are included in consolidated equity until the disposal or liquidation of the net investment, at which date they are recognised as income or expenses in the income statement, in the same way as other exchange differences concerning the Company.

1.3.2.3 Translation of transactions in foreign currencies

In application of IAS 21, transactions expressed in foreign currencies are initially translated and recorded in the functional currency of the entity concerned, using the rate in force at the transaction date.

At each reporting date, monetary assets and liabilities expressed in foreign currencies are translated at the closing rate. The resulting foreign exchange differences are taken to the income statement.

However, any payment or receipt of a non-monetary advance in a foreign currency is translated at the exchange rate of the transaction date, with no subsequent adjustment.

1.3.3 Financial statement presentation rules

Assets and liabilities contributing to working capital used in the entity's normal operating cycle are classified as current in the consolidated balance sheet. Other assets and liabilities are classified as current if they mature within one year of the closing date, and non-current if they mature more than one year after the closing date.

The income statement presents items by nature. The heading “Other income and expenses” presented below the operating profit before depreciation and amortisation comprises items of an unusual nature or amount.

1.3.4 Management judgements and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in the Group's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

In a context characterised by volatility on the financial and energy markets, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of Group assets.

The principal operations for which the Group uses estimates and judgments are the following:

1.3.4.1 Depreciation period of nuclear power plants in France

In the specific case of the depreciation period of its French nuclear power plants, the EDF group's industrial strategy is to continue operation beyond 40 years, in optimum conditions as regards safety and efficiency.

The Group has therefore been making preparations for several years to extend the operation period, and making the necessary investments under its *Grand Carénage* industrial refurbishment programme which was approved in principle by the Board of Directors in January 2015.

The depreciation period of 900MW-series power plants was extended from 40 years to 50 years in 2016 (except for Fessenheim where both reactors were permanently shut down in the first half of 2020) since all the technical, economic and governance conditions were fulfilled.

On 23 February 2021, the Nuclear Safety Authority (*Autorité de sûreté nucléaire* (ASN)) issued a resolution on the conditions for continued operation of EDF's 900MW reactors beyond their fourth 10-year inspection. The ASN considered that “the measures planned by EDF combined with those prescribed by ASN open the prospect of continued operation of these reactors for a further ten years following their fourth periodic safety review”. This resolution ends the “generic” phase of the review, which concerns the studies and modifications of facilities common to all the 900MW reactors, which all have a similar design model.

After the pilot reactor Tricastin 1 in December 2019, Bugey 2, Bugey 4 and Tricastin 2 reached the milestone of 40 years of operation, and were restarted after a successful fourth 10-year inspection during 2021. Three other 10-year inspections were in progress at 31 December 2021 (Dampierre 1, Bugey 5 and Gravelines 1). The fourth 10-year inspection of Dampierre 1 was completed on 5 February 2022.

The depreciation period of other series (1300MW and 1450MW), which are more recent, remained at 40 years until 31 December 2020.

In 2021, the technical, economic and governance conditions for extending the depreciation period of 1300MW-series plants were fulfilled, and consequently the Group proceeded to the corresponding change of estimate at 1 January 2021 for all its 1300MW power plants (see note 1.4.1, Extension to 50 years of the depreciation period of the 1300MW PWR series in France).

The depreciation period of the 1450MW series (the four reactors at Chooz and Civaux), which are much more recent, currently remains at 40 years as the conditions for extension are not yet fulfilled.

These depreciation periods take into account the date of recoupling with the network after the most recent 10-year inspection.

1.3.4.2 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning technical processes, costs, inflation rates, long-term discount rates, the depreciation period of plants currently in operation and disbursement schedules.

These parameters are therefore re-estimated at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by the Group.

The Group considers that the assumptions used at 31 December 2021 are appropriate and justified. However, any future change in assumptions could have a significant impact on the Group's financial statements (see note 15).

For France, the main assumptions and sensitivity analyses relating to EDF's nuclear provisions are presented in note 15.1.1.5.

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as:

- changes in the regulations, particularly on safety, security and environmental protection, and financing of long-term nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*);
- changes in the contractual terms for spent fuel management;
- changes in certain financial parameters such as discount rates and/or inflation rates;
- the depreciation period of nuclear facilities (calculation of decommissioning provisions for nuclear plants in operation is based on the depreciation period of the assets concerned, *i.e.* 50 years for 900MW series and 1300MW series power plants and 40 years for 1450MW series power plants).

1.3.4.3 Pensions and other long-term and post-employment benefit obligations

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates, inflation rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2021 are presented in note 16. These assumptions are updated annually. The Group considers the actuarial assumptions used at 31 December 2021 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and the Group's equity and net income. Sensitivity analyses are therefore presented in note 16.

1.3.4.4 Impairment of goodwill and long-term assets

Impairment tests on goodwill and long-term assets are sensitive to the macro-economic and segment assumptions used – particularly concerning energy price movements – and medium-term financial forecasts. The Group therefore revises the underlying estimates and assumptions based on regularly updated information.

These assumptions, which are specific to Group companies, are presented in note 10.8.

1.3.4.5 Financial instruments

In measuring the fair value of unlisted financial instruments (essentially energy contracts), the Group uses valuation models based on a certain number of assumptions subject to unforeseeable developments.

1.3.4.6 Energy supplied but not yet measured and billed

As explained in note 5.1, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistic models and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

1.3.4.7 Obligations concerning French public distribution concession assets to be replaced

In view of the specific nature of French public electricity distribution concessions, the Group has opted to present its obligation to replace concession assets in the balance sheet at a value based on the amount of contractual commitments as calculated and disclosed to the concession-granting authorities in the annual

business reports (see note 11). Measurement of the concession liabilities concerning assets to be replaced is notably subject to unforeseeable developments in terms of costs, the useful life of assets and disbursement dates.

1.3.4.8 Deferred tax assets

The use of estimates and assumptions over recovery horizons is particularly important in the recognition of deferred tax assets.

1.3.4.9 Other judgements and estimates

- When there is no standard or interpretation applicable to a specific transaction, the Group exercises judgment to define and apply accounting methods that supply relevant and reliable information for preparation of its financial statements.
- For the application of IFRS 10 and IFRS 11, the Group uses judgment to assess control or classify the type of partnership arrangement represented by a jointly-controlled entity. For example:
 - ▶ EDF has set up "reserved" investment funds for some of its funds set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste (see note 15.1.2.2). In view of the funds' characteristics, the prerogatives exercised by their managers and the procedures for defining the management strategies applicable to them, the Group considers that it does not have control, as defined by IFRS 10, over these funds. They are consequently treated as debt securities, in application of IFRS 9.
 - ▶ Through its subsidiary Edison, the Group held a 30% investment in E2i Energie Speciali, alongside the other shareholder F2i. The governance arrangements and contractual agreements gave Edison exclusive control over this company under IFRS 10. On 16 February 2021, Edison acquired the other 70% of E2i Energie from F2i. As the company was already fully consolidated by the Group, the only impact of this acquisition was on non-controlling interests, and therefore on equity (see note 3.1) and ultimately on EDF net income.

1.3.5 Nature and extent of restrictions on the Group's ability to access and use assets or settle liabilities

The main restrictions that may limit the Group's ability to access or use its assets or settle its liabilities concern the following items:

- assets held to fund employee benefits (principally in France and the United Kingdom – see note 16) and expenses related to nuclear liabilities (principally in France – see note 15.1.2 – and the United Kingdom – see note 15.2);
- tangible and intangible assets and the related liabilities associated with concession agreements, whether or not they are subject to regulatory mechanisms (obligations to supply energy or energy-related services, rules governing investments, an obligation to return concession facilities at the end of the contract, amounts payable at the end of the contract, tariff constraints, etc.). These restrictions mainly apply to assets of this type in France (EDF, Enedis, Electricité de Strasbourg and Dalkia), and to a lesser extent Italy (see notes 10.5);
- the sale of Group investments in certain subsidiaries may require authorisations from State bodies, particularly when they exercise a regulated activity or operate nuclear power plants (this is the case for EDF Nuclear Generation Ltd. in the United Kingdom and Taishan (TNPJVC) in China);
- prudential reserves established and measures taken as regards distribution capacity, so that the insurance subsidiaries will meet their prudential ratio requirements;
- the cash of certain entities that use financing arrangements stipulating that dividend distribution is subject to conditions concerning repayment of bank debt (or qualification for loans) and shareholders, or are subject to regulatory limitations in certain countries.

Certain shareholder agreements concerning companies controlled by the Group include clauses to protect minority shareholders, requiring approval from minority shareholders for certain particularly important decisions.

Finally, certain financing loans granted to Group entities contain early repayment clauses (see note 18.3.4), and certain items of cash and cash equivalents are subject to restrictions (see note 18.2).

1.4 Comparability

1.4.1 Extension to 50 years of the depreciation period of the 1300MW PWR series in France

The Group considers that all the technical, economic and governance conditions for bringing the depreciation period of 1300MW-series PWR plants in France into line with its industrial strategy are now fulfilled.

The studies and work already completed, particularly concerning replacement of components and controlled equipment ageing, have given the Group sufficient assurance of the 1300MW plants' technical capacity to operate for at least 50 years. This is also supported by the international benchmark.

The Group has also made progress with the ASN on the question of the content of the fourth 10 year inspections of the 1300MW series (a project included in the *Grand Carénage* programme). These inspections use a work methodology with ambitions focusing particularly on safety, similar to the fourth 10 year inspections of the 900MW series and incorporating the lessons learned from that series. In December 2019, the ASN's response to the Re-examination Orientation file for the fourth 10-year inspections of the 1300MW reactors gave general approval for the themes selected and commitments made by EDF for these inspections.

Most importantly, the ASN approval published in February 2021 for the generic aspects of the continued operation of 900MW reactors for ten years following their fourth 10-year inspection, and the industrial success of the initial fourth 10-year inspections for such reactors (after the pilot reactor Tricastin 1 in December 2019, Bugey 2 and Bugey 4 reached 40 years of operation and were restarted after a successful fourth 10-year inspection during the first half of 2021 followed by Tricastin 2 in the second half of 2021), reinforce EDF's confidence that its inspection content for the 1300MW series is appropriate and well controlled.

Once its fourth 10-year inspections are completed, the 1300MW PWR plants will thus have reached a level of safety close to EPR safety level.

Also, extending operation of the 1300MW-series plants beyond 40 years offers high profitability even in low long-term price scenarios, and in a range of sensitivity scenarios.

Finally, operating the 1300MW-series plants for 50 years is consistent with France's Energy and Climate law of 8 November 2019 (which sets a target of 50% nuclear for France's electricity output by 2035), and the adoption decree of 21 April 2020 for France's multi-year energy programme (*programmation pluriannuelle de l'énergie* (PPE)). A study for the energy future, *Futurs énergétiques 2050*, was conducted by France's national grid operator RTE at the request of the French government, examining electricity mix scenarios to achieve carbon neutrality in France by 2050. The related progress report published in June 2021, and the key results published on 25 October 2021, indicate a significant need for carbon-free generation capacity. For all scenarios relating to the post-2035 period, the study includes the assumption that EDF's existing nuclear power plant fleet will remain in operation beyond 50 years, and be shut down between 50 and 60 years of operation.

In view of all these factors, the Group considers that the best estimate for the depreciation period of the 1300MW-series plants is now 50 years. This accounting estimate does not predetermine the ASN's future decisions to authorise continued operation, which will be given individually for each unit after each 10-year inspection, as currently applied and required by law.

The Group therefore changed the estimate at 1 January 2021 for all 1300MW power plants.

This change of accounting estimate is applied prospectively, and has the following consequences for the Group's consolidated financial statements at 31 December 2021:

- at 1 January 2021, due to timing differences in the payment schedules, provisions relating to nuclear power generation were reduced by

€1,016 million (see note 15), including €848 million covered by dedicated assets. This reversal from provisions is principally allocated to the net book value of the assets in accordance with IFRIC 1 (€1,031 million, see note 10.3), with the balance allocated to profit and loss (€15) million. It is largely taxable and generated a tax payment of €184 million;

- in 2021:

- the 10-year extension of the depreciation period and the reduction in the value of assets at 1 January in line with the decrease in nuclear provisions have led to a lower depreciation charge than for a 40 year depreciation period, estimated at €564 million for the year,
- the decrease in nuclear provisions at 1 January 2021 led to a €33 million decrease in the cost of unwinding the discount,
- the amounts of contributions received on jointly-operated power plants transferred to profit and loss decreased by €23 million.

In total, the various effects in 2021 lead to a €559 million increase in the income before taxes, and a €405 million increase in EDF net income.

1.4.2 Effects of market price levels on comparability

The significant increase in 2021 in market prices for electricity and gas, which was particularly noticeable during the second half-year and even more pronounced in the final quarter, had various effects on the Group's financial statements that affect the comparability of certain items, as highlighted in the notes. As an illustration, between 2020 and 2021 spot baseload electricity prices in France increased by an average 240%, and the forward annual contract baseload price increased by around 113%.

The principal items concerned include, but are not limited to, the following:

In the balance sheet:

- The increases in trade receivables (around €8 billion, see note 13.3), current financial assets (around €17 billion, see note 18.1), and other current liabilities (around €9 billion, see note 13.3.4) particularly concern EDF Trading (through margin calls on assets and the positive fair value of trading derivatives) and Edison (through gas activities);
- The increases in trade payables (around €8 billion, see note 13.4), current financial liabilities (around €27 billion, see note 18.3), and other current liabilities (around €8 billion, see note 13.5), particularly concern EDF Trading (notably through margin calls on liabilities and the negative fair value of trading derivatives) and Edison (through gas activities). The value of derivatives hedging cash flows on commodities (see note 18.7.5) has also changed significantly in the statement of comprehensive income;
- In other current receivables, the normal debit position of the CSPE for EDF SA (a receivable of some €2 billion at 31 December 2020) is in a credit position in "other current liabilities" at the value of €0.3 billion at 31 December 2021 (see note 13.3.4).

In the income statement:

In general, the high level of prices had significant upward impacts on sales (see note 5.1.2) and fuel and energy purchases (see note 5.2). The trading margin included in sales benefited from the volatility and high energy prices.

However, the profitability of certain Group entities was penalised by electricity purchases made at very high prices on the markets late in the year, in response to their own supply-demand balance, as these prices could only partially be passed on through sale prices to final customers in 2021, depending on any regulatory systems applicable. This situation particularly affected the France- Generation and supply and United Kingdom segments, and to a lesser extent the Other international segment (Belgium), and France – Regulated activities (cost of purchases to cover energy losses) (see note 5).

Note 23 presents the measures announced to date by the French and UK government to limit the impact of the market price rises for consumers in 2022.

1.4.3 Consequences of the Covid-19 pandemic

The economic disruption caused by the Covid-19 pandemic in 2020 had significant repercussions for many of the Group's activities in 2020, particularly nuclear power, worksites and services.

For the half-yearly closing at 30 June 2020, then the annual closing at 31 December 2020, in-depth analyses were conducted in the Group's entities to prepare reliable estimates of the impacts of the pandemic on the Group's financial statements, based on specific reporting and valuation principles explained in the 2020 half-year financial statements (see note 2.1) and 2020 annual financial statements (see note 1.4.1).

The impact of the Covid-19 pandemic on the Group's operating profit before depreciation and amortisation was estimated at €(1,479) million at 31 December 2020 and mainly concerned:

- the France – Generation and Supply segment €(872) million, due to lower nuclear power output, a decrease in demand, and recognition of impairment on trade receivables;
- the France – Regulated activities segment €(237) million, reflecting lower delivery volumes and the downturn in network connection activity as site work was suspended or slowed down; and

- the United Kingdom €(182) million, mainly due to the decline in demand.

Even though the Covid-19 pandemic continued to have effects during 2021, its impacts on the Group's operating profit before depreciation and amortisation at 31 December 2021 are not very significant, diffuse and not easily traceable.

Impairment of trade receivables

Analyses conducted by different Group entities to estimate credit losses on trade receivables at 31 December 2020 led to a €223 million increase to impairment of trade receivables for 2020 resulting from the pandemic, recognised in "Other operating income and expenses" in the income statement. This amount was calculated under the principles presented in note 1.4.1.2 to the consolidated financial statements at 31 December 2020. It comprised €80 million concerning the France – Generation and Supply segment, €58 million for the France – Regulated activities segment, €68 million for the United Kingdom, and €13 million for Belgium.

The risk analyses were updated at 31 December 2021 in view of the recovery levels observed over the year, and this led to recovery of a total €115 million from impairment concerning the various operating segments.

Note 2 Summary of significant events

The main significant events and transactions for the Group in 2021 and up to the date of approval of the consolidated financial statements are the following:

• Nuclear developments:

- EDF submitted to the Indian nuclear operator NPCIL the French binding techno-commercial offer to build six EPRs at the Jaitapur site (see the Group press release of 23 April 2021);
- EDF decided to move Dungeness B into the defueling phase (see the EDF Energy press release of 7 June 2021, and notes 7, 10.8, 15.2);
- Reactors of the Civaux and Chooz nuclear power plants: replacements and preventive checks on parts of the piping of a safety system (see the Group press release of 15 December 2021, and note 23);
- AGR lifetime reviews were carried out (see the EDF Energy press release of 15 December 2021, and note 10.8);
- Update on the Flamanville EPR (see the Group press release of 12 January 2022, and note 10.6);
- On 13 January 2022 EDF updated its estimated nuclear output in France for 2022 (see the Group press release of 13 January 2022, and note 23);
- On 7 February 2022 EDF adjusted its estimated nuclear output in France for 2022 (see the Group press release of 7 February 2022, and note 23);
- On 11 February 2022 EDF adjusted its estimated nuclear output in France for 2023 (see the Group press release of 11 February 2022, and note 23).

• Disposals:

- Edison completed the sale of Edison Norge to Sval Energi for a value of \$374 million (see the Edison press release of 25 March 2021, and note 3.1);
- Edison completed the sale of Infrastrutture Distribuzione Gas (IDG) to 2I ReteGas for a value of €150 million (see the Edison press release of 30 April 2021, and note 3.1);
- Dalkia completed the sale of its subsidiary Dalkia Wastenergy to Paprec (see the Dalkia press release of 28 July 2021, and notes 3.1 and 7);
- EDF completed the sale of its interest in CENG (see the Group press release of 9 August 2021, and notes 3.1 and 7);
- EDF completed the sale of the West Burton B CCGT gas power station to EIG (see the EDF Energy press release of 31 August 2021, and note 3.1);

- Edison and Credit Agricole Assurances completed the transaction to accelerate the development of renewables in Italy together (see the Edison press releases of 3 and 14 December 2021, and note 3.1);

- EDF transferred a property portfolio in the Île-de-France region to a joint venture with POWERHOUSE HABITAT (see the Group press release of 16 December 2021, and note 5.4).

• Financing operations:

- EDF launched an issue of a Euro-denominated perpetual social hybrid notes on 26 May 2021 with a total nominal amount of €1.25 billion (see the Group press release of 27 May 2021, and note 14.4);
- EDF launched an issue of a senior Green Bond with a nominal amount of €1.75 billion on 23 November 2021 (see the Group press release of 24 November 2021 and note 18.3.2.2);
- EDF announced the signature of a new credit facility indexed on social indicators, syndicated with 9 banks on 23 December 2021 (see the Group press release of 23 December 2021, and note 18.4).

• Renewable energies:

- Edison completed the acquisition of E2i (see the Edison press release of 16 February 2021, and notes 1.3.4.9 and 3.1);
- EDF Renewables, Enbridge and wpd launched construction of the Calvados offshore wind farm (see the EDF Renewables press release of 22 February 2021, and note 12.3);
- The EDF group won a 1.5GW offshore wind power project in New Jersey in the United States (see the Group and EDF Renewables press releases of 1 July 2021 and note 12.3);
- For construction of France's first offshore wind farm in Saint-Nazaire, production of components was finalised and offshore operations continued (see the Group and EDF Renewables press releases of 28 August 2021, and note 12.3);
- The Dongtai V offshore wind farm in China was commissioned (see the Group and EDF Renewables press releases of 9 December 2021, and note 12.3).
- EDF and AREVA reached a settlement agreement (see the Group press release of 30 June 2021, and note 7);
- EDF put an end to EcoCombust, a project to develop a new class B wood-based fuel (see the Group press release of 8 July 2021, and note 10.3);
- Framatome announced the completion of its purchase of Rolls Royce Civil Nuclear I&C (see the Framatome press release of 8 November 2021, and note 3.1);

- Exceptional measures were announced by the French Government (see the Group press release of 13 January 2022, and note 23);
- EDF signed an exclusive agreement to acquire part of GE Steam Power's nuclear activities (see the Group press release of 10 February 2022 and note 23).

Apart from the Covid-19 pandemic, the main significant events and transactions for the Group in 2020 were the following:

- **Nuclear developments:**
 - EDF restarted Hunterston B power station and confirmed its plan to move into the decommissioning phase by January 2022. It also announced that

Hinkley Point B power station in Somerset would enter into the defueling phase no later than 15 July 2022 (see the EDF Energy press release of 27 August 2020 and 19 November 2020, and note 10.8);

- the Group readjusted the cost of the *Grand Carénage* programme to increase safety and extend the operating life of nuclear reactors beyond 40 years (see the press release of 29 October 2020 and note 10.6);

- Hinkley Point C project update (see the press release of 27 January 2021 and note 10.6).

• Disposals:

- Edison completed the sale of Edison Exploration & Production SpA to Energean (see the Edison press release of 17 December 2020 and note 3.1).

Note 3 Scope of consolidation

Accounting principles and methods

Controlled entities

Subsidiaries are companies in which the Group exercises exclusive control and are fully consolidated. The Group controls an entity when the three following conditions are fulfilled:

- it holds power over the entity;
- it is exposed, or has rights, to variable returns from its involvement with the entity;
- it has the ability to use its power to affect the amount of the investor's returns.

The Group considers all facts and circumstances when assessing control. All substantive potential voting rights exercisable, including by another party, are also taken into consideration.

Investments in associates and joint ventures

An associate is an entity in which the Group exercises significant influence on financial and operational policies without having exclusive or joint control. Significant influence is presumed to exist when the Group's investment is at least 20%.

A joint venture is a partnership in which the parties (joint venturers) that exercise joint control over the entity have rights to the entity's net assets. Joint control is the contractually agreed sharing of control of an entity operated jointly by a limited number of partners or shareholders, such that the financial and operational policies result from unanimous consent of the parties.

Investments in associates and joint ventures are accounted for by the equity method. They are carried in the balance sheet at historical cost, adjusted for the share in net assets generated after the acquisition, less any impairment. The share in the net income for the period is reported in "Share in net income of associates and joint ventures" in the income statement (see note 12).

Investments in joint operations

A joint operation is a joint arrangement in which the parties (joint operators) that exercise joint control over the entity have direct rights to its assets, and obligations for its liabilities. The Group, as an operator in a joint operation, reports the assets and liabilities and income and expenses related to its investment line by line.

The Group's principal joint operations are the LNG optimisation activities of JERA Global Markets, co-owned by EDF Trading, and the gas storage operator activity carried out by Friedeburger Speicherbetriebsgesellschaft mbH (FSG).

Business combinations

In application of IFRS 3 business combinations arising since 1 January 2010 are measured and recognised under the following principles:

- At the date of acquisition, the identifiable assets acquired and liabilities assumed, measured at fair value, and any non-controlling interests in the Company acquired (minority interests) are recorded separately from goodwill;
- Non-controlling interests may be valued either at fair value (full goodwill method) or their share in the fair value of the net assets of the acquired company (partial goodwill method). The decision is made individually for each transaction;
- Any acquisition or disposal of an investment in a subsidiary that does not affect control is considered as a transaction between shareholders and must be recorded directly in equity;
- If additional interests are acquired in a joint venture, joint operation or associate without resulting in acquisition of control, the value of the previously-acquired assets and liabilities remains unchanged in the consolidated financial statements;
- If control is acquired in stages, the cost of the business combination includes the fair value, at the date control is acquired, of the purchaser's previously-held interest in the acquired company;
- Related costs directly attributable to an acquisition leading to control are treated as expenses for the periods in which they were incurred, except for issuance costs for debt securities or equity instruments, which must be recorded in compliance with IAS 32 and IFRS 9;
- IFRS 3 does not apply to common control business combinations, which are examined on a case-by-case basis to determine the appropriate accounting treatment;
- Commitments given by the Group to purchase minority interests in Group-controlled companies are included in liabilities. For commitments of this kind given since 1 January 2010, the date of the Group's first application of IAS 27 (amended) and IFRS 3 (revised), the differential between the value of the non-controlling interests and the liability corresponding to the commitment is recorded in equity.

3.1 Changes in the scope of consolidation

3.1.1 Changes in the scope of consolidation in 2021

The following main changes took place in the Group's scope of consolidation during 2021:

- acquisition of 70% of E2i on 16 February 2021;
- disposal of Edison Norge on 25 March 2021;
- disposal of Infrastrutture Distribuzione Gas (IDG) on 30 April 2021;
- disposal of Dalkia Wastenergy on 28 July 2021;
- disposal of interests in CENG on 9 August 2021;
- disposal of West Burton B on 31 August 2021;
- initial public offering of Pod Point on 4 November 2021;
- acquisition of Rolls-Royce Civil Nuclear I&C on 8 November 2021;
- disposal of 49% of Edison Renewables on 3 December 2021;
- consolidation of IZI Solutions Renov and Dynamics.

Acquisition of 70% of E2i

On 16 February 2021, Edison announced the completion of the agreement signed on 14 January 2021 with F2i Fondi Italiani per le Infrastrutture to take over 70% of E2i Energie Speciali, a leading company in the Italian wind power sector that is already fully consolidated by Edison, which held the remaining stake of 30%, in application of a specific governance arrangement.

This acquisition increased the Group's net indebtedness by €0.3 billion.

As it concerned a minority interest and there is no change of consolidation method, the €155 million difference between the sale price and the equity acquired has been charged to Equity (EDF share).

Sale of Edison Norge

On 25 March 2021, Edison announced the closing of the agreement signed with Sval Energi on 30 December 2020 to sell 100% of Edison Norge AS (the hydrocarbon exploration and production activities in Norway).

The balance sheet items for all of Edison Norge's operations were reclassified at 31 December 2020 as assets held for sale and related liabilities (see note 3.2).

This operation relates to the Group's exit from hydrocarbons exploration and production, and followed a first sale by Edison Exploration & Production to Energean, completed in December 2020. The price was based on an enterprise value of \$374 million and included a payment of \$12.5 million receivable when the Dvalin gas field is commissioned.

The sale of Edison Norge reduced the EDF group's net indebtedness by €0.3 billion and has no significant impact on the Group's net income.

Sale of Infrastrutture Distribuzione Gas (IDG)

On 30 April 2021, Edison announced the closing of the agreement signed with 2i Rete Gas to sell 100% of Infrastrutture Distribuzione Gas (IDG) for €150 million, pursuant to an agreement signed on 14 January 2021.

IDG manages gas distribution networks and plants in 58 municipalities in Abruzzo, Emilia-Romagna, Lazio, Lombardy and Veneto, and is present in 17 minimum territorial areas (Atem) and has 152,000 customers.

The balance sheet items for all of IDG were reclassified at 31 December 2020 as assets held for sale and related liabilities (see note 3.2).

This transaction reduced the Group's net indebtedness by €0.2 billion and has no significant impact on the Group's net income.

These two disposals (Edison Norge and IDG) will support Edison's plan for growth in strategic areas of business: production of renewable and low-carbon energies, energy efficiency, sustainable mobility and value-added services for customers.

Sale of Dalkia Wastenergy

Following receipt of the required regulatory approvals, Dalkia announced completion of the sale of 100% of Dalkia Wastenergy (formerly TIRU) to Paprec on 28 July 2021.

This transaction reduced the Group's net indebtedness by €0.1 billion and has no significant impact on the Group's net income.

Sale of the investment in CENG

On 9 August 2021, EDF announced completion of the sale of its 49.99% interest in Constellation Energy Nuclear Group, LLC ("CENG") to its joint venture partner, Exelon Generation, LLC ("Exelon"). The sale followed a Put Agreement entered into by EDF and Exelon in April 2014 ⁽¹⁾, in which Exelon granted EDF the right to sell its interest to Exelon at fair market value. EDF exercised the put option in January 2020 ⁽²⁾.

The sale price for EDF's investment in CENG was \$885 million (€750 million), and the transaction reduced the Group's net indebtedness by the same amount.

This transaction has an impact of €(0.3) million on the Group's net income.

Sale of West Burton B

On 9 April 2021, EDF announced the signature of a binding agreement with the investment fund EIG to sell its 1332MW Combined Cycle Gas Turbine power station and 49MW battery storage system at West Burton B in Nottinghamshire, and the West Burton C development project. On 31 August 2021, further to satisfaction of all necessary conditions precedent, the sale process was completed.

This transaction reduced the Group's net indebtedness by €0.3 billion and has no significant impact on the Group's net income.

Initial public offering of Pod Point

On 9 November 2021, EDF's subsidiary Pod Point, a UK company specialising in charging infrastructures for electric vehicles, was admitted to trading on the London Stock Exchange. Its IPO through new share issues raised £120 million. Following these operations EDF, as owner of more than 50%, retains control of Pod Point.

As this was a sale of a minority interest with no change of consolidation method, the non-significant difference between the sale price and the equity transferred was recognised as an increase to Equity (EDF share).

This transaction reduced the Group's net indebtedness by €0.1 billion.

Rolls-Royce Civil Nuclear I&C

On 8 November 2021 Framatome completed the purchase of Rolls Royce Civil Nuclear Instrumentation and Control (I&C), for which the contract had been signed on 7 December 2020.

The acquisition of Rolls-Royce Civil Nuclear's products and technologies (such as Spinline, Rodline and Hardline) will enable Framatome to capitalise on its engineering expertise, broaden its industrial footprint, strengthen its ability to serve customers and expand its nuclear I&C business across the world.

As control was acquired through this acquisition, the €92 million difference between the purchase price and the equity acquired was recognised as goodwill.

(1) Cf. EDF Press Release of 1 April 2014 "EDF and Exelon finalize agreement on CENG".

(2) Cf. EDF Press Release of 20 November 2019 "EDF notifies the exercise of its put option on its participation in CENG".

Sale of 49% of Edison Renewables

On 14 December 2021, Edison and Crédit Agricole Assurances completed the transaction signed on 3 December 2021. Crédit Agricole Assurances has thus become Edison's long-term financial partner, acquiring 49% of Edison Renewables' platform and participating in the development of its wind and photovoltaic production. The transaction valued Edison Renewables at more than €2 billion and followed the acquisition of 70% of the capital of E2i on 16 February 2021.

Edison retains full control over the company's business and governance and will lead its development in renewable energies in line with the decarbonisation targets fixed by the Italian PNIEC (National Integrated Energy and Climate Plan) and the

European Green Deal. Edison will continue to fully consolidate Edison Renewables, which has renewable energy assets with a total capacity of 1.1GW, including approximately 1,000MW of wind farms located in the windiest areas of the country.

As this was a sale of a non-controlling interest with no change of consolidation method, the €455 million difference between the sale price and the equity transferred was recognised as an increase to Equity (EDF share).

This transaction reduced the Group's net indebtedness by €0.9 billion.

All the transactions completed as part of the disposal plan in 2021 reduced the Group's net indebtedness by a total €2.8 billion.

3.1.2 Changes in the scope of consolidation in 2020

The following changes in the Group's scope of consolidation took place during 2020:

- disposal of Edison Exploration and Production SpA. (E&P) on 17 December 2020 (see notes 1.4.2 and 3.2 to the consolidated financial statements at 31 December 2020);
- consolidation of EDF Pulse Holding (formerly EDF Pulse Croissance), Agregio, Energy2Market (E2M) and IZIVIA.

3.2 Discontinued operations

Accounting principles and methods

Assets that qualify as held for sale and related liabilities are disclosed separately from other assets and liabilities in the balance sheet.

When assets or groups of assets are classified as discontinued operations, income and expenses relating to these discontinued operations are disclosed in a single net amount after taxes in the income statement and net changes in cash and cash equivalents of discontinued operations are also reported separately in the cash flow statement.

Impairment is booked when the realisable value is lower than the net book value.

In accordance with IFRS 5:

- for assets or groups of assets that are identified and classified as held for sale during the year, there is no change of presentation or retrospective restatement in prior year balance sheets;
- assets or groups of assets that qualify as discontinued operations are restated in the income statement and the cash flow statement for the prior periods presented in the financial statements.

3.2.1 Assets held for sale and related liabilities

(in millions of euros)	31/12/2021	31/12/2020
ASSETS HELD FOR SALE	69	2,296
LIABILITIES RELATED TO ASSETS HELD FOR SALE	30	108

In application of IFRS 5, assets held for sale and related liabilities are shown below:

(in millions of euros)	31/12/2021	31/12/2020
Non-current non-financial assets ⁽¹⁾	-	316
Non-current financial assets	-	1,811
Current non-financial assets ⁽²⁾	69	151
Current financial assets	-	18
TOTAL ASSETS HELD FOR SALE	69	2,296

(in millions of euros)	31/12/2021	31/12/2020
Non-current non-financial liabilities ⁽³⁾	-	86
Non-current financial liabilities	-	1
Current non-financial liabilities	30	21
Current financial liabilities	-	-
TOTAL LIABILITIES RELATED TO ASSETS HELD FOR SALE	30	108

(1) Non-current non-financial assets comprise tangible assets and property, plant and equipment.

(2) Current non-financial assets comprise components of working capital and deferred taxes.

(3) Non-financial liabilities comprise provisions.

At 31 December 2021, assets held for sale and related liabilities concern the following:

- the residual amount of assets corresponds to the price supplement for the Dvalin gas project (E&P in Norway) and Cassiopea (E&P in Italy);
- the residual amount of liabilities corresponds to provisions on the Energian contract.

The decrease in assets held for sale and related liabilities is explained by:

- the sale of Edison Norge in March 2021 (see note 3.1) which represented assets of €331 million and liabilities of €42 million at 31 December 2020;
- the sale of Infrastrutture Distribuzione Gas (IDG), a fully-owned subsidiary of Edison (see note 3.1) which represented assets of €98 million and liabilities of €7 million at 31 December 2020;
- the sale of the shares held in CENG (see note 3.1) in August 2021 which represented assets of €1,811 million at 31 December 2020.

The principal profit and loss indicators for the E&P operations (excluding the Algerian and Norwegian operations) in 2020 and 2021 are as follows:

<i>(in millions of euros)</i>	2021	2020
Sales	-	216
Operating profit before depreciation and amortisation	(1)	86
Operating profit	(1)	13
Financial result	-	(22)
Income taxes	-	(32)
NET INCOME	(1)	(41)
Impairment of discontinued operations, net of income taxes	-	(117)
NET INCOME OF DISCONTINUED OPERATIONS	(1)	(158)

3.2.2 Net income of discontinued operations

In the 2020 financial statements, the line "Net income of discontinued operations" comprised Edison's E&P operations (excluding the Algerian and Norwegian operations), and impairment recognised in respect of these assets.

As these E&P operations were sold in December 2020, no net income of discontinued operations is presented in 2021 except for the estimated adjustments to prices or warranties related to the sale transaction (see note 1.4.2 to the consolidated financial statements at 31 December 2020).

3.3 Scope of consolidation at 31 December 2021

The Group's business sectors are defined as follows:

- **"Generation/Supply"** (G): generation of nuclear energy, thermal energy, and renewable energies (wind, photovoltaic and hydro) and energy sales to industry, local authorities, small businesses and private customers. This segment also includes trading activities;
- **"Distribution"** (D): management of the low and medium-voltage public electricity distribution networks;
- **"Transmission"** (T): operation, maintenance and development of the high-voltage and very-high-voltage electricity transmission networks;

- **"Reactors and Services (Framatome)"** (R): services and production of equipment and fuel for nuclear reactors;

- **"Services and other activities"** (O): energy services (district heating, thermal energy services, etc.) for industry and local authorities. This activity also includes EDF Invest's holding companies and entities that are classified as dedicated assets.

The companies and subgroups included in the EDF group consolidation are listed below.

3.3.1 Fully consolidated companies

		Percentage ownership at 31/12/2021	Percentage ownership at 31/12/2020	Business sector
FRANCE – GENERATION AND SUPPLY				
Électricité de France – Parent Company		100.00	100.00	G,D,O
Group Support Services (G2S)		100.00	100.00	O
Edvance		95.10	95.10	O
Cyclife		100.00	100.00	O
CHAM SAS		100.00	100.00	O
Sowee		100.00	100.00	O
IZI Solutions		100.00	100.00	O
IZI Solutions Renov		100.00	-	O
IZIVIA		100.00	100.00	O
EDF Pulse Holding (formerly EDF Pulse Croissance)		100.00	100.00	O
Hynamics		100.00	-	G
Agregio		100.00	100.00	O
Energy2Market (E2M)		100.00	100.00	O
EDF ENR (formerly ENRS)		100.00	100.00	O
Immo C47		51.00	51.00	O
Other holding companies (EDF Invest)		100.00	100.00	O
FRANCE – REGULATED ACTIVITIES				
Enedis		100.00	100.00	D
Électricité de Strasbourg		88.64	88.64	G, D
EDF Production Électrique Insulaire (EDF PEI)		100.00	100.00	G
FRAMATOME				
Framatome	France	75.50	75.50	R
UNITED KINGDOM				
EDF Energy Holdings Limited (EDF Energy)		100.00	100.00	G, O
EDF Energy UK Ltd.		100.00	100.00	O
ITALY				
Edison SpA (Edison)		97.17	97.45	G, O
Transalpina di Energia SpA (TdE SpA)		100.00	100.00	O
OTHER INTERNATIONAL				
EDF International SAS	France	100.00	100.00	O
EDF Belgium SA	Belgium	100.00	100.00	G
Luminus SA	Belgium	68.63	68.63	G, O
EDF Norte Fluminense SA	Brazil	100.00	100.00	G
French Investment Guangxi Laibin Electric Power Co., Ltd. (Figlec)*	China	-	100.00	G
EDF (China) Holding Ltd.	China	100.00	100.00	O
EDF Inc.	USA	100.00	100.00	O
EDF Alpes Investissements SARL	Switzerland	-	100.00	O
Mekong Energy Company Ltd. (MECO)	Vietnam	56.25	56.25	G
EDF Andes Spa	Chile	100.00	100.00	G

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

* French Investment Guangxi Laibin Electric Power Co., Ltd. (Figlec) has been liquidated in 2021.

		Percentage ownership at 31/12/2021	Percentage ownership at 31/12/2020	Business sector
EDF RENEWABLES				
EDF Renewables	France	100.00	100.00	G,O
DALKIA				
Dalkia	France	99.94	99.94	O
OTHER ACTIVITIES				
EDF Développement Environnement SA	France	100.00	100.00	O
EDF IMMO and real estate subsidiaries	France	100.00	100.00	O
Société C3	France	100.00	100.00	O
EDF Holding SAS	France	100.00	100.00	O
Citelum	France	100.00	100.00	O
EDF Trading Ltd.	United Kingdom	100.00	100.00	G
Wagram Insurance Company DAC	Ireland	100.00	100.00	O
EDF Investissements Groupe SA	Belgium	92.46	92.46	O
Océane Re	Luxembourg	99.98	99.98	O
EDF Gas Deutschland GmbH	Germany	100.00	100.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.2 Joint operations

		Percentage ownership at 31/12/2021	Percentage ownership at 31/12/2020	Business sector
<i>Other activities</i>				
Friedeburger Speicherbetriebsgesellschaft GmbH (Crystal)	Germany	50.00	50.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.3 Companies accounted for by the equity method

		Percentage ownership at 31/12/2021	Percentage ownership at 31/12/2020	Business sector
FRANCE – GENERATION AND SUPPLY				
Domofinance	France	45.00	45.00	O
CTE (EDF Invest) ⁽¹⁾	France	50.10	50.10	O
Elisandra IV (Madrileña Red de Gas Holding) (EDF Invest)	Spain	20.00	20.00	O
AREPE Fund SCS (EDF Invest)	Luxembourg	-	21.99	O
Géosel Manosque (EDF Invest)	France	38.35	38.35	O
Transport Stockage Hydrocarbures (EDF Invest)	France	50.00	50.00	O
Central Sicaf (EDF Invest)	Italy	24.50	24.50	O
Thyssengas (EDF Invest)	Germany	50.00	50.00	O
Aéroports Côte d'Azur (EDF Invest)	France	19.40	19.40	O
Ecowest (EDF Invest)	France	50.00	50.00	O
Fallago Rig (EDF Invest)	United Kingdom	20.00	20.00	G
Fenland Wind Farm (EDF Invest)	United Kingdom	20.00	20.00	G
Catalinar Solar (EDF Invest)	USA	50.00	50.00	G
Switch (EDF Invest)	USA	50.00	50.00	G
MiRose (EDF Invest)	USA	50.00	50.00	G
Red Pine (EDF Invest)	USA	50.00	50.00	G
Energy Assets Group (EDF Invest)	United Kingdom	40.00	40.00	O
Valentine Solar (EDF Invest)	USA	50.00	50.00	G
Glacier's Edge (EDF Invest)	USA	50.00	50.00	G
Nicolas Riou (EDF Invest)	Canada	50.00	50.00	G
Arada (EDF Invest)	Portugal	-	30.00	G
Cabreira (EDF Invest)	Portugal	-	30.00	G
Montemuro (EDF Invest)	Portugal	-	30.00	G
Korian & Partenaires Immobilier 1 & 2 (EDF Invest)	France	24.50	24.50	O
Issy Shift (EDF Invest)	France	33.33	-	O
Orange Concessions (EDF Invest)	France	16.66	-	O
92 France (EDF Invest)	France	50.00	-	O
OTHER INTERNATIONAL				
Compagnie Énergétique de Sinop (CES)	Brazil	51.00	51.00	G
Constellation Energy Nuclear Group LLC (CENG) ⁽²⁾	USA	-	49.99	G
SLOE Centrale Holding BV	Netherlands	50.00	50.00	G
Shandong Zhonghua Power Company, Ltd.	China	19.60	19.60	G
Datang Sanmenxia Power Generation Co., Ltd.	China	35.00	35.00	G
Taishan Nuclear Power Joint Venture Company Ltd. (TNPJVC)	China	30.00	30.00	G
Jiangxi Datang International Fuzhou Power Generation Company Ltd.	China	49.00	49.00	G
Nam Theun 2 Power Company (NTPC) (EDF Invest)	Laos	40.00	40.00	G
Generadora Metropolitana (GM)	Chile	50.00	50.00	G
Nachtigal Hydro Power Company	Cameroon	40.00	40.00	G

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

(1) Coentreprise de Transport d'Électricité or CTE, the company holding 100% of RTE.

(2) Shares in Constellation Energy Nuclear Group LLC (CENG) was sold on 6 August 2021 (see note 3.1).

3.3.4 Companies in which the EDF group's voting rights differ from its percentage ownership

The percentage of voting rights, which is decisive for assessing control, differs from the Group's percentage ownership for the following entities:

	Percentage ownership at 31/12/2021	Percentage of voting rights held at 31/12/2021
Edison SpA	97.17	99.48
EDF Investissements Groupe SA	92.46	50.00

Note 4 Segment reporting

4.1 Reporting by operating segment

Accounting principles and methods

Segment reporting presentation complies with IFRS 8, "Operating segments".

Segment reporting is presented before inter-segment eliminations. Inter-segment transactions take place at market prices.

In accordance with IFRS 8, the breakdown used by the EDF group corresponds to the operating segments as regularly reviewed by the Management Committee (the Group's chief operating decision-maker).

The Group's segments are:

- **"France – Generation and Supply"**: EDF SA's energy production and sales activities. This segment also includes entities operating on the downstream sectors (B2B and B2C, aggregation) and all EDF Invest's shareholdings;
- **"France – Regulated activities"**: Enedis and Électricité de Strasbourg's distribution activities, and EDF's island activities;
- **"Framatome"**: the entities of the Framatome subgroup;
- **"United Kingdom"**: the entities of the EDF Energy subgroup;
- **"Italy"**: Edison entities and TdE SpA;
- **"Other international"**: EDF International and the entities located in continental Europe, the US, Latin America and Asia;
- **"EDF Renewables"**: the entities of the EDF Renewables subgroup;
- **"Dalkia"**: the entities of the Dalkia subgroup;
- **"Other activities"**: comprising in particular EDF Trading and EDF Investissements Groupe.

No segments have been merged.

4.1.1 At 31 December 2021

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy	Other international	EDF Renew- ables	Dalkia	Other activities ⁽⁵⁾	Inter- segment elimina- tions	Total
Income statement:											
External sales	31,532	17,483	1,862	10,103	11,166	3,148	1,203	4,503	3,461	-	84,461
Inter-segment sales	1,650	81	1,500	11	46	205	564	693	444	(5,194)	-
TOTAL SALES	33,182	17,564	3,362	10,114	11,212	3,353	1,767	5,196	3,905	(5,194)	84,461
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	7,394	5,992	584	(21)	1,046	267	815	378	1,824	(274)	18,005
OPERATING PROFIT	2,394	2,610	265	(2,016)	608	(475)	241	217	1,655	(274)	5,225
Balance sheet:											
Goodwill	126	223	1,428	8,095	108	46	185	592	142	-	10,945
Intangible assets and property, plant and equipment	61,468	67,273	2,826	24,408	5,744	2,084	10,842	2,248	578	-	177,471
Investments in associates and joint ventures ⁽¹⁾	3,474	-	70	187	178	2,071	1,453	64	587	-	8,084
Financial assets and cash ⁽²⁾	55,415	420	323	18,949	1,512	697	1,788	262	26,099	-	105,465
Other segment assets ⁽³⁾	22,024	4,204	1,997	5,240	5,913	1,265	1,166	2,708	14,415	-	58,932
Assets classified as held for sale	-	-	-	-	69	-	-	-	-	-	69
TOTAL ASSETS	142,507	72,120	6,644	56,879	13,524	6,163	15,434	5,874	41,821	-	360,966
Other information:											
Net depreciation and amortisation ⁽⁴⁾	(4,449)	(3,381)	(291)	(1,071)	(422)	(305)	(520)	(281)	(69)	-	(10,789)
Impairment	(24)	-	(5)	(713)	149	-	(54)	(5)	(1)	-	(653)
Equity (non-controlling interests)	115	43	86	8,899	552	407	897	258	521	-	11,778
Investments in intangible assets and property, plant and equipment	5,327	4,784	280	4,325	592	129	1,849	295	25	-	17,606
Loans and other financial liabilities	71,214	3,386	304	5,417	1,902	13,761	7,513	2,143	3,267	(39,501)	69,406
• external liabilities	63,378	820	237	201	988	112	3,165	303	202	-	69,406
• intersegment liabilities ⁽⁶⁾	7,836	2,566	67	5,216	914	13,649	4,348	1,840	3,065	(39,501)	-

(1) At 31 December 2021, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

(2) Financial assets and cash mainly comprise dedicated assets amounting to €31,013 million in the France – Generation and Supply segment (see note 18.1.2), the NLF receivable (see note 18.1.3) amounting to €15,986 million in the United Kingdom segment and the positive fair value of EDF Trading's derivatives, amounting to €19,605 million (in "Other activities").

(3) Other segment assets include inventories, trade receivables, other receivables and tax assets.

(4) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

(5) Sales by the "Other activities" segment include the €1,518 million trading margin realised by EDF Trading.

(6) The amount of intersegment liabilities corresponds to the Group's centralised cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment), EDF Energy (United Kingdom segment) and EDF Trading (in the "Other activities" segment).

4.1.2 At 31 December 2020

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy	Other international	EDF Renew- ables	Dalkia	Other activities ⁽⁵⁾	Inter- segment elimina- tions	Total
Income statement:											
External sales	27,112	16,178	1,900	9,041	5,937	2,242	1,069	3,729	1,823	-	69,031
Inter-segment sales	1,249	50	1,395	-	30	178	513	483	304	(4,202)	-
TOTAL SALES	28,361	16,228	3,295	9,041	5,967	2,420	1,582	4,212	2,127	(4,202)	69,031
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	7,412	5,206	534	823	683	380	848	290	261	(263)	16,174
OPERATING PROFIT	2,270	1,893	269	(947)	134	98	354	(32)	99	(263)	3,875
Balance sheet:											
Goodwill	109	223	1,332	7,569	98	37	183	572	142	-	10,265
Intangible assets and property, plant and equipment	60,773	65,383	2,603	20,537	5,286	2,127	9,782	2,255	647	-	169,393
Investments in associates and joint ventures ⁽¹⁾	2,859	-	65	119	156	1,991	1,197	75	332	-	6,794
Financial assets and cash ⁽²⁾	52,134	339	263	14,833	400	654	1,727	170	6,897	-	77,417
Other segment assets ⁽³⁾	19,901	5,608	1,763	4,772	1,661	662	866	1,919	2,574	-	39,726
Assets classified as held for sale	-	-	-	-	485	1,811	-	-	-	-	2,296
TOTAL ASSETS	135,776	71,553	6,026	47,830	8,086	7,282	13,755	4,991	10,592	-	305,891
Other information:											
Net depreciation and amortisation ⁽⁴⁾	(4,613)	(3,314)	(276)	(1,122)	(417)	(284)	(458)	(278)	(76)	-	(10,838)
Impairment	(16)	-	-	(638)	(74)	-	(36)	(34)	(1)	-	(799)
Equity (non-controlling interests)	118	38	115	7,090	178	423	828	284	519	-	9,593
Investments in intangible assets and property, plant and equipment	5,503	4,187	215	3,485	492	191	1,650	257	27	-	16,007
Loans and other financial liabilities	67,534	2,335	288	5,311	1,737	11,564	6,537	1,695	264	(31,674)	65,591
• external liabilities	60,181	761	198	225	823	96	2,792	312	203	-	65,591
• intersegment liabilities ⁽⁶⁾	7,353	1,574	90	5,087	913	11,468	3,747	1,380	62	(31,674)	-

(1) At 31 December 2020, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

(2) Financial assets and cash mainly comprise dedicated assets amounting to €28,398 million in the France – Generation and Supply segment (see note 18.1.2) and the NLF receivable (see note 18.1.3) amounting to €13,034 million in the United Kingdom segment.

(3) Other segment assets include inventories, trade receivables, other receivables and tax assets. By convention, the CSPE receivable is totally allocated to the France – Regulated Activities segment, in the amount of €1,993 million (see note 13.3.4).

(4) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

(5) Sales by the "Other activities" segment include the €912 million trading margin realised by EDF Trading.

(6) The amount of intersegment liabilities corresponds to the Group's centralised cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment) and EDF Energy (United Kingdom segment).

4.2 Sales to external customers, by product and service group

The Group's sales are broken down by product and service group as follows:

- **"Generation/Supply"**: energy generation and energy sales to industry, local authorities, small businesses and residential consumers. This segment also includes EDF Trading;
- **"Distribution"**: management of the low and medium-voltage public electricity distribution networks;
- **"Other"**: services and production of equipment and fuel for reactors, energy services (district heating, thermal energy services, etc.) for industry and local authorities, and electricity generation through cogeneration and renewable energy sources (e.g. wind turbines, photovoltaic panels, etc.).

(in millions of euros)	Generation – Supply	Distribution	Other ⁽¹⁾	Total
2021:				
External sales:				
• France ⁽²⁾	31,678	16,960	377	49,015
• International and Other activities	27,292	-	8,154	35,446
SALES	58,970	16,960	8,531	84,461

(in millions of euros)	Generation – Supply	Distribution	Other ⁽¹⁾	Total
2020:				
External sales:				
• France ⁽²⁾	27,261	15,731	298	43,290
• International and Other activities	18,601	-	7,140	25,741
SALES	45,862	15,731	7,438	69,031

(1) "Other" groups of services include Framatome.

(2) France comprises the two operating segments France – Generation and Supply and France – Regulated activities (see note 4.1).

Note 5 Operating profit before depreciation and amortisation

(in millions of euros)	Notes	2021	2020
Sales	5.1	84,461	69,031
Fuel and energy purchases	5.2	(44,299)	(32,425)
External services		(14,145)	(13,072)
Other purchases (excluding external services, fuel and energy)		(3,698)	(3,524)
Change in inventories and capitalised production		8,987	7,888
(Increase)/decrease in provisions on other external expenses		261	247
Other external expenses ⁽¹⁾		(8,595)	(8,461)
Personnel expenses	5.3	(14,494)	(13,957)
Payroll taxes		(301)	(292)
Energy taxes		(1,672)	(1,635)
Other non-income taxes ⁽²⁾		(1,357)	(1,870)
Taxes other than income taxes ⁽³⁾		(3,330)	(3,797)
Other operating income and expenses	5.4	4,262	5,783
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION		18,005	16,174

(1) After elimination of the effect of changes in foreign exchange rates and the scope of consolidation, other external expenses increased by 1.3% compared to 2020.

(2) Taxes other than income taxes mainly concern France and essentially comprise land tax and the French business taxes on land and value added.

(3) After elimination of changes in foreign exchange rates and scope of consolidation, taxes other than income taxes decreased by 12% compared to 2020, principally due to lower generation taxes introduced in France's economic recovery plan.

The Group's consolidated operating profit before depreciation and amortisation for 2021 amounts to €18,005 million, an organic increase of 11.3% from 2020.

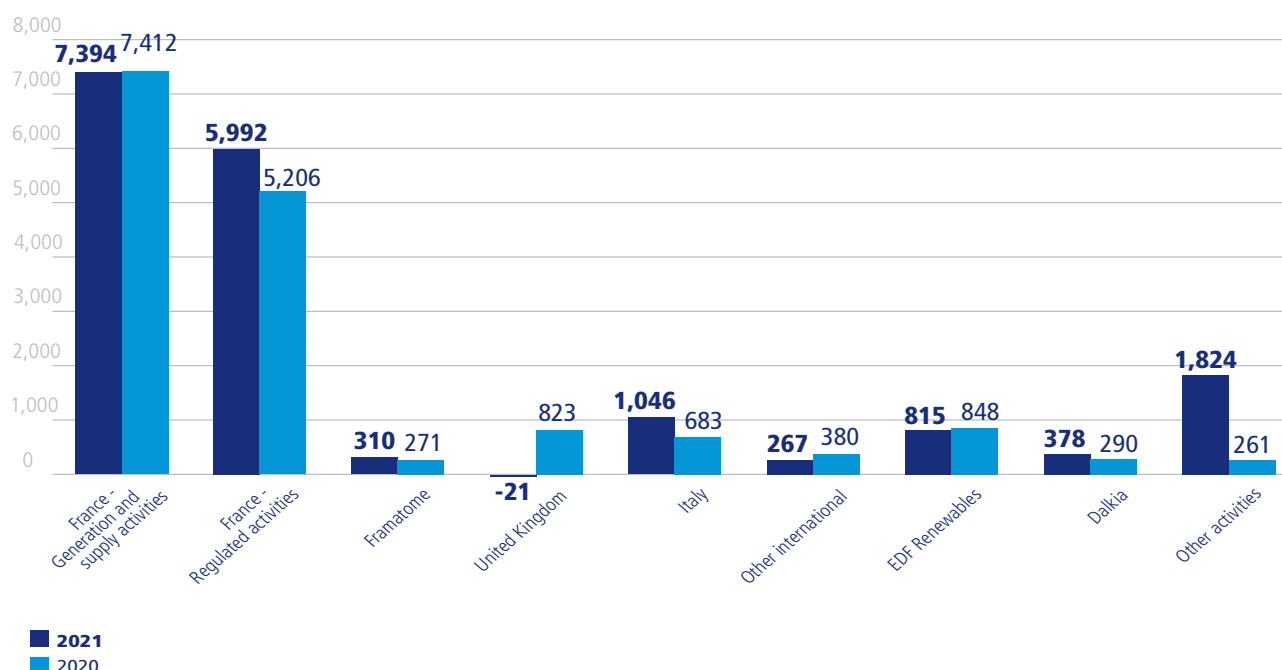
The breakdown of the Group's Operating profit before depreciation and amortisation by operating segment in 2021 and 2020 is as follows, in millions of euros (see note 4.1):

Operating profit before depreciation and amortisation

in M€

Operating profit before depreciation and amortisation

In million of euros



After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's operating profit before depreciation and amortisation registered organic growth of 11.3% or €1,825 million. This increase is principally explained by the contributions of the France – Regulated activities segment (+15.1% or +€786 million), Other activities (+€1,563 million), Italy (+53.0% or +€362 million) and the United Kingdom (-108.0% or €(889) million).

The rise in operating profit before depreciation and amortisation includes €476 million resulting from the lower generation taxes in France under the government measures decided for the national recovery plan, comprising €322 million for the France – Generation and Supply segment and €130 million for the France – Regulated activities segment.

Note that in 2020, operating profit before depreciation and amortisation had been affected by the Covid-19 pandemic which had an estimated impact of €(1,479) million. The principal business segments concerned were France – Generation and Supply (€(872) million), France – Regulated activities (€(237) million) and the United Kingdom (€(182) million).

The stability of the operating profit before depreciation and amortisation in the France – Generation and Supply segment (€(21) million) is explained by several factors, particularly the following two contrasting effects: a 25.3TWh rise in nuclear power output in 2021, whereas generation in 2020 had been greatly affected by the Covid-19 pandemic (estimated impact of 33TWh in 2020 due to modulation and adaptation of the maintenance outage schedule) and a 2.6TWh decrease in hydropower output; and despite the favourable effects of higher generation volumes, very unfavourable energy price effects relating to purchases and sales on the open market as purchases had to be made at very high prices, particularly in the fourth quarter when certain power plants were offline. The operating profit before depreciation and amortisation was also supported by the reduction in generation taxes introduced as part of the French government's national recovery plan.

Operating profit before depreciation and amortisation for the France – Regulated activities segment registered growth of €786 million, principally reflecting the 15.8TWh increase in volumes delivered due to the favourable climate effect, changes in tariff indexations, and the unfavourable effect of higher energy purchases to compensate for network losses as prices rose substantially at the end of the year. The operating profit before depreciation and amortisation was also

sustained by a high number of consumer and producer connections, after 2020 had been affected by Covid-19 measures, and a decrease in generation taxes.

The €(31) million decline in EDF Renewables' operating profit before depreciation and amortisation was principally due to the negative consequences of the exceptional spell of cold weather in Texas, and conversely, the favourable effect of progress in generation and development and sales of structured assets, mainly in the United States and Portugal.

The Italy segment saw a rise of €362 million in operating profit before depreciation and amortisation, notably reflecting the resumption of business with industrial customers on the gas segment, and residential and business customers on the electricity segment, after the pandemic-affected year 2020. This rise also reflects the colder weather in a context of good performances by fossil-fired and renewable generation, and optimisation activities. The operating profit before depreciation and amortisation was also augmented by the gain on disposal of Infrastrutture Distribuzione Gas (IDG).

In the United Kingdom, the substantial €(889) million decrease in operating profit before depreciation and amortisation is explained by a number of factors: a decline in nuclear power output (-4TWh) and the substantial decline in realised nuclear power prices reflecting purchases made at high prices to serve customers in this context of lower output; a recovery of business with industrial customers, which had been penalised in 2020 by the Covid-19 pandemic; the impossibility in 2021 of passing on energy price rises to customers on the Standard Variable Tariff due to the price cap mechanism, and the takeover of certain suppliers' customer portfolios in application of the regulator's supplier of last resort mechanism.

The significant €92 million increase in Dalkia's operating profit before depreciation and amortisation largely reflects the resumption of services and works after the Covid-19-affected year 2020.

In the Other activities segment, of the €1,563 million improvement in operating profit before depreciation and amortisation, €881 million is attributable to the gas activities, principally reflecting higher gas prices (including the variation in increases/decreases to provisions for onerous contracts between 2020 and 2021), and €567 million is attributable to EDF Trading following the high market volatility observed in Europe and the United States (notably during the spell of extremely cold weather in Texas), and to a lesser degree sales of real estate assets in France.

5.1 Sales

Accounting principles and methods

Sales essentially comprise income from energy sales (to final customers and as part of trading activities), delivery services related to use of the transmission and distribution network, and connection services. They also comprise income from other services and deliveries of goods, mainly engineering, operating and maintenance services, services related to energy sales, design, delivery and commissioning services for power plants or their major components.

Income on energy sales is recognised as deliveries are made to customers.

The quantities of energy supplied but not yet measured and billed are calculated using consumption statistics and selling price estimates, and are recognised in sales on that basis.

Some Group entities conduct optimisation operations on the wholesale gas and electricity markets, to balance supply and demand in compliance with the Group's risk management policy. The sales concerned are recorded net of purchases. When an entity has a net short position in euros, it is included in "energy sales". A net long position in euros is included in "fuel and energy purchases".

In accordance of IFRS 15 on the principal/agent distinction, energy delivery services are recognised in sales upon delivery to the customer in the following two cases:

- when these services are not distinct from the energy supply service;
- when they are distinct from the energy supply service and the entity concerned is acting as a principal, notably because it bears the risk of execution of the service or is able to set the tariff for delivery to the final customer.

Income from connections to the French electricity network is recognised in sales at the date when the connection becomes operational.

The sales revenue from other services or deliveries of goods is recognised over time in the three following cases, based on a contractual analysis:

- when the customer simultaneously receives and consumes all the benefits generated as the service is performed by the Group (this is notably the case of operations and maintenance services);
- when the good or service to be supplied cannot be reallocated to another customer, and the Group is entitled to payment for the work done so far (this is notably the case of certain design, delivery and commissioning activities for power plants or major components designed specifically for a customer);
- when the service creates or enhances an asset (good or service) for which the customer acquires control as performance of the service progresses.

Trading activities

Sales revenues include the margin realised, essentially by EDF Trading, on energy market trading operations that fall within the scope of IFRS 9, which are recognised at fair value.

EDF Trading is the Group's trading entity. It operates on the markets on behalf of other Group entities and through trading activity for its own purposes or for non-Group entities, backed by the Group's industrial assets and within its assigned risk mandate.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options.

EDF Trading undertakes purchase and sale operations on the wholesale markets in Europe and North America for:

- electricity and fuel (principally gas);
- CO₂ emission permits, weather derivatives and other environmental instruments;
- capacity guarantees for electricity production.

EDF Trading also operates in the unregulated North American markets as part of its energy supply activities.

For LNG, optimisation activities (recognised as a joint operation) and trading activities (recognised as a joint venture) are carried out through JERA Global Markets, which is jointly owned with JERA.

Capacity mechanism

Capacity mechanisms have been set up in France, the UK and Italy to ensure secure power supplies during peak periods.

French system: French law 2010-1488 of 7 December 2010 on the new organisation of the electricity market introduced an obligation in France to contribute to guaranteeing a secure power supply from January 2017.

Operators of electricity generation plants and load-shedding operators must have their capacities certified by RTE, and commit to a forecast level of availability for a given year of delivery. In return, they are awarded capacity certificates.

Meanwhile, electricity suppliers and purchasers of power to compensate for network losses (obligated actors) must have capacity certificates equivalent to consumption by their customers in peak periods. Suppliers pass on the cost of the capacity mechanism to final customers through their sale prices.

The system is completed by registers for capacity trading between actors. Capacity auctions are held several times a year.

The Group is concerned by both aspects of this system, as an operator of electricity plants (EDF SA, Dalkia, EDF Renewables), as an electricity supplier (EDF SA, Électricité de Strasbourg) and as a purchaser of power to compensate for network losses (Enedis and Électricité de Strasbourg).

As a result of the capacity mechanism review clause, in 2021 RTE published a report on the mechanism's first few years of operation and performance. On the basis of this report, on 29 November 2021 RTE submitted rule change proposals to the CRE for its opinion. In decision 2021-370 of 16 December 2021, the CRE issued a favourable opinion of these proposals and of changes to certain parameters for delivery years 2023 and 2024 (the contribution by interconnections, the extreme temperature vector and the safety coefficient). The CRE considered that the proposed changes will simplify the capacity mechanism for all actors, and improve visibility for capacity market participants. The new rules were approved by decision of the Ministry for the Ecological Transition on 21 December 2021. They set the opening date for trading of capacity guarantees for delivery years 2023 and 2024 at 1 March 2022.

The auctions organised by EPEX Spot for delivery years 2023 and 2024 will be held from March 2022.

Another consultation phase is due to take place in 2022. It will concern structural changes to the capacity mechanism starting from delivery year 2025, which will require approval by the European Commission.

The trading sessions of 2020 registered a significant increase in capacity prices for the 2020s and subsequent years from the auction in June 2020. This is mainly explained by the market actors anticipating lower fleet availability for peak periods, in the context of the Covid-19 crisis. In 2021, prices generally remained high, sustained by electricity prices and tensions on the electricity system for the winter 2021-2022.

For delivery years 2017 to 2021, the mean market prices resulting from capacity auctions ahead of the delivery year were as follows:

Delivery year	2017	2018	2019	2020	2021
Price (€/kW)	10.0	9.3	17.4	19.5	31.2

The delivery year 2022 was opened to auction in 2020, and ten auctions have been held since then, six of them in 2021. These capacity auctions resulted in the following prices, in chronological order:

- in 2020: €16.6/kW in April; €38.9/kW in June; €18.1/kW in October and €18.2/kW in December;
- in 2021: €28.3/kW in March; €28.2/kW in April; €28.8/kW in June; €29.9/kW in September and €31.5/kW in October and €23.9/kW in December.

The operations are recorded as follows:

- sales of certificates are recognised in income when the auctions or over-the-counter sales take place;
- the cost of the capacity mechanism passed on to final customers through regulated sales tariffs and market-price offers is recognised in sales revenues as and when the electricity is delivered. In addition, the ARENH price, although it has not changed since first introduced, is considered to have included a capacity value since 1 January 2017 when the capacity mechanism took effect, as the terms of transfer for the capacity guarantees associated with the ARENH scheme were defined by the CRE;
- stocks of certificates are stated either at their certification value (*i.e.* cost of certification by RTE) or at their purchase value on the markets;
- decreases in the stock of certificates are valued at the weighted average unit cost. The timing of recognition depends on the actor:
 - › operators of installations: when the auction sales take place,
 - › obligated actors: spread on a straight-line basis over the 5-month peak period;
- for operators of installations, if the effective capacity is lower than the certified capacity, a liability (accrued expenses or provision) is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation (rebalancing or settlement mechanism);
- for obligated actors, if there is a shortfall in the stocks of capacity certificates, a provision is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation;
- at the closing date, if the realisable value of the stock of capacity certificates is lower than its net book value, impairment is recognised.

British system:

The British capacity mechanism was introduced in 2014 to ensure security of electricity supply by providing a payment for reliable sources of capacity, alongside their electricity revenues, to ensure they deliver energy when needed. It is based on a system of auctions for operators, organised by the network operator "National Grid" to procure capacity 4 years ahead of delivery; delivery years run from 1 October to 30 September. Capacity operators which have been successful at the auctions are remunerated in the year of delivery out of a fund consisting of contributions from electricity suppliers.

The electricity suppliers' contribution to this mechanism is proportional to their sales to customers in the peak period and the cost of capacity is passed on to final customers through their sale price.

EDF Energy is concerned by both aspects of this system, as an operator of electricity plants and a supplier.

For accounting purposes, the remuneration received in its capacity as an operator is recognised in sales revenues in the year of delivery, and the contribution paid to the mechanism in its capacity as an electricity supplier is recognised in energy purchases over the peak period. The cost of the capacity mechanism passed on to final customers is recognised in sales revenues as and when the electricity is delivered.

In November 2018, a judgment by the General Court of the Court of Justice of the EU had the effect of annulling the European Commission's State aid approval for the capacity market scheme, leading to a standstill period during which no capacity payments could be made.

In October 2019, following a further State aid investigation; the European Commission reappraised the capacity market scheme, enabling the resumption of capacity payments.

Deferred capacity payments in respect of the standstill period were made to capacity providers, including EDF Energy's nuclear, coal and gas-fired generation, in January 2020. The capacity market continues to operate, although the inclusion of new emission limits means that unabated coal-fired generation will be unable to compete for capacity agreements for periods after 30 September 2024. The UK Government has also announced its intention to require unabated coal-fired generation to close by this date. The UK Government's five-year review of the capacity market, published in 2019, committed to retaining the capacity market as a guarantee of system reliability and to making further incremental improvements to its design. The UK Government's Energy White Paper, published in December 2020, confirmed that the next review will take place by 2024 and that the UK Government intends that the mechanism will act in concert with other markets to incentivise investment in capacity.

Italian system: A capacity mechanism was set up in 2019 using rules approved in a decree of 28 June 2019 issued by the Economic Development Ministry.

This mechanism is based on an auction process organised by TERNA, the Italian transmission grid operator, for each delivery year. Operators of existing and future production or storage units can participate in the auctions. The operators of the capacities selected are paid through a fixed premium during one year for existing capacities and 15 years for future capacities. The fixed premium is paid during the delivery year.

The selected operator must offer its capacity on the day-ahead market (*Mercato del Giorno Prima*) and the balancing market (*Mercato per il Servizio di Dispacciamento*). If the selling price on these markets reaches a level exceeding a strike price defined by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA), the operator must repay the surplus to TERNA.

Two auctions were held during 2019 for delivery dates set in 2022 and 2023, and Edison won 3.8GW for 2022 and 3.3GW for 2023 for an annual price of €75,000/MW for new capacities and €33,000/MW for existing capacities. Edison did not participate in any auction in 2021.

The fixed premium is recorded in income during the corresponding delivery year, and reduced if appropriate by any repayments made to TERNA, or if the power plant is unavailable.

5.1.1 Regulatory changes in France

The principal regulatory changes in 2021 are presented below. Changes in 2022 are presented in note 23.

Regulated electricity sales tariffs in France – “Blue” tariffs

In accordance with Article L. 337-4 of the French Energy Code, regulated electricity sales tariffs are set by the Ministers for Energy and the Economy following proposals by the French Energy Regulatory Commission (Commission de régulation de l'énergie or CRE).

France's Council of State ruled in decisions of 18 May and 3 October 2018 that the principle of regulated electricity sales tariffs is compatible with European Union law when such tariffs serve the general economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices.

In accordance with European Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity, the French Energy and Climate law of 8 November 2019 authorises continuation of regulated sales tariffs, but they are reserved for residential or business consumers with a subscribed power level of up to 36kVA, provided they have fewer than 10 employees and their annual sales, income or balance sheet total is below €2 million.

Tariff changes

In accordance with Article L. 337-4 of the French Energy Code, the French Energy Regulatory Commission “CRE” (Commission de régulation de l'énergie) is responsible for sending the Ministers for the Economy and Energy its reasoned proposals for regulated sales tariffs for electricity. If no objections are made within three months, the proposals are deemed to have been approved.

In a decision of 14 January 2021, the CRE proposed an increase of 1.61% including taxes (1.93% excluding taxes) in the “blue” tariffs for residential customers and 2.61% including taxes (3.23% excluding taxes) in the “blue” tariffs for non-residential customers from 1 February 2021. This proposed increase takes particular account of the rising cost of energy supplies and capacity guarantees, the “catch-up” adjustment to cover the cost-income differential on regulated sales tariffs in 2019 and 2020, movements in selling costs associated with unpaid receivable forecasts for 2021, particularly in the context of the Covid-19 pandemic, and adjustment of selling costs for non-residential customers who are still eligible for the regulated tariffs. This CRE proposal was confirmed by tariff decisions of 28 January 2021 that were published in the *Journal officiel* of 31 January 2021, and has applied since 1 February 2021.

In a decision of 8 July 2021, in view of changes in the TURPE tariff from 1 August 2021 and in application of the Energy Code, the CRE proposed an increase of 0.48% including taxes (1.08% excluding taxes) in the “blue” tariffs for residential customers and 0.38% including taxes (0.84% excluding taxes) in the “blue” tariffs for non-residential customers. The CRE has proposed that this change should apply from 1 August 2021.

The proposed tariff increase results from the increase in the TURPE network access tariffs from 1 August 2021 (+0.33% on regulated sales tariffs including taxes), the increase in the remuneration received by suppliers for the service of managing customers on behalf of the network operator, which is deducted from selling costs (-0.07% on regulated sales tariffs including taxes), and a new update of the “catch-up” adjustment for amounts not covered in 2019, so that the full amount will be recovered in two years, as the CRE had announced (+0.21% on regulated sales tariffs including taxes).

Comparability between periods is thus affected by the tariff changes introduced since 1 August 2020, presented in the table below:

Date of the CRE proposal	Increase in “blue” residential customer tariffs (inc. taxes/excl. taxes)	Increase in “blue” non-residential customer tariffs (inc. taxes/excl. taxes)	Date of the tariff decision	Date of application
02/07/2020	1.54%/1.82%	1.58%/1.81%	29/07/2020	01/08/2020
14/01/2021	1.61%/1.93%	2.61%/3.23%	28/01/2021	01/02/2021
08/07/2021	0.48%/1.08%	0.38%/0.84%	29/07/2021	01/08/2021
18/01/2022	4.00%/24.3%	4.00%/23.6%	28/01/2022	01/02/2022

“TURPE” Network access tariffs

The costs borne by the network operators Enedis and RTE for management of the public electricity distribution and transmission networks are covered, provided they are in line with the costs of an efficient network operator, by the “TURPE” tariffs for using the networks, as stipulated in Articles L. 341-2 and following of the French Energy Code.

These tariffs apply to users connected to the distribution and transmission networks.

Second TURPE 5 Distribution tariff and TURPE 5 Transmission tariff

On 17 November 2016, the CRE published its decisions for the TURPE 5 Transmission (high voltage) and TURPE 5 Distribution (medium voltage and low voltage) tariffs for the period from 1 August 2017 to 31 July 2021.

On 28 June 2018, the CRE adopted a decision regarding the TURPE 5 HTA-BT (medium voltage – low voltage) tariff and the new version of that tariff from 1 August 2018, known as the “second TURPE 5 HTA-BT”. Among other things, this decision reflected implementation of the Council of State's partial cancellation decision of 9 March 2018. This decision had no impact on the tariff preparation method, the operating expense trajectory, the principle of regulation for incentive purposes, or the regulations applicable to Linky meters.

By a decision of 20 May 2020, the CRE adopted a +2.75% increase to the second TURPE 5 tariff for the medium and low voltage network from 1 August 2020. This increase comprises +0.92% for inflation, +1.85% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

For transmission expenses, on 14 May 2020, the CRE adopted a decision reducing the TURPE 5 tariff for the high voltage network by -1.08% from 1 August 2020, comprising +0.92% for inflation, and -2% to balance the income and expenses adjustment account (CRCP ⁽¹⁾).

(1) A mechanism to measure and offset main differences between the actual figures and the forecasts on which tariffs are based.

TURPE 6 Distribution and Transmission tariffs

The CRE issued two decisions of 21 January 2021 (published in France's *Journal Officiel* 0096 of 23 April 2021) on the TURPE 6 Transmission (high voltage) and TURPE 6 Distribution (medium voltage – low voltage), after the Higher Energy Council (Conseil supérieur de l'énergie) gave its approval. These tariffs apply from 1 August 2021 for a period of approximately 4 years.

For distribution expenses, in its tariff decision n°2021-13 of 21 January 2021, the CRE set the margin on assets at 2.5% and the additional return on regulated equity at 2.3%. The average tariff increase is +0.91% at 1 August 2021 and +1.39% per year for the whole tariff period, assuming average annual inflation of 1.07%.

For transmission expenses, in its tariff decision n°2021-12 of 21 January 2021, the CRE set a nominal pre-tax weighted average cost of capital (WACC) of 4.6% for the return on RTE's regulated asset base. The average tariff increase is +1.09% at 1 August 2021 and +1.57% per year for the whole tariff period, assuming average annual inflation of 1.07%.

Supplier commissioning

In application of the CRE's decision of 18 January 2018, energy suppliers receive remuneration from distribution network operators for the service of managing single-contract customers on their behalf.

The commissioning principle is identical for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs have given rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), with progressive reduction of this difference to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision set an amount it considered as a cap that can be passed on through the TURPE tariff.

However, Law 2017-1839 of 30 December 2017 introduced a measure intended to rule out the possibility of suppliers receiving remuneration from network managers for past customer management services. On 23 December 2016, ENGIE brought an action against Enedis before the Paris Commercial Court claiming such remuneration. In the course of this litigation, ENGIE filed an application for a preliminary ruling on constitutionality concerning the arrangements introduced by the French "Hydrocarbons" law which ended the possibility of obtaining supplier commissioning for past services. These arrangements were validated by the Constitutional Council in its decision 2019-776 of 19 April 2019. The proceedings at the Paris Commercial Court are still ongoing.

Electricity Equalisation Fund

The TURPE tariff for the medium and low-voltage network is identical for every electricity network operator. It is determined on the basis of forecast expenses to be borne by Enedis, provided they correspond to an efficient network operator, and forecasts of the number of consumers connected to Enedis' networks, their consumption, and the power level subscribed.

As this tariff cannot always cover the specific needs of certain service zones, the Electricity Equalisation Fund (FPE) exists to compensate for disparities in network operating conditions. The Energy Code requires electricity distribution costs resulting from public network operation to be shared between public distribution network operators. There are two equalisation mechanisms: one based on fixed amounts, the other set by the CRE based on analysis of the network operators' accounts. The calculation method for the fixed-rate allocation mechanism is defined by decree and ministerial order. The EDF entities concerned by the Electricity Equalisation Fund are Enedis, Électricité de Strasbourg and SEI.

On 28 July 2021, the CRE published its decision setting the final amount of the allocation from the Electricity Equalisation Fund (*fonds de péréquation de l'électricité*) to SEI, following analysis of the network operators' accounts. SEI's allocation is set at €195.3 million for 2021.

For the fixed-amount mechanism, the ministerial order of 7 October 2021 set the 2021 contributions payable and allocations receivable from the Electricity Equalisation Fund for distribution network operators. The fixed contribution due by Strasbourg Électricité Réseaux and Enedis amount to €1.7 million and €26.4 million respectively. Enedis is also the CRE's designated operator for collection and payment of Electricity Equalisation Fund contributions from all the Local Distribution Companies.

ARENH

The ARENH scheme for regulated access to historic nuclear power, set up in 2011, allows alternative suppliers to purchase electricity from EDF to supply their final customers, after signing a framework agreement, at a regulated price for set quantities determined under the provisions of the French Energy Code. This scheme is also open to network operators to cover their energy losses.

The ARENH price, determined by the Ministers for Energy and the Economy following a proposal by the CRE, has been fixed at €42/MWh since January 2012. This includes delivery of the electricity and has incorporated the associated capacity guarantees since 2017.

The maximum total volume that can be sold under the ARENH scheme to suppliers who apply to the scheme to cover the needs of their final customers is set at 100TWh per year (see note 23).

In decision 2021-339 of 8 November 2021, as required by the Energy Code, the CRE set out the method for allocating ARENH volumes if applications exceed the maximum total volume defined for 2022. In view of the current exceptional crisis in the electricity market, it also introduced reinforced checks and special rules for accepting the ARENH volumes applied for by suppliers.

The CRE stated that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to network operators) and they could enter into contracts with the parent company that replicate the ARENH scheme and terms of supply, particularly the curtailment rate for alternative suppliers.

The Energy and Climate law of 8 November 2019 introduced new measures. It raised the initial 100TWh ceiling for ARENH sales to 150TWh from 1 January 2020, allowing the French government to raise the maximum total volume of ARENH deliveries above 100TWh by ministerial order, and to revise the ARENH price by ministerial order during a transition period (see note 23).

ARENH applications during the November 2021 session for delivery in 2022 totalled 160.36TWh (excluding applications from EDF subsidiaries and network operators). The CRE scaled down certain applications (-0.03TWh in total), bringing the total application volumes validated by the CRE to 160.33TWh, and curtailed each supplier's application. Further volumes were also sold by EDF to its subsidiaries through contracts that replicate the ARENH scheme, and to compensate for network electricity losses (26.4TWh).

Litigation relating to the ARENH scheme has also been instigated in 2020 by some energy suppliers in the context of the Covid-19 pandemic. Details are provided in note 17.3.4.

As announced in the draft multi-year energy programme (PPE) published on 25 January 2019, in January 2020 the French government launched a call for contributions regarding the fundamental findings driving the plan to reform the economic regulations for existing nuclear facilities, and its construction and operating principles. The proposed new regulations would replace the ARENH scheme. Like many other actors in the sector, the EDF group participated in this consultation, which ended on 17 March 2020. France's Minister for the Ecological and Inclusive Transition and Minister of the Economy and Finance then commissioned the CRE to carry out an assessment of the costs borne by the nuclear operator, and to determine fair remuneration for its nuclear activities under the government's potential future regulations for existing nuclear facilities. There were no significant developments in 2021 concerning the terms and conditions of these potential new regulations.

5.1.2 Sales

Sales are comprised of:

(in millions of euros)	2021	2020
Sales of energy and energy-related services	77,432	62,918
energy ⁽¹⁾	56,866	43,767
energy-related services (including delivery ⁽²⁾)	20,566	19,151
Other sales of goods and services	5,511	5,201
Trading	1,518	912
SALES	84,461	69,031

(1) Sales of energy include €1,623 million of sales related to optimisation operations on the wholesale gas and electricity markets in 2021 (€1,112 million in 2020). These operations are carried out by certain Group entities to balance supply and demand, in compliance with the Group's risk management policy. In 2021, the principal operating segments with a net short position in euros on the markets are France – Generation and supply (gas) and Italy (electricity). In 2020, the segments were France – Generation and supply (gas), Italy (electricity) and the United Kingdom (electricity).

(2) Delivery services included in this item concern the distribution network operators Enedis, Électricité de Strasbourg and EDF SA for non-interconnected zones. However, delivery services concerning EDF Energy and Edison are included in Sales of energy, because those entities are classified as the principal under IFRS 15 for both supply and delivery. The delivery services by EDF Energy and Edison have no impact on net income because they are included in "Transmission and delivery expenses" in note 5.2.

After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's sales for 2021 were up by 21.6% or €14.9 billion. Practically all operating segments were concerned by this increase, which reflects the rise in energy prices and a recovery in business after the Covid-19-affected year 2020, particularly France – Generation and Supply (+16.3% or +€4.4 billion), France – Regulated activities (+8.1% or +€1.3 billion), Italy (+88.3% or €5.2 billion), Other activities (+90.6% or €1.7 billion), Dalkia (+21.3% or +€0.8 billion) and the United Kingdom (+8.3% or +€0.8 billion).

Note that in 2020, sales were affected by the Covid-19 pandemic which had an estimated impact of €(2,306) million. The principal operating segments concerned were France – Generation and Supply (€(1,083) million), France – Regulated activities (€(278) million), the United Kingdom (€(451) million), Italy (€(90) million), and Dalkia (€(193) million).

Sales by the France – Generation and Supply segment registered an organic increase of +€4.4 billion. This increase is principally explained by favourable energy market price effects on resales of purchase obligations. Sales were also affected by the following two contrasting effects: a 25.3TWh increase in nuclear power output compared to 2020, which was greatly affected by the Covid-19 pandemic (with an estimated impact of 33TWh in 2020 due to modulation and adaptation of the maintenance outage schedule) and a 2.6TWh decrease in hydropower output; and despite the favourable effects of higher generation volumes, very unfavourable price effects relating to purchases and sales on the wholesale market as purchases

had to be made at very high prices, particularly in the fourth quarter when certain power plants were offline. This segment's sales were also supported by good levels of business by the service subsidiaries.

The rise in sales by the France – Regulated activities segment (+€1.3 billion) principally reflects changes made to the TURPE distribution tariff in a context of higher delivery quantities (as the weather was colder in 2021 than 2020), and an increase in connection services (including the unfavourable effect of the Covid-19 pandemic, particularly in the first half of 2020).

The Italy segment registered an increase of +€5.2 billion in sales, principally explained by favourable gas price effects across all markets, and to a lesser degree by a volume effect. Higher electricity prices also contributed to the rise in sales in 2021.

The +€1.7 billion organic growth in sales by the Other activities segment essentially concerned the gas businesses (+€1.0 billion) due to rising gas prices on the wholesale markets, and higher sales by EDF Trading (+€0.6 billion) thanks to its trading performance in highly volatile commodity markets in Europe and the United States (notably during the spell of extremely cold weather in Texas in early 2021).

Dalkia registered an organic increase of +€0.8 billion in sales, notably attributable to higher business volumes (including the unfavourable effect of the Covid-19 pandemic in 2020, especially in the first half-year), a substantial rise in gas prices, and a favourable weather-related volume effect in 2021.

5.2 Fuel and energy purchases

Fuel and energy purchases comprise:

(in millions of euros)	2021	2020
Fuel purchases used – power generation*	(14,973)	(10,162)
Energy purchases*	(21,417)	(14,645)
Transmission and delivery expenses	(8,088)	(7,916)
Gain/loss on hedge accounting	(10)	(22)
(Increase)/decrease in provisions related to nuclear fuels and energy purchases	189	320
FUEL AND ENERGY PURCHASES	(44,299)	(32,425)

* Fuel purchases used and Energy purchases include respectively €864 million and €4,167 million for optimisation operations on the wholesale gas and electricity markets in 2021 (€514 million and €1,674 million in 2020). In 2021 the principal operating segments with net long positions in euros on the markets are France – Generation and supply (electricity), United Kingdom (gas and electricity), Other international (Luminus – gas and electricity) and Dalkia (gas). In 2020, the same segments were concerned.

Fuel purchases used include costs relating to raw materials for energy generation (principally nuclear fuels and fissile materials, gas to a smaller degree, and a non-significant proportion of coal and oil), purchases of services related to the nuclear fuel cycle, and costs associated with environmental schemes (mainly greenhouse gas emission rights and renewable energy certificates).

"Energy purchases" include purchases made under the purchase obligation mechanism in France.

After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's fuel and energy purchases were up by €11.4 billion from 2020. The increase principally concerned the following segments: Italy (€4.9 billion, essentially gas purchases), France – Generation and Supply (€2.5 billion, essentially electricity purchases), and the United Kingdom (€1.8 billion). The main explanation for the higher amount of purchases is the effect of price rises on the commodity markets.

5.3 Personnel expenses

Personnel expenses comprise:

<i>(in millions of euros)</i>	2021	2020
Wages and salaries	(9,351)	(9,024)
Social contributions	(2,059)	(2,020)
Employee profit sharing	(319)	(271)
Other contributions related to personnel	(350)	(347)
Other expenses linked to short-term benefits	(219)	(219)
Short-term benefits	(12,298)	(11,881)
Expenses under defined-contribution plans	(1,029)	(952)
Expenses under defined-benefit plans	(1,003)	(944)
Post-employment benefits	(2,032)	(1,896)
Other long-term expenses	(132)	(155)
Termination payments	(32)	(25)
Other personnel expenses	(164)	(180)
PERSONNEL EXPENSES	(14,494)	(13,957)

Excluding foreign exchange effects and changes in the scope of consolidation, personnel expenses increased by 3.5% from 2020, mainly in the Framatome, United Kingdom, Dalkia and EDF Renewables segments.

Average workforce comprise:

	2021	2020
IEG status	94,775	95,530
Other	68,648	65,673
AVERAGE WORKFORCE	163,423	161,203

Average workforce numbers for the controlled entities and joint operations are reported on a full-time equivalent basis.

A more detailed presentation of workforce categories can be found in section 3.3.3.9 "Detail of Group's workforce" of the 2021 Universal Registration Document.



5.4 Other operating income and expenses

Other operating income and expenses comprise:

<i>(in millions of euros)</i>	Notes	2021	2020
Operating subsidies	5.4.1	5,685	8,305
Net income on deconsolidation	5.4.2	302	221
Gains on disposal of fixed assets	5.4.2	(29)	(229)
Net increase/decrease in provisions on current assets*		124	(203)
Net increase in provisions for operating contingencies and losses		(381)	(348)
Other items	5.4.3	(1,439)	(1,963)
OTHER OPERATING INCOME AND EXPENSES		4,262	5,783

* For details of impairment of trade receivables as a result of the Covid-19 pandemic see note 1.4.3.

5.4.1 Operating subsidies

This item mainly comprises the subsidy received or receivable by EDF in respect of the compensation for public energy charges (CSPE), excluding the annual repayment of the past CSPE receivable and associated interest, reflected in the financial statements through recognition of income of €5,472 million for 2021 (€8,081 million for 2020). The decrease in CSPE income is principally explained by the higher market prices observed in 2021 compared to 2020.

The operating liability corresponding to the CSPE is recorded in "Other liabilities" at 31 December 2021 (see note 13.5).

Compensation for public energy charges (CSPE) (France)

Mechanism

The compensation mechanism for public energy service charges (*compensation des charges de service public de l'énergie*) resulted from a reform introduced by France's amended finance law for 2015, published in the *Journal officiel* on 30 December 2015. Under the legislative and regulatory framework, public energy service charges (electricity and gas) were to be compensated. Compensation initially came from two State budget items, a special "energy transition" item and a "public energy service" item, but since 1 January 2021 public energy service charges have been compensated entirely through the general budget.

In compensation for the 2021 charges, France's initial finance law for 2021 introduced a €9.1 billion "public energy service" item in the general budget, to cover additional costs incurred on support contracts (purchase obligations and additional remuneration) for renewable energies and biogas, solidarity charges borne by gas and electricity suppliers, costs associated with support for non-renewable energy production (essentially cogeneration), and the cost of applying the standard national tariffs to zones that are not connected to France's mainland network.

Income generated by the domestic tax on the final consumption of electricity, now renamed the Compensation for Public Electricity Charges (CSPE) goes directly into the general budget. The CSPE tax is collected directly from final consumers of electricity in the form of an additional levy on the electricity sale price (collected by the suppliers), or directly from electricity producers that produce electricity for their own uses.

The level of the CSPE tax was set in 2016 at a full rate of €22.5/MWh, and eight reduced rates ranging from €12/MWh to €0.5/MWh depending on criteria of electro-intensiveness, business category and the risk of carbon leakage from installations (the risk of industries relocating to countries where greenhouse gas emissions are higher due to their electricity mix). These rates remain unchanged in 2021.

5.4.2 Net income on deconsolidation and gains on disposal of fixed assets

In 2021, net income on deconsolidation and gains on disposal of property, plant and equipment mainly includes:

- gains on sales of EDF Renewables' generation assets as part of the Development and Sale of Structured Assets (DSSA) activities, amounting to €245 million (€210 million in 2020);
- gains on sales of real estate assets in France and the gain on the sale of IDG (a gas distribution network, see note 3.1), amounting to €260 million.

5.4.3 Other items

Other items mainly include costs relating to energy savings certificates used or consumed during the year, additional remuneration paid to producers of electricity from renewable sources in France and losses on non-recoverable operating receivables. The favourable change in other items in 2021 is principally explained by changes in the additional remuneration as a result of higher market prices, and to a smaller extent lower costs relating to energy savings certificates.

The additional remuneration paid to electricity producers using renewable energies was introduced by France's law on the Energy Transition for green growth. It is a support mechanism intended to guarantee reasonable remuneration for producers who sell their energy directly on the markets, by compensating for the differential between the revenues from those sales and a reference amount. This mechanism complements the purchase obligation system in France.

From the first half of 2020, other items also include income and expenses related to closure of the Fessenheim plant.

Closure of Fessenheim nuclear power plant

In accordance with the application for termination of operations and the declaration of the permanent shutdown of both reactors at Fessenheim nuclear power plant sent by EDF to the Minister for the Ecological and Inclusive Transition and to the ASN on 30 September 2019, EDF shut down reactor 1 on 22 February 2020 and reactor 2 on 30 June 2020.

On 27 September 2019, due to the cap on nuclear power output set by the "energy transition for green growth" law of 17 August 2015, the French State and EDF signed a protocol agreement whereby the State will compensate EDF for the early closure of Fessenheim.

The compensation paid under the terms of this protocol comprises:

- initial instalments to compensate for expenses incurred after the closure of the plant (end-of-operations expenditure, BNI taxes, dismantling costs and staff redeployment costs), which will be paid over a 4-year period following the closure. An amount of €370 million was received on 14 December 2020 (see note 13.5).
This compensation is recognised as income in profit and loss as and when the associated costs are incurred;
- subsequent payments corresponding to the lost income that would have been generated by future power generation up until 2041, based on Fessenheim's previous output figures and calculated *ex post* on the basis of nuclear power sale prices, particularly observed market prices. There is no reason to recognise such income in the financial statements at this stage.

Since its decoupling from the network, the Fessenheim plant has entered a post-operating phase that will last approximately five years. During that period, units 1 and 2 will continue to be operated and maintained as "defueled core" and "evacuated fuel" reactors. This will require a series of technical and administrative operations. A significant milestone was reached on 18 October 2021 when the last two packages of spent fuel were dispatched from Fessenheim unit 1 to the Orano site at La Hague.

All the post-operating expenses and income associated with the closure of the two units in 2020 are recognised in other operating income and expenses. At 31 December 2021, they mainly comprise:

- expenses of €126 million (salaries and social security charges for labour at the site amounting to €57 million, purchases of goods and services amounting to €54 million, taxes other than income taxes, mainly payroll taxes, energy taxes and local taxes amounting to €15 million);
- the compensation defined in the protocol for expenses that will be incurred after the closure, amounting to €57 million, recognised as an operating subsidy in the income statement under the methods explained above.

Energy savings certificates**Accounting principles and methods**

In France, the Law of 13 July 2005 introduced a system of energy savings certificates. Suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level became subject to energy savings obligations, initially for a three-year period.

To meet this obligation, three sources are available to the EDF group: supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors.

Expenses incurred for this purpose are recorded in expenses of the year concerned, in "Other operating income and expenses". Expenses in excess of the accumulated obligation at year-end are included in inventories and may be used to cover the obligation in later years.

A provision is recognised if the energy savings achieved are lower than the cumulative energy savings obligation at the year-end. The amount of the provision is equal to the cost of actions still to be taken to extinguish the obligations related to the energy sales made.

Energy saving regulations in France**4th period of the French Energy Savings Certificates Scheme (2018-2021):**

Initially planned for the period 2018-2020, the fourth period of France's energy savings certificates scheme was extended by one year (by law no. 2019-1147 of 8 November 2019 on Energy and the Climate). This period substantially raises the energy savings obligation levels (to 1,600TWhc for the "standard" obligations and 533TWhc for the obligations intended to benefit households in situations of energy poverty), and adds a new chapter on antifraud measures concerning energy savings certificates (increasing the number and effectiveness of controls and sanctions).

If there is a shortfall in certificates surrendered at the end of the period, obligated actors must pay a fine of €15 per MWhc of shortfall.

In order to fulfil these obligations, EDF has made every effort to increase its number of energy savings certificates, taking advantage of the "Coup de pouce" operations launched in France early in 2019 (subsidies for insulation, financial aid for replacing oil heating by heat pumps, 50% additional energy savings subsidy for heat pump users, special offers for heat pump maintenance contracts, etc.).

Despite a substantial increase in the energy savings obligation in the fourth period (2018-2021) of the scheme, the EDF group met its energy savings target and has a stock of certificates for the start of the fifth period (2022-2025).

5th period of the French Energy Savings Certificates Scheme (2022-2025):

Decree 2021-712 on the fifth period of the energy savings certificates scheme (2022-2025) was published in the *Journal officiel* of 5 June 2021. The decree makes the scheme more effective (for example by significantly reducing special measures and bringing calculations close to the real savings), increases funding for very vulnerable households (higher obligations intended to benefit households in situations of energy poverty, restriction of the scope to very vulnerable households, an increase in the penalties in this category to €20/MWhc) and encourages development of carbon-free energies:

- the overall obligation is increased by 17.2% to 2,500TWhc for this period (obligations intended to benefit households in situations of energy poverty: +37% to 730TWhc, "standard" obligations: +11% to 1,770TWhc);
- the Energy Savings Certificate coefficient (MWhc to be produced per MWh of energy sold) is reduced by 10.2% for electricity and increased by 51.8% for gas;
- for electricity and gas, the threshold below which no energy savings certificates are required is progressively reduced from the current 400GWh/year to 300GWh/year in 2022, 200GWh/year in 2023 and 100GWh/year in 2024 and subsequent years.

Note 6 Net changes in fair value on energy and commodity derivatives, excluding trading activities

Accounting principles and methods

This item essentially consists of changes over the period in the fair value of derivatives used for economic hedging of commodity purchases or sales that are not eligible for hedge accounting as defined in IFRS 9, and are therefore

included directly in profit and loss. The Group reports these changes in a specific line of the income statement, "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" below the operating profit before depreciation and amortisation.

(in millions of euros)

	2021	2020
NET CHANGES IN FAIR VALUE ON ENERGY AND COMMODITY DERIVATIVES, EXCLUDING TRADING ACTIVITIES	(215)	(175)

Note 7 Other income and expenses

Other income and expenses amount to €(1,123) million in 2021. They principally comprise:

- an amount of €505 million received in application of the agreement signed by AREVA and EDF on 29 June 2021 (see note 2) for a settlement payment of €563 million, less certain amounts, principally payments collected for third parties and assets previously included in the balance sheet;
- exceptional additional costs relating to work for repairs to the main secondary circuit welds at the Flamanville 3 EPR, totalling €(573) million at 31 December 2021 (these are defined by IAS 16.22 as abnormal costs and cannot be included in the cost of assets in progress);
- the net loss on the sales of Dalkia Wastenergy and the investment in CENG, amounting to a total €(286) million (see note 3.1);

- costs relating to the early closure of Dungeness B, amounting to €(164) million including impairment of fuel inventories and spare parts, and provisions for penalties due under the capacity mechanism (see notes 2 and 10.8);
- provisions relating to proceedings before the civil, administrative and criminal courts concerning the sale by Montedison of Ausimont (the Bussi site) in Italy to Solvay in 2002 (see note 17.3.5);
- a provision relating to litigation proceedings in process.

Other income and expenses includes restructuring expenses in certain Group entities, and other items which are operating income and expenses by nature but of non-significant amounts individually.

Other income and expenses amounted to €(487) million for 2020. They principally comprised exceptional additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR, totalling €(397) million in 2020.

Note 8 Financial result

8.1 Cost of gross financial indebtedness

Details of the components of the cost of gross financial indebtedness are as follows:

<i>(in millions of euros)</i>	2021	2020
Interest expenses on financing operations*	(1,494)	(1,699)
Change in the fair value of derivatives and hedges of liabilities	15	90
Transfer to income of changes in the fair value of cash flow hedges	32	(8)
Net foreign exchange gain on indebtedness	(12)	7
COST OF GROSS FINANCIAL INDEBTEDNESS	(1,459)	(1,610)

* Interest expenses on financing operations includes interest on the IFRS 16 lease liability amounting to €(75) million in 2021 and €(80) million in 2020.

8.2 Discount effect

The effect of unwinding the discount primarily concerns provisions for the back-end of the nuclear cycle, decommissioning and last cores, and long-term and post-employment employee benefits.

Details of the final discount effect are as follows:

<i>(in millions of euros)</i>	2021	2020
Provisions for long-term and post-employment employee benefits ⁽¹⁾	(498)	(637)
Provisions for the back-end of the nuclear cycle, decommissioning and last cores ⁽²⁾	(2,109)	(2,679)
Other provisions and advances	(63)	(417)
DISCOUNT EFFECT	(2,670)	(3,733)

(1) See note 16.1.3.

(2) Including the effect of discounting the receivable corresponding to amounts reimbursable by the NLF (see note 18.1.3).

The decrease in the effect of unwinding the discount on nuclear provisions is largely explained by the 10bp decrease in the real discount rate in 2021 (versus a 20bp decrease in 2020) applied to nuclear provisions in France (see note 15.1.1).

The decrease in the effect of unwinding the discount on "Other provisions and advances" is largely explained by a change of method introduced in 2020 for determining the discount rates to be used in calculating provisions (particularly provisions for onerous contracts).

8.3 Other financial income and expenses

Other financial income and expenses comprise:

<i>(in millions of euros)</i>	2021	2020
Financial income on cash and cash equivalents	38	35
Gains/(losses) on other financial assets (including loans and financial receivables)	312	181
Gains/(losses) on debt and equity securities	673	691
Changes in financial instruments carried at fair value through profit and loss	2,683	1,253
Other financial expenses	(217)	(102)
Foreign exchange gain/loss on financial items other than debts	120	(254)
Return on fund assets	319	378
Capitalised borrowing costs	561	579
OTHER FINANCIAL INCOME AND EXPENSES	4,489	2,761

"Gains/(losses) on debt and equity securities" in 2021 principally include:

- €605 million of dividends and interest income on debt securities (€518 million in 2020);
- €68 million of net gains and losses on sales of debt securities carried at fair value through OCI with recycling (including 41 million on dedicated assets), compared to €173 million in 2020 (including €162 million on dedicated assets).

In 2021, other financial income and expenses include changes in fair value on financial instruments, amounting to €2,683 million. In a context of bullish markets, this favourable overall change for the year was driven by a €2,739 million increase in the fair value of dedicated assets.

In 2020, changes in financial instruments carried at fair value through profit and loss amounted to €1,253 million, including €1,218 million relating to dedicated assets.

Note 9 Income taxes

Accounting principles and methods

Income taxes include the current tax expense (income) and the deferred tax expense (income), calculated under the tax legislation in force in the countries where earnings are taxable.

In compliance with IAS 12, current and deferred taxes are generally recorded in the income statement or in equity symmetrically to the underlying operation.

Under IAS 32, income taxes on distributions to holders of equity instruments (notably dividends and the remuneration paid to holders of perpetual subordinated bonds) must be recognised in accordance with IAS 12. The Group considers that these distributions are paid out of previous years' accumulated profits and as a result the associated tax effects are included in the net income for the period.

In application of IFRIC 23, a tax asset or liability is recognised when there is uncertainty over income tax treatments. If the Group considers it likely that the tax authorities will not accept its chosen treatment, it recognises a tax liability, and if it considers it likely that the tax authorities will reimburse a tax that has already been paid, it recognises a tax asset. The tax assets and liabilities relating to these uncertainties are estimated on a case-by-case basis and stated at the most likely amount, or the weighted average of the various outcomes considered. These tax assets and liabilities are included in deferred taxes.

The current tax expense (income) is the estimated amount of tax due on the taxable income for the period, calculated using the tax rates adopted at the year-end.

Deferred taxes result from temporary differences between the book value of assets and liabilities and their tax basis. No deferred taxes are recognised for temporary differences generated by:

- goodwill which is not tax deductible;
- the initial recognition of an asset or liability in a transaction which is not a business combination and does not affect the accounting profit or taxable profit (tax loss) at the transaction date;
- investments in subsidiaries and associates, investments in branches and interests in joint arrangements, when the Group controls the timing of reversal of the temporary differences, and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred tax assets and liabilities are valued at the expected tax rate for the period in which the asset will be realised or the liability extinguished, based on tax rates adopted at the year-end. If the tax rate changes, deferred taxes are adjusted to the new rate and the adjustment is recorded in the income statement, unless it relates to an underlying for which changes in value are recorded in equity, for example in accounting for actuarial gains and losses or fair value on hedging instruments and debt or equity securities.

Deferred taxes are reviewed at each closing date, to take into account changes in tax legislation and the prospects for recovery of deductible temporary differences. Deferred tax assets are only recognised when it is probable that the Group will have sufficient taxable profit to utilise the benefit of the asset in the foreseeable future, or beyond that horizon, if there are deferred tax liabilities with the same maturity.

Deferred tax assets and liabilities are reported on a net basis, determined at the level of a tax entity or tax group.

9.1 Breakdown of tax expense

The tax expense breaks down as follows:

<i>(in millions of euros)</i>	2021	2020
Current tax expense	(2,016)	(747)
Deferred taxes	616	(198)
TOTAL	(1,400)	(945)

In 2021, €(1,679) million of the current tax expenses relates to French companies, and €(337) million relates to other subsidiaries (€(604) million and €(143) million respectively in 2020).

9.2 Reconciliation of the theoretical and effective tax expense (tax proof)

<i>(in millions of euros)</i>	2021	2020
Income of consolidated companies before tax	5,585	1,293
Income tax rate applicable to the parent company	28.41 %	32.02 %
Theoretical tax expense	(1,587)	(414)
Differences in tax rate ⁽¹⁾	(349)	(225)
Permanent differences	(160)	6
Taxes without basis ⁽²⁾	727	(27)
Unrecognised deferred tax assets ⁽³⁾	(36)	(288)
Other	5	3
ACTUAL TAX EXPENSE	(1,400)	(945)
EFFECTIVE TAX RATE	25.09 %	73.10 %

The income tax expense amounts to €(1,400) million in 2021, corresponding to an effective tax rate of 25.09% (compared to €(945) million in 2020, corresponding to an effective tax rate of 73.10%).

The €455 million increase in the Group's tax expense between 2021 and 2020 essentially reflects the €4,292 million increase in net income before tax, generating an additional tax charge of €1,219 million.

The tax expense also reflects the favourable effects of deferred tax asset recognition in the United States and asset revaluations for tax purposes in Italy, which were partly counterbalanced by the forthcoming increase in the UK's income tax rate from 19% to 25% from 2023 (creating a larger negative impact than in 2020, which the rate was raised from 17% to 19%).

Regarding the tax revaluations of assets in Italy, special tax measures introduced in response to the Covid-19 pandemic allow Italian companies, by virtue of Article 110 of decree-law 104/2020, to realign the tax value of certain assets and goodwill with their accounting value in return for payment of a 3% tax. The Group's Italian companies opted to realign the tax value of certain tangible assets and goodwill at 31 December 2021.

Finally, the income tax expense in 2020 was strongly affected by the unfavourable Council of State decision issued in December 2020 rejecting the tax-deductibility of certain long-term liabilities of EDF SA, a factor that had no equivalent in 2021.

After elimination of these non-recurring items (principally unrealised gains and losses on financial assets, impairment, asset restatements for tax purposes in Italy, the impact of changes in the UK tax rate and the sale of CENG), the effective current tax rate for 2021 is 21.3%, compared to 19.0% in 2020.

The main factors explaining the difference between the theoretical tax rate and this effective rate are:

• 2021:

- › ⁽¹⁾ the unfavourable impact of tax rate differences amounting to €359 million, due to the forthcoming increase in the UK's normative rate from 19% to 25% from 2023;
- › ⁽²⁾ the favourable impact of asset restatements for tax purposes in Italy (amounting to €422 million) and deduction of payments made to bearers of perpetual subordinated bonds (amounting to €157 million);
- › ⁽³⁾ the effect of non-recognition of deferred tax assets, amounting to €(36) million, including €(309) million of deferred taxes recognised during the year following restatements of the tax value of assets in Italy, partly offset by the favourable effect of deferred tax assets recognised in the United States (€191 million);

• 2020:

- › ⁽¹⁾ the unfavourable impact of tax rate differences amounting to €225 million, mainly explained by an increase in the UK income tax rate from 17% to 19% and the difference between the current tax rate (32.02%) and deferred tax rate in France (28.41% or 25.82%, depending on the timing of reversal of the temporary differences);
- › ⁽²⁾ the economic impact of tax litigation, amounting to €(175) million, partly offset by the positive effect of deduction of payments made to bearers of perpetual subordinated bonds amounting to €162 million;
- › ⁽³⁾ the effect of non-recognition of deferred tax assets, amounting to €(288) million, including €(361) million of deferred taxes recognised in connection with tax litigation (resulting from the future deductibility of expenses whose deductibility is temporarily being questioned), due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon.

9.3 Change in deferred tax assets and liabilities

(in millions of euros)	2021	2020
Deferred tax assets	1,150	557
Deferred tax liabilities	(3,115)	(2,295)
Net deferred taxes at 1 January	(1,965)	(1,738)
Change in net income	616	(198)
Change in equity	694	(215)
Translation adjustments	(93)	72
Changes in scope of consolidation*	28	69
Other movements	(14)	45
NET DEFERRED TAXES AT 31 DECEMBER	(734)	(1,965)
Deferred tax assets	1,667	1,150
Deferred tax liabilities	(2,401)	(3,115)

* Changes in the scope of consolidation essentially concern the sale of West Burton.

In 2021, the change in deferred taxes included in equity includes €(510) million of actuarial gains and losses on post-employment benefits (€(238) million in 2020) and €1,223 million of changes in the fair value of hedges €(50) million in 2020).

9.4 Breakdown of deferred tax assets and liabilities by nature

(in millions of euros)	31/12/2021	31/12/2020
Deferred taxes:		
Fixed assets	(6,201)	(6,194)
Provisions for employee benefits	4,706	5,222
Other provisions and impairment	346	321
Financial instruments	1,408	290
Tax loss carryforwards and unused tax credits	2,004	1,172
Other	1,080	711
Total deferred tax assets and liabilities	3,343	1,523
Unrecognised deferred tax assets	(4,077)	(3,489)
NET DEFERRED TAXES	(734)	(1,965)

At 31 December 2021, unrecognised deferred tax assets represent a potential tax saving of €4,077 million (€3,489 million at 31 December 2020), mainly relating to Italy, France and the United States.

In Italy, the potential tax saving of €310 million relates to the tax value of goodwill, which was restated in 2021 and can be amortised over 50 years for tax purposes. Some of the corresponding deferred taxes are unrecognised due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon.

In France, this potential tax saving, which amounts to €2,913 million (€2,900 million at 31 December 2020), essentially concerns deferred tax assets on employee benefits. These deferred tax assets have no expiry date.

In the United States, this potential tax saving amounts to €730 million (€428 million in 2020) and relates mainly to losses which can be carried forward until dates between 2030 and 2037 if generated before 31 December 2017, and for an unlimited period otherwise.

Recognised deferred tax assets on tax loss carryforwards and unused tax credits amount to €1,140 million (€584 million in 2020) and principally concern the United States (€286 million in 2021, €151 million in 2020), United Kingdom (€548 million in 2021, €173 million in 2020), France (€51 million in 2021, €52 million in 2020) and in Germany (€65 million in 2021, €47 million in 2020). They have been recognised due to the existence of deferred tax liabilities on the same tax entities that will reverse over the same time horizon, or because there are prospects of taxable profits.



Note 10 Property, plant and equipment and intangible assets (excluding french public electricity distribution concession assets)

Details of property, plant and equipment and intangible assets (excluding French electricity distribution concession assets) are as follows:

(in millions of euros)	Notes	31/12/2021	Assets in progress*	31/12/2020	Assets in progress*
Goodwill	10.1	10,945	n.a.	10,265	n.a.
Other intangible assets	10.2	10,221	1,793	9,583	1,581
Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets	10.3	98,237	45,220	92,600	39,460
Right-of-use assets	10.4	4,146	n.a.	4,116	n.a.
Property, plant and equipment operated under concessions other than French electricity distribution concessions	10.5	6,881	621	6,858	574
TOTAL PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLE ASSETS (EXCLUDING FRENCH ELECTRICITY DISTRIBUTION CONCESSION ASSETS)		126,284	47,634	119,306	41,615

n.a.: not applicable.

* Assets in progress are presented in note 10.6.

10.1 Goodwill

Accounting principles and methods

Determination of goodwill

In application of IFRS 3, "Business combinations" (see note 3), goodwill is the difference between:

- the sum of the following items:
 - the acquisition-date fair value of the price paid to acquire control;
 - the value of non-controlling interests in the entity acquired; and
 - for acquisitions achieved in stages, the acquisition-date fair value of the Group's share in the acquired entity before it acquired control; and
- the net value of the assets acquired and liabilities assumed, measured at fair value at the acquisition date.

When this difference is negative it is immediately included in net income.

The fair values of assets and liabilities and the resulting goodwill are finalised within twelve months of the acquisition.

Measurement and presentation of goodwill

Goodwill on acquisition of subsidiaries is disclosed separately in the balance sheet. Impairment on this goodwill is reported under the heading "Impairment" in the income statement. After initial recognition, goodwill is carried at cost less any impairment recognised.

Goodwill on acquisition of associates and joint ventures is included in the investment's net book value. Impairment on this goodwill is included under the heading "Share in income of associates and joint ventures".

Goodwill is not amortised, but impairment tests are carried out as soon as there is an indication of possible loss of value, and at least annually, as described in note 10.8.

In 2021, goodwill primarily related to Framatome (€1,428 million) and EDF Energy (€8,095 million). The breakdown by operating segment is presented in note 4.1.

Changes in goodwill in 2021 and 2020 were as follows:

(in millions of euros)	31/12/2021	31/12/2020
Net book value at opening date	10,265	10,623
Acquisitions	143	139
Disposals	(1)	-
Impairment (note 10.8)	-	(31)
Translation adjustments	537	(439)
Other changes	1	(27)
NET BOOK VALUE AT CLOSING DATE	10,945	10,265
Gross value at closing date	11,715	11,032
Accumulated impairment at closing date	(770)	(767)

The changes in goodwill in 2021 primarily related to:

- the acquisition of Rolls Royce Civil Nuclear I&C from Framatome for €92 million (see note 3.1);
- translation adjustments (€537 million) resulting chiefly from the rise of the pound sterling against the Euro.

The changes in goodwill in 2020 primarily related to:

- the acquisition of Pod Point by EDF Energy for €74 million, a company specialising in charging for electric vehicles in the United Kingdom;
- the first consolidation of Energy2market for €37 million;
- translation adjustments of €(439) million, principally due to the pound sterling's depreciation against the euro.

10.2 Other intangible assets

Accounting principles and methods

General principles

Other intangible assets mainly comprise:

- software, which is amortised on a straight-line basis over its useful life, including SaaS (Software as a Service) contracts which are not treated as service contracts and included in expenses. To qualify for treatment as fixed assets, SaaS contracts must confer a right of control to the user in addition to access to the software for a fixed period;
- research and development costs that qualify for capitalisation under IAS 38 amortised on a straight-line basis over their foreseeable useful life.
- purchased brands with an indefinite useful life, or amortised on a straight-line basis over their useful life;
- operating or usage rights for power plants, which are amortised on a straight-line basis over the useful life of the underlying asset;
- the positive value of energy purchase/sale contracts stated at fair value as part of a business combination governed by IFRS 3: this value is amortised as the contractual deliveries take place;
- assets related to concession contracts governed by IFRIC 12, under the "intangible model" (see note 10.5);
- technology related to activities as designer and supplier of nuclear steam supply systems and manufacturer of control rod clusters and nuclear fuel (Framatome) including codes and methods, EPR technology, patents and manufacturing processes, all amortised over their useful life;
- purchased customer contracts and relations, amortised over their useful life;
- incremental costs of winning or renewing customer contracts, which are amortised over the average duration of customer contracts;
- intangible assets related to environmental regulations.

Intangible assets relating to environmental regulations

These include greenhouse gas emission rights and renewable energy certificates purchased (see notes 20.1.1 and 20.1.2).

Greenhouse gas emission rights

EU Directive 2003/87/EC set up a greenhouse gas emission quota system for the European Union. Although the United Kingdom is no longer a member of the European Union, it is still concerned by this system.

This quota system was incorporated into national laws. Among other things it requires obligated actors, which is the case of EDF, to surrender to the State a number of greenhouse gas emission credits each year, corresponding to their emissions for the year.

In the EDF group, the entities subject to this Directive are EDF, EDF Energy, Edison, Dalkia, and Luminus.

The accounting treatment of emission rights depends on the holding intention. Two economic models coexist in the Group:

- rights held under the "Trading" model are included in "Other inventories" at fair value. The change in fair value observed over the year is recorded in the income statement;

- rights held to comply with regulatory requirements on greenhouse gas emissions (the "Generation" model) are recorded in intangible assets as "Greenhouse gas emission rights – green certificates":

- at acquisition cost when purchased on the market,
- at nil value when allocated free of charge (in countries that still have a free allocation system).

A provision is established at the year-end when the estimated annual emissions by an entity are higher than the rights held or purchased on the forward market, less any rights sold on the forward market (see note 17.2).

This provision is equal to the acquisition cost up to the amount of rights acquired on the spot or forward markets, and to market prices for the balance. It is cancelled when the rights are surrendered to the State.

At the closing date, the portfolio of emission rights and the obligation to surrender rights for the emissions of the year are presented gross, without netting.

If the number of emission rights at the end of the year and not subject to forward sale is higher than the number of rights to be surrendered to the State for the year's emissions, an impairment test must be applied to the excess. If the realisable value is lower than the net book value, impairment is booked.

Renewable energy certificates (green certificates)

In application of EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources, every EU member state has set national targets for consumption of electricity from renewable sources. Although the United Kingdom is no longer a member of the European Union, it is still concerned by this system.

States can use two possible mechanisms to meet these targets:

- introducing a specific sales tariff for energy from renewable sources (this system is used in France and Italy);
- introducing a system of renewable energy certificates to be surrendered by energy suppliers (this system is used in the United Kingdom (Renewable Obligation Certificates) and Belgium (*Certificats verts*)).

For renewable energy certificate systems, the Group applies the following accounting treatment:

- certificates earned through energy generation are not recognised, since their cost is nil;
- certificates purchased are recognised as intangible assets in the line "Greenhouse gas emission rights – green certificates";
- a provision is established to reflect the obligation to surrender certificates. It is based on the cost of certificates earned (with nil value) and purchased (on the spot or forward market), the market price of the certificates still be purchased, and where relevant the market price or penalty price for the balance. The provision is cancelled when the certificates are surrendered to the State (see note 17.2).

The net value of other intangible assets breaks down as follows:

<i>(in millions of euros)</i>	31/12/2020	Acquisitions	Disposals	Translation adjustments	Changes in scope ⁽²⁾	Other movements	31/12/2021
Software	5,970	897	(83)	76	2	(75)	6,787
Positive fair value of commodity contracts acquired in a business combination	504	-	-	-	-	-	504
Greenhouse gas emission rights – green certificates	769	1,820	(1,732)	21	-	22	900
Other intangible assets	7,546	541	(52)	45	58	14	8,152
Intangible assets in development ⁽¹⁾	1,581	207	(8)	4	11	(2)	1,793
Gross value	16,370	3,465	(1,875)	146	71	(41)	18,136
Software	(3,569)	(756)	79	(58)	5	17	(4,282)
Positive fair value of commodity contracts acquired in a business combination	(216)	(25)	-	-	-	-	(241)
Other intangible assets	(3,002)	(463)	51	(32)	15	39	(3,392)
Accumulated amortisation and impairment	(6,787)	(1,244)	130	(90)	20	56	(7,915)
NET VALUE	9,583	2,221	(1,745)	56	91	15	10,221

(1) Increases in intangible assets in development are stated net of the effects of newly-commissioned assets. Intangible assets in development are detailed in note 10.6.

(2) Changes in scope essentially comprise EDF Luminus (acquisition of Essent).

The gross value of other intangible assets at 31 December 2021 includes:

- the Edison brand and intangible assets related to Edison's hydropower concessions, amounting to €945 million and €489 million respectively;
- the Dalkia brand and intangible assets related to Dalkia's concession agreements in France, amounting to €130 million and €1,341 million respectively;

- the Framatome brand, Framatome's nuclear technology-related intangible assets and Framatome's customer contracts, amounting to €151 million, €712 million and €344 million respectively.

Net impairment of €59 million was recorded in respect of other intangible assets in 2021 (€85 million in 2020).

EDF's research and development expenses recorded in the income statement total €487 million for 2021 (€518 million in 2020).

10.3 Property, plant and equipment used in generation and other tangible assets owned by the Group

Accounting principles and methods

Property, plant and equipment is recorded at acquisition or production cost:

- the cost of facilities developed in-house includes all labour and materials costs, and all other production costs that can be included in the construction of the asset;
- borrowing costs attributable to the financing of an asset incurred during the construction period are included in the value of the asset provided it is a qualifying asset as defined by IAS 23 "Borrowing costs";
- the cost of property, plant and equipment also includes the initial estimate of decommissioning costs. These costs are recognised in assets against the provision recognised to cover these obligations. At the date of commissioning, these assets are measured and recorded in the same way as the corresponding provision (see note 15);
- decommissioning costs for nuclear generation installations also include last core costs (see note 15).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded in "Property, plant and equipment", and subsequent payments by the partner are deducted from the accrued income.

The Group capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

Strategic safety spare parts for generation facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

The costs of operations that are necessary for generation assets to remain in service, and are undertaken at the time of scheduled shutdowns, particularly during major inspections, are capitalised and amortised over a period corresponding to the time elapsing between two inspections.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Group expects to draw future economic benefits from their use.

Depending on each country's specific regulations and contractual arrangements, the expected useful lives for the main facilities are as follows:

- nuclear generation facilities: 40 to 50 years;
- wind farm and photovoltaic facilities: 20 to 25 years;
- fossil-fired power plants (mainly CCGT-Combined Cycle Gas Turbine plants): 25 to 45 years;
- transmission and distribution installations (lines, substations): 20 to 60 years;
- other general plant and machinery: 10 to 20 years.

The net values of property, plant and equipment used in generation and other tangible assets owned by the Group are as follows:

(in millions of euros)	31/12/2020	Increases	Decreases	Translation adjustments	Changes in the scope of consolidation ⁽¹⁾	Other movements ⁽²⁾	31/12/2021
Land and buildings	14,091	346	(122)	66	(210)	46	14,217
Nuclear power plants	77,329	3,765	(2,546)	784	-	204	79,536
Fossil-fired & hydropower plants	18,166	330	(119)	179	(1,188)	(3)	17,365
Other installations, plant, machinery, equipment & other	20,620	3,026	(691)	641	(934)	(25)	22,637
Right-of-use assets ⁽³⁾	5,733	764	-	68	(88)	(273)	6,204
Assets in progress ⁽⁴⁾	39,616	4,637	(40)	1,251	(33)	(63)	45,368
Gross value	175,555	12,868	(3,518)	2,989	(2,453)	(114)	185,327
Land and buildings	(7,843)	(608)	79	(16)	71	(13)	(8,330)
Nuclear power plants	(50,353)	(3,907)	2,449	(465)	-	(1,379)	(53,655)
Fossil-fired & hydropower plants	(13,450)	(643)	116	(203)	994	646	(12,540)
Other installations, plant, machinery, equipment & other	(9,536)	(1,347)	647	(229)	51	56	(10,358)
Right-of-use assets ⁽³⁾	(1,617)	(723)	-	(8)	81	208	(2,059)
Assets in progress ⁽⁴⁾	(156)	(39)	1	(6)	8	44	(148)
Depreciation and impairment	(82,955)	(7,267)	3,292	(927)	1,205	(438)	(87,090)
NET VALUE	92,600	5,601	(226)	2,062	(1,248)	(552)	98,237

(1) Changes in the scope of consolidation essentially relate to EDF Renewables (development and sale of structured assets) and EDF Energy (sale of West Burton B – see note 3.1).

(2) Other movements include the effect on assets associated with provisions and underlying assets of the €495 million change in the real discount rate used to calculate provisions related to EDF's nuclear generation (see note 15.1).

(3) Right-of-use assets are detailed in note 10.4.

(4) Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.

The changes observed in property, plant and equipment used in generation owned by the Group include a €2,062 million impact of translation adjustments due to the rise of the pound sterling against the euro and a €(1,031) million impact resulting from extension to 50 years of the depreciation period of 1300MW PWR nuclear plants at 1 January 2021 (see note 1.4.1).

Depreciation periods of nuclear plants in France

As stated in note 1.3.4.1, the depreciation period of nuclear power plants currently in operation in France, i.e. thirty-two 900MW reactors, twenty 1300MW reactors and four 1450MW reactors, is 50 years for 900MW-series plants (since 1 January 2016) and 1300MW-series plants (since 1 January 2021), and 40 years for N4-series plants which do not yet fulfil the conditions for a longer depreciation period.

Under France's multi-year energy programme (PPE, standing for *programmation pluriannuelle de l'énergie*) for the periods 2019-2028, adopted by decree 2020-456 of 21 April 2020, twelve French nuclear reactors are to be shut down by 2035, in addition to closure of the two reactors at Fessenheim which took place in the first half of 2020 in accordance with decree 2020-129 of 18 February 2020 terminating the plant's operating licence. Consequently two 900MW reactors will be shut down in 2027 and 2028 ahead of their fifth 10-year inspection (two others could also be shut down early in 2025-2026 if certain conditions are fulfilled, notably concerning the price of electricity and security of supply). To select the two reactors concerned, priority will be given to shutdowns that minimise the economic and social impact, have the lowest impact on the electricity network, and do not entail closure of an entire site. At the request of the French government, based on these criteria, on 20 January 2020 EDF proposed to examine the possibility of shutting down pairs of reactors at the sites of Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin. The PPE also stipulates that early reactor shutdowns will be confirmed 3 years prior to implementation. Consequently, notwithstanding the depreciation periods indicated above, adoption of the PPE in April 2020 has led to re-estimation of nuclear provisions since 2020 by reference to various scenarios for the early shutdowns of two 900MW reactors, resulting in a €29 million increase in nuclear provisions (mainly decommissioning provisions, due to the payment schedules being shortened by a few years). Accelerated depreciation schedules were also estimated based on these scenarios, leading to an increase in the depreciation expense recognised, with no significant impact on the Group's financial statements.

Depreciation period of coal-fired plants in France

In view of France's Energy and Climate law of 8 November 2019, the ends of the depreciation periods for the Le Havre and Cordemais coal-fired plants were changed at 1 June 2019, setting the closure of Le Havre at 1 April 2021 while Cordemais is to continue operating until 2026, considering a conversion to biomass as part of the Ecocombust project.

Le Havre power plant was permanently shut down on 31 March 2021.

As a result of the changes made in 2019 to the end of the depreciation period, accelerated depreciation (compared to the previous depreciation period) of €222 million was recognised during 2021 (€250 million in 2020, as the Le Havre plant ceased operations on 31 March 2021).

On 8 July 2021, EDF announced it had decided to put an end to the Ecocombust project to develop fuel from class B "waste" wood as an alternative to coal, since the conditions for continuing the project were not fulfilled: the project cost could not guarantee an attractive price for the final product, and the industrial partner recently withdrew.

EDF began the Ecocombust project in 2015. Since late 2018 the project had consisted of adapting the Cordemais plant to use this alternative fuel, and creating a dedicated facility to produce pellets on site. EDF carried out successful technical and environmental feasibility studies.

The economics of the project were penalised by its very innovative nature, and the lack of experience with this type of product, as well as recently soaring commodity prices. Also, the partner with which EDF was holding discussions for the treatment of effluents from the pellet production facility decided to withdraw from the project. This meant the industrial commissioning date had to be deferred to 2024, as the Cordemais plant would not have been able to produce electricity from an alternative non-coal fuel during the period 2022/2024.

Cordemais will continue to operate until 2024, perhaps even 2026, to meet the requirements of the electricity system as defined by RTE, in compliance with the Energy and Climate law which allows the Cordemais plant to be used at full capacity for a maximum 750 hours a year. Consequently, the end of the depreciation period is currently unchanged at 2026, and the depreciation schedule was accelerated from the second half of 2021 to take account of the expected new operating arrangements. The investment expenditure on the Ecocombust project was written off at 30 June 2021.

10.4 Right-of-use assets

Accounting principles and methods

Under IFRS 16, applicable since 1 January 2019, a contract is, or contains, a lease if it confers the right to control the use of an identified asset for a period of time in exchange for a consideration.

Identified arrangements that do not have the legal form of a lease contract but nonetheless convey the right to control the use of an asset or group of specific assets to the purchaser are classified as leases by reference to IFRS 16.

Recognition of a lease contract as lessee under IFRS 16

The Group's lease contracts as lessee essentially concern real estate assets (office and residential properties), industrial installations (land, wind farms) and to a lesser extent vehicles, IT and industrial equipment.

IFRS 16 requires leases to be recognised in the lessee's balance sheet when the leased asset is made available, in the form of a "right-of-use" asset, presented in "Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets" with a corresponding financial liability associated with the lease commitment, presented in "Current and non-current financial liabilities".

Upon initial recognition of a lease, the right of use and the lease liability are valued by discounting the future lease payments over the term of the lease, taking into consideration assumptions regarding the renewal or termination of leases if the relevant options are reasonably certain to be exercised.

As a rule, since the implicit interest rate in a lease is difficult to determine, the lessee's incremental borrowing rate is used to discount the lease liability. This rate is based on zero-coupon EDF bond rates, adjusted for the currency risk, a country risk premium, the term of the lease contracts and the subsidiary's credit risk at the date of initial recognition of the contract. In certain cases, it is based on a subsidiary's specific incremental borrowing rate.

Subsequently, the right of use is amortised over the expected term of the lease, while the lease liability is stated at amortised cost, i.e. adding the interest recognised in the financial result, and deducting the amount of the lease payments made.

The Group applies the two exemptions allowed by IFRS 16, and as a result leases with a term of 12 months or less and leases of assets with individual value when new of less than USD 5,000 are not recognised in the balance sheet. Consequently, the payments on these leases are recognised on a straight-line basis over the lease term in the income statement.

If the Group performs a sale and leaseback operation – consisting of selling an asset to a third party and then renting it back as lessee – which is classified as a sale under IFRS 15, it measures the right-of-use asset resulting from the lease as the proportion of the asset's previous book value that corresponds to the right of use retained by the Group. Also, the gain on the sale of the asset by the Group only corresponds to the proportion of the right of use actually transferred to the third party. The lease liability is not adjusted, unless the conditions of the sale or lease do not reflect market values.

Off-balance sheet commitments presented in note 21.1.1 concern:

- short-term leases (12 months or less);
- leases of assets with low value (less than USD 5,000 when new);
- leases signed for which the leased assets have not yet been made available (for example, assets under construction).

Recognition of a lease contract as lessor

The accounting treatment of a lease contract in which the Group is lessor depends on the classification of the contract. For a finance lease which transfers substantially all risks and rewards inherent to ownership of the underlying asset to the lessee, the Group recognises a financial asset in its balance sheet instead of the initial fixed asset; in this case, the receivable is equal to the discounted value of future lease payments.

10.4.1 Change in right-of-use assets

(in millions of euros)	31/12/2020	Increases ⁽¹⁾	Decreases	Changes in the scope of consolidation	Other movements ⁽²⁾	31/12/2021
Land and buildings	4,740	479	-	1	(68)	5,152
Other installations, plant, machinery, equipment & other	993	285	-	(89)	(137)	1,052
Gross value	5,733	764	-	(88)	(205)	6,204
Land and buildings	(1,055)	(566)	-	3	89	(1,529)
Other installations, plant, machinery, equipment & other	(562)	(157)	-	78	112	(529)
Depreciation and impairment	(1,617)	(723)	-	81	201	(2,058)
NET VALUE	4,116	41	-	(7)	(4)	4,146

(1) Increases concern right-of-use assets recognised in respect of new leases.

(2) Other movements include the effect of contract revisions on right-of-use assets and translation differences.

10.4.2 Impacts in the income statement

The main impacts of recognition in the income statement of lease contracts as lessee, in accordance with IFRS 16, are as follows:

(in millions of euros)	2021	2020
Income from subleases	56	56
Variable lease expenses	(53)	(46)
Expenses on short-term leases or leases of low-value assets	(70)	(106)
Income from sale and leaseback operations	-	-
Operating profit before depreciation and amortisation	(67)	(96)
Depreciation on right-of-use assets	(723)	(697)
Operating profit	(790)	(793)
Interest expense on the lease liability	(75)	(80)
INCOME BEFORE TAXES OF CONSOLIDATED COMPANIES	(865)	(873)

10.4.3 Payments relating to leases

(in millions of euros)	2021	2020
TOTAL PAYMENTS RELATING TO THE LEASE LIABILITY	(801)	(795)

Payments relating to the lease liability mainly concern principal repayments, and amount to €729 million in 2021 (€719 million in 2020).

10.5 Property, plant and equipment operated under concessions other than french public electricity distribution concessions

Accounting principles and methods

The accounting treatment of concession agreements depends on the nature of the agreements and their specific contractual features.

Concessions in France

In France, the Group is the operator for three types of concessions:

- public electricity distribution concessions granted by local authorities (municipalities or syndicated municipalities) (see note 11);
- hydropower concessions granted by the State;
- heat generation and distribution concessions from public authorities.

Hydropower concessions

Hydropower concessions follow standard rules approved by decree. For concessions granted before 1999, hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc.), while for more recent concessions, they also include hydropower generation equipment and switching facilities (alternators, etc.).

Most concessions that expired before 2012 were initially for 75 years and were renewed for terms of 30 to 50 years. However, the French government has not yet renewed 29 concessions that have expired. Since their expiry these concessions have thus been in the "rolling extension" situation defined by the law, which stipulates that at the expiry date of a concession, if no new concession has been established "the concession is extended on the existing terms until such time as a new concession is granted", so as to ensure continuity of operations in the meantime (Article L. 521-16 par. 3 of the French Energy Code).

As these concession agreements are not concerned by IFRIC 12 "Service concession agreements", the assets used, whether directly owned or part of the concession, are recorded under "Property, plant and equipment operated under concessions other than French public electricity distribution concessions" at acquisition cost.

The main depreciation periods applied are:

- Hydroelectric dams: 75 years;
- Electromechanical equipment used in hydropower plants: 50 years.

Heat generation and distribution concessions from public authorities

Heat generation and distribution concession agreements signed by Dalkia with public authorities confer the right to operate facilities remitted by or constructed at the request of those authorities for a limited period, under the concession-granting authority's supervision.

These agreements set the terms for remuneration and transfer of the facilities to the concession-granting authority or another operator taking over at the end of the agreement.

The assets are recorded as "Other intangible assets", in accordance with IFRIC 12 "Service concession agreements".

Concession assets generally comprise:

- boiler houses;
- networks;
- network extensions;
- network connections; and
- sometimes cogeneration assets.

Intangible assets are depreciated on a straight-line basis over the term of the concession, which is generally between 15 and 25 years.

Almost all of these assets are located in France.

Foreign concessions

Foreign concessions are governed by a range of contracts and national laws. Most assets operated under foreign concessions are recorded under "Property, plant and equipment operated under concessions other than French public electricity distribution concessions". Foreign concessions essentially concern Edison in Italy, which operates local gas distribution networks, hydropower generating plants and energy services under concessions. Edison owns all the assets except for some items of property, plant and equipment on the hydropower generation sites, which will be returned to the concession-granting authority for nil consideration or with an indemnity when the concession ends. In compliance with IFRIC 12, certain concession agreements are recorded as intangible assets. Hydropower generation assets which will be returned for nil consideration at the end of the concession are depreciated over the duration of the concession.

The net values of property, plant and equipment operated under concessions other than French public electricity distribution concessions are as follows:

(in millions of euros)	31/12/2020	Increases	Decreases	Changes in the scope of consolidation	Other movements	31/12/2021
Land and buildings	1,640	17	(17)	1	-	1,641
Fossil-fired & hydropower plants	11,711	260	(96)	21	38	11,934
Other	677	13	(16)	-	6	680
Assets in progress*	590	64	(4)	-	(11)	639
Gross value	14,618	354	(133)	22	33	14,894
Land and buildings	(980)	(34)	16	-	1	(997)
Fossil-fired & hydropower plants	(6,282)	(291)	92	-	(24)	(6,505)
Other	(482)	(35)	19	-	6	(492)
Assets in progress*	(16)	(2)	(4)	-	2	(19)
Depreciation and impairment	(7,760)	(362)	123	-	(15)	(8,013)
NET VALUE	6,858	(8)	(10)	22	19	6,881

* Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.

At 31 December 2021, property, plant and equipment operated under concessions other than French public electricity distribution concessions comprise concession facilities mainly located in France and in Italy (hydropower, excluding public electricity distribution).

10.6 Assets in progress

(in millions of euros)

	2021	2020
Intangible assets	1,793	1,581
Property, plant and equipment used in generation and other tangible assets owned by the Group	45,220	39,460
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	621	574
TOTAL ASSETS IN PROGRESS	47,634	41,615

Intangible assets

At 31 December 2021, intangible assets in progress include notably studies for the EPR 2 and SMR projects, amounting respectively to €761 million (€577 million at 31 December 2020), and €69 million.

New nuclear reactors in France: the EPR 2 project

The EPR 2 project concerns a new pressurised water nuclear reactor that meets the objectives for third-generation reactor safety, aiming to incorporate design, construction and commissioning experience acquired from EPR reactors and the nuclear reactors currently in operation.

On 16 July 2019, the ASN issued an opinion that the safety levels of EDF's key design options for its EPR 2 were satisfactory. It stated that "the general safety objectives, the safety baseline requirements and the main design options are on the whole satisfactory".

The EPR 2 will also offer superior operating performance in terms of power (1650MW compared to 1450MW for the most powerful current reactor), output, availability and manoeuvrability.

The draft PPE published on 25 January 2019 by the Ministry for the Ecological and Inclusive Transition stated that the Government, together with the nuclear industry, would conduct a programme of work by mid-2021 to examine the questions of the cost of new nuclear energy production and its advantages and disadvantages in relation to other low-carbon generation methods, the possible financing models, the project management modalities for new reactor projects and public consultation, and matters relating to the management of waste generated by the potential new nuclear fleet, and that based on this information and depending on developments in the energy situation, the Government would make a decision regarding the suitability of launching a renewal programme for nuclear installations.

While awaiting a decision about the EPR 2, EDF was authorised by its Board of Directors on 16 December 2020 to continue the project until the end of 2022, with a cost budget of around €1 billion.

In 2021, EDF, working with the French authorities, finalised its contribution to the government-supervised work programme: formal provision of feedback from construction of the first EPRs, and demonstration of the French nuclear sector's ability to handle an industrial programme to build 3 pairs of reactors (using an adjusted EPR model incorporating feedback from the earliest EPR projects in France and internationally).

The analysis conducted covered justification of the need, an action plan to mobilise actors in the nuclear sector, estimation of anticipated costs, analysis of the possible options for the programme's leadership and funding (and their consequences as regards regulation and changes in the legal framework), identification of locations, consideration of questions relating to management of the waste produced by a new nuclear fleet and action to be taken, including interaction with the European Commission and public consultation.

The DGEC audited this programme in the summer of 2021 and validated the methods used to estimate the schedule and costs.

The French President declared in a speech in November 2021 that France would restart a nuclear programme and build new reactors on French soil. On 10 February 2022 during a visit to Belfort in eastern France, he announced the launch of a programme to construct 6 EPR 2 reactors by 2035, and begin studies for an additional 8 EPR 2 reactors by 2050. No investment decision has yet been taken, and the programme will require appropriate regulation and funding arrangements.

NUWARD, France's Small Modular Reactor (SMR) project

Regarding Small Modular Reactors (SMRs), development of the NUWARD™, a 340MW pressurised water plant with two 170MW units, continued in 2021. Power plants in this bracket are largely designed for the export market, to contribute to the widespread replacement of the oldest fossil-fired plants in the next few decades. These export sales will be backed up by a model plant in France, due to start construction by 2030.

Development, industrial production and marketing of the NUWARD will be supervised by EDF with engineering support from the CEA, Naval Group, and TechnicAtome. Given its export target, this development is the subject of an investigation into the viability of cooperation with one or more international partner, particularly European partners.

The conceptual design phase is currently in process, benefiting from public funding of €50 million granted by the French State as part of the "France Relance" national recovery plan.

Property, plant and equipment used in generation and other tangible assets owned by the Group

At 31 December 2021, property, plant and equipment in progress used in generation and owned by the Group mainly comprise:

- investments for the Flamanville 3 EPR amounting to €15,014 million, including capitalised interim interest of €3,471 million at 31 December 2020 (€14,565 million at 31 December 2020, including capitalised interim interest of €3,291 million). The amount capitalised for the Flamanville 3 project in the financial statements at 31 December 2021 is €15,251 million, which also includes €231 million ⁽¹⁾ for assets that have been commissioned, including €25 million of interim interest (see note 10.3).

This capitalised amount of €15,251 million including capitalised interim interest, includes, in addition to the construction cost:

- › an inventory of spare parts and capitalised amounts totalling €529 million for related projects (notably the initial comprehensive inspection and North Area development),
- › €781 million of pre-operating expenses and other property, plant and equipment related to the Flamanville project,
- › and the elimination of internal balances on balance sheet items and margins between Framatome and EDF SA in connection with the Flamanville 3 EPR project (€311 million, essentially consisting of advances and progress payments),
- › giving a construction cost at historical value of €10,445 million in the consolidated financial statements at 31 December 2021, and a construction cost at completion (excluding interim interest) of €12.7 billion (in 2015 euros).

This follows the Group's announcement on 12 January 2022 that the schedule for the Flamanville 3 project was being adjusted and the estimated completion cost raised from €12.4 billion to €12.7 billion (in 2015 euros, excluding interim interest).

In its report of July 2020 on EPR technology, the French Court of Auditors (Cour des comptes) stated that by its calculations, in addition to the construction cost of €12.4 billion (in 2015 euros) announced by EDF in its press release of 9 October 2019, there would be further costs that could reach €6.7 billion (in 2015 euros), including €4.2 billion of interest expenses. As stated above, at 31 December 2021 the capitalised interest amounts to €3.5 billion and other capitalised project costs amount to €1.3 billion.

(1) €336 million in gross value, less €105 million of depreciation.

The non-recurring additional costs resulting from the necessary repairs to the main secondary circuit welds (see Group press release of 9 October 2019) are recorded in other income and expenses at the amount of €573 million in 2021 (€397 million in 2020) (see note 7). Additional costs induced by the readjustment announced on 12 January 2022 will be recognised in other operating income and expenses;

- investments relating to Hinkley Point C, amounting to €18,542 million including capitalised interim interest of €835 million (€13,586 million at 31 December 2020 including capitalised interim interest of €518 million). In 2021 investments in this project amounted to €3,635 million (€2,868 million in 2020);
- studies concerning Sizewell C amounting to €533 million (€324 million in 2020).

The balance of property, plant and equipment in progress (excluding assets operated under concessions), i.e. €11,131 million, principally concerns EDF SA's existing nuclear plants (70%) in line with the *Grand Carénage* programme (replacement of major components, particularly steam generators; work in connection with periodic reviews and 10-year inspections), and to a lesser extent (around 15%) EDF Renewables (power plants in development in Europe, North America and emerging countries).

Property, plant and equipment in progress increased by €5,760 million as the level of investment in 2021 is significantly higher than the amount of assets brought into service during the year (see note 10.3).

Principal projects in progress and investments during the year

Grand Carénage programme

Since 2014 EDF has been implementing its *Grand Carénage* industrial refurbishment programme designed to enhance reactor safety and extend nuclear fleet operating lifetimes beyond 40 years. The most recent estimate of the programme's cost for the period 2014 to 2025 was established in 29 October 2020 and amounted to €49.4 billion in current euros.

This cost estimate mainly reflected the first information about the additional works to be conducted, based on the fourth periodic review of the Group's 900MW reactors, a process that concluded with the ASN's decision issued on 23 February 2021. The work required covers studies, modification work and initially unplanned additional equipment to improve safety levels. This estimate also factored in the revised duration of scheduled maintenance outages for 10-year and partial inspections, building on prior year experience, and the impacts of the Covid-19 pandemic for the period 2020-2022 as estimated in 2020. The estimated cost of the *Grand Carénage* programme is regularly updated, and currently stands at €50.2 billion in current euros. This figure takes account of further work, studies and controls to be conducted, and a revaluation of certain costs. The industrial work will continue beyond 2025, and consequently the investment expenses will remain high beyond that date.

The principal events and industrial milestones of the *Grand Carénage* programme in 2021 were the following:

- on 23 February 2021, the ASN issued its opinion on the generic aspects of continued operation of 900MW reactors for ten years following their fourth 10-year inspection, considering that all the measures taken and recommended by EDF make this feasible. After Tricastin 1 in late 2019, Bugey 2, Bugey 4 and Tricastin 2 reached the milestone of 40 years of operation in 2021, and were restarted after a successful fourth 10-year inspection during 2021. Three other fourth 10-year inspections were in process at 31 December 2021 (Dampierre 1, Bugey 5 and Gravelines 1);
- the programme for preventive replacement of the main unit transformers continued. 150 of a total 174 main unit transformers have been replaced, i.e. 86% of the programme;
- the steam generators have been replaced at 27 of the total 32 900MW-series units;
- all 56 Emergency Diesel Generators are now in operation. The 56th (Paluel 1) was commissioned in February 2021.

Flamanville 3 EPR project

Developments in 2020

The main developments at the Flamanville site in 2020 were the following:

The second hot functional test phase which started on 21 September 2019 was completed in February 2020. Hot functional testing checks plant performance under simulated normal operating conditions.

In the context of the Covid-19 pandemic, after a cluster of cases was identified in the Manche area, work on the Flamanville site was restricted to safety, security and environment monitoring work only from mid-March (see note 1.4.3). General activity on the site resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020.

Functional tests of the open reactor vessel were successfully completed between 21 May and 25 June 2020.

Following the ASN's decision of 8 October 2020 authorising partial commissioning of the EPR, the first fuel assemblies arrived at the site on 26 October and are stored in the reactor building pool.

In parallel, the upgrading work continued on non-penetration welds on the main secondary circuit that had quality deviations or did not meet the break preclusion requirements defined by EDF, and several welds were repaired in August 2020 once the ASN issued its first authorisations. EDF also decided to include the welds on the circuit supplying water to the steam generators in the scope of the repairs concerning the main secondary circuit. Qualification of the repair procedure for these welds began, with the objective of performing the work in the second half of 2021. At this stage, the repairs concern a hundred welds in the secondary circuits.

A review was conducted in 2020 of the impact of France's first national lockdown on the Flamanville project. This did not lead to any change to the fuel loading dates or the construction cost announced in October 2019, but it showed that the project has no remaining margin in its schedule or cost. However, achievement of the targets depends on a number of factors, notably the ASN's examinations of EDF's proposed methods for repairing the main secondary circuit welds, particularly the qualification of welding robots for repairing the penetration welds.

Work on these repairs could not begin until the ASN made its final decision as to approval of the entire process involving remote-controlled robots, which was deferred to the first quarter of 2021. This phase of the project is among those in the critical path for on-schedule finalisation of the EPR.

Developments in 2021

The fuel assemblies required for the first fuel load continued to arrive during the first half of the year, and the entire first core is now stored in the Flamanville 3 reactor building pool.

The process of repairing the penetration welds on the main secondary circuit using remote-controlled robots was approved by the ASN on 19 March 2021, several weeks behind the expected date, and work began on the eight welds that were not compliant with the break preclusion principle. All eight were repaired in 2021, then subjected to stress-relieving heat treatment. Demonstration of the qualification of the stress-relieving heat treatment for repairs of VVP (steam discharge pipework circuit) penetration welds was validated by the ASN, which issued authorisation for its use in late 2021. Furthermore, four ARE (steam generator water supply circuit) penetration welds also require repair, and qualification of the repair process is under way at the ASN. This process is an adaptation of the process used for VVP penetration weld repairs.

For the non-penetration welds located on the main secondary circuit that had quality deviations (this concerns 45 VVP welds and 32 ARE welds), the ASN issued approval in April 2021 for the repair of a third batch of 6 welds. In the 3 batches authorised to date, 12 weld upgrades have been completed. In April the ASN gave approval for the related regulatory checks, which are currently in process.

In total, a hundred welds (penetration and non-penetration) on the main secondary circuit are concerned by repairs to the VVP and ARE pipework. The final stage of repair for most of these welds will be an optimised stress-relieving heat treatment, prior to the final verification. Repairing these welds remains one of the key challenges on the Flamanville 3 critical pathway.

On 2 March 2021 EDF declared a significant event to the ASN, concerning incomplete application of the 2006 design standards when installing three nozzles on the main primary circuit (these nozzles connect auxiliary circuits to the primary circuit). At the request of the ASN, three scenarios were examined by the Group's engineering teams. A file was sent to the ASN on 21 June 2021, stating that EDF's chosen solution is to install a "containment collar", and asking the ASN for its

position on this solution, so that all the design and procurement activities could be launched by the end of 2021. In a letter of 8 October 2021 the ASN indicated that it had no objections to this solution in principle. Nonetheless the design file for the containment collar will be examined by the French Radiation protection and Nuclear Safety Institute IRSN (Institut de radioprotection et de sûreté nucléaire).

Also, after corrosion was observed on pressuriser valves at the EPR at Olkiluoto (Finland), the Group carried out equipment checks and also detected traces of corrosion on the Flamanville EPR's valves. The material used for certain components of the pilots control valves has been changed accordingly. Several corrosion stress tests were conducted to select the best material. The components are currently in production and will be installed on site during the first half of 2022. The ASN has been regularly informed of the technical choices, and made no objection to this strategy. The ASN and the IRSN are also continuing their examination of the operation and reliability of the pressuriser valves. EDF is due to respond to the IRSN's most recent questions so that it can finalise examination of the valve design by the end of the first half of 2022.

As the work advances, new technical matters emerge that could increase the completion cost and the risk of deferred timelines. In view of the progress made on operations and preparations for start-up, on 2 January 2022 EDF has adjusted the schedule for the Flamanville 3 project. The fuel loading date has been deferred from late 2022 to the second quarter of 2023, and the estimated completion cost revised from €12.4 billion to €12.7 billion (in 2015 euros, excluding interim interest).

Before loading the fuel into the reactor vessel and carrying out the overall start-up tests, several operations remain to be carried out, mainly:

- completion of the weld repairs on the main secondary circuit;
- a new series of qualification tests of the installation before loading the fuel into the reactor;
- incorporation of experience gained from the technical issue handled at Taishan reactor 1;
- finishing work on the installation, and remittal of all the documents required for operation.

As announced in January 2022, inspections of fuel assemblies of the Taishan 1 reactor following the technical issue encountered during its second operating cycle showed mechanical wear on certain assembly components. This kind of wear has already been observed in several reactors of the French nuclear fleet. For the future commissioning of Flamanville 3, a solution will be examined with the ASN.

Hinkley Point C

Following the final investment decision (FID) made by EDF's Board of Directors on 28 July 2016, EDF and China General Nuclear Power Corporation (CGN) signed contracts with the UK government for the construction and operation of two EPR reactors at the Hinkley Point site in Somerset (the "Hinkley Point C" or "HPC" project). EDF's share in HPC is 66.5% and CGN's share is 33.5%.

Construction work continued on the HPC project in 2021, and many milestones including the following have been reached (work on Unit 2 follows around 11 months after the work on Unit 1):

- at unit 1, the concrete base for the reactor building has been completed. On the conventional island, the 2,500m³ concrete "table" that will support the turbine has been completed;
- the 1.8km water outfall tunnel is complete, and work has begun on the second water intake tunnel. The six water intake and outfall tunnel heads are ready;
- electrical and mechanical work began in a first room following completion of the civil engineering works. At Unit 2 the first steel ring of the containment liner was lifted into place on the reactor building in November 2021, just 11 months after the same operation on the Unit 1 reactor;
- production of essential equipment continued: the beams for the rotary overhead crane and the first low-pressure turbine were completed.

Progress in 2021 on the HPC project was affected by the Covid-19 pandemic beyond the first quarter, and also by a lower-than-expected engineering performance and tensions on the worldwide building materials markets. The offshore phase of maritime work was also slowed down by delays with planning permission; a court case is currently ongoing. In this context, the risks of schedule and cost adjustments rose again in 2021. Action plans are under way to reduce the risk of delays, and steps are being taken to improve the engineering performance. Respect of the current schedule and completion costs will depend on the success of these measures.

A detailed review of the HPC project's schedule and cost was performed in 2020, particularly to estimate the impact of the pandemic so far. As a result the following information was announced on 27 January 2021:

- the start of electricity generation from Unit 1 is now expected in June 2026, instead of end-2025 as initially announced in 2016;
- the project completion costs are now estimated in the range of £22 to 23 billion (in 2015 sterling) ⁽¹⁾;
- the risk of a Commercial Operation Date delay for Units 1 and 2 is maintained at 15 and 9 months respectively. The realisation of this risk, which has a high probability, would generate a potential additional cost in the region of £0.7 billion (in 2015 sterling).

A full review of the benchmark costs and schedule will be carried out in 2022.

Sizewell C

On 29 September 2016, alongside the HPC contracts, EDF and CGN signed agreements for the Sizewell C project, concerning the development, construction and operation of two EPR reactors at Sizewell in Suffolk with total capacity of 3.2GW, to supply electricity to 6 million British households for approximately 60 years. The project objective is to replicate HPC as far as possible.

Development of this project is headed by EDF, which owns an 80% share at 31 December 2021 while CGN owns the other 20%. By the final investment decision date at the latest, EDF expects to become a minority shareholder with a maximum stake of 20% and correspondingly limited rights, at which point it will deconsolidate the project in the Group's financial statements. Consequently, the project aims to achieve the right conditions for non-Group investors and lenders to invest in the project, particularly the definition of an appropriate regulatory and funding framework, which is necessary to obtain a quality credit rating that will attract private sector funding at a competitive cost for consumers, and mobilise the necessary capital.

Once the final investment decision is made, EDF plans to supply design, equipment and essential nuclear components (particularly steam generators, instrumentation and control equipment, and fuel) and the associated services.

In June 2020, the UK's Planning Inspectorate accepted the application for a Development Consent Order (DCO) for construction of Sizewell C. Examination of the DCO took place between April and October 2021. As part of the UK planning process, a Deed of Obligation (programme of mitigation measures) and an Environment Trust (promising additional environmental protection) were set up. The Planning Inspectorate is currently studying the final draft of the DCO and all the related documents (technical assessments, mitigation measures, etc.) before making a recommendation to the UK's Secretary of State. The Secretary of State's decision on the DCO application is expected to be made by the end of May 2022, and will be open to appeal for a six-week period. Applications for environmental permits and a nuclear site licence were submitted in May and June 2020 and are currently under examination. The requirements for attribution of a nuclear site licence should be fulfilled during 2022.

On 26 October 2021, the UK government presented the Nuclear Energy (Financing) Bill setting out a proposed funding framework for future nuclear projects, the Regulated Asset Base (RAB) model. The bill completed all the stages in the House of Commons on 10 January 2022 and was then sent to the House of Lords for a second reading. The RAB model aims to enable investors to share the risks of project construction and operation of the project with consumers. A Government Support Package (GSP) will also be defined to protect investors and lenders against

(1) The costs previously announced in the press release of 25 September 2019 were £21.5-22.5 billion (costs net of operational action plans, in 2015 sterling, excluding interim interest and foreign exchange effects versus the reference exchange rate for the project of £1 = €1.23). Costs are calculated by discounting estimated costs in current sterling using the British Construction Output Price Index for All New Work.

certain risks. The Sizewell C project aims to be eligible for a RAB licence. The terms of the RAB model and the GSP for Sizewell C are currently in discussion.

On 27 October 2021, in its budget and spending review for 2021, the UK government announced that the budget for 2022-2025 included up to £1.7 billion of direct government funding to enable a large-scale nuclear project to reach a final investment decision, and that the government was in active negotiations with EDF

over the Sizewell C project. On 27 January 2022 the UK government announced that it was granting £100 million of public funding in return for an option to purchase land at the Sizewell C site or EDF's shares in the Sizewell C company.

EDF's ability to participate along with other investors in a final investment decision and contribute to funding for the construction phase depends on the fulfilment of conditions which are not guaranteed at this date.

10.7 Investments in intangible assets and property, plant and equipment

The table below provides a breakdown of the investments in intangible assets and property, plant and equipment presented in the cash flow statement:

(in millions of euros)	2021	2020
Acquisitions of intangible assets	(1,645)	(1,446)
Acquisitions of property, plant and equipment	(16,102)	(15,086)
Change in payables to suppliers of fixed assets	141	525
INVESTMENTS IN INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT	(17,606)	(16,007)

Investments in property, plant and equipment and intangible assets during 2021 mainly concern:

- the France – Generation and Supply segment for €5,327 million, primarily investments made under the “Grand Carénage” programme, investments for Flamanville 3, and investments in hydropower generation;
- the France – Regulated activities segment: €4,784 million, essentially investments related to connections for customers and producers, but also

investments for network renewal, quality of service and network modernisation;

- the United Kingdom segment for €4,325 million, where investments principally related to nuclear power generation;
- the EDF Renewables segment for €1,849 million, which saw a significant rise in wind and solar capacities under construction in France, in North America, and in emerging countries.

10.8 Impairment/reversals

Accounting principles and methods

At the year-end and at each interim reporting date, in application of IAS 36, the Group assesses whether there is an indication that an asset could have been significantly impaired. An impairment test is also carried out at least once a year on cash-generating units (CGUs) or groups of CGUs including an intangible asset with an indefinite useful life, or to which goodwill has been partly or totally allocated.

Impairment tests are carried out as follows:

- the Group measures any long-term asset impairment by comparing the carrying value of these assets and goodwill, grouped into CGUs where necessary, and their recoverable amount;
- CGUs are groups of homogeneous assets that generate identifiable independent cash flows. They reflect the way activities are managed in the Group: they may be subgroups when the activity is optimised across the whole subgroup, or CGUs formed by parts of subgroups corresponding to different types of activity that are managed separately (thermal generation, renewable energy production, services), or single assets;
- the recoverable value of these CGUs is the higher of fair value net of disposal costs, and value in use. When this recoverable value is lower than the carrying amount in the balance sheet, an amount equal to the difference is booked under the heading “Impairment”. The loss is allocated first to goodwill, and any surplus to the other assets of the CGU concerned; impairment booked on goodwill is irreversible;
- fair value is the asset's potential sale price in a normal transaction between economic actors;
- value in use is calculated based on projected future cash flows:
 - over a horizon that is coherent with the asset's useful life and/or operating life,
 - for certain intangible assets with an indefinite useful life (such as brands), beyond the horizon that can be observed or modelled, a terminal value is determined by discounting to infinity a normative cash flow,
 - excluding development projects other than those that have been decided at the valuation date,
 - and discounted at a rate that reflects the risk profile of the asset or CGU;

- the discount rates used are based on the weighted average cost of capital (WACC) for each asset or group of assets concerned, determined by geographical area and by business segment under the CAPM. WACC is calculated after taxes;
- future cash flows are calculated on the basis of the best available information at the closing date:
 - for the first few years, the flows correspond to the Medium-Term Plan (MTP). Over the MTP horizon, energy and commodity prices are determined based on available forward prices, taking hedges into consideration,
 - beyond the MTP horizon, cash flows are estimated based on long-term assumptions prepared for each country where the Group controls nuclear assets, within the framework of a scripting process updated annually. Long-term electricity prices are constructed analytically by assembling blocks of assumptions, e.g. economic growth, commodity prices (oil, gas, coal) and CO₂, demand for electricity, interconnections, and developments in the energy mix (rise of renewable energies, installed nuclear capacity, etc.) with fundamental models of supply-demand balance. The Group refers in particular to external analyses for each assumption object (for example, for commodities and CO₂, which are primary factors in electricity prices, the Group compares its own scenarios with scenarios developed by organisations such as the AIE, IHS, Wood Mackenzie or Aurora, bearing in mind that each of these analysts itself proposes a cone of scenarios corresponding to different macro-economic environments);
- income from capacity market mechanisms is also taken into consideration in valuing generation assets, starting from the MTP horizon where relevant, provided the countries concerned have introduced or announced the future introduction of a capacity revenue mechanism.

These calculations may be influenced by several variables:

- changes in discount rates;
- changes in market prices for energy and commodities and tariff regulations;

- changes in demand and Group's market shares, and the attrition rate on customer portfolios;
- the useful life of facilities, or the duration of concession agreements where relevant;

- the growth rates used beyond the medium-term plans and where relevant the terminal values taken into consideration.

10.8.1 Impairment by category of asset

Details of impairment recognised and reversed are as follows:

<i>(in millions of euros)</i>	<i>Notes</i>	2021	2020
Impairment of goodwill	10.1	-	(31)
Impairment of other intangible assets	10.2	59	(85)
Impairment of tangible assets	10.3-10.5	(712)	(683)
IMPAIRMENT NET OF REVERSALS		(653)	(799)

Impairment recognised at 31 December 2020 amounted to €(799) million and concerned:

- nuclear assets (€(621) million) and gas storage assets (€(13) million) in the United Kingdom;
- various CGUs of EDF Renewables (€(36) million);
- hydropower assets (€(39) million) and energy service assets (€(27) million) owned by Edison in Italy;

- the goodwill of DES Groom, a subsidiary in the United States (€(26) million); end

- other assets (total €(37) million).

Impairment recognised in 2021 amounts to €(653) million. Details are given below.

10.8.2 Impairment test on goodwill, intangible assets and property, plant and equipment

The following tables present the results of impairment tests carried out on the main goodwill, intangible assets with indefinite useful lives and other Group assets in 2021, and some of the key assumptions used.

Impairment of goodwill and intangible assets with indefinite useful lives

No new impairment was recorded on the Group's goodwill and intangible assets with indefinite useful lives at 31 December 2021.

Operating segment	Cash-Generating Unit or asset	Net book value (in millions of euros)	WACC after tax	Growth rate to infinity	Impairment 2021 (in millions of euros)
United Kingdom*	EDF Energy goodwill	8,095	5.7%	-	-
Italy	Edison brand	945	6%	1.5%	-
Framatome	Framatome goodwill	1,428	5.9%	0.5%	-
	Framatome brand	151	5.9%	0.5%	-
Dalkia	Dalkia goodwill	592	4.2%	1.5%	-
	Dalkia brand	130	4.2%	1.5%	-
Other impairment					-
IMPAIRMENT OF GOODWILL AND INTANGIBLE ASSETS WITH INDEFINITE USEFUL LIVES					-

* The impairment test of EDF Energy goodwill covers the useful life of industrial assets, with no projection to infinity.

Impairment of other intangible assets and property, plant and equipment

Operating segment	Cash-Generating Unit or concerned asset	Impairment indicators	WACC after tax	Impairment 2021 (in millions of euros)
United Kingdom	Nuclear assets*	Early closure of the Dungeness plant	5.7%	(445)
	Land	Lower prospects for appreciation of land value	5.7%	(260)
Italy	Hydropower assets	Confirmed favourable developments in market prices and WACC	6%	60
	Wind power assets	Confirmed favourable developments in market prices and WACC, supported by a significant transaction	5%	90
EDF Renewables	Some CGUs (mainly in France)	Unfavourable prospects for tariffs and operations	3.6%	(54)
Other impairment				(44)
IMPAIRMENT OF OTHER INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT				(653)

* Impairment mainly booked at 30 June 2021.

General assumptions

In the general context at 30 June 2021, following a financial year 2020 affected by the Covid-19 pandemic, the Group entities' market conditions and operating performance presented no indication of impairment in 2021. However, some specific situations required impairment tests, which led to recognition of impairment of €(502) million at 30 June 2021 on individual assets, principally in EDF Energy's nuclear power plants in operation in the UK, and in France some of EDF Renewables' photovoltaic plants and the Cordemais plant, following discontinuation of the Ecocombust project.

At 31 December 2021, the Group applied its usual method for impairment testing, updating the annual tests for goodwill and intangible assets.

Electricity prices

Over the market horizon (generally three years), the forward prices used in the impairment tests are the market prices observed at the end of December, including hedged positions, which (to an even greater extent than at 30 June) were significantly higher than observed forward prices at the end of 2020, in all geographical zones.

Over the long-term horizon, these tests use price curves constructed analytically by assembling blocks of assumptions and fundamental models of the supply-demand balance, in an annually updated scenario-building process.

The long-term scenarios constructed for electricity prices in countries where the Group does business are consistent with the trajectories of European decarbonisation targets, as defined in the 2015 Paris climate agreement, then the June 2021 "Fit for 55" package, setting a target 55% reduction in greenhouse gas emissions (compared to 1990 levels) by 2030. The scenarios used mainly include high CO₂ prices that can lead to carbon-free electricity production in Europe, and the economy more generally through electrification of uses. At this stage, however, the scenarios used for impairment testing do not include an assumption that the net-zero target for Europe will be attained by 2050.

The long-term price curves in the 2021 scenario rise until 2040, then decrease slightly due to the projected development of new-generation Combined Cycle Gas (CCG) power plants. Compared to the 2020 scenario, the long-term curves are higher until 2040 with a rise in the baseload power price of +€5 to +€10/MWh in the four core countries (France, the United Kingdom, Italy and Belgium), followed by a slight reversal in the trend expected for the last decade up to 2050, but on a smaller scale (-€1 to -€5/MWh). There are several explanatory factors for this pattern:

- a rising trajectory of CO₂ quotas in the ETS (EU Emissions Trading System), incorporating the European Union's stricter commitments from the start of the horizon to achieve a substantial reduction in greenhouse gas emissions from

2030 and aim for net-zero by 2050. The upward effect of CO₂ on electricity is lessened towards the end of the horizon by development of CCG plants with carbon capture and storage, which will make variable costs for those plants largely independent of carbon emissions;

- lower gas prices in Europe at the end of the horizon compared to the 2020 scenario, due to downward revision of long-term imports with greater penetration of the electricity mix by renewable energies (particularly in Europe, China and Japan) and upward revision of assumptions of LNG supply in regions with low-cost resources (particularly Russia and Qatar);
- updated assumptions regarding supply and demand for electricity, reflecting a decline in demand for electricity in the medium term due to an increase in energy efficiency measures. This trend self-corrects over the longer term, with demand rising in line with the growth in electric vehicles and electrolytic hydrogen.

As these assumptions are crucial in determining recoverable value, sensitivity analyses are conducted on long-term price curves when impairment tests are carried out.

Furthermore, for the assumptions concerning capacity mechanisms, the necessary non-market revenue is expected to be higher across European countries generally than in the 2020 scenario, due to the downward revision of the return of the peaking plants on the Energy Only Market, particularly given the upward revision of CO₂ prices. To break even and stay on the market, these facilities are having to draw on other revenue sources, including capacity revenue and ancillary services. This structural trend also concerns France, although the headroom is expected to recover in 2026 with the arrival of new capacities in the next few years, notably France's first offshore wind farm, the Flamanville EPR, and the Landivisiau CCG plant.

Discount rates

The discount rates used in impairment tests are lower than at 31 December 2020 for all Euro zone countries and the United Kingdom.

This is due to the general downward trend in risk-free rates despite an upturn at the end of the year, combined in the United Kingdom with a higher corporate income tax rate. In Italy, the sovereign risk premium, which had been raised in June 2020 due to the specific national context, decreased due to rate tightening on the markets, leading to a more pronounced decrease in the WACC.

The year-on-year decrease in the principal WACC rates used in the tests is around 10 to 30bp for France, United Kingdom and Belgium and 50bp for Italy. The test results have been subjected to analyses of their sensitivity to the discount rate.

At 31 December 2021, the macro-economic context presented above did not involve any major new risk for the Group compared to the risks already taken into account in prior financial statements; the impairment recorded relates to risks specific to certain CGUs and specific assets.

United Kingdom – EDF Energy

Thermal assets

Significant amounts of impairment have been booked in recent years in respect of the Group's thermal assets in the United Kingdom reducing the net book value of the remaining assets practically to zero.

The necessary investments for the Hole House and Hill Top gas storage site were fully written off at 31 December 2020, for a cost of €(13) million.

Regarding coal-fired plants, the Cottam power plant was closed in September 2019 and the Group will close the United Kingdom's last remaining coal-fired plant, West Burton A, in September 2022.

The sale of the West Burton B gas-fired (CCGT) plant announced at the end of the first half of 2021 was completed on 31 August 2021. Impairment had been recognised on this plant several times after it first began operation in 2013, mainly due to unfavourable developments in the spark spreads and the insufficient additional income from the capacity mechanism. The limited amount of impairment booked in the 2021 half-year financial statements in addition to previously-booked impairment was reversed in the second half-year after the final sale price was established when the sale was completed.

At 31 December 2021, the Group has practically no remaining coal-fired or gas-fired operations in the United Kingdom, confirming its ambition to take proactive steps for carbon-free electricity generation.

Sales and Supply segment

Despite several positive signals as the Covid-19 pandemic receded, the sales and supply segment was affected by the current crisis on the United Kingdom energy market that has obliged OFGEM (the Office of Gas and Electricity Markets) to apply the Supplier of Last Resort rule several times: for EDF Energy, this meant taking over the customers of Green Network Energy, Utility Point and Zog Energy. OFGEM's tariff method also prevented suppliers from passing on the substantial rise in raw material costs to the SVT (*Standard Variable Tariff*) cap for residential customers in winter 2022. In the long term, the margin prospects are confirmed for the BtoB and BtoC activities, which remain relatively insensitive to price scenarios as wholesale energy costs tend to be passed on the consumers in the long run. The recoverable value for the sales and supply segment is lower than in 2020 and benefits from a favourable effect of lower WACC. Sensitivity analysis was conducted with a reduction in long term margins, and loss of market share, this indicated that the CGU is sensitive to these parameters, particularly as it has few fixed assets (mainly information systems).

Nuclear assets (plants in operation)

The recoverable value of existing nuclear plants is determined by discounting future cash flows over their useful life, assuming a 20-year extension for the Sizewell B PWR plant, in line with Group strategy. The recoverable also value reflects the early shutdown decisions made in recent years for certain AGR plants, beginning with Hunterston, which was closed on 7 January 2022, and Hinkley Point B, to be closed no later than 15 July 2022, as announced by the Group on 27 August 2020 and 19 November 2020 respectively. It also incorporates the impact of the decision of 7 June 2021 to move Dungeness B AGR plant into the defueling phase; Dungeness had been offline since September 2018, and has had continuous specific technical difficulties (impairment of €(445) million was recognised at 30 June 2021). The updated impairment test conducted at 31 December 2021 also takes account of the decision made in December 2021 to bring forward the end of generation operations by Torness and Heysham 2 from 31 March 2030 to 31 March 2028. The operating lifetimes of the two AGR plants at Hartlepool and Heysham 1 are still scheduled to end in 2024.

Using higher, but volatile, market price forecasts, and taking into consideration possible production issues with AGR plants in view of recent history, the result of the impairment test did not lead to any change in impairment recorded in previous periods.

The recoverable value of nuclear assets is sensitive to price assumptions: a +/-5% difference over the entire horizon of the scenario used for the impairment test

would have an impact of +/-€500 million on the result. The nuclear output assumptions used also have a substantial influence on the calculation: a +/-5% revision to forecasts over the entire horizon would result in a variation of +/-€700 million in the recoverable value, all other things being equal. In addition, a 50bp increase in the discount rate would lead to a reduction of around £200 million in the recoverable value.

Land associated with the nuclear fleet

Following the early end of generation at the Dungeness plant, the imminent end of generation by the Hunterston and Hinkley Point B plants and the option exercised by the British government (see note 15.2.1), confirming that EDF will carry out the defueling of the stations and that the ownership of the sites will be transferred to the government, an expert review was carried out of the land adjacent to each nuclear power station (known as non-operational land). This resulted in recognition of a total £226 million on various areas of land owned by EDF Energy.

Goodwill and the HPC Project

EDF Energy's goodwill amounted to €8.1 billion (or £6.8 billion) at 31 December 2021 and mainly results from the takeover of British Energy in 2009.

The recoverable value of EDF Energy is determined by discounting future cash flows over the assets' useful life, taking into consideration the two EPRs with a 60-year useful life currently under construction at the Hinkley Point site, a project for which the final contracts were signed on 29 September 2016. Future cash flows from these plants are determined by reference to the Contract for Difference (CfD) between the Group and the UK government. The CfD sets stable, predictable prices for EDF Energy for a period of 35 years from the date the two EPRs are first commissioned: if market prices fall below the CfD exercise price, EDF Energy will receive an additional payment. The CfD exercise price for HPC is set at £92.50/MWh (in 2012 sterling) and is indexed on UK inflation via the consumer price index (CPI). Thus, for the operation period under a CfD, future cash flows include a long-term inflation assumption. For the 25 years of operation after the CfD period, for which no forecasts exist for long-term UK electricity market prices, future cash flows include a very long-term inflation assumption and a price assumption based on the CfD exercise price of £92.50/MWh (in 2012 sterling), which is the best estimate of market price levels over this horizon.

The impairment test conducted at 31 December 2021 incorporates the estimated completion cost range announced on 27 January 2021, i.e. total project completion costs (excluding interim interest and exchange rate effects compared to the project's benchmark rate of £1 = €1.23) of an estimated £22-23 billion (in 2015 sterling), instead of the estimate of £21.5-22.5 billion (in 2015 sterling) resulting from the previous cost revision of September 2019, and deferral of the delivery of reactor 1 to mid-2026. The breadth of the range will depend on the success of action plans to be delivered in partnership with contractors, and the impairment test used a mid-range value. A full examination of the benchmark costs and schedule will take place in 2022. A detailed review of the assumptions used in the model for the HPC's operating phase was conducted in 2021, leading among other things to an update of the very long-term inflation rate applied to electricity prices. The model also takes account of an increase in the UK tax rate, which is set to rise from the current 19% to 25% in April 2023. This change of assumption is applied across the whole lifetime of the model, since no other rate is known, and has a significant impact on the project's recoverable value. EDF's projected rate of return (IRR) is now estimated at between 6.8% and 6.9% (compared to 7.1%-7.2% previously).

Applying this revised basis to the HPC project, and in view of the unfavourable effects explained above, which particularly affect the recoverable value of existing nuclear assets, the headroom between the recoverable value and the book value of EDF Energy shows a moderate decline, but remains significant at 31 December 2021.

The risk of deferral of HPC's Commercial Operation Date (COD) by 15 months for Unit 1 and 9 months for Unit 2, which would generate a potential additional cost in the region of £0.7 billion (in 2015 sterling) as explained in the Group's press release of January 2021, could reduce the headroom indicated by the impairment test of EDF Energy by around 34%.

Sensitivity analyses on various dimensions and assumptions (particularly WACC) do not indicate any risk of impairment, all other things being equal.

Sensitivity analyses were also conducted for information purposes using extremely pessimistic assumptions: for example, it was estimated that a further 3-year deferral of the COD and an associated additional cost of £3 billion, or a 60-point rise in WACC, would lead to a threshold value for the goodwill impairment headroom, all other things being equal.

Finally, a multi-sensitivity scenario was developed to test the goodwill's resilience in the event of several adverse scenarios concerning the project's various phases (construction, operation, decommissioning) in the absence of any action or remedial plan, incorporating a delay of 1 year and additional costs of £1 billion in the construction phase, a 3% decrease in plant availability, a 5% rise in fuel costs and a 3% rise in operating and maintenance costs. Under this combined stress test, the headroom remains slightly positive, confirming the recoverability of the goodwill's net book value.

Finally, although at this stage Brexit has no observable impact on impairment tests of EDF Energy's assets since most cash flows (income, costs, investments) and assets are stated in sterling, the longer-term consequences are still hard to predict. The Group will monitor changes in the prices of fuel, materials and supplies, macro-economic data, and electricity price formation, which could all potentially affect the results of future tests.

Italy - Edison

As an intangible asset with an indefinite useful life, the impairment test of the Edison brand, first recognised at the value of €945 million when Edison was taken over in 2012, is updated annually using the royalty relief method and a 100bp risk premium for determining the discount rate. The updated test at 31 December 2021, incorporated the recommendations of an external assessment carried out in 2020 (reducing the long-term growth rate from 2% to 1.5% based on GDP forecasts; increasing the royalty rate for the Business customer segment following a survey of business customers). The result showed a rise in the brand's recoverable value, taking account of higher volume effects and a favourable WACC effect. Sensitivity analyses including a 50bp increase in the WACC, and a -0.2% decrease in royalties, did not indicate any risk of impairment.

At 31 December 2021, there was a general improvement in the recoverable value of Edison's CGUs due to the more favourable long-term price environment, favourable operating effects, particularly higher volumes for certain CGUs, and the impact of the decrease of around 50bp in the WACC. No risk of impairment was detected. On the contrary, some of the impairment booked previously in the context of a downward trend in market prices (especially in 2015) was recovered.

Concerning Edison's hydropower assets, accumulated impairment of €(430) million had been recorded in the past, principally in 2014, 2015 and 2016. Impairment of -€39 million was also recognised at 30 June 2020, based on conservative assumptions in the context of the Covid-19 pandemic. At 31 December 2020 the difference between this CGU's recoverable value and book value was observed to be positive once more, but a conservative approach was applied and no impairment was recovered. The durable increase in the recoverable value, confirmed at 31 December 2021, led to a partial recovery from past impairment, amounting to €60 million. This recovery was limited by depreciation recorded since the initial recognition of assets, together with long-term market price assumptions limited by including a PUN price sensitivity of -10%.

Concerning wind power assets, accumulated impairment of some €150 million had been recorded in the past, principally in 2014 and 2015. At 31 December 2021 the recoverable value was improving, confirming the durability of the headroom observed in recent years. This was also confirmed by the sale of 49% of Edison Renewables to Crédit Agricole Assurance in December 2021 (see note 3.1.1). The durable increase in this CGU's recoverable value at 31 December 2021 led to a partial recovery from past impairment, which was limited to €90 million due to the depreciation booked since the initial recognition of the assets.

Concerning thermal assets, on which accumulated impairment of some €600 million had been recorded in the past, the impairment test at 31 December 2021 showed significantly positive headroom, but no impairment was recovered in 2021 since this result essentially related to the new-generation CCGT plants at

Marghera and Presenzano which are due to be commissioned in 2022 and 2023. Marghera and Presenzano are two new-generation gas-fired plants with respective capacities of 780MW and 760MW and low environmental impact (carbon emissions 40% below the national average, NOx emissions reduced by 70%) and will benefit from capacity revenue. Sensitivity analyses were conducted on these assets, and the results show that a 10% decrease in clean spark spreads or a 50 bp increase in WACC would not entail any risk of impairment.

Finally, the Algerian E&P assets still owned by the Group at this stage were subjected to an impairment test at 31 December 2021, particularly in view of the commodity price situation on the market. The value resulting from the test did not lead to recognition of any additional impairment.

Framatome

At 31 December 2021, the goodwill of Framatome amounted to €1,428 million, almost entirely resulting from EDF's acquisition of 75.5% of the capital of Framatome on 31 December 2017. The Group finalised recognition of the business combination in its financial statements at 31 December 2018.

The recoverable value of Framatome was determined on the basis of a 10-year business plan and a terminal value. This business plan is sensitive to assumptions concerning the completion of major construction projects that are incorporated into the reactor scenario, and market share assumptions for services to the installed base and fuel deliveries to customers' reactors. The WACC applied in discounting future cash flows is weighted to reflect Framatome's different businesses depending on their risk profile. The headroom indicated by the impairment test remains very significant and was slightly higher than at 31 December 2020, principally due to the lower WACC.

Sensitivity analyses were conducted using a 50bp increase in WACC and a 0% growth rate to infinity. The test conclusions were not affected.

Framatome's intangible assets recognised after its acquisition (technologies, including the EPR, which are depreciated over an average 15 to 20 years; customer relations amortised over an average period of 11 years; and the brand) were tested and no risk of impairment was identified.

EDF Renewables

EDF Renewables' assets mainly consist of CGUs benefiting from Power Purchase Agreements (PPAs) providing contractually defined revenues over most of the assets' useful lives, and consequently have low market risk exposure.

In 2021, impairment of -€54 million was recognised in respect of various CGUs of EDF Renewables.

As explained in the financial statements at 31 December 2020, the French Finance Law for 2021, published in the *Journal officiel* on 30 December 2020, introduced a reduction in purchase tariffs for electricity generated by photovoltaic plants of over 250 kWp covered by a purchase obligation contract in application of the tariff decisions of July 2006, January 2010 and August 2010 (article 225), but it was not possible at the time to determine the potential effects for EDF Renewables (which is the exclusive or joint owner of solar plants concerned by this tariff revision, with total net capacity of 145MWp), since further details had yet to be set by decree and order. Decree 2021-1385 and the order of 26 October 2021, after examination by the Higher Energy Council (Conseil Supérieur de l'Énergie), stipulated the modalities for application of this tariff reduction and the "safeguard clause", and put the CRE in charge of defining the conditions and format for review applications submitted to it under that clause, and the information necessary to examine those applications.

Impairment tests conducted at 30 June 2021, based on tariff assumptions made available by the CRE at the time, led to recognition of impairment of -€9 million on fully-consolidated solar power plants, and €(25) million on investments accounted for by the equity method. The updated tests at 31 December using the final tariffs only led to minor adjustments to these amounts (see note 11.2).

Other impairment at EDF Renewables concerns specific assets, including -€24 million for a wind farm and a solar power plant in the United States. Sale of these facilities is under consideration for prices expected to be lower than the value of the assets.

Dalkia

At 31 December 2021, Dalkia's goodwill amounts to €592 million, principally resulting from acquisition of the Dalkia group in France under the agreement of 25 March 2014 with Veolia Environnement.

The recoverable value of the Dalkia group is based on future cash flows projected over a medium-term horizon, and a terminal value that represents cash flow projections to infinity. The updated test at 31 December 2021 benefited from improvements in certain parameters since 31 December 2020, particularly the discount rate, the growth rate and the favourable effect of Dalkia's growth prospects under the "France Relance" plan. Applying the updated assumptions, the recoverable value is still well above the book value. The key parameters of the test are the terminal value and the discount rate: sensitivity analyses of those parameters did not call into question the headroom between the recoverable value and the book value.

The Dalkia brand, which was recognised as an asset when the Group took control of Dalkia in 2014 at the value of €130 million, is estimated by the royalty relief method. The updated impairment test at 31 December 2021 supports its current book value.

An impairment test was conducted for the technical service subsidiary Imtech in the United Kingdom, in view of past losses made by this CGU. No risk of impairment was indicated, including for the brand, which is carried in the balance sheet at the value of €86 million. Threshold value analyses were performed to confirm that this result was robust in view of the parameters used.

France - Generation and Supply

Due to the integrated management and interdependence of the different generation facilities that make up the French fleet (nuclear, thermal and hydropower plants), independently of their maximum technical capacities, the Group considers the entire fleet as a single CGU. This CGU does not include any goodwill.

Even when there is no indication of any loss of value, an impairment test is performed due to the highly significant value of this CGU in the Group's financial statements and its substantial exposure to market prices since the "yellow" and "green" regulated tariffs were discontinued on 1 January 2016.

The recoverable value of the generation fleet is estimated by discounting future cash flows under the Group's usual methodology, described in the accounting policies, over the assets' useful life, using an after-tax WACC of 5.1% at 31 December 2021 (5.2% at 31 December 2020). For nuclear assets, the Group's benchmark model assumes an operating lifetime of 50 years for currently active plants, as it is the Group's strategy to keep plants in operation for at least 50 years. This takes account of the proposed early closures of two 900MW nuclear reactors included in France's multi-year energy programme.

The impairment test incorporates the latest forecasts concerning Flamanville 3 (which has a planned operating lifetime of 60 years) established in January 2022, with an adjusted schedule reflecting the progress on the project and preparation for its start of operation. The fuel loading date has been deferred from late 2022 to the second quarter of 2023, and the estimated completion cost has been raised from €12.4 billion to €12.7 billion in 2015 euros (excluding interim interest).

At 31 December 2021, this impairment test showed that the recoverable value was clearly higher than at 31 December 2020, due to the favourable impact of higher short-term, medium-term and long-term price scenarios, while other changes in assumptions used in the test had moderate or minor impacts.

The sensitivity dimension of the test was updated to incorporate the effect of announcements made by the Group on 13 January 2022 concerning the French government's decision to attribute an additional 20TWh of volume to the ARENH scheme for 2022 at the price of €46.2/MWh, on 13 January and 7 February about the downward revision of estimated nuclear power output in France for 2022, and on 11 February about the revision of estimated nuclear power output in France for 2023 (see note 23). These factors noticeably reduce the headroom calculated by the test, but it remains very positive.

The key assumptions in the test still concern the useful life of nuclear assets, the long-term market price scenario, the discount rate, changes in costs and investments, and the capacity revenue. Each of these assumptions was subjected to sensitivity analyses and the results did not call into question the existence of a positive difference between the book value and recoverable value.

Other International - Belgium

The updated impairment test at the year-end showed that the difference between the recoverable value and the book value was higher than at 31 December 2020, due to favourable electricity price scenarios, and a higher value for wind power following increased capacity resulting from projects validated in 2021.

For tests of the nuclear plants operated by the ENGIE Group in which Luminus owns a 10.2% share (419MW), it has historically been assumed that operations will continue until 2025 at the latest depending on the plants.

Sensitivity analyses were conducted to incorporate the risk that the hydropower concessions may be shortened, and no associated risk of impairment has been identified.

Impairment of -€219 million was also recognised on associates at 31 December 2021, principally in respect of assets owned by EDF Renewables (see note 12.3). Impairment of €189 million was also booked at 31 December 2020 in respect of associates.

Note 11 French public electricity distribution concessions

Accounting principles and methods

The accounting treatment of public distribution electricity concessions in France is determined by the concession agreements, with particular reference to their special clauses. It takes into consideration the possibility that the EDF group, particularly Enedis, may one day lose its status as the sole authorised State concession operator.

In application of the concession agreements, the concession operator manages the facilities at its own risk for the entire term of the concession, and bears substantially all the risks and benefits (both technical and economic) over the useful life of the network infrastructure. Under IAS 16, the assets are controlled by the operator and the grantors have no decisive characteristics of control over the infrastructures as defined by IFRIC 12.

All concession assets are consequently carried in the balance sheet, regardless of their origin (facilities constructed or purchased by the concession operators, and facilities provided by the concession grantors) and the source of financing, while the contractual obligations to the grantor are recognised in the liabilities.

Public electricity distribution facilities that are constructed or purchased by the concession operator are carried at production or acquisition cost:

- purchased facilities are initially recognised at acquisition cost including directly attributable expenses incurred to make the asset ready for use;
- the production cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction of the asset, whether incurred directly by the company or invoiced by third parties.

New facilities provided by the concession grantors are carried at the value of the cost the Company would have borne if it had constructed them itself.

In the specific case of rising mains transferred for no consideration to the public distribution network in application of article 176 of French law 2018-1021 of 2 November 2018 on housing, development and digital affairs (the "ELAN" law), these assets are carried at their market value under article 213 of France's national chart of accounts.

Balance sheet liabilities are recognised in respect of new facilities provided for no consideration by the concession grantors and the rising mains transferred under the ELAN law are included in "Special French public electricity distribution concession liabilities" in the balance sheet liabilities.

Distribution assets (pipes, substations) are depreciated over periods of 30 to 60 years, meters and metering equipment over periods of 20 to 30 years. The Group regularly checks the relevance of the main accounting parameters for concession assets (depreciation periods, replacement values, management levels).

Regulations governing distribution concessions in France

Since the enactment of the French Law of 8 April 1946, EDF, and subsequently Enedis, has been the concession operator of most of the public distribution networks in France.

SEI is the concession operator for distribution network zones that are not interconnected with the network in mainland France, under identical concession regulations to Enedis.

Électricité de Strasbourg is the concession operator for public distribution networks in a limited zone depending on a non-nationalised distributor, in application of the Law of 8 April 1946.

In accordance with France's Energy Code and Local Authorities Code, the public distribution of electricity is principally operated under the public service concessions system. The authorities granting the concessions (local authorities or public establishments for cooperation acting as an Energy Distribution Organisation Authority (Autorité organisatrice de la distribution d'énergie – AODE)) organise the public electricity distribution service through concession agreements with specifications that define the respective rights and obligations of the parties. Enedis distributes electricity to 95% of the population of mainland France under such concessions, with 415 concession agreements at 31 December 2021. The other 5% are served by Local Distribution Companies (including Électricité de Strasbourg).

Concession agreement models

Enedis' concession agreements correspond to different models depending on the date of signature.

1992 concession agreement model

The 1992 concession specifications model (updated in 2007) was negotiated with the FNCCR (National Federation of licensing authorities) and EDF, and approved by the public authorities. This model places Enedis under an obligation to record industrial depreciation and establish provisions for replacement.

2017 concession agreement model

On 21 December 2017, the FNCCR, France Urbaine, EDF and Enedis signed a framework agreement for a new concession agreement model. This new model modernises the relationship between Enedis and concession-granting authorities in the long term and reflects the parties' attachment to the principles of French concessions for electricity distribution: public service, regional solidarity and national optimisation. The FNCCR and France Urbaine represent the concession-granting authorities, particularly towns, syndicated municipalities, boroughs and major cities when they are the authorities with competence to grant public electricity distribution concessions.

As of 2018, newly-signed concession agreements apply the concession agreement model validated on 21 December 2017. At the effective date of a new agreement, the existing special concession liabilities recorded in application of the previous concession agreement to represent the concession-granting authority's rights in the concession assets remain in the accounts. Like earlier concession agreements signed since 2011, the contractual obligation to establish provisions for replacement no longer exists, and the governance of investments is different.

To provide an effective public service, the distribution network operator and the concession-granting authority now agree to jointly set up a governance system to oversee investments in the public electricity distribution network over the area covered by the concession, including replacement of infrastructures. This system mainly takes the form of a master plan taking a long-term view of developments in the network over the concession area, and multi-year investment plans (*programmes pluriannuels d'investissements* – PPIs) for 4 and 5-year periods that are medium-term applications of the master plan.

PPIs contain detailed objectives for each investment purpose, concerning a selection of quantified, localised investments with financial valuations for the duration of the plan.

PPIs are revised when necessary, after consulting with Enedis and the authority granting the concession, to take account of changes in each party's investment priorities and financial resources.

If it were observed at the end of a PPI that any investment concerned by Enedis' financial commitment had not been made, the concession-granting authority could oblige Enedis to deposit a sum equal to 7% of the investments still to be made. This deposit would then be returned or retained after a two-year period, depending on the investments made by that time.

In accordance with the agreement reached in late 2017 with the FNCCR and France Urbaine, negotiations for concession renewals continued in the regions of France during 2021. By 31 December 2021, 291 concession agreements had been concluded under the new model, for local projects with all kinds of concession-granting authorities: syndicated counties, two individual counties (*départements*), syndicated municipalities, major cities, urban boroughs, conglomerations and towns.

Added to the 41 previously renewed or amended concessions that contain stipulations similar to the new model, these 291 concessions bring the total number of modernised concession agreements to 332 of the 364 that are due for renewal. Negotiations are continuing with a view to renewing the small number of remaining agreements, mostly old-model agreement with syndicated counties.

11.1 Property, plant and equipment operated under French public electricity distribution concessions

(in millions of euros)	31/12/2020	Increases ⁽¹⁾	Decreases	Other movements ⁽²⁾	31/12/2021
Land and buildings	3,219	205	(20)	3	3,407
Networks	100,899	4,308	(512)	5	104,700
Other installations, plant, machinery, equipment & other	4,872	416	(209)	(7)	5,072
Assets in progress ⁽³⁾	1,828	52	-	6	1,886
Gross value	110,818	4,981	(741)	7	115,065
Land and buildings	(1,592)	(80)	19	(8)	(1,661)
Networks	(45,873)	(237)	379	(2,388)	(48,119)
Other installations, plant, machinery, equipment & other	(3,001)	(215)	190	(127)	(3,153)
Depreciation and impairment	(50,466)	(532)	588	(2,523)	(52,933)
NET VALUE	60,352	4,449	(153)	(2,516)	62,132

(1) Increases also include facilities provided by the concession-granting authorities.

(2) Other movements mainly concern depreciation of assets operated under concessions, booked against amortization recorded in the special concession liability accounts.

(3) Increases in assets in progress are stated net of the effects of newly-commissioned assets.

11.2 Special French public electricity distribution concession liabilities

Accounting principles and methods

Concession liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, and comprise the following:

- the concession-granting authority's rights in existing assets (its right to recover all the concession assets):
 - the value in kind of the facilities (the net book value of assets operated under concessions),
 - less any as yet unamortised financing provided by the operator;
- the concession-granting authority's rights in assets to be replaced (the operator's obligations relating to assets due for replacement):
 - amortisation of financing by the grantor: this is a liability owed by the concession operator to the grantor and is recognised progressively as the asset is used,
 - provision for replacement: this provision exclusively concerns assets due for replacement before the end of concessions using the 1992 concession agreement model, except for the rising mains transferred in application of the ELAN law. It is accrued over the asset's useful

life, based on the difference between the asset's replacement value for identical capacity and functions, and the original value. The replacement value is adjusted at each year-end based on indexes from official publications, and the impact of the adjustment is spread over the residual useful life of the assets concerned.

When assets are replaced, amortisation recognised on the portion of assets considered to be financed by the grantor, and the provision for replacement established for the relevant asset, are cancelled and transferred to rights in existing assets. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's replacement to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

The Group considers that the obligations related to assets to be replaced are to be valued on the basis of the special clauses contained in the concession agreements. Under this approach, these obligations are stated at the value of the contractual obligations as calculated and reported annually in the reports to the grantors. This contractual value also reflects the possibility that the EDF group may one day lose its status as the concession operator.

The changes in special concession liabilities for existing assets and assets to be replaced are as follows:

(in millions of euros)	31/12/2021	31/12/2020
Value in kind of assets*	54,391	52,907
Unamortised financing by the operator	(30,307)	(28,730)
Rights in existing assets – net value	24,084	24,177
Amortisation of financing by the grantor	15,630	15,000
Provisions for replacement	9,139	9,243
Rights in assets to be replaced	24,769	24,243
SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES	48,853	48,420

* Including contributions received to finance concession assets, amounting to €129 million (€108 million in 2020).

Note 12 Investments in associates and joint ventures

Investments in associates and joint ventures are as follows:

31/12/2021					31/12/2020	
(in millions of euros)	Notes	Ownership %	Share of net equity	Share of net income	Share of net equity	Share of net income
Principal investments in associates						
CTE	12.1	50.10	1,478	307	1,378	237
Taishan (TNPJVC)*	12.2	30.00	n.c	n.c	1,123	(12)
Other investments held by EDF SA	12.3	n.a.	2,282	102	1,742	-
Investments held by EDF Renewables	12.3	n.a.	1,453	(117)	1,198	70
Other investments in associates and joint ventures	12.3	n.a.	n.c	n.c	1,353	67
Subtotal			8,084	513	6,794	362
CENG (sold on 6 August 2021)	3.1	n.a.	n.a.	131	n.a.	63
Subtotal				131		63
TOTAL			8,084	644	6,794	425

n.a. = not applicable. n.c. = not communicated.

* The financial data for Taishan at 31 December 2021 are not reported in this table as CGN (Taishan's parent company) publishes its consolidated financial statements later than the Group.

12.1 Coentreprise de Transport d'Électricité (CTE)

The key financial indicators for the CTE subgroup (on a 100% basis) are as follows:

(in millions of euros)	31/12/2021	31/12/2020
Non-current assets	19,866	19,202
Current assets	3,577	3,712
TOTAL ASSETS	23,443	22,914
Equity	2,950	2,750
Non-current liabilities	15,163	15,630
Current liabilities	5,330	4,534
TOTAL EQUITY AND LIABILITIES	23,443	22,914
Sales	5,254	4,729
Operating profit before depreciation and amortisation	2,094	1,914
Net income	612	473
Net indebtedness	12,602	12,700
Gains and losses recorded directly in equity	(161)	(188)
Dividends paid	259	367

CTE's affiliate, RTE (Réseau de Transport d'Électricité), is responsible for managing the high voltage and very high voltage public electricity transmission network. Enedis uses RTE's network to convey energy to the distribution network.

12.2 Taishan

12.2.1 Taishan financial indicators

The key financial indicators published for Taishan (on a 100% basis) are as follows:

<i>(in millions of euros)</i>	31/12/2020	31/12/2019
Non-current assets	11,303	12,183
Current assets	897	618
TOTAL ASSETS	12,200	12,801
Equity	3,744	3,882
Non-current liabilities	6,022	7,467
Current liabilities	2,434	1,452
TOTAL EQUITY AND LIABILITIES	12,200	12,801
Sales	1,027	783
Net income	(41)	44
Dividends paid	-	-

12.2.2 Transactions between the EDF group and Taishan

EDF owns 30% of Taishan Nuclear Power Joint Venture Company Limited (TNPJVC), which was set up to build and operate two EPR nuclear reactors in Taishan, in the province of Guangdong in China. Comprising two 1750MW EPR reactors, Taishan nuclear power plant is the biggest cooperation project between China and France in the energy sector. CGN holds a 51% stake and Yudean a 19% stake.

Following the start of commercial operation by the first reactor on 13 December 2018, the second reactor began commercial operation on 7 September 2019. 2020 saw the first shutdown for refuelling of Taishan 1, from 29 June to 24 September 2020.

On 20 March 2019, the NDRC (National Development and Reform Commission) attributed regulated tariffs to the first three third-generation nuclear projects in China, one of which is Taishan. The tariff attributed to Taishan was set at RMB435/MWh until the end of 2021, with retroactive effect to the date the first unit was commissioned (13 December 2018). The indexing mechanisms applicable from 2022 were not set out in this decision and are still currently unknown.

On 14 June 2021, a build-up of noble gases was detected in the primary circuit of reactor 1 at the Taishan plant. The Chinese ministry for ecology and the environment stated that this was due to five unsealed fuel rods. Following an initial analysis of the situation, on 30 July 2021 the operator of the Taishan plant decided to shut down reactor 1 to assess the situation in more detail, prevent it from progressing, and take remedial action. Defueling operations were completed on 22 August 2021. As stated in the Group's press release of 12 January 2022, inspections carried out on the fuel assemblies of Taishan reactor 1 following the technical issue encountered during its second operating cycle showed mechanical wear on certain assembly components. This phenomenon has already been encountered in several reactors in the French nuclear fleet. EDF and Framatome are currently contributing to preparation of the documentation to safely restart Taishan reactor 1, and assisting TNPJVC in its examination.

Taishan's net electricity output in 2021 was affected by this unscheduled 5-month outage for reactor 1 during the second half of 2021, and by the scheduled outage of reactor 2 which underwent its first full inspection during the second quarter. Apart from these outages, availability was very high.

The net value of the investment in Taishan in the financial statements includes a level of prudence relating to the tariff projections from 2022, and updates to certain operational assumptions relating to the above information.

12.3 Other investments in associates and joint ventures

The other investments held by EDF SA are included in dedicated assets (see note 15.1.2).

The other investments held by EDF Renewables are mainly located in North America, and to a lesser degree in Europe, China and Brazil.

Other investments in associates and joint ventures principally concern:

- JERA Global Markets (JERA GM), 33%-owned by EDF Trading, a company specializing in trading and optimization activities, particularly for liquefied natural gas (LNG);
- the supercritical coal-fired plant owned by Jiangxi Datang International Fuzhou Power Generation Company Ltd. in China, 49%-owned by the Group;
- the dam owned by Compagnie Énergétique de Sinop (CES) in Brazil, 51%-owned by the Group, which was commissioned in 2019;
- the Nachtigal dam in Cameroon, 40%-owned by the Group: construction began in March 2019, with commissioning expected in early 2024.

In 2021, €(219) million of impairment was booked in respect of investments in associates and joint ventures, principally concerning associates of EDF Renewables (€(149) million). This impairment primarily relates to wind power assets in the USA following the major weather event of February 2021 in Texas, photovoltaic plants in France due to revision of purchase obligation tariffs introduced for certain facilities by the French Finance Law for 2021 (see note 10.8.2), and an offshore wind farm currently being built off the coast of Scotland, following construction difficulties with the foundations. Some impairment was also booked on unlisted assets owned by EDF SA (EDF Invest), included in dedicated assets.

In 2020, €(189) million of impairment was booked in respect of investments in associates and joint ventures concerning various specific assets: certain coal-fired plants in China, investments held by Framatome in entities operating in sectors greatly impacted by the Covid-19 pandemic, and certain unlisted assets owned by EDF SA (EDF Invest) included in dedicated assets (see note 15.1.2).

Developments in 2021 in investments accounted for by the equity method owned by EDF Renewables

Launch of construction of the Calvados offshore wind farm by EDF Renewables, Enbridge and wpd

On 22 February 2021, EDF Renewables, EIH S.a.r.l., a subsidiary of Enbridge Inc., a North American energy infrastructure company, and wpd, a European renewable energies company, announced the launch of construction activity on the Calvados offshore wind farm (Courseulles-sur-Mer). This announcement followed the finalisation of financing agreements between the consortium and its financial partners.

The 448MW Calvados offshore wind power project is comprised of 64 wind turbines located more than 10km from the Bessin coastline and occupies a total surface area of approximately 45km². Upon its commissioning, expected in 2024, it will generate the equivalent of the annual electricity consumption of 630,000 people, or over 90% of the Calvados department's population.

The total project cost is estimated at around €2 billion. The majority will be financed through non-recourse project finance debt. The Calvados offshore wind farm holds a 20-year power purchase agreement (PPA) granted by the French government in June 2018.

The shareholders of this project are EDF Renewables and EIH S.a.r.l. (each with a 42.5% stake in the project through Eolien Maritime France) and wpd (which holds a 15% stake in the project).

Successful bid for a 1.5GW offshore wind power project in New Jersey, USA

On 1 July 2021, the EDF group, through Atlantic Shores Offshore Wind (Atlantic Shores), a 50-50 joint venture between its subsidiary EDF Renewables and Shell New Energies US LLC., announced that it had been awarded a 1.5GW offshore wind farm project off the coast of New Jersey, USA. The New Jersey Board of Public Utilities selected the winner of the project.

The future wind farm is located between 15 and 30km off the coast of New Jersey. This offshore wind farm will be one of the most powerful in the United States and will be able to supply enough power for 700,000 homes every year. Construction is scheduled to begin in 2024.

Construction of France's first offshore wind farm in Saint-Nazaire: continuation of component production and offshore operations

The Saint-Nazaire offshore wind farm is jointly owned by EDF Renewables, and EIH S. à r.l., a joint venture between Enbridge Inc. and the Canada Pension Plan Investment Board (through its wholly owned subsidiary CPP Investment Board Europe S. à r.l.). With a capacity of 480MW, it comprises 80 wind turbines located on the rocky plateau of the Banc de Guérande, more than 12km off the coast of the Guérande peninsula.

Two years after construction works began, significant progress has been made in producing the various components required for the future wind farm.

Commissioning of the Dongtai V offshore wind farm in China

The EDF group and China Energy Investment Corporation (CEI), its Chinese partner, announced the commissioning of the 200MW Dongtai V offshore wind farm. Located in the China Sea, off the Jiangsu coast, north of Shanghai, its construction took 20 months.

Together with the 300MW Dongtai IV wind farm commissioned in December 2019, the Group now operates 500MW in offshore wind capacity in China. The Dongtai IV and V wind farms lie approximately 40km off the coast of Jiangsu, the most advanced province in offshore technology, and operate 125 wind turbines which will generate electricity covering the annual needs of 2 million local inhabitants.

The joint venture between CEI (62.5%) and the EDF group (37.5%) operates both the Dongtai IV and V wind farms. It is the first Sino-French joint venture dedicated to the development and operation of offshore wind energy projects in China.

Note 13 Working capital

13.1 Working capital: composition and change

13.1.1 Composition of working capital

Changes in net working capital during 2021 are as follows:

(in millions of euros)	Notes	31/12/2020	Monetary changes	Non-monetary changes	31/12/2021
Inventories and work-in-process	13.2	(14,738)	(626)	(833)	(16,197)
Trade receivables net of provisions	13.3	(14,521)	(7,411)	(303)	(22,235)
Trade payables	13.4	11,900	7,407	258	19,565
Compensation receivable for Public Energy Service charges (CSPE receivable)	13.3.4	(1,993)	2,268	(275)	-
Other receivables and payables ⁽¹⁾	13.3.4 and 13.5	9,551	(3,133)	(74)	6,344
Other components of working capital ⁽²⁾		(740)	(31)	123	(648)
NET WORKING CAPITAL		(10,541)	(1,526)	(1,104)	(13,171)

(1) Excluding receivables and payables on acquisition/disposal of assets and investment subsidies.

(2) The other components of working capital includes CO₂ emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

13.1.2 Non-monetary changes in working capital

Non-monetary changes include the effect of changes in the scope of consolidation, foreign exchange effects, changes in fair values and the effect of reclassifications.

The variation in non-monetary changes in 2021 is principally due to the €(0.8) billion change in fair value (including €(0.5) billion on inventories carried at

fair value) and the €(0.3) billion foreign exchange effect (principally attributable to the rise of the pound sterling against the euro). Reclassification of EDF's CSPE receivable to "Other liabilities" at 31 December 2021 in the amount of €294 million is also included in the variation in non-monetary changes (see note 13.3.4).

13.1.3 Monetary changes in working capital

<i>(in millions of euros)</i>	<i>Notes</i>	2021	2020
Change in inventories	13.2	(626)	(873)
Change in trade receivables	13.3	(7,411)	842
Change in trade payables	13.4	7,407	(861)
Change in the Compensation receivable for Public Energy Service charges (CSPE receivable)	13.3.4	2,268	(328)
Change in other receivables and payables*	13.3.4 and 13.5	(3,164)	(459)
CHANGE IN WORKING CAPITAL		(1,526)	(1,679)

* The change in other receivables and payables includes monetary changes in CO₂ emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

Monetary changes in working capital were down by €(1.5) billion in 2021, mainly as a result of higher market prices with an effect of €(1.9) billion on working capital for the trading activity (an increase in net margin calls and inventories) and the operating working capital of other Group subsidiaries (change of €(1.8) billion in the net trade receivables/trade payables position). Conversely, the decrease in purchase obligations is reflected in a €2.3 billion improvement in working capital, relating to the CSPE receivable (see note 13.3.4).

These three factors also explain most of the difference in the change in working capital between 2020 and 2021.

13.2 Inventories

Accounting principles and methods

Inventories are recognised at the lower of acquisition cost or net realisable value, except for inventories held for trading activities, which are carried at market value. Inventories consumed are generally valued by the weighted average unit cost method.

Cost includes all direct materials costs, labour costs, and a share of indirect production costs.

Nuclear fuel

Inventory accounts include:

- nuclear materials, whatever their form during the fuel production cycle;
- and fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (e.g. fluorination, enrichment, fabrication, etc.).

In accordance with regulatory obligations specific to each country, inventories of fuel (new or not entirely consumed) may also comprise expenses for spent fuel management and long-term radioactive waste management, with corresponding provisions or debts in the liabilities, or full and final payments made when the fuel is loaded.

In France, in application of the concept of "loaded fuel" as defined in the ministerial order of 21 March 2007, the cost of inventories for fuel loaded in the reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

In compliance with IAS 23, interest expenses incurred in financing inventories of nuclear fuels are charged to expenses for the period provided these inventories are manufactured in large quantities on a repetitive basis.

Nuclear fuel consumption is determined by component (natural uranium, fluorination, enrichment, fuel assembly fabrication) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

Other inventories

Other inventories comprise:

- other fuels, comprising fossil fuels required for operation of fossil-fired power plants and gas stocks;
- other operating supplies, consisting of operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- goods and services in progress, particularly relating to the businesses of EDF Renewables, Dalkia and Framatome;
- other inventories, mainly consisting of certificates issued under the various environmental schemes (see notes 5.4.3 and 10.2) and capacity obligation mechanisms (capacity guarantees in France – see note 5.1).

Other non-trading operating inventories are generally valued at weighted average cost including direct and indirect purchasing costs.

Impairment of spare parts principally depends on the turnover of these parts.

The carrying value of inventories, broken down by nature, is as follows:

(in millions of euros)	31/12/2021			31/12/2020		
	Gross value	Provision	Net value	Gross value	Provision	Net value
Nuclear fuel	10,938	(459)	10,479	10,564	(33)	10,531
Other fuel	1,255	(4)	1,251	770	(42)	728
Other supplies	1,770	(402)	1,368	1,660	(398)	1,262
Work-in-progress for production of goods and services	615	(38)	577	469	(33)	436
Other inventories	2,540	(18)	2,522	1,804	(23)	1,781
TOTAL INVENTORIES	17,118	(921)	16,197	15,267	(529)	14,738

The long-term portion (more than one year) mainly concerns nuclear fuel inventories amounting to €8,576 million at 31 December 2021 (8,068 million at 31 December 2020).

At 31 December 2021, provisions on nuclear fuel inventories include the effect of the early closure decision for Dungeness B in the United Kingdom (see note 7).

The change in inventories in 2021 is principally explained by the rise in prices, particularly for EDF Trading's inventories, presented in "Other fuel" and "Other inventories" which are stated at market value (€1,068 million at 31 December 2021 and €300 million at 31 December 2020), and the increase over the year in stocks of energy savings certificates, presented in "Other inventories" (see note 5.4.3).

13.3 Trade receivables

Accounting principles and methods

Trade receivables are initially recognised at the fair value of the consideration received or receivable, and subsequently carried at amortised cost or at fair value through OCI.

Trade receivables also include the value of unbilled receivables for energy already supplied, which are presented net of advances received from customers who pay in regular monthly instalments.

The Group applies IFRS 9's simplified approach to measure expected credit losses on trade receivables, using provision matrices established on the basis of credit loss histories.

Details of net trade receivables are as follows:

(in millions of euros)	Note	31/12/2021	31/12/2020
Trade receivables, gross value – excluding EDF Trading		19,781	14,686
contract assets	13.3.3	545	389
Trade receivables, gross value – EDF Trading		3,545	1,036
Impairment*		(1,091)	(1,201)
TRADE RECEIVABLES – NET VALUE		22,235	14,521

* See note 1.4.3.

Most trade receivables mature within one year.

Advances received from customers in France who pay in regular monthly instalments, amounting to €7,071 million at 31 December 2021 (€6,782 million at 31 December 2020), are deducted from trade receivables.

The increase in the gross value of trade receivables in 2021 is principally explained by changes in market prices, amounting to €2.5 billion for EDF Trading and €5.1 billion for other Group subsidiaries including €2.3 billion for Edison (essentially relating to gas sales given the rise in market prices, and to a lesser extent the take-or-pay clauses included in some contracts).

13.3.1 Trade receivables due and not yet due

(in millions of euros)	31/12/2021			31/12/2020		
	Gross value	Provision	Net value	Gross value	Provision	Net value
TRADE RECEIVABLES	23,326	(1,091)	22,235	15,722	(1,201)	14,521
overdue by up to 6 months	1,285	(215)	1,070	1,249	(242)	1,007
overdue by 6-12 months	481	(136)	345	465	(193)	272
overdue by more than 12 months	978	(551)	427	851	(526)	325
Trade receivables due	2,744	(902)	1,842	2,565	(961)	1,604
Trade receivables not yet due	20,582	(189)	20,393	13,157	(240)	12,917

13.3.2 Assignment of receivables

Accounting principles and methods

When it can be demonstrated that the Group has transferred substantially all the risks and benefits related to assignment of receivables, particularly the credit risk, the items concerned are derecognised.

Otherwise, the operation is considered as a financing operation, and the receivables remain in the balance sheet assets, with recognition of a corresponding financial liability.

(in millions of euros)	31/12/2021	31/12/2020
Trade receivables assigned and wholly retained in the balance sheet	340	84
Trade receivables assigned and partly retained in the balance sheet	-	60
Trade receivables assigned and wholly derecognised	1,456	792

The Group assigned trade receivables for a total of €1,456 millions at 31 December 2021, mainly concerning Edison, EDF SA, Dalkia and Luminus (€792 million at 31 December 2020, mainly concerning Edison, EDF SA and Dalkia).

As most assignment operations are carried out on a recurrent, without-recourse basis, the corresponding receivables are no longer carried in the Group's consolidated balance sheet.

13.3.3 Contract assets

Contract assets are rights held by an entity to receive a consideration in return for goods or services supplied to customers, when such rights are conditional on something other than the passage of time. Most contract assets mature within one year.

The contract assets included in receivables represent an amount of €545 million at 31 December 2021 and €389 million at 31 December 2020 and mainly concern Framatome, Dalkia and EDF Renewables.

13.3.4 Other receivables

Details of other receivables are as follows:

(in millions of euros)	31/12/2021	31/12/2020
Prepaid expenses	1,485	1,457
Compensation for Public Energy Service charges (CSPE)	-	1,993
VAT receivables	2,051	1,988
Other tax receivables	348	248
Other operating receivables	14,405	3,247
OTHER RECEIVABLES	18,289	8,933
Non-current portion	2,092	2,015
Current portion	16,197	6,918
Gross value	18,344	9,013
Impairment	(55)	(80)

At 31 December 2021, other operating receivables include €9.8 billion of margin calls made in the trading activity (€0.6 billion in 2020), due to the commodity price rises observed in Europe in the second half of 2021. The amounts of margin calls recognised in assets cannot be netted with the margin calls recognised in liabilities (see note 13.5).

Other operating receivables also include €1,274 million of advances paid to suppliers (€1,045 million at 31 December 2020). Most of these advances concern nuclear fuel supply contracts in the France – Generation and Supply segment.

EDF's Public Service Charges

The amount of expenses to be compensated to EDF for 2021 is €5,472 million.

The amounts received in 2021 from the State's General Budget, totalled €8,085 million.

The surplus compensation principally results from changes in market prices between 2020 and 2021. The renewable electricity support charges to be compensated decreased significantly due to the rise in market prices in 2021, whereas the compensation received from the State (defined in the Finance Law for 2021 on the basis of 2020 market prices, which were particularly low) was very high.

Consequently, at 31 December 2021, EDF SA recognised an operating liability due to the State of €294 million (compared to a receivable of €1,974 million at 31 December 2020).

During 2021 EDF also bore an amount of €255 million in repayment of excess amounts received in 2016 under the former CSPE mechanism.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 22 July 2021 the CRE published its decision 2021-230 of 15 July 2021 setting out a forecast of EDF's public service charges for 2022 (€7,620 million), a revised forecast of charges for 2021 (€7,142 million), and the actual charges recorded for 2020 (€8,034 million).

The compensation mechanism for public energy service charges in France is presented in note 5.4.1.

13.4 Trade payables

(in millions of euros)

	31/12/2021	31/12/2020
Trade payables – excluding EDF Trading	14,041	10,868
Trade payables – EDF Trading	5,524	1,032
TRADE PAYABLES	19,565	11,900

The increase in trade payables in 2021 is mainly explained by changes in market prices, and comprises €4.5 billion concerning EDF Trading and €3.2 billion for other Group subsidiaries including €1.5 billion for Edison (reflecting gas purchases made at market prices, which were higher this year).

The Group has a reverse factoring programme allowing suppliers to transfer their receivables on EDF to a factoring company, at their own initiative. For the Group, this programme does not cause any change in the substance and features of the receivables held by suppliers on EDF. In particular it does not affect the sequences of operating cash flows. The associated liabilities are therefore included in "trade payables" in the Group's financial statements.

13.5 Other liabilities

Details of other liabilities are as follows:

(in millions of euros)	31/12/2021	Including contract liabilities	31/12/2020	Including contract liabilities
Advances and progress payments received	2,114	1,635	1,788	1,344
Liabilities related to property, plant and equipment	4,368	-	4,196	-
Tax liabilities	5,093	-	4,532	-
Social charges	5,092	-	4,712	-
Deferred income on long-term contracts	3,146	3,110	3,290	3,233
Other deferred income*	997	592	827	430
Other	9,254	-	2,390	-
OTHER LIABILITIES	30,064	5,337	21,735	5,007
Non-current portion	4,816	3,107	4,874	3,092
Current portion	25,248	2,230	16,861	1,915

* Including the initial payment made under the Fessenheim compensation protocol (see note 5.4.3).

13.5.1 Advances and progress payments received

Advances and progress payments received comprise €642 million of payments made by the customers in Framatome's long-term contracts (€518 million at 31 December 2020).

13.5.2 Tax liabilities

At 31 December 2021, tax liabilities mainly include an amount of €562 million for the CSPE to be collected by EDF on energy supplied but not yet billed, less the CSPE tax collected on advances from customers who pay in regular monthly instalments (€502 million at 31 December 2020).

13.5.3 Deferred income on long-term contracts

EDF's deferred income on long-term contracts at 31 December 2021 comprises €1,746 million (€1,713 million at 31 December 2020) of partner advances made to EDF under the nuclear plant financing plans. Deferred income on long-term contracts also includes an advance of €1.7 billion paid to the EDF group in 2010 under the agreement with the Exeltium consortium. This advance is transferred to the income statement progressively over the term of the contract (24 years).

13.5.4 Other

Accounting principles and methods

Investment subsidies

Investment subsidies received by Group companies are included in liabilities under the heading "Other liabilities" and transferred to income as and when the economic benefits of the corresponding assets are utilised.

At 31 December 2021, other operating liabilities include €5.8 billion of margin calls made in the trading activity (€0.2 billion in 2020), reflecting commodity price rises observed in Europe in the second half of 2021. The amounts of margins calls recognised in liabilities cannot be netted with margin calls recognised in assets (see note 13.3.4).

Other liabilities at 31 December 2021 also include a €294 million operating liability due to the State in connection with the CSPE (compared to a receivable of €1,974 million at 31 December 2020, see note 13.3.4).

The final line of the table of other liabilities includes investment subsidies received during 2021, amounting to €536 million (€414 million in 2020).

13.5.5 Contract liabilities

Contract liabilities represent an entity's obligations to provide customers with goods or services for which it has already been paid, or for which payment is due.

Changes in contract liabilities were as follows:

(in millions of euros)	31/12/2020	Amounts recorded during the period	Amounts transferred to sales during the period	Amounts cancelled during the period with no impact on sales	Effect of unwinding the discount	Change in scope of consolidation	Foreign exchange effect	31/12/2021
Advance payments received	1,344	1,277	(1,013)	(22)	(1)	14	36	1,635
Deferred income on long-term contracts	3,233	417	(519)	(1)	56	(88)	12	3,110
Other deferred income	430	488	(455)	(18)	-	138	9	592

These liabilities comprise the majority of advances and progress payments received, amounting to €1,635 million (principally concerning the Framatome, United Kingdom and France – Regulated activities segments), and the majority of deferred income (on long-term and other contracts), amounting to €3,702 million (principally concerning the France – Generation and Supply segment). They thus total €5,337 million at 31 December 2021 (€5,007 million at 31 December 2020).

Contracts expiring in more than one year on which obligations are unfulfilled or partially fulfilled at the reporting date should generate sales revenues of approximately €11,697 million which have not yet been recognised. €1,093 million of these sales revenues will be recognised progressively until 2034 on the Exeltium contract, and the balance will be recognised over the operating period for contracts relating to jointly-operated power plants, and over the term of the contract for other firm sale contracts (excluding energy sales).

Note 14 Equity and earnings per share

14.1 Share capital

Accounting principles and methods

Share issue expenses correspond exclusively to external costs expressly related to the capital increase. They are charged against the issue premium at their net-of-tax value.

Other expenses are classified as expenses of the period.

At 31 December 2021, EDF's share capital amounts to €1,619,338,374 comprising 3,238,676,748 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.88% by the French State, 14.77% by the public (institutional and private investors) and 1.32% by current and retired Group employees, with 0.03% held by EDF as treasury shares.

In June 2021, the payment of part of the dividend for 2020 in the form of a scrip dividend led to a €29 million increase in the share capital and an issue premium of €587 million following issuance of 57,908,528 new shares.

In December 2021, the payment of part of the interim dividend for 2021 in the form of a scrip dividend led to a €40 million increase in the share capital and an issue premium of €859 million following issuance of 80,844,641 new shares.

Under Article L. 111-67 of the French Energy Code, the French State must hold more than 70% of the capital of EDF at all times.

14.2 Treasury shares

Accounting principles and methods

Treasury shares are shares issued by EDF and held either by that company or by other entities in the consolidated Group. They are valued at acquisition cost and deducted from equity until the date of disposal. Net gains or losses on disposals of treasury shares are directly included in equity and do not affect net income.

A share repurchase programme authorised by the General Shareholders' Meeting of 9 June 2006 was implemented by the Board of Directors, within the limit of 10% of the total number of shares making up the Company's capital. The initial duration of the programme was 18 months, renewed for 12 months then by tacit agreement every year.

A liquidity contract exists for this programme, as required by the French market regulator AMF (Autorité des marchés financiers).

At 31 December 2021, treasury shares deducted from consolidated equity represent 1,174,554 shares with total value of €14 million.

14.3 Dividends

At the General Shareholders' Meeting of 6 May 2021 it was decided to distribute an ordinary dividend of €0.21 per share in respect of 2020, offering shareholders the choice of payment in cash or shares (scrip option).

In application of Article 24 of the Company's articles of association, shareholders who have held their shares continuously for at least 2 years at the year-end and still hold them at the dividend distribution date benefit from a 10% bonus on their dividends. The number of shares carrying an entitlement to the bonus dividend cannot exceed 0.5% of the Company's capital per shareholder. The bonus dividend amounts to €0.231 per share.

The French government opted for the scrip dividend for 2020. The amount of the cash dividend paid to shareholders who did not opt for the scrip dividend for 2020 amounts to €36 million.

On 4 November 2021, EDF's Board of Directors decided to distribute an interim dividend of €0.30 per share in respect of 2021, payable in new shares (scrip option) or cash on 2 December 2021. The total amount of the interim dividend was €947 million.

The French government opted for the scrip dividend for this 2021 interim dividend.

The amount of the cash dividend paid to shareholders who did not take the scrip option for this 2021 interim dividend amounts to €48 million.

14.4 Perpetual subordinated bonds

Accounting principles and methods

Perpetual subordinated bonds ("hybrid" bond issue)

The perpetual subordinated bonds issued by the Group incorporate options for redemption at the initiative of EDF. These options may be exercised after a minimum period that depends on the specific terms of each issue, and subsequently at each coupon date or in the event of highly specific circumstances. The annual yield is fixed and reviewable based on contractual clauses that vary according to the specific terms of the issuance.

There is no obligation for EDF to make any payment, due to the existence of contractual clauses entitling it to defer payment indefinitely.

However, those clauses stipulate that any deferred payments must be made in the event of a dividend distribution. All these features give EDF an unconditional right to avoid paying out cash or another financial asset for the principal or interest. Consequently, in compliance with IAS 32, these bonds are recorded as equity instruments and any payment made is treated in the same way as dividends.

14.4.1 Outstanding perpetual subordinated bonds at 31 December 2021

At 31 December 2021, perpetual subordinated bonds carried in equity amounted to €12,264 million (less net-of-tax transaction costs) (€11,290 million at 31 December 2020).

Issues and redemptions of perpetual subordinated bonds were recorded in equity at 31 December 2021 at the total net value of €972 million (see note 14.4.2).

On 22 January 2022 EDF exercised its option to redeem all the perpetual subordinated bonds issued in January 2014, totalling €267 million. Consequently EDF reclassified these equity instruments as financial liabilities at 31 December 2021 at the amount of €267 million, considering the redemption as certain (see note 18.3.2.1).

Interest paid by EDF to the bearers of perpetual subordinated bonds issued totalled €547 million in 2021 and €501 million in 2020. The resulting cash payout is reflected in a corresponding reduction in Group equity.

In January 2022, EDF paid interest of around €275 million to the bearers of perpetual subordinated bonds.

Perpetual subordinated bonds in the accounts of EDF

(in millions of currency units)

Entity	Issue	Nominal amount	Currency	Redemption option	Coupon
EDF	01/2013	1,250	EUR	12 years	5.38%
EDF	01/2013	1,250	GBP	13 years	6.00%
EDF	01/2013	2,098	USD	10 years	5.25%
EDF	01/2014	1,500	USD	10 years	5.63%
EDF	01/2014	1,000	EUR	12 years	5.00%
EDF	01/2014	750	GBP	15 years	5.88%
EDF	10/2018	1,250	EUR	6 years	4.00%
EDF	11/2019	500	EUR	8 years	3.00%
EDF	09/2020	850	EUR	6.5 years	2.88%
EDF	09/2020	1,250	EUR	10 years	3.38%
EDF	05/2021	1,250	EUR	7 years	2.63%

14.4.2 Changes in perpetual subordinated bonds during 2021

Social hybrid notes issue

EDF launched on 26 May 2021 an issue of an Euro-denominated perpetual social hybrid notes for a total nominal amount of €1.25 billion with an initial coupon of 2.625% and a first redemption at the option of EDF on 1 June 2028.

EDF can redeem the social hybrid notes for cash at any time during the 60 days before the first interest reset date, which is expected to be in 7 years (*i.e.* in 2028), and before every coupon payment date thereafter.

The proceeds raised through the social hybrid notes will be dedicated to the financing of eligible projects including any capital expenditure engaged by EDF group and contracted with SMEs which contribute to the development or maintenance of EDF group's power generation or distribution assets in Europe and in the United Kingdom. In compliance with the social bond principles and the Sustainability Bond Guidelines of the ICMA (International Capital Market Association), this issuance of social hybrid notes is consistent with the commitments and the CSR (Corporate Social Responsibility) strategy of the Group in relation to the responsible development of local areas and the development of industrial sectors.

The settlement date occurred on 1 June 2021, on which date the social hybrid notes is admitted to trading on the regulated market of Euronext Paris.

This issue was recorded in equity upon reception of the proceeds, total net value of €1,239 million.

14.5 Convertible Green Bonds (OCEANES)

Accounting principles and methods

OCEANES (bonds convertible into new shares and/or exchangeable for existing shares)

OCEANE bonds, which are convertible by remittal of a fixed number of shares in exchange for a fixed amount of cash (the "fixed-for-fixed" rule) give rise to recognition of a debt component and an equity component, in accordance with IAS 32.

The debt-equity proportions remain constant even if there is a change in the likelihood that the conversion option will be exercised.

The debt component is measured by the discounted future cash flows method using a discount rate applicable to a comparable market bond with no conversion option. The equity component corresponds to the difference between the fair value of the bond and the fair value of the debt component.

Issue expenses are allocated between the debt and equity components in the same proportions as the initial allocation.

On 8 September 2020, EDF made an issuance of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANES Vertes*) with the nominal amount of €2,400 million and an issue value of €2,569 million. These bonds are

recorded at an amount of €2,389 million net of expenses and taxes in "Financial loans and borrowings" and €126 million in "Equity". The key features of this issue are presented in note 18.3.2.2.

14.6 Non-controlling interests (minority interests)

14.6.1 Details of non-controlling interests

	31/12/2021			31/12/2020	
	Ownership%	Equity (non-controlling interests)	Net income attributable to non-controlling interests	Equity(non-controlling interests)	Net income attributable to non-controlling interests
<i>(in millions of euros)</i>					
Principal non-controlling interests:					
EDF Energy Nuclear Generation Ltd.	20.0%	2,567	(307)	2,526	(91)
NNB Holding Ltd.	33.5%	6,305	(39)	4,716	1
EDF Investissements Groupe SA	7.54%	518	11	515	11
Luminus SA	31.4%	381	(30)	400	(5)
Framatome	24.5%	86	(22)	115	(26)
Other non-controlling interests		1,921	102	1,321	75
TOTAL		11,778	(285)	9,593	(35)

Non-controlling interests in EDF Energy Nuclear Generation Ltd., which is owned 80% by the Group *via* EDF Energy, correspond to Centrica's share.

Non-controlling interests in NNB Holding Limited, the holding company for the Hinkley Point C project, which is owned 66.5% by the Group *via* EDF Energy, correspond to CGN's share.

Non-controlling interests in EDF Investissements Groupe correspond to the investment held by Natixis Belgique Investissements.

Non-controlling interests in Luminus correspond to the investments held by Belgian local authorities.

Non-controlling interests in Framatome, owned 75.5% by the Group *via* EDF SA, correspond to the 19.5% share held by Mitsubishi Heavy Industries and the 5% share held by Assystem.

Other non-controlling interests principally consist of the minority interests in Sizewell C Holding Co., owned 80% by the Group *via* EDF Energy and 20% by CGN, and subsidiaries of the Edison and EDF Renewables subgroups.

Other non-controlling interests also include instruments in the form of bonds convertible into shares, issued by the Dalkia group and subscribed by minority interests, amounting to a total €165 million at 31 December 2021 (€202 million in 2020).

14.6.2 Key financial indicators for EDF Energy Nuclear Generation Ltd.

The key financial indicators (100% basis) for EDF Energy Nuclear Generation Ltd. are as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Non-current assets	25,784	23,317
Current assets	3,868	4,399
TOTAL ASSETS	29,652	27,716
Equity	12,837	12,630
Non-current liabilities	16,352	14,741
Current liabilities	463	345
TOTAL EQUITY AND LIABILITIES	29,652	27,716
Sales	1,842	3,091
Net income	(1,535)	(455)
GAINS AND LOSSES RECORDED DIRECTLY IN EQUITY	906	(735)
Net cash flow from operating activities	84	982
Net cash flow from investing activities	(420)	(380)
Net cash flow from financing activities	(11)	(335)
CASH AND CASH EQUIVALENTS – OPENING BALANCE	585	329
Net increase/(decrease) in cash and cash equivalents	(347)	267
Effect of currency fluctuations	42	(11)
Other	-	-
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	279	585
Dividends paid to non-controlling interests	2	68

14.7 Basic earnings per share and diluted earnings per share

The diluted earnings per share is calculated by dividing the Group's share of net income, corrected for dilutive instruments and the payments made during the year to bearers of perpetual subordinated bonds, by the weighted average number of potential shares outstanding over the period after elimination of treasury shares.

The following table shows the reconciliation of the basic and diluted earnings used to calculate earnings per share (basic and diluted), and the variation in the weighted average number of shares used in calculating basic and diluted earnings per share:

<i>(in millions of euros)</i>	2021	2020
Net income attributable to ordinary shares	5,113	650
• EDF net income from continuing operations	5,114	804
• EDF net income from discontinued operations	(1)	(154)
Payments on perpetual subordinated bonds	(547)	(501)
Net income used to calculate earnings per share	4,566	149
• from continuing operations	4,567	303
• from discontinued operations	(1)	(154)
Cancellation of the effect of dilutive instruments	2	1
Net income used to calculate diluted earnings per share	4,567	150
• from continuing operations	4,568	304
• from discontinued operations	(1)	(154)
Average weighted number of ordinary shares outstanding during the year	3,138,060,309	3,106,323,609
Effect of dilutive instruments	222,574,780	9,149,131
Average weighted number of diluted shares outstanding during the year	3,360,635,089	3,115,472,740
Earnings per share (in euros)		
BASIC EARNING PER SHARE	1.46	0.05
DILUTED EARNINGS PER SHARE	1.36	0.05
BASIC EARNINGS PER SHARE OF CONTINUING OPERATIONS	1.46	0.10
DILUTED EARNINGS PER SHARE OF CONTINUING OPERATIONS	1.36	0.10
BASIC EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	-	(0.05)
DILUTED EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	-	(0.05)

On 8 September 2020, EDF issued unsecured senior Green Bonds convertible into new shares and/or exchangeable for existing shares of the Company (OCEANES Vertes, see note 18.3.2.2). The diluted earnings per share incorporates the impact

of conversion of these bonds and adjustment of the conversion/exchange ratio following capital increases undertaken during the year.

Note 15 Provisions related to nuclear generation and dedicated assets

Accounting principles and methods

The Group recognises provisions when it has a present obligation (legal or constructive) arising from a past event, an outflow of resources will probably be required to settle the obligation, and the obligation amount can be estimated reliably.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if the Group is virtually certain of receiving it.

Provisions are determined based on the Group's expectation of the cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Group, and if necessary, experience of similar transactions or operations, based on independent expert reports, or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

In the case of decommissioning provisions for power plants in operation, adjustments are recorded *via* fixed assets.

The discount effect generated at each closing to reflect the passage of time is recorded under "Discount effect" in financial expenses.

Changes in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in contractor quote are recorded:

- as an increase or decrease in the corresponding assets, up to the net book value, if the provision was initially covered by balance sheet assets;
- in the income statement in all other cases.

Provisions related to nuclear generation mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management, for waste removal and conditioning and long-term radioactive waste management are established in accordance with the obligations and final contributions specific to each country;
- costs for decommissioning power plants;

- costs relating to fuel in the reactor when the reactor is shut down (provisions for last cores). These correspond to the cost of the fuel stock in the reactor that is not totally spent at the time of the final reactor shutdown and cannot be reused due to technical and regulatory constraints, the cost of processing for that fuel, and the cost of removal and storage of the resulting waste.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved.

The breakdown between current and non-current provisions related to nuclear generation is as follows:

(in millions of euros)	31/12/2021			31/12/2020		
	Current	Non-current	Total	Current	Non-current	Total
Provisions for the back-end of the nuclear cycle	1,359	28,155	29,514	1,430	26,137	27,567
Provisions for decommissioning and last cores	1,346	33,912	35,258	723	32,196	32,919
Provisions related to nuclear generation	2,705	62,067	64,772	2,153	58,333	60,486

The breakdown of provisions by company is shown below:

(in millions of euros)	EDF	EDF Energy	Belgium	Total
	Note 15.1	Note 15.2	Note 15.3	
Provisions for spent fuel management	11,819	1,401	-	13,220
Provisions for waste removal and conditioning	-	639	-	639
Provisions for long-term radioactive waste management	14,233	1,415	7	15,655
PROVISIONS FOR THE BACK-END OF THE NUCLEAR CYCLE AT 31/12/2021	26,052	3,455	7	29,514
Provisions for the back-end of the nuclear cycle at 31/12/2020	24,622	2,938	7	27,567
Provisions for nuclear plant decommissioning	17,730	12,595	434	30,759
Provisions for last cores	2,660	1,839	-	4,499
PROVISIONS FOR DECOMMISSIONING AND LAST CORES AT 31/12/2021	20,390	14,434	434	35,258
Provisions for decommissioning and last cores at 31/12/2020	20,200	12,342	377	32,919
PROVISIONS RELATED TO NUCLEAR GENERATION AT 31/12/2021	46,442	17,889	441	64,772
Provisions related to nuclear generation at 31/12/2020	44,822	15,280	384	60,486

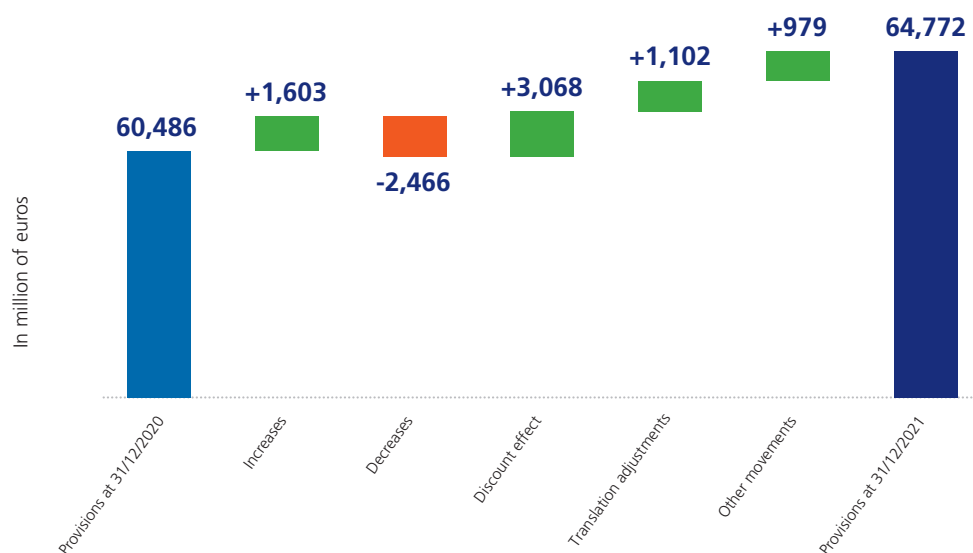
The movement in provisions for the back-end of the nuclear cycle, provisions for decommissioning and provisions for last cores breaks down as follows:

<i>(in millions of euros)</i>	31/12/2020	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2021
Provisions for spent fuel management	12,608	1,205	(1,470)	601	90	186	13,220
Provisions for waste removal and conditioning	546	4	-	38	39	12	639
Provisions for long-term radioactive waste management	14,413	132	(227)	932	82	323	15,655
Provisions for the back-end of the nuclear cycle	27,567	1,341	(1,697)	1,571	211	521	29,514
Provisions for nuclear plant decommissioning	28,036	262	(428)	1,397	750	742	30,759
Provisions for last cores	4,883	-	(341)	100	141	(284)	4,499
Provisions for decommissioning and last cores	32,919	262	(769)	1,497	891	458	35,258
PROVISIONS RELATED TO NUCLEAR GENERATION	60,486	1,603	(2,466)	3,068	1,102	979	64,772
Current portion	2,153						2,705
Non-current portion	58,333						62,067

The change in provisions related to nuclear generation in 2021 is mainly due to:

- a 10bp decrease in the real discount rate in France: the corresponding effects are included in the "Discount effect" (€617 million) for provisions adjusted *via* profit and loss, and in "Other movements" (€495 million) for changes in provisions backed by assets (assets associated with provisions and underlying assets) (see note 15.1.1);
- extension of the depreciation period of 1300MW-series power plants: the corresponding effects at 1 January 2021 are included in "Other movements" (€1,031 million) for changes in provisions backed by assets (assets associated with provisions and underlying assets), and in "Increases" (€15 million) for provisions adjusted *via* profit and loss (see note 15.1.1);
- revision of the assumptions used in valuing liabilities for nuclear plant decommissioning in the United Kingdom: the corresponding effects are included in "Other movements" (€1.2 billion) for changes in provisions backed by the receivable representing amounts due from the Nuclear Liabilities Fund (NLF) and the British government in the United Kingdom (see note 15.2.3).

Details of the change in provisions related to nuclear generation in 2021 are as follows:



15.1 Provisions related to nuclear generation and dedicated assets in France

15.1.1 Nuclear provisions

In France, the provisions established by EDF SA for the nuclear generation fleet result principally from the Law of 28 June 2006 on long-term management of radioactive materials and waste, and the associated implementing provisions concerning secure financing of nuclear expenses.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores in France are as follows:

(in millions of euros)	Notes	31/12/2020	Increases	Decreases	Discount effect	Other movements	31/12/2021
Provisions for spent fuel management	15.1.1.1	11,322	1,185	(1,282)	505	89	11,819
• amount unrelated to the operating cycle		1,297	366	(15)	89	(11)	1,726
• amount outside the scope of the Law of 28 June 2006		1,076	42	(36)	54	-	1,136
Provisions for long-term radioactive waste management	15.1.1.2	13,300	126	(227)	854	180	14,233
Provisions for the back-end of the nuclear cycle		24,622	1,311	(1,509)	1,359	269	26,052
Provisions for nuclear plant decommissioning	15.1.1.3	17,489	262	(186)	649	(484)	17,730
Provisions for last cores	15.1.1.4	2,711	-	-	83	(134)	2,660
Provisions for decommissioning and last cores		20,200	262	(186)	732	(618)	20,390
PROVISIONS RELATED TO NUCLEAR GENERATION		44,822	1,573	(1,695)	2,091	(349)	46,442
<i>Provisions related to nuclear generation within the scope of the Law of 28 June 2006*</i>		<i>43,746</i>	<i>1,531</i>	<i>(1,659)</i>	<i>2,037</i>	<i>(349)</i>	<i>45,306</i>
<i>Provisions related to nuclear generation outside the scope of the Law of 28 June 2006*</i>		<i>1,076</i>	<i>42</i>	<i>(36)</i>	<i>54</i>	<i>-</i>	<i>1,136</i>

* Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application decrease concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations (see below).

The discount effect comprises the €1,474 million cost of unwinding the discount, and the €617 million effects of the change in the real discount rate in 2021 which were recorded in the income statement for provisions with no related assets (cost of unwinding the discount).

The change in EDF SA's provisions related to nuclear generation is mainly explained by the extension of the depreciation period of 1300MW-series power plants, which had an impact of €(1,016) million at 1 January 2021 (see note 1.4.1), distributed as follows: €(916) million on provisions for decommissioning, €(214) million on provisions for last cores, and €114 million on provisions for long-term radioactive waste management.

This impact on provisions related to nuclear generation principally results from timing differences in payment outflows (the discount effect on provisions), and also includes a minor revision of estimates to reflect the increase in decommissioning waste to be sent for interim or final storage in certain years, which requires industrial solutions to smooth the waste dispatch flows.

The €(1,016) decrease in provisions related to nuclear generation is presented as follows:

- €(1,031) million in "Other movements" for changes in the provisions backed by assets;
- €15 million in "Increases" for provisions adjusted via profit and loss.

In compliance with the accounting principles described above:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF also holds dedicated assets for secure financing of long-term obligations (see note 15.1.2).

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as described in note 1.3.4.2.

"Other movements" also include the €495 million effects of the change in the real discount rate at 31 December 2021 for provisions backed by assets.

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Recyclage) and the French Atomic Energy Commission (Commissariat à l'énergie atomique or CEA) signed an agreement in December 2004 which transferred the management and financing of final shutdown, decommissioning and waste recovery and reconditioning for the UP1 reprocessing facility at Marcoule to the CEA. In return, EDF paid the CEA a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs;
- EDF, AREVA and AREVA NC (now Orano Recyclage) signed two agreements in December 2008 and July 2010 defining the legal and financial terms for the transfer to AREVA NC of EDF's contractual obligations regarding its financial contribution to the dismantling of La Hague installations and the recovery and conditioning of waste. In application of those agreements, EDF paid Orano Recyclage a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs.

15.1.1.1 Provisions for spent fuel management

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French State, is to process spent fuel, to recycle the separated plutonium in the form of MOX fuel (Mixed OXide of plutonium and uranium) and recycling of reprocessed uranium.

The quantities processed by Orano at the request of EDF, totalling approximately 1,100 tonnes per year, are determined based on the quantity of recyclable plutonium in the reactors that are authorised to load MOX fuel.

Consequently, provisions for spent fuel management cover the following services to be provided by Orano Recyclage:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter.

The processing expenses included in these provisions exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are measured based on forecast physical flows at the year-end, with reference to the contracts with Orano which define the terms for implementation of the framework agreement for the period 2008-2040. The most recent contract, signed on 5 February 2016, covers the period 2016-2023. These contracts contain price indexes that are revised annually.

Negotiations are currently in process with Orano Recyclage, notably concerning the amendment for the current period 2016-2023. At 31 December 2021, EDF used its best estimate of the costs to be incurred under this contract considering progress on the discussions with Orano. An additional provision of €267 million was recognised to cover the increase in processing costs for EDF associated with the various Orano projects, notably in view of changes concerning the new fission product concentrators.

In 2018, the Board of Directors approved resumption of reprocessed uranium recycling (which had been suspended in 2013 pending availability of a new industrial schema), with loading of the first fuel assemblies scheduled for 2023, subject to technical adaptations and the necessary authorisations from the Nuclear Safety Authority. The objective is to start recycling in certain 900MW units, and later in certain 1300MW units. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018. The 50-year operating life for the 1300MW-series plants – reflected in the financial statements at 30 June 2021 by extension from 40 to 50 years of the depreciation period for the relevant units – which will entail industrial adaptations to allow enriched reprocessed uranium fuel to be loaded into 1300MW reactors, and attainment of the significant industrial milestones for resumption of uranium recycling, particularly commissioning the Tenex residual waste vitrification plant during the second half of 2021, confirm that all the industrial, regulatory and economic conditions for resumption of uranium recycling are now fulfilled. Consequently, from an accounting perspective, a portion the provision related to storage of uranium from reprocessing was partly recovered, for an amount €476 million based on a 50-year operating life for the units concerned.

Furthermore, the temporary storage of spent fuel is a key issue for the back-end of the nuclear cycle. Usage forecasts for Orano's intermediate storage facilities at La Hague for spent fuel from EDF's generation fleet suggest that the pools at La Hague could be saturated by 2030. Consequently, the long-term storage capacity for spent fuel is to be increased by construction of a centralised fuel storage pool under EDF's supervision (see below). Commissioning of the new pool is scheduled for

2034 and it will be operated by EDF. The following measures will also be taken to address storage needs.

For the period until the centralised storage pool is built, studies of transitional solutions were launched by Orano and EDF in 2019 in association with the ASN. The preferred solution is densification of the existing pools at Orano's La Hague site (with a related provision of €168 million at 31 December 2020 for this plan). A supplementary solution would be to use a dry storage facility for MOX fuel (Mixed OXide of plutonium and uranium) and reprocessed uranium.

Production issues at Orano's Melox plant are affecting the pace of reprocessing in the short and medium term, and the lower level of recycling has increased the quantities requiring storage in the medium term. As a result the provisions were increased in 2021 by €362 million in consideration of both these industrial solutions, based on a forecast storage capacity of approximately 3,100 tonnes as opposed to a situation involving neither densification nor dry storage.

Provisions for spent fuel management also cover long-term storage of spent fuel that cannot currently be recycled in existing industrial facilities or under construction: plutonium fuel (MOX) or uranium fuel derived from processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available. Dedicated assets are held in association with this provision, which is unrelated to the operating cycle as defined by the law of 2006 (see note 15.1.2). The provision is founded on a scenario involving construction, managed by EDF (as nuclear operator), of a centralised underwater storage site at La Hague. This project was presented during the public debate on the National Plan for Managing Radioactive Matter and Waste (PNGMDR) in 2019-2020, and is subject to a specific public consultation organised by France's National Public Debate Commission (CNDP) that began on 22 November 2021. This consultation was suspended on 3 February 2022, to take time to reinforce consultation practices so as to better cover the Manche county and the themes raised. The procedure will continue from 20 June to 8 July 2022.

15.1.1.2 Provisions for long-term radioactive waste management

Provisions for long-term radioactive waste management concern the following future expenses:

- interim storage, removal and storage of radioactive waste packages resulting from spent fuel processing;
- direct storage, where relevant, of spent fuel that cannot be recycled in existing installations: specifically plutonium fuel (MOX) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis;
- characterisation, processing, conditioning and interim storage of radioactive waste resulting from decommissioning and certain operating waste and final storage of this radioactive waste;
- EDF's share of the costs of studies, construction, operation and maintenance, shutdown and surveillance of existing and future storage centres.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting in particular from plant decommissioning or spent fuel processing at La Hague (comprising all fuel in reactors at 31 December, irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by ANDRA.

The provisions for long-term radioactive waste management break down as follows:

(in millions of euros)		Storage centre	31/12/2021	31/12/2020
Very low-level and low and medium-level waste	Very low-level waste: CIRES -Morvilliers (ANDRA)		3,093	2,856
	Low and medium-level waste: CSA – Soulaines (ANDRA)			
Long-lived low-level waste	Project under examination: Soulaines (ANDRA)		394	365
Long-lived medium and high-level waste	Geological storage centre (Cigéo project)		10,746	10,079
PROVISIONS FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT			14,233	13,300

Very low-level and low and medium-level waste

Very low-level waste and low and medium-level waste come from nuclear facilities in operation or in the process of being decommissioned:

- very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of metals (large components, piping, support structures, etc.) or rubble (concrete, earth, etc.). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA commissioned in 2003;
- low and medium-level waste (gloves, filters, resins, materials, etc.) is stored at surface level at the Soulaïnes storage centre managed by ANDRA, commissioned in 1992.

The cost of removing, processing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of:

- current contracts with transporters, and ANDRA for operation of the existing storage centres;
- the costs of the plant run by the subsidiary Cyclife France (the Centraco site at Marcoule, commissioned in 1999) for processing some of this waste that can be melted prior to storage in the ANDRA's centres;
- an estimate of the cost of a centralised facility for temporary storage, segmentation and conditioning of major components like steam generators;
- the preliminary plans for temporary storage and segmentation of control rod cluster guide tubes prior to their long-term storage.

In 2019, the inventory assumptions were updated by a time series analysis of past waste removal and better characterisation of future volumes, leading to a €206 million increase in the provision (with an unfavourable effect of €132 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

In 2020, the assumptions concerning the shares of costs were reassessed, to reflect the long-term distribution between the three producers concerned of fixed storage costs for very low-level waste and low and medium-level waste. All the effects of this cost-share updating work have led to a €179 million increase in the provision (with an unfavourable effect of €50 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

Also, since 31 December 2020, to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the treatment, conditioning and interim storage of waste; many of these operations were previously included in the provisions for nuclear plant decommissioning and waste removal and conditioning (reclassification of €979 million applied at 31 December 2020).

In 2021, in addition to changing the technical assumptions underlying provisions so as to reflect the impacts of extending the depreciation period for 1300MW-series plants (the modified timing of waste production from decommissioning results in an increase in decommissioning waste to be sent to storage in some years and industrial solutions are required to smooth the waste dispatch flows), the industrial scenario for management of decommissioning waste prior to storage was optimized by introducing prior processing to reduce the volumes stored. This had no significant impact on provisions.

Finally, for very low-level waste, in February 2020, following the public debate of 2019-2020 concerning the French National Plan for the Management of Radioactive Matter and Waste (PNGMDR), the conclusions of the Ministry for the Ecological and Inclusive Transition and the ASN opened up the possibility of a change in regulations that would allow recycling of very low-level metallic waste after processing: "The Government will make changes to the regulatory framework applicable to the management of very low-level waste, in order to introduce a new possibility of targeted exceptions, allowing recycling, after fusion and decontamination and on a case by case basis, of very low-level radioactive metallic waste". The new regulations (issued in decrees by the Minister for the Ecological Transition) were published in the *Journal officiel* on 15 February 2022. Amid these developments, EDF is continuing its ongoing studies for construction of a segmentation and fusion facility to process and recycle very low-level radioactive metallic waste resulting from dismantling operations in France and other countries. This project, called Technocentre, is led by EDF in collaboration with Orano, with a target commissioning date of 2031.

Long-lived low-level waste

Long-lived low-level waste belonging to EDF essentially consists of graphite waste from the ongoing decommissioning of the former UNGG (natural uranium graphite gas-cooled) reactors.

As this waste has a long lifetime but is lower-level than long-lived medium and high-level waste, specific subsurface storage requirements apply under the French Law of 28 June 2006.

Following the initial geological investigations, in July 2015 ANDRA remitted a report on the proposed storage centre for long-lived low-level waste on a site located in the Soulaïnes region (Aube) in France. This report was submitted to the ASN for its opinion. Uncertainties remain about the site's capacity to accommodate all of the waste included in the baseline inventory of the long-lived low-level waste storage facility. Further studies were planned under the 2016-2018 period of the National Plan for the Management of Radioactive Matter and Waste (PNGMDR), concerning both the feasibility of this storage centre and the search for additional waste management solutions. The ASN's opinion on management of this waste, issued on 6 August 2020 after the work done over the period 2016-2018, and the orientations proposed by the head of the PNGMDR in the current elaboration phase of the fifth edition of the PNGMDR, set a horizon of 2023 for definition by ANDRA of several reference management scenarios, and of the needs for complementary concepts and the production of a file (equivalent to a Summary Preliminary Plan or *avant-projet sommaire* – APS) presenting the technical and safety options selected for storage of long-lived low-level waste.

Long-lived medium and high-level waste

Long-lived medium and high-level waste essentially comes from processing of spent fuel, and to a lesser extent waste resulting from nuclear plant decommissioning (metallic components that have been inside the reactor).

The French Law of 28 June 2006 requires reversible storage in deep geological layers for this type of waste.

The provision established for long-lived medium and high-level waste is the largest component of provisions for long-term radioactive waste management.

Until June 2015 the gross value and disbursement schedules for forecast expenses were based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by a working group formed under supervision of the State involving representatives of the administrations concerned, ANDRA and the producers of waste (EDF, Orano, CEA). EDF applied a reasonable approach to information supplied by this working group, leading to a benchmark cost, for storage of waste from all producers, of €14.1 billion under the economic conditions of 2003 (€20.8 billion under 2011 economic conditions, based on the 2011 inventory).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project.

On this basis, ANDRA drew up figures which, in compliance with the Law of 28 June 2006, were subjected to a consultation process with waste producers started in late 2014 by the French Department for Energy and Climate (Direction générale de l'énergie et du climat or DGEC). In April 2015 EDF and the other producers sent the DGEC their comments on ANDRA's report and a joint estimation of the target Cigéo storage cost due to divergences in the valuation of technical optimisations and their induced effects. All this information was included, together with the ASN's opinion, in a report submitted to the Minister for Ecology, Sustainable Development and Energy.

On 15 January 2016 the Ministry of Ecology, Sustainable Development and Energy issued a Ministerial Order setting the target cost for the Cigéo storage project at €25 billion under 2011 year-end economic conditions. The cost as defined constitutes an objective to be met by ANDRA, in compliance with safety standards set by the ASN, working in close liaison with the operators of nuclear installations.

In application of this Ministerial Order, the cost of the Cigéo project will be regularly updated, at least at each key milestone in the course of the project's development (authorisation to create the facility, commissioning, end of the "pilot industrial phase", safety reviews) in accordance with the opinion of the ASN.

In April 2016 ANDRA sent the ASN a safety option report (DOS). The law of 11 July 2016 clarified the concept of reversibility.

On 11 January 2018, the ASN issued its opinion on the DOS. It considered that the Cigéo project had reached satisfactory overall technological maturity at that stage. This opinion included a requirement for examination of alternatives to the proposals for storage of bituminous waste at Cigéo. A group of experts appointed by the DGEC in September 2018 to draw up a report on current bituminous waste management concluded in September 2019 that various options were feasible

(storage or neutralisation) but stressed the importance of continuing the studies in order to identify the most appropriate option.

The detailed design review by a group of independent experts, organised at the request of the DGEC, reported its conclusions at the end of 2020. While issuing a generally favourable opinion for the ANDRA's submission, the Group made a certain number of recommendations for finalisation of the detailed design studies and the application for authorisation to create the centre, calling for closer involvement of EDF, Orano and the CEA on these matters.

Under the schedule prepared by ANDRA, the application to develop Cigéo (classified as a basic nuclear facility), previously due to be made in 2021, should now be made in 2022. This will delay the granting of authorisation by an equivalent period, and it is now expected in 2025. However, producers are still currently working on the hypothesis that the first waste packages will be received in 2031.

In August 2020 ANDRA filed an application for a *déclaration d'utilité publique* (DUP) officially recognising the public utility of the Cigéo storage centre. This was examined by the government departments and subjected to a public inquiry from 15 September to 23 October 2021, and the inquiry commissioners issued an unreservedly favourable opinion on 20 December 2021. Publication of the DUP decree, which will automatically confer compatibility on the planning documents, is expected in early 2022.

Finally, the French finance law for 2021, published in the *Journal officiel* of 30 December 2020, includes a change to the tax treatment of this project (based on storage tax instead of the standard tax regime). The associated measures remain to be defined and managed by the Government to prevent any cost increase for the Cigéo project.

Also, since 31 December 2020, to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the conditioning and interim storage of low and medium-level waste at the ICEDA storage facility (*installation de conditionnement et d'entreposage des déchets activés*). These nuclear expenses were previously covered by the provisions for waste removal and conditioning.

This facility, constructed at the Bugey power plant, received its first waste packages in September 2020 after the ASN authorised its commissioning on 28 July 2020. The ASN's decision approving and governing the conditioning of long-lived medium-level waste into packages at the ICEDA facility was formally received on 19 July 2021. At the end of 2021 the first waste packages were sealed, in compliance with the authorisations granted and the commissioning schedule.

15.1.1.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the basic nuclear facilities (*installations nucléaires de base*, INB) it operates. The final shutdown and decommissioning process is governed by legal provisions and regulations set out in Articles L. 593-20 to L. 593-25 and R.593-65 to R.593-74 in the Environmental Code. It involves the following operations for each INB:

- a definitive shutdown declaration, to be made at least two years prior to the planned shutdown date;
 - ▷ since the Energy Transition Law of 17 August 2015, the final shutdown of the INB, which takes place during its operating phase, is considered separately from dismantling, as a notable change of lesser importance (simply requiring a declaration by the operator to the Minister and the ASN);
- a dismantling plan compiled by the operator and sent to the minister in charge of nuclear safety, which after examination by the authorities and a public inquiry, leads to a decree prescribing dismantling that authorises the start of dismantling operations;

- key-stage progress reviews submitted for the ASN's approval, with a safety file specific to the dismantling operations to be performed;
- an internal control process concerning significant changes introduced by the operator in the case of operations that must be declared to or approved by the ASN;
- finally, once these operations are complete, declassification of the facility, which removes it from the legal regime governing basic nuclear facilities.

The decommissioning scenario adopted by EDF complies with France's Environmental Code, which requires as short a period as possible to elapse between final shutdown and dismantling in economically acceptable conditions and in compliance with the principles laid down in Article L. 1333-1 of the public Health Code (radioprotection) and section II of Article L. 110-1 of the Environmental Code (protection of the environment). The intended end-state is industrial use: the sites will be restored to their original condition and will be reusable for industrial facilities.

The ongoing dismantling operations concern mainly plants that were constructed and operated before the nuclear fleet currently in operations, known as "first-generation" plants, and the Superphenix plant and Irradiated Materials Workshop. These operations cover four different technologies: a heavy water reactor (Brennilis), a sodium-cooled fast-neutron reactor (the Superphenix at Creys-Malville), natural uranium graphite gas-cooled (UNGG) reactors (at Chinon, Saint Laurent and Bugey) and a pressurised water reactor (PWR at Chooz). Each of them is a first for EDF, and apart from the PWR at Chooz, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. Decommissioning of the Chooz PWR is benefiting from past experience (essentially in the US and limited), but the plant has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific challenges.

Based on the ongoing decommissioning operations at permanently shut-down plants (particularly the experience gained from the Chooz PWR), the studies conducted for the Summary Preliminary Plan for the two 900MW reactors at Fessenheim, and the preparatory work for dismantling of Fessenheim, it was possible at the end of 2021 to establish a detailed reference estimate of future decommissioning costs for the nuclear fleet currently in operation ("second-generation" plants). However, neither EDF nor any other operator has begun a decommissioning programme on a scale comparable to the current PWR fleet, and as a result the estimates include both opportunities and risks, especially associated with the scale effect.

At Fessenheim, the two pressurised water reactors were shut down definitively on 22 February 2020 and 30 June 2020 respectively, in accordance with the law and before the end of their technical operating life. The Consolidated Preliminary Plan (*avant-projet consolidé* or APC) was finalised in late 2018, with more in-depth studies and derisking of the Summary Preliminary Plan (*avant-projet sommaire* or APS). The dismantling plan was sent to the ASN in September 2019 together with the declaration of the permanent shutdown of this INB. The studies conducted in 2019 and 2020 focused on preparing the dismantling plan, which was sent to the ASN on 2 December 2020. After the filing date, the ASN will examine the documents for a period of 3 to 5 years. 2021 was marked by the complete defueling of reactor 1, preparations for decontamination of the primary circuit which will take place in 2022, dispatch of the first operating waste to the ICEDA facility, and dispatch of the uppermost parts of the steam generators to the subsidiary Cyclife Sweden for processing, in line with the objectives of the work and studies done in preparation for decommissioning of Fessenheim.

The decommissioning provisions cover future decommissioning expenses as described above (excluding the cost of removing and storing waste, which is covered by the provisions for long-term waste management).

Details of changes in decommissioning provisions for nuclear power plants are as follows:

(in millions of euros)	31/12/2020	Increases	Decreases	Discount effect	Other movements	31/12/2021
Provisions for decommissioning nuclear plants in operation	12,775	-	(7)	396	(484)	12,680
Provisions for decommissioning permanently shut-down nuclear plants	4,714	262	(179)	253	-	5,050
DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	17,489	262	(186)	649	(484)	17,730

Other movements in provisions for decommissioning nuclear plants in operation include the impact of extension of the depreciation period for 1300MW-series plants, which is partly offset by the effects of the change in the real discount rate at 31 December 2021.

For nuclear power plants currently in operation (PWR pressurized water reactor plants with 900MW, 1,300MW and N4 reactors)

Until 2013, provisions were estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost for decommissioning expressed in €/MW, confirming the assumptions defined in 1979 by the PEON Commission. These estimates had been confirmed from 2009 by a detailed study of decommissioning costs conducted by EDF at the representative site of Dampierre (four 900MW units), and its results were corroborated by an intercomparison with the study carried out by consultants La Guardia, based mainly on the Maine Yankee reactor in the US.

In 2014 the Dampierre study was reviewed by EDF to make sure that the previous calculations were still valid in view of recent developments and experience, both internationally and internally. For this revision, the decommissioning provisions for plants in operation were based on costs resulting from the Dampierre study, in order to incorporate best estimates and experience from inside and outside France. This change of estimate had no significant impact on the level of provisions at 31 December 2014.

Between June 2014 and July 2015, an audit of dismantling costs for EDF's nuclear fleet currently in operation was conducted by specialised consulting firms, at the request of the French Department for Energy and Climate (Direction Générale de l'Énergie et du Climat or DGEC). On 15 January 2016 the DGEC published a summary of the audit report. It stated that although estimating the cost of decommissioning nuclear reactors is a demanding exercise due to relatively limited past experience, the prospects of changes in techniques, and the distant timing of the expenditure, overall, the audit confirmed EDF's estimate of decommissioning costs for its nuclear fleet currently in operation. The DGEC also made a number of recommendations to EDF following this audit.

In 2016, EDF revised the decommissioning estimate, in order to incorporate the audit recommendations and past experience gained from dismantling operations for first-generation reactors (particularly Chooz A).

A detailed analytical approach was used to revise this estimate, identifying all costs for the engineering, construction work, operation and waste processing involved in future decommissioning of reactors currently in operation. This led to figures based on detailed timetables for plant decommissioning. The approach adopted made it possible to explore more thoroughly the assessment of costs specific to the initial units of each series, estimated for each series based on transposition coefficients applied to the baseline costs for the initial 900MW unit, and the series and mutualisation effects, as these costs and effects are inherent to the fleet's size and configuration.

The natures of the principal series and mutualisation effects used to arrive at the estimate are explained below.

Series effects (effects of work for the first-of-a-kind site on the following sites of the same series) are mainly of two types:

- first, in a fleet using the same technology, many of the studies do not need to be repeated each time;

- second, in a fleet using the same technology, robots and tooling can be largely reused from one site to another.

Mutualisation effects (effects between units in the same site, whether in operation or being decommissioned) are of several different types:

- some of them relate to the fact that several reactors may share common buildings and facilities on the same site, and these buildings and facilities will not have to be dismantled twice;
- certain costs are not higher when two or four reactors are dismantled on the same site. This is usually the case for surveillance costs, common equipment, and the cost of maintaining safe operating conditions on the site.

Due to mutualisation effects, dismantling a pair of reactors on the same site costs less than dismantling two standalone reactors on two different sites. In France, unlike other countries, there are no single reactors but sites with two or four, and in one case six reactors.

Series and mutualisation effects reduce the estimated decommissioning cost by 10% and 6% respectively compared to an estimate that ignores these effects. Series and mutualisation effects vary depending on the series: they are greater when there are more units in a series (series effect) and more units on a site (mutualisation effect), leading to a combined effect (series and mutualisation effect) of over 16% for the 900MW series.

In particular, series and mutualisation effects explain why it is not appropriate simply to compare the average dismantling cost per reactor between the French fleet and other countries' nuclear fleets.

In contrast, the estimates only marginally reflect changes in productivity and the learning effect. The external audit of the decommissioning cost for the fleet currently in operation, ordered by the DGEC, considered that this approach resulted in a prudent estimation method.

For reasons of prudence, the estimate also includes an assessment of risks and uncertainties as follows:

- incorporation of uncertainties relating to each "elementary" block of costs, series effects, mutualisation effects, transposition coefficients and fleet expenses;
- incorporation of risks, corresponding to the completion risks (which are identifiable and quantifiable, but only contingent). An initial register of risks on the Fessenheim project was drawn up in 2021 based on the ongoing studies, and detailed assessment of these risks is continuing for one first-of-a-kind 900MW reactor on the Fessenheim site that has no specificities. Until the results are released, the financial impact of the risks and opportunities is included via a flat-rate increase.

The above method for assessing risks and uncertainties leads to an overall margin of some 15.7% for the whole fleet (19.5% for the first 900MW unit).

Since its in-depth revision in 2016 this cost estimate has been reviewed annually. The reviews have led to non-significant annual adjustments.

In 2021, to take account of the impacts of the longer depreciation period for 1300MW-series plants, the sequence of operations for dispatching waste from decommissioning was adapted to reflect the increase in decommissioning waste to be sent for interim storage in certain years.

Also, the reference cost for decommissioning of the first 900MW units was updated following preliminary studies conducted in preparation for the decommissioning of Fessenheim, and experience gained at the beginning of the pre-dismantling phase. This update also incorporates optimisation of the industrial scenario for management of decommissioning waste before storage, involving prior processing to reduce the volumes stored. Extrapolation of these elements to the whole PWR fleet has a limited impact on the provisions for decommissioning nuclear plants in operation: they are increased by €149 million via adjustment to balance sheet assets.

EDF confirms its analyses through an international intercomparison, taking care to identify and characterise a number of factors that could distort direct comparisons, for example differences in the scope concerned by the cost estimate, or national and regulatory contexts.

Based on the estimates of the different types of cost, the benchmark cost to completion (in 2021 euros) for decommissioning of the first two 900MW units (Fessenheim) amounts to approximately €0.8 billion, giving an average of €0.4 billion per initial 900MW unit, compared to an average cost of €0.36 billion for the entire PWR fleet, including the series and mutualisation effects described above.

For permanently shut-down nuclear power plants

Decommissioning of shut-down reactors involves pilot operations corresponding to four different technologies, each with clear specificities: a PWR reactor at Chooz A located in a cave, UNGG (natural uranium graphite gas-cooled) reactors at Bugey, Saint-Laurent and Chinon, a heavy water reactor at Brennilis, a sodium-cooled fast neutron reactor at Creys-Malville, and the first-of-a-kind second-generation PWR reactor at Fessenheim.

The decommissioning costs are based on contractor quotes, which take account of accumulated industrial experience, unforeseeable and regulatory developments, and the latest available figures. They have been revised annually since 2015. In 2015 the industrial decommissioning strategy for UNGG plants was totally revised. The previously selected strategy was based on a scenario involving “underwater” dismantling of caissons (UNGG reactor buildings) for four of the reactors, with direct graphite storage in a centre currently under examination by ANDRA (see note 15.1.1.2 “Long-lived low-level waste”). Several new technical developments showed that the alternative “in-air” dismantling solution for the caissons would improve industrial control of operations and was apparently more favourable in terms of safety, radioprotection and environmental impact. The Company therefore selected a new “in-air” dismantling scenario as the benchmark strategy for all six caissons. This scenario includes a consolidation phase, building on experience acquired from dismantling the first caisson before beginning work on the other five. The decommissioning phase will ultimately be longer than previously planned, leading to a higher estimated cost due to the induced operating charges.

Updating the industrial decommissioning scenario for permanently shut-down power plants, particularly UNGG plants, led to a €590 million increase in the provision at 31 December 2015.

The review of decommissioning provisions for permanently shut-down plants in 2016 led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). In 2017 and 2018, this annual review gave rise to non-significant adjustments.

The amended industrial scenario for dismantling of the UNGG reactors in 2015 was presented to the ASN’s commissioners on 29 March 2016. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. A consensus was reached regarding “in-air” dismantling for all reactors, the usefulness of an industrial demonstrator, and the timetable for dismantling the first-of-a-kind reactor (Chinon A2), but discussions continued regarding the dismantling timetable for the other 5 reactors. EDF’s proposed schedule allowed for significant experience-based adjustments (after dismantling the first reactor) before beginning almost simultaneous dismantling of the other 5 reactors. On 12 February 2019, EDF presented all the information justifying the Group’s chosen timetable to the ASN’s commissioners. The ASN then issued draft decisions that were submitted to public consultation between July and November 2019, setting the deadline for

filing regulatory applications for authorisation of dismantling work, and the dismantling schedule to be included in the applications. In those draft decisions, the ASN acknowledged that the required operations are complex, and that EDF’s proposed risk control strategy (industrial demonstrator, significant experience with a first reactor) is justified. However, it asked for work on the five reactors after the first-of-a-kind reactor to be brought forward slightly and begin no later than 2055.

In view of the ASN’s draft decisions, the nuclear provisions were increased in 2019 by a total €108 million: €77 million for decommissioning provisions for permanently shut-down nuclear power plants and €31 million for provisions for long-term radioactive waste management (long-lived low-level waste, very low-level and low and medium-level waste).

The ASN’s decisions concerning dismantling of UNGG reactors were published on 17 March 2020 and did not contradict the principles of the draft decisions of 2019. Consequently, the nuclear provisions for decommissioning of UNGG plants were not subjected to any particular reestimation in 2020, and they reflect the best estimate of the industrial and technical scenario.

In 2020, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €45 million increase in provisions due to critical path delays following suspension of work during France’s first lockdown phase, and a major unforeseen event associated with suspension of segmentation work on vessel internals at Chooz A. The costs for decontamination of civil engineering work were also updated, leading to a €43 million increase in provisions for the entire scope of permanently shut-down plants.

In 2021, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €77 million increase in provisions following revision of the industrial decommissioning strategy for Chooz A. That strategy has shifted to a full continuous decommissioning scenario, dropping the period of cave runoff water surveillance between the end of installations dismantling and the start of final dismantling and decontamination work, as it is no longer necessary as the quality of the water means this is no longer necessary. Also, the cost estimate for decommissioning of the APEC Fuel Storage Workshop at Creys-Malville – a facility operated by EDF with the principal activity of storing fuel from the Superphénix reactor – was updated based on Summary Preliminary Plan studies conducted in 2020-2021, leading to a €61 million increase in provisions.

Finally, in accordance with its powers under Article 594-4 of the Environment Code, in June 2020 the DGEC commissioned an external audit of the valuation of dismantling operations for EDF’s permanently shut-down nuclear facilities (a UNGG facility and management of low-level long-lived waste, Superphenix and Brennilis), conducted by a consortium of specialist firms. This audit took place from December 2020 to July 2021, and the audit report was posted on the Ministry for the Ecological Transition website in November 2021. Its conclusions (confirming the ASN’s observations during its inspection of complex project management, the conclusions of which were released in the first quarter of 2021) highlights “an organization with a structural focus on execution of dismantling projects”, an “annual estimation and revision process [that] is robust, and provides good traceability for the assumptions used and the original data”, and “a long-term industrial approach to overcome the small number of technological challenges that remain”. Finally, the report states that apart from a non-significant correction (taken into account in the 2021 provisions), “the provisions are coherent with the basic scenarios or the projects and cover the full scope of expenses for the scope audited”, and of “adequate sizing” through testing the sizing of EDF’s expenses and provisions.

At 31 December 2021, the gross amounts estimated under year-end economic conditions (amounts still to be spent) and the present value of those amounts are as follows, presented by type of reactor technology:

(in millions of euros)	31/12/2021	
	Costs based on year-end economic conditions	Amounts in provisions at present value
Pressurised water reactor – PWR – Chooz A	288	259
Pressurised water reactor – PWR – Fessenheim*	829	707
Natural uranium graphite gas-cooled reactors – UNGG – Bugey, Saint Laurent, Chinon	5,478	3,136
Heavy water reactor – Brennilis	323	284
Sodium-cooled fast neutron reactor – Superphenix at Creys Malville	534	479

* Excluding interim storage and processing of steam generators.

Provisions for decommissioning of permanently shut-down nuclear plants also cover dismantling costs for related facilities such as the APEC Fuel Storage Workshop at Creys-Malville and the BCOT Operational Hot Unit at Tricastin.

Compared to decommissioning costs for the PWR technology, the cost at completion (all costs both settled and remaining) for decommissioning of the other reactors is higher, to different extents depending on their specific characteristics:

- costs are around twice as high for Brennilis (completion cost of approximately €0.88 billion for one reactor) due to its compactness, the fact that the core is encased in concrete and thus difficult to access, the absence of a fuel pool, which complicates remote-controlled segmentation, and the presence of zircaloy (a fire hazard), meaning that segmentation work takes longer and must be more closely supervised;
- costs are around twice as high for UNGG reactors (completion cost of approximately €6.6 billion for six reactors), because they require removal of 20 times more material than a PWR due to their size, and contain graphite which is hard to access and requires special handling such that specific remote-controlled equipment must be developed;
- costs are around four times as high for Creys-Malville (completion cost of approximately €1.8 billion for one reactor), due to processing of sodium for which elimination is very sensitive, and the size of the facilities, especially the reactor (with a vessel 20 times bigger than the vessel of the 1300MW PWR).

The following progress has been made on decommissioning work:

- Chooz A: the reactor was shut down in 1991 and nuclear dismantling began in 2007 after the dismantling decree was issued. The final stage of dismantling began in 2016 and involves segmentation, conditioning and removal of reactor vessel internals, followed by dismantling of the vessel itself. These operations are due to be completed in 2024. Under the new full continuous decommissioning scenario, the plant should be declassified by late 2035 (not 2047 as previously expected);
- UNGG reactors: these six reactors were shut down between 1973 and 1994 and received their dismantling decrees between 2008 and 2010 (except for Chinon A1 and A2). Fuel removal and circuit draining have been completed for all these reactors, and dismantling operations are in process for the conventional and nuclear buildings in the periphery of the “reactor caissons”. Following the ASN’s decision of 2020, applications for dismantling permits will be submitted for all these reactors in 2022, to obtain new decrees allowing continuation of dismantling operations according to an “in-air” strategy. Opening of the top part of the first UNGG reactor caisson – Chinon A2 – is expected in 2033: the initial extractions of vessel internals and graphite blocks are due to start in 2040 and last 14 years. In parallel, the other UNGG sites are finalising their work to put the sites into a safe storage configuration (by 2035). A safe storage configuration state means that 80% of surfaces have been dismantled and the reactor caissons awaiting dismantling are safe: this will allow sufficient progress on the first reactor in this series to gain experience and ensure safety for the other five operations. Opening of the caissons after the first UNGG decommissioning is scheduled to take place in or after 2055;

- Creys Malville: this plant was shut down in 1998 and received its dismantling decree in 2006. The following key stages have been completed: removal of the fuel, dismantling of the machine room, drainage of the circuits, processing and elimination of the sodium used for cooling in all circuits, filling the reactor vessel, opening and extracting the vessel caps, and the start of dismantling of the core vessel cap (which weighs several hundred tonnes). The next stages are dismantling the vessel internals (due to be completed in 2026), electromechanical dismantling in the reactor building, then decontamination (dismantling should end in 2038);
- Brennilis: this plant was shut down in 1985 and received a partial dismantling decree in 2011 allowing dismantling of all installations peripheral to the “reactor block”. The following key stages have been completed: removal of the fuel, dismantling of the machine room, the fuel building, auxiliary buildings, heat exchangers and the effluent treatment station. The next stages are examination of the application for full dismantling authorisation, with a view to obtaining a dismantling decree in 2022 that would enable EDF to dismantle the reactor block (the end of these operations is currently forecast at 2040). The public inquiry began on 15 November as planned, and will last 7 weeks. The inquiry commissioner is expected to issue his opinion in mid-February 2022.

15.1.1.4 Provisions for last cores

These provisions cover the future expenses resulting from scrapping fuel that will only be partially irradiated when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints (“front-end” expenses);
- the cost of fuel processing, and waste removal and storage operations (“back-end” expenses). These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provisions from the commissioning date and an asset associated with the provision is recognised. In a decision of 11 December 2020, France’s Council of State challenged the tax-deductibility of the consequences of immediate recognition of a provision for dismantling of the last core (“front-end” last core expenses) (see note 17.3.1).

In 2020 after the Fessenheim plant was definitively shut down, €99 million of the provision for last cores, concerning the two reactors at Fessenheim, was reversed with a corresponding reduction in the inventories of non-irradiated fuel in the reactor at the time of the shutdown, and in parallel, provisions for spent fuel management and long-term radioactive waste management were recognised for the cost of processing this fuel and storage of the waste that will result.

In 2021, apart from the effects of extending the depreciation period for 1300MW-series plants at 1 January 2021 (see note 1.4.1), there were few changes in provisions for last cores.

15.1.1.5 Discount rate, inflation and sensitivity analyses

Calculation of the discount rate and inflation rate

The methodologies used to determine the discount rate changed as follows from 31 December 2020:

The discount rate is based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (OAT bond 0-20 year curve) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) – with yields that become close to the UFR after 50 years – plus a curve of the spread of corporate bonds rated A to BBB. Based on the disbursements expected to meet nuclear obligations, a single equivalent discount rate is deduced by applying the discount rates from the interest rate curve constructed in this way to each flow as appropriate to its maturity. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.

The UFR was defined by the European Insurance and Occupational Pensions Authority (EIOPA) for very long-term insurance liabilities that will involve disbursements beyond market horizons. The UFR calculated for 2021 is 3.46%. This is used in the calculation methodology, in compliance with the decision by the French authorities, which in the ministerial order of 1 July 2020 amending the order of 21 March 2007 on secure financing of nuclear expenses (see below) changed the formula of the regulatory ceiling for the discount rate, such that it now refers to the UFR instead of the arithmetic 48-month average of the TEC 30-year rate. The UFR is considered more relevant for nuclear provisions in view of the very long-term maturities. The sovereign yield curve at 31 December 2021 indicates rates in a range of [-0.6%;0.6%] ([-0.6%;0.2%] in 2020) for outflows between 0 and 20 years, [0.6%;3.1%] ([0.2%;3.2%] in 2020) for outflows between 20 and 50 years, and a rate moving towards 3.46% (3.51% in 2020) for outflows after 50 years.

This change in calculation methodology for the discount rate provides the best assessment of the time value of money with regard to nuclear provisions, which are characterised by very long-term disbursement outflows, well beyond market horizons. This assessment is largely achieved through:

- use of an interest rate curve based on observed year-end market data with liquid horizons, converging over non-liquid horizons towards a very long-term rate with no cycle effect, i.e. yield data for all the maturities associated with nuclear provisions;
- use of a very long-term rate (calculated UFR) produced by an independent body and now adopted by the French authorities in setting the formula for regulatory ceiling, to take account of long trends in yield movements, in coherence with the distant disbursement horizon;

- references of the bond spread to include corporate bonds rated A to BBB by ratings agencies, in order to construct a robust spread curve since there are few AA-rated bonds, particularly on long maturities, whereas most "Investment Grade" bonds are BBB-rated bonds and the great majority of them have longer maturities.

The inflation assumption is based on an inflation curve constructed by reference to inflation-indexed market products and economic forecasts, in long-term coherence with the inflation assumption underlying the UFR (2%), which leads to an inflation assumption of 1.7% at 31 December up by 50 base points from 31 December 2020, particularly reflecting break-even inflation rates.

The discount rate determined is thus 3.7% at 31 December 2021, assuming inflation of 1.7% (3.3% – mainly relating to the sovereign yield curve – and 1.2% at 31 December 2020), i.e. a real discount rate of 2.0% at 31 December 2021 (2.1% at 31 December 2020).

Regulatory discount rate limit

The discount rate must comply with two regulatory limits. Under the decree of 1 July 2020 on secure financing for nuclear expenses (which codified and updated the initial decree of 23 February 2007 as part of the Environmental Code) and the ministerial order of 1 July 2020 on secure financing for nuclear expenses (which amended the initial ministerial order of 21 March 2007), it must be lower than:

- a regulatory maximum, expressed in real value, i.e. net of inflation; this value is equal to the unrounded value representative of expectations concerning the real long-term interest rate, as used for the calculation of the Ultimate Forward Rate (UFR) applicable at the date concerned published by the European Insurance and Occupational Pensions Authority (EIOPA), plus 150 bp. This maximum is applicable from 2024. Until 2024, the maximum is the weighted average of 2.3% and the above calculation. The weighting applied to the 2.3% rate is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023; and
- the expected rate of return on assets covering the liability (dedicated assets).

The maximum discount rate calculated by reference to the UFR in application of the order that took effect on 1 July 2020 is 2.80% at 31 December 2021 (2.66% at 31 December 2020).

The real discount rate used in the financial statements at 31 December 2021, calculated by the method presented above, is 2.0%.

Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

Provisions related to nuclear generation within the scope of the Law of 28 June 2006

	31/12/2021		31/12/2020	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
<i>(in millions of euros)</i>				
Spent fuel management	16,121	10,683	18,998	10,246
amount unrelated to the operating cycle	3,282	1,726	2,727	1,297
Long-term radioactive waste management	36,779	14,233	35,580	13,300
BACK-END NUCLEAR CYCLE EXPENSES	52,900	24,916	54,578	23,546
Decommissioning of nuclear plants in operation	20,479	12,680	19,693	12,775
Decommissioning of shut-down nuclear plants	7,718	5,050	7,400	4,714
Last cores	4,349	2,660	4,258	2,711
DECOMMISSIONING AND LAST CORE EXPENSES	32,546	20,390	31,351	20,200
PROVISIONS RELATED TO NUCLEAR GENERATION within the scope of the law of 28 June 2006		45,306		43,746

The cumulative disbursements of nuclear expenses (based on gross values at year-end economic conditions) are distributed as follows:

Provisions related to nuclear generation within the scope of the Law of 28 June 2006

31/12/2021

(in millions of euros)	Costs based on year-end economic conditions		
	Disbursement expected within 10 years	Disbursement expected after 10 years*	Total
Spent fuel management	7,846	8,275	16,121
amount unrelated to the operating cycle	540	2,742	3,282
Long-term radioactive waste management	5,116	31,663	36,779
BACK-END NUCLEAR CYCLE EXPENSES	12,962	39,938	52,900
Decommissioning of nuclear plants in operation	347	20,132	20,479
Decommissioning of shut-down nuclear plants	2,903	4,815	7,718
Last cores	262	4,087	4,349
DECOMMISSIONING AND LAST CORE EXPENSES	3,512	29,034	32,546

* Over a 20-year and 50-year horizon, 20% and 41% respectively of cumulative disbursements (at year-end economic conditions) will concern long-term radioactive waste management provisions, and 32% and 96% respectively will concern decommissioning provisions.

This approach can be complemented by estimating the impact of a change in the discount rate on the present value.

The following table reports these details for the main components of EDF's provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

At 31 December 2021

(in millions of euros)	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
		+0.10%	-0.10%	+0.10%	-0.10%
BACK-END NUCLEAR CYCLE EXPENSES					
Spent fuel management	11,819	(120)	124	102	(107)
Long-term radioactive waste management	14,233	(472)	504	385	(413)
DECOMMISSIONING AND LAST CORE EXPENSES					
Decommissioning of nuclear plants in operation	12,680	(291)	299	-	-
Decommissioning of shut-down nuclear plants	5,050	(88)	91	88	(91)
Last cores	2,660	(54)	55	-	-
TOTAL	46,442	(1,025)	1,073	575	(611)
Amount covered by dedicated assets	34,276	(917)	963	515	(548)

15.1.2 EDF's dedicated assets

15.1.2.1 Regulations

Articles L. 594-1 and following of France's Environment Code and their implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste. These regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. Dedicated assets are clearly identified and managed separately from the Company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The law requires the realisable value of dedicated assets to be higher than the value of the provisions corresponding to the present value of the long-term nuclear expenses defined in France's Environment Code.

The Decree of 1 July 2020 codified the regulatory obligations concerning dedicated assets in articles D. 594-1 and following of the Environment Code, complemented by the ministerial order of 21 March 2007 amended by the order of 1 July 2020. These documents define the list of eligible

assets, which is largely based on France's Insurance Code and mainly includes unlisted assets. In particular, they authorise allocation to dedicated assets of the shares of CTE, which has held 100% of the capital of RTE since 31 December 2017 (see note 15.1.2.2 below).

EDF received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

Since the decree of 1 July 2020, EDF is no longer obliged to add to dedicated assets when the coverage rate of obligations, determined by the ratio of the assets' realisable value to the amount of the provisions concerned, is above 100%, and withdrawals from assets are not authorised unless that rate is above 120%. The decree also increased the maximum period for allocating funds to dedicated assets in the event of undercoverage, subject to authorisation by the administrative authority, to 5 years (instead of 3 years previously).

15.1.2.2 Strategic allocation and composition of dedicated assets

Given the regulations governing dedicated assets, they form a highly specific category of assets.

Dedicated assets are structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It takes into account regulatory constraints concerning the nature and liquidity of the dedicated assets, the financial outlook for the equity and bond markets, and the diversifying contribution of unlisted assets.

Several changes have been made to this strategic allocation in order to pursue the diversification into unlisted assets, particularly in 2010 when the shares in RTE (now held *via* CTE) were allocated to dedicated assets, and in 2013 when an unlisted asset portfolio (consisting of infrastructures, real estate and debt or equity funds) was set up. This portfolio is managed by EDF SA's "EDF Invest" Division.

On 29 June 2018 the Board of Directors validated the principle of strategic allocation for dedicated assets:

- yield assets (target of 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- growth assets (target of 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- fixed-income assets (target of 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually by 2025.

Growth assets and fixed-income assets

Certain growth and fixed-income assets take the form of bonds held directly by EDF. Others consist of specialised collective investment funds on leading international markets and French general-purpose investment funds (FIVGs), managed by independent asset management companies. They take the form of open-end funds and "reserved" funds located in France, established for the Company. The reserved funds are owned by EDF and are not consolidated as EDF does not participate in management of these funds and provides no financial support for them.

The value of the assets of the reserved investment funds amounts to €13,106 million at 31 December 2021 (€10,422 million at 31 December 2020). These funds mainly consist of 16 listed funds with total value of €12,153 million (at 31 December 2020, 13 listed funds with total value of €9,742 million).

The listed equity funds consist of international equities (mainly in North America but also in Europe, Asia-Pacific and emerging countries). Listed bonds and listed bond funds consist of sovereign and corporate bonds.

These investments are structured and managed in line with the strategic allocation, which takes into consideration international stock market cycles, for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led the Group to define a long-term investment policy with appropriate allocation between growth assets and fixed-income assets.

Growth assets also include a small portion of funds invested in unlisted equities, and fixed-income assets also include a small portion of funds invested in unlisted debt. These funds are mainly managed by EDF Invest (see yield assets below).

At the year-end, dedicated assets are presented in debt and equity securities in the balance sheet, at their liquidation value.

In the course of operational asset monitoring, the Group applies long-term, specific management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

Yield assets

The yield assets managed by EDF Invest consist mainly of assets related to investments in infrastructures and real estate, made either directly by EDF Invest or by investment funds under delegated management arrangements.

Through unlisted investment funds, EDF Invest also manages growth assets and fixed-income assets.

At 31 December 2021, the assets managed by EDF Invest represent a total realisable value of €8,626 million, including €7,908 million of yield assets. Yield assets particularly include:

- 50.1% of the Group's shares in CTE, amounting to €3,343 million at 31 December 2021 (€2,788 million at 31 December 2020), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Madrileña Red de Gas (MRG), Géosel, Thyssengas, Aéroports de la Côte d'Azur, Energy Assets Group, Nam Theun Power Company, companies that own wind and solar power plants (in the United States, Canada, and the United Kingdom) and companies that own real estate assets (Central Sicaf, Ecwest, Korian & Partenaires Immobilier, Issy Shift, 92 France), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Teréga, Porterbrook, Autostrade per l'Italia, Q-Park and companies that own wind farms in the United Kingdom, presented in debt and equity securities in the consolidated balance sheet.

15.1.2.3 Changes in dedicated assets in 2021

As the coverage of provisions by dedicated assets was above 100% at 31 December 2020 (103.6%), EDF had no obligation to add to the dedicated asset portfolio in 2021, and no allocation was made in 2021 (compared to allocations of €797 million in 2020 in compliance with EDF's regulatory obligation for 2020). The coverage rate of provisions at 31 December 2021 is 109.3%.

2021 was another extremely favourable year on the equity markets. The economic environment remained very dynamic despite concerns triggered by the emergence of several variants of the Covid-19 virus. Vaccination campaigns in the developed countries limited the pandemic's impact on economic activity and contributed to the equity market performance.

Equity indexes rose significantly over the year, driven by a very good performance on the US market, then the European market, while other zones were less dynamic. More unusually, the biggest rises were registered by mega-caps, which progressed in all zones except the emerging countries.

As the economy recovered, the bond markets suffered due to rising rates. German 10-year rates, for example, rose by +0.4% to -0.2% and American rates rose by +0.6% to 1.5%. However, this rise remained moderate compared to the increase in inflation. The central banks still managed to reassure the markets by stressing that this development was temporary, which meant that monetary support policies would only be withdrawn gradually.

EDF Invest continued to extend its portfolio of unlisted assets in smart meters *via* an additional investment in Energy Assets Group in the United Kingdom (the percentage ownership remains unchanged), in the French telecommunications sector *via* acquisition of a minority shareholding (as part of a consortium) in the fibre optics operator Orange Concessions, in real estate in France and Germany *via* acquisition of minority shareholdings and shares in diversified unlisted investment funds.

Positive changes in the fair value of the dedicated asset portfolio (investment funds, equities) amounting to €2,739 million were recognised in the financial result in 2021 (see note 8.3), compared to positive changes amounting to €1,218 million in 2020.

Negative changes in the fair value of the bonds in the dedicated asset portfolio amounting to €(244) million were recognised in OCI in 2021 (see note 18.1.2), compared to positive changes amounting to €62 million in 2020.

Withdrawals from dedicated assets in 2021 totalled €389 million, equivalent to payments made in respect of the long-term nuclear obligations to be covered during the year (€431 million in 2020).

15.1.2.4 Valuation of EDF's dedicated assets

EDF's dedicated assets are included in the Group's consolidated financial statements at the following values:

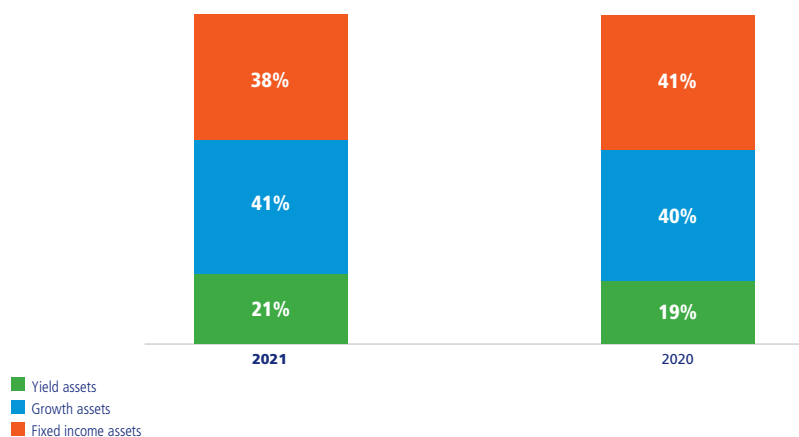
(in millions of euros)		Consolidated balance sheet presentation	31/12/2021		31/12/2020	
			Book value	Realisable value	Book value	Realisable value
Yield assets (EDF Invest)			5,626	7,908	4,677	6,420
CTE	Investments in associates ⁽¹⁾		1,478	3,343	1,378	2,788
Other associates	Investments in associates ⁽²⁾		2,567	2,923	1,974	2,252
Other unlisted assets	Debt and equity securities and other net assets ⁽³⁾		1,581	1,642	1,309	1,364
Derivatives	Fair value of derivatives		-	-	16	16
Growth assets			15,320	15,320	13,692	13,692
Equities (investment funds)	Debt securities		14,815	14,815	13,174	13,174
Unlisted equity funds (EDF Invest)	Debt securities		519	519	330	330
Derivatives	Fair value of derivatives		(14)	(14)	188	188
Fixed-income assets			14,226	14,226	13,736	13,736
Bonds	Debt securities		13,007	13,007	12,371	12,371
Unlisted debt funds (EDF Invest)	Debt securities		199	199	155	155
Cash portfolio	Debt securities		1,016	1,016	1,185	1,185
Derivatives	Fair value of derivatives		4	4	25	25
TOTAL EDF DEDICATED ASSETS			35,172	37,454	32,105	33,848

(1) The Group's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The CTE shares are included at their equity value in the consolidated financial statements (book value in the table). The realisable value of CTE in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets.

(2) Including the value of the share in equity of the controlled companies owning these investments.

(3) Including debt and equity securities amounting to €1,457 million and the value of the share in equity of other controlled companies.

The structure of the dedicated asset portfolio in 2021 and 2020 is as follows (in realisable value):



15.1.3 Coverage of EDF's long-term nuclear obligations

The Group's long-term nuclear obligations in France concerned by the regulations for dedicated assets related to nuclear generation are included in the EDF group's consolidated financial statements at the following values:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,726	1,297
Provisions for long-term radioactive waste management	14,233	13,300
Provisions for nuclear plant decommissioning	17,730	17,489
Provisions for last cores – portion for future long-term radioactive waste management	587	590
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	34,276	32,676
REALISABLE VALUE OF DEDICATED ASSETS	37,454	33,848
REGULATORY COVERAGE RATE	109.3%	103.6%

At 31 December 2021, by the regulatory calculations provisions are 109.3% covered by dedicated assets. The potential regulatory caps on the realisable value of certain investments set in the Environment Code were not applicable at 31 December 2021.

At 31 December 2020, by the regulatory calculations provisions were 103.6% covered by dedicated assets. Again, the regulatory caps were not applicable.

15.2 EDF Energy's nuclear provisions

The specific financing terms for long-term nuclear commitments related to EDF Energy are reflected as follows in the EDF group's financial statements:

- the obligations are reported in liabilities in the form of provisions amounting to €17,889 million at 31 December 2021;
- in the assets, EDF Energy reports receivables corresponding to the amounts payable under the restructuring agreements by the Nuclear Liabilities Fund (NLF), for non-contracted obligations or decommissioning obligations, and by the British Government for contracted obligations (or historical liabilities).

These receivables are discounted at the same real rate as the obligations they are intended to finance. They are included in "Financial assets" in the consolidated balance sheet (see note 18.1.3) at the amount of €15,986 million at 31 December 2021 (€13,034 million at 31 December 2020).

Details of changes in provisions for the back-end of the nuclear cycle and provisions for decommissioning and last cores are as follows:

<i>(in millions of euros)</i>	31/12/2020	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2021
Provisions for spent fuel management	1,286	20	(188)	96	90	97	1,401
Provisions for waste removal and conditioning	546	4	-	38	39	12	639
Provisions for long-term radioactive waste management	1,106	6	-	78	82	143	1,415
Provisions for the back-end of the nuclear cycle	2,938	30	(188)	212	211	252	3,455
Provisions for nuclear plant decommissioning	10,170	-	(242)	739	750	1,178	12,595
Provisions for last cores	2,172	-	(341)	17	141	(150)	1,839
Provisions for decommissioning and last cores	12,342	-	(583)	756	891	1,028	14,434
PROVISIONS RELATED TO NUCLEAR GENERATION	15,280	30	(771)	968	1,102	1,280	17,889

"Other movements" include the changes in nuclear liabilities with a corresponding adjustment in the amount of reimbursements receivable from the NLF and the British government, and the change in the provision for last cores via an adjustment to fixed assets.

The overall change of the "other movements" regarding Provisions for decommissioning for an amount of €1.2 billions mainly results from the unexpected early end of generation at Dungeness B in June 2021 (see note 15.2.3).

15.2.1 Regulatory and contractual framework

Amendments signed with the Nuclear Liabilities Fund (NLF – an independent trust set up by the UK Government as part of the restructuring of British Energy) following the EDF group's acquisition of British Energy had a limited impact on the contractual financing commitments made to British Energy by the UK Secretary of State and the NLF under the "Restructuring Agreements". These agreements were entered into by British Energy on 14 January 2005 as part of the restructuring led by the UK Government in order to stabilise British Energy's financial position. These agreements were amended and restated on 5 January 2009 as part of the acquisition of the British Energy Generation Limited by the Group. British Energy Generation Limited changed its name to EDF Energy Nuclear Generation Limited on 1 July 2011 and replaced British Energy in these agreements and amendments.

Under the terms of the Restructuring Agreements:

- the NLF agreed to fund, to the extent of its assets: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for management of spent fuel from the Sizewell B power station); and (ii) qualifying decommissioning costs for EDF Energy's existing nuclear power stations;
- the Secretary of State agreed to fund: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for the management of spent fuel from the Sizewell B power station) and qualifying decommissioning costs related to EDF Energy's existing nuclear power stations, to the extent that they exceed the assets of the NLF; and (ii) subject to a cap of £2,185 million (in December 2002 monetary values, adjusted accordingly), qualifying known existing liabilities for EDF Energy's spent fuel (including liabilities for management of spent fuel from plants other than Sizewell B loaded in reactors prior to 15 January 2005);
- EDF Energy is responsible for funding certain excluded or disqualified liabilities (e.g. those defined as EDF Energy liabilities), and additional liabilities which could be created as a result of failure by EDF Energy to meet minimum performance standards under applicable law. The obligations of EDF Energy to the NLF and the Secretary of State are guaranteed by the assets of the principal members of EDF Energy.

EDF Energy also made commitments to pay:

- annual decommissioning contributions for a period limited to the useful life of the plants as at the date of the "restructuring agreements"; the corresponding provision amounts to €101 million at 31 December 2021;
- £150,000 (indexed to inflation) per tonne of uranium loaded in the Sizewell B reactor after the date of the "restructuring agreements".

Furthermore, EDF Energy entered into a separate contract with the Nuclear Decommissioning Authority (NDA) for management of AGR spent fuel and associated radioactive waste resulting from operation of power plants other than Sizewell B after 15 January 2005, and bears no responsibility for this fuel and waste once it is transferred to the processing site at Sellafield. The corresponding costs of £150,000 (indexed to inflation) per tonne of loaded uranium – plus a rebate or surcharge dependent on market electricity price and electricity generated in the year – are included in inventories.

On 23 June 2021 EDF and the UK government signed an update to the Restructuring Agreements. The changes and clarifications to the Agreements confirm the recovery of qualifying costs and stipulate that once the AGR stations have finished defueling under EDF Energy responsibility, they will transfer to the NDA which will be responsible for subsequent decommissioning activities. These amended agreements have no consequences in the Group financial statements at 31 December 2021.

In addition, in early 2020 EDF Energy carried out phase 1 of the Decommissioning Plan Submission (DPS 20) which was an update to the defueling liability. This phase of the DPS 20 was approved by the NDA in June 2021.

In November 2021, EDF Energy submitted Integrated Plan (IP) 22 to the Non-Nuclear Liabilities Assurance team (NLA) which updated the defueling cost estimates submitted in 2020. This was approved in December 2021.

In February 2022, EDF Energy will submit phase 2 of the Decommissioning plan submission (DPS 21) to the NLA. The DPS 21 will include updates for all the other decommissioning activities for the AGR plants, decommissioning of Sizewell B and an update to the Uncontracted Liability Discharge Plan (UCLDP).

15.2.2 Provisions for the back-end of the nuclear cycle

Spent fuel from the Sizewell B PWR (pressurised water reactor) plant is stored on site. Spent fuel from the AGR plants is transferred to Sellafield for storage and reprocessing.

EDF Energy's provisions for the back-end of the nuclear cycle concern obligations for reprocessing and storage of spent fuel and long-term storage of radioactive waste, required by the existing regulations in the UK approved by the Nuclear Decommissioning Authority (NDA). Their amount is based on contractual agreements or if this is not possible, on the most recent technical estimates.

	31/12/2021		31/12/2020	
(in millions of euros)	Costs based on year-end economic conditions*	Amounts in provisions at present value	Costs based on year-end economic conditions*	Amounts in provisions at present value
Spent fuel management	2,725	1,401	2,318	1,286
Waste removal and conditioning	2,154	639	1,875	546
Long-term radioactive waste management	5,126	1,415	3,724	1,106
BACK-END NUCLEAR CYCLE EXPENSES	10,005	3,455	7,917	2,938

* The costs based on year-end economic conditions include spent fuel and associated waste management over the operating life of the reactors (including future load fuel for Sizewell B only); the provisions are based on the fuel committed to date.

15.2.3 Provisions for nuclear plant decommissioning

Provisions for decommissioning of nuclear plants cover the full cost of decommissioning and are measured on the basis of existing techniques and methods that are most likely to be used for application of current regulations.

As explained above, the Restructuring Agreements updated in June 2021 provide that once the AGR power plants have finished defueling that they will transfer to the NDA for subsequent decommissioning activities.

The signature of these agreements has no immediate accounting consequences for decommissioning provisions or the receivable representing reimbursements to be made by the NLF and the UK government. Nuclear decommissioning liabilities and the associated assets will be derecognised during the agreement's operational implementation phase.

In early 2020, EDF Energy submitted phase 1 of the decommissioning plan submission (DPS 20) which was an update to the defueling liability. This led to a €1.9 billion increase in the provision at 31 December 2019, notably reflecting i) the extension of the defueling period following risk and contingency modelling, ii) better definition of the costs covered, and iii) an updated estimate of the costs of preparing and removing fuel, following a review of the industrial scenario. This phase of the DPS 20 was approved by the NDA in June 2021.

In November 2021, EDF Energy submitted Integrated Plan (IP) 22 to the NLA which updated the defueling cost estimates. The updated cost estimate represents an increase of €0.9 billion in the provision compared to 2020. This increase is mainly explained by the unexpected early end of generation at Dungeness B in June 2021, previously expected to be 2028, leading in particular to a longer defueling duration (and hence an increase in costs) due to the unplanned nature of this shutdown.

Furthermore, in 2021 EDF Energy updated the cost estimates relating to phase 2 of the decommissioning plan submission (DPS 21) which includes the other

decommissioning activities for the AGR plants, decommissioning of Sizewell B and an update to the Uncontracted Liability Discharge Plan. The updated cost estimate represents an increase in the provision of €0.2 billion which includes the upward effects of the unexpected early end of generation at Dungeness (previously planned for 2028) and the new assumptions regarding the closure of Heysham 2 and Torness AGR plants, scheduled for 2028 (previously 2030), as well as the downward effect of extension of the depreciation period of Sizewell B (PWR plant) at 31 December 2021. Phase 2 will be submitted to the NLA at the end of February 2022.

	31/12/2021		31/12/2020	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
(in millions of euros)				
PLANT DECOMMISSIONING EXPENSES	19,864	12,494	18,175	10,069

15.2.4 Discounting of EDF Energy's provisions related to nuclear generation

The method used to determine the discount rate changed as follows from 31 December 2020:

- Like the discount rate for nuclear provisions in France, the discount rate for EDF Energy's provisions is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (UK gilt 0-20 year yield) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) plus a curve of the spread of corporate bonds rated A to BBB. Based on expected disbursements corresponding to nuclear obligations, a single equivalent discount rate is deduced from the curve constructed in this way. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions;
- The inflation assumption is based on an inflation curve constructed by reference to economic forecasts and inflation-indexed market products, in long-term coherence with the inflation assumption underlying the UFR (2%).

Determined under this method, the real discount rate for calculation of all EDF Energy's nuclear provisions is unchanged overall. In particular, the real discount rate used to calculate provisions for the back-end of the nuclear cycle and decommissioning of nuclear plants is 1.9%, the same as at 31 December 2020.

15.3 Nuclear provisions in Belgium

In Belgium, the Belgian law of 11 April 2003 assigned management of provisions concerning the Belgian nuclear plants, and the funds that cover them, to Synatom (a subsidiary of the ENGIE group). Luminus contributes *via* Synatom to these funds, to cover its share of plant decommissioning and back-end nuclear fuel expenses as a co-owner of 4 nuclear plants. These funding mechanisms are reflected through the following items in the consolidated financial statements:

- obligations presented in the liabilities in the form of provisions, amounting to €272 million at 31 December 2021 (€265 million at 31 December 2020);
- a receivable representing the advance payments made to Synatom, recognised in the consolidated balance sheet assets as financial assets carried at fair value (see note 18.1.3) at the value of €282 million at 31 December 2021 (€263 million at 31 December 2020). This receivable, which corresponds to the fair value of the share of funds held by Synatom on behalf of Luminus, is discounted by applying the same real discount rate used to determine the obligations they will cover.

Other provisions related to nuclear generation in Belgium correspond to liabilities covered by provisions that are not part of the mechanisms described above.

Note 16 Provisions for employee benefits

Accounting principles and methods

The Group grants its employees post-employment benefits (pension plans, retirement indemnities, etc.) and other long-term benefits (*e.g.* long-service awards) in compliance with the specific laws and measures in force in each country where it does business.

Calculation and recognition of employee benefits

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end under all types of plan, taking into consideration the prospects for wage increases and each country's specific economic conditions.

Post-employment benefit obligations are valued mainly using the following methods and assumptions:

- retirement age, determined on the basis of the applicable rules for each plan, and the requirements to qualify for a full pension;

- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data available in each country;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate;
- a discount rate that depends on the geographical zone and the duration of the obligations, determined at the year-end date by reference to the market yield on high-quality corporate bonds or the rate on government bonds whose duration is coherent with EDF group's commitments to employees.

The amount of the provision corresponds to the value of obligations less the fair value of the fund assets that cover those obligations.

The net expense booked during the year for employee benefit obligations includes:

- in the income statement:
 - › the current service cost, corresponding to additional benefit entitlements earned during the year,
 - › the net interest expense, corresponding to interest on obligations net of the return on fund assets, which is calculated using the same discount rate as for the obligations,
 - › the past service cost, including the income or expense related to amendments or settlements of benefit plans or introduction of new plans,
 - › the actuarial gains and losses relating to other long-term benefits;
- in other components of consolidated comprehensive income:
 - › the actuarial gains and losses relating to post-employment benefits and any return on hedging assets in excess of the discount rates used,
 - › the effect of the limitation to the asset ceiling if any.

Post-employment benefit obligations

When they retire, Group employees benefit from pensions determined under local rules. They may also be entitled to benefits directly paid by the companies, and additional benefits prescribed by the relevant regulations.

French entities covered by the IEG system

Entities belonging to the specific IEG (electricity and gas) sector system, namely EDF, Enedis, Électricité de Strasbourg, EDF PEI and certain subsidiaries of the Dalkia subgroup, are Group companies where almost all employees benefit from the IEG statutes, including the special pension system and other statutory benefits.

After the financing reform for the IEG sector system took effect on 1 January 2005 (law of 9 August 2004), pension provisions were recognised by IEG companies to cover entitlements not funded by France's standard systems (CNAV, AGIRC and ARRCO), to which the IEG system is affiliated, or by the CTA (*contribution tarifaire d'acheminement*) levy on gas and electricity transmission and distribution services.

As a result of the system affiliation mechanism, any change (whether favourable or unfavourable to employees) in the standard French pension system that is not passed on to the IEG pension system is likely to cause a variation in the amount of the provisions recorded by the Group to cover its obligations.

The obligations concerned by the pensions and for which a provision is recorded thus include:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (transmission and distribution) (benefits earned prior to that date are financed by the CTA levy).

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind: Article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at preferential prices. The obligation for supplies of energy to employees of the EDF and ENGIE (formerly GDF-Suez) groups corresponds to the probable present value of kWh to be supplied to beneficiaries or their dependants during their retirement, valued on the basis of the unit cost (which mainly depends on the marginal production cost and taxes). It also includes the payment made under the energy exchange agreement with ENGIE;

- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy;
- bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26 – § 5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension, subject to a ceiling) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include help with the cost of studies, time banking for pre-retirement leave, and pensions for personnel sent on secondment to subsidiaries not covered by the IEG system.

French and foreign subsidiaries not covered by the special IEG system

Regarding pension obligations in the United Kingdom, EDF Energy had three principal defined-benefit pension plans at 1 January 2021:

- the British Energy Generation Group (BEGG) plan, of which the majority of members are current or retired employees of the Nuclear Generation business. The BEGG plan was closed to new members in August 2012;
- the EDF Energy Generation and Supply Group (EEGSG) plan, which was established in December 2010 for the employees remaining with EDF Energy following the transfer of the former Group plan to UK Power Networks as part of the sale of the Networks. The EEGSG plan has not accepted any new members since then;
- the EDF Energy Pension Scheme (EEPS). This scheme was established in March 2004 and membership remained open to new employees until 1 January 2021.

From 30 June or 31 December 2021, depending on the option chosen, employees were transferred from the EEGSG, EEPS and BEGG defined-benefit plans to their replacement, a new defined-contribution plan called "my Retirement Plan" and the old plans were closed.

The closed plans were merged into a single plan called "EDF group of the ESPS" (EDFG). This plan will remain in force for rights vested up to the closing date of the previous plans. The corresponding obligations will be adjusted for changes in discount and inflation rates, but will no longer be affected by new members or wage increases.

Other long-term benefit obligations

These benefits concern employees currently in service, and are earned according to local regulations, particularly the statutory regulations for the electricity and gas sector for EDF and French subsidiaries covered by the IEG regime. They include:

- annuities following incapacity, invalidity, industrial accident or work-related illness;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

16.1 Group provisions for employee benefits

(in millions of euros)

	31/12/2021	31/12/2020
Provisions for employee benefits – current portion	792	879
Provisions for employee benefits – non-current portion	21,716	22,130
PROVISIONS FOR EMPLOYEE BENEFITS	22,508	23,009

16.1.1 Breakdown of the change in the provision by geographical area: obligations, fund assets, net liability

(in millions of euros)

	France ⁽¹⁾	United Kingdom	Other	Total
Obligations at 31/12/2020	35,489	10,117	952	46,558
Net expense for 2021	1,237	356	40	1,633
Actuarial gains and losses	110	(356)	7	(239)
Employer's contributions to funds	-	-	-	-
Employees' contributions to funds	-	3	1	4
Benefits paid ⁽²⁾	(1,336)	(408)	(28)	(1,772)
Changes in scope of consolidation	-	-	(57)	(57)
Translation adjustment	-	698	-	698
Other movements ⁽⁴⁾	(64)	-	(5)	(69)
OBLIGATIONS AT 31/12/2021	35,436	10,410	910	46,756

(in millions of euros)

	France ⁽¹⁾	United Kingdom	Other	Total
Fund assets at 31/12/2020	(13,470)	(11,406)	(398)	(25,274)
Net expense for 2021	(119)	(196)	(4)	(319)
Actuarial gains and losses	(287)	(859)	(22)	(1,168)
Employer's contributions to funds	-	(247)	(26)	(273)
Employees' contributions to funds	-	(3)	(1)	(4)
Benefits paid	465	408	7	880
Changes in scope of consolidation	-	-	(2)	(2)
Translation adjustment	-	(821)	-	(821)
FUND ASSETS AT 31/12/2021	(13,411)	(13,124)	(446)	(26,981)

(in millions of euros)

	France ⁽¹⁾	United Kingdom	Other	Total
Net employee benefit liability at 31/12/2020 ⁽²⁾	22,019	(1,289)	554	21,284
Net expense for 2021	1,118	160	36	1,314
Actuarial gains and losses	(177)	(1,215)	(15)	(1,407)
Employer's contributions to funds	-	(247)	(26)	(273)
Employees' contributions to funds	-	-	-	-
Benefits paid	(871)	-	(21)	(892)
Changes in scope of consolidation	-	-	(59)	(59)
Translation adjustment	-	(123)	-	(123)
Other movements ⁽⁴⁾	(64)	-	(5)	(69)
NET EMPLOYEE BENEFIT LIABILITY AT 31/12/2021	22,025	(2,714)	464	19,775

Including:

Provisions for employee benefits	22,508
Non-current financial assets ⁽³⁾	(2,733)

(1) France comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 16.2).

(2) The net liability at 31 December 2020 comprised €23,009 million for the provisions for employee benefits and €(1,725) million of non-current financial assets, giving a net liability amount of €21,284 million.

(3) At 31 December 2021, EDF Energy recognised surplus funding on its EDFG pension scheme.

(4) Including €(67) million relating to the change in the method for attribution of benefits (see note 1.2.3).

Actuarial gains and losses on obligations in 2021

Actuarial gains and losses on obligations amount to €(239) million for 2021, including:

- €110 million in France as a result of:
 - › the €(3,099) million change in the discount rate,
 - › the €(540) million change in experience adjustments,
 - › the €151 million change in the ARRCO-AGIRC agreement,
 - › the €3,598 million change in the inflation rate;
- €(356) million in the United Kingdom, essentially associated with changes in the discount and inflation rates (see note 16.1.2).

Actuarial gains and losses on obligations amount to €3,293 million for 2020, including:

- €2,356 million in France as a result of:
 - › the €2,695 million change in the discount rate,
 - › the €(604) million change in the inflation rate;
- €896 million in the United Kingdom, essentially associated with changes in the discount and inflation rates.

Actuarial gains and losses on fund assets in 2021

Actuarial gains and losses on fund assets amount to €(1,168) million for 2021. They mainly result from a €(859) million change in the United Kingdom and a €(287) million change in France due to a very good performance on the bond markets.

Net employee benefit liability at 31 December 2021

The net liability at 31 December 2021 amounted to €19,775 million, including:

- €22,025 million in France;
- €(2,714) million in the United Kingdom, reflecting recognition by EDF Energy of surplus funding on its EDFG pension scheme (as explained in the accounting principles and methods below), totalling €2,733 million compared to €1,725 million at 31 December 2020. This surplus funding, which increased due to the good performance by fund assets, is recognised in balance sheet assets under "non-current financial assets".

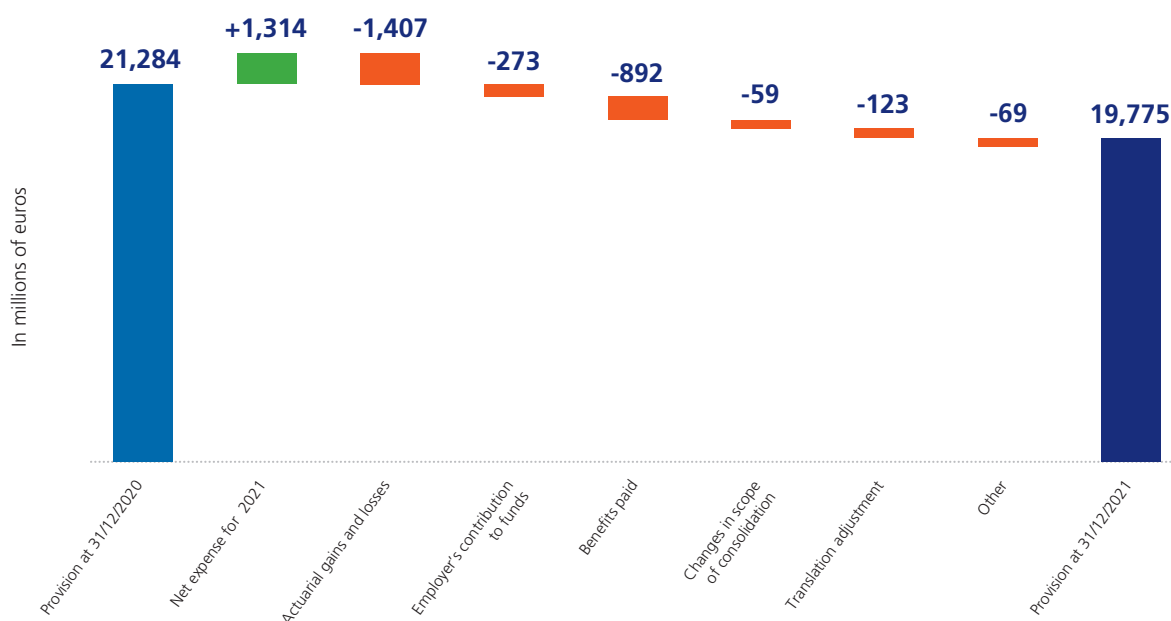
Developments in the United Kingdom

Following the closure of the EEGSG, EEPS and BEGG defined-benefit pension plans and their replacement by a new defined-contribution plan (see "Accounting principles and methods" above) at 31 December 2021, restatement of this plan at 31 December 2021 led to a €35 million decrease in pension obligations due to the lower past service cost, recognised in "Personnel expenses".

Employees were granted a transition bonus in connection with this change, recognised in "Personnel expenses" at the amount of €(82) million.

Changes in the net liability in 2021 were as follows:

Changes in the net liability in 2021



16.1.2 Actuarial assumptions and sensitivity analyses

The following actuarial assumptions are used:

(in %)	France		United Kingdom	
	31/12/2021	31/12/2020	31/12/2021	31/12/2020
Discount rate/rate of return on assets ⁽¹⁾	1.30%	0.90%	1.90%	1.45%
Inflation rate	1.70%	1.20%	2.95%	2.53%
Wage increase rate ⁽²⁾	2.80%	2.30%	2.70%	2.37%

(1) The interest income generated by assets is calculated using the discount rate. The difference between this interest income and the return on assets is recorded in equity.

(2) Average wage increase rate, including inflation and projected over a full career.

In France, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations. For longer durations, the calculation also takes into consideration data from a wider selection of corporate bonds adjusted for comparability with the high-quality bonds, given the smaller panel of bonds with these durations since 2017. The increase in the discount rate essentially relates to the increase in risk-free rates observed in 2021.

Changes in the economic and market parameters used have led the Group to set the nominal discount rate at 1.30% at 31 December 2021 (0.90% at 31 December 2020).

The inflation assumption is based on an inflation curve constructed from economic forecasts and inflation-indexed market products.

As a result of changes in the economic and market parameters, the assumed average inflation rate used as the Group's benchmark for Euro zone countries is 1.70% at 31 December 2020 (1.2% at 31 December 2020).

The wage law used to calculate obligations refers to wage increases observed over the period 2015-2018 (adjusted for non-recurring effects), which are comparable to the wage increases observed in the last two years.

The mortality table used to calculate obligations is based on the INSEE 2013-2070 generation table (produced by the French statistics office), corrected for differences in mortality between the general French population and the population covered by the IEG regime.

In the United Kingdom, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations.

Sensitivity analyses on the amount of the obligations are as follows:

(in millions of euros)	31/12/2021	
	France	United Kingdom
Impact of a 25bp increase or decrease in the discount rate	(1,785)/1,939	(545)/614
Impact of a 25bp increase or decrease in the inflation rate	1,826/(1,691)	552/(492)
Impact of a 25bp increase or decrease in the wage increase rate	1,844/(1,721)	n.a.

n.a.: not applicable.

16.1.3 Breakdown by geographical area of post-employment and other long-term employee benefits

(in millions of euros)	2021			
	France	United Kingdom	Other	Total
Current service cost	(793)	(223)	(25)	(1,041)
Past service cost	-	35	-	35
Actuarial gains and losses – other long-term benefits	(123)	-	(6)	(129)
Net expenses recorded as operating expenses	(916)	(188)	(31)	(1,135)
Interest expense (discount effect)	(321)	(168)	(9)	(498)
Return on fund assets	119	196	4	319
Net interest expense included in financial result	(202)	28	(5)	(179)
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	(1,118)	(160)	(36)	(1,314)
Actuarial gains and losses – post-employment benefits	(110)	356	(7)	239
Actuarial gains and losses on fund assets	287	859	22	1,168
Actuarial gains and losses	177	1,215	15	1,407
Translation adjustments	-	123	-	123
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	177	1,338	15	1,530

(in millions of euros)	2020			
	France	United Kingdom	Other	Total
Current service cost	(663)	(262)	(28)	(953)
Past service cost	-	-	-	-
Actuarial gains and losses – other long-term benefits	(146)	-	-	(146)
Net expenses recorded as operating expenses	(809)	(262)	(28)	(1,099)
Interest expense (discount effect)	(432)	(194)	(11)	(637)
Return on fund assets	160	215	3	378
Net interest expense included in financial result	(272)	21	(8)	(259)
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	(1,081)	(241)	(36)	(1,358)
Actuarial gains and losses – post-employment benefits	(2,356)	(896)	(41)	(3,293)
Actuarial gains and losses on fund assets	1,204	1,179	7	2,390
Actuarial gains and losses	(1,152)	283	(35)	(903)
Translation adjustments	-	(58)	1	(57)
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	(1,152)	225	(34)	(960)

In 2021, actuarial gains and losses on post-employment benefits and other long-term employee benefits recognised in profit and loss amount to €110 million (€129 million for long-term employee benefits and €239 million for post-employment benefit obligations), including:

- €356 million in the United Kingdom;
- €(233) million in France (€(123) million for long-term employee benefits and €(110) million for post-employment benefit obligations). These actuarial gains

and losses relate to changes in the discount rate, the inflation rate and experience adjustments (see note 16.1.2 and the table below).

The actuarial gains and losses on obligations generated over 2020 amount to €(2,502) million in France and are mainly associated with changes in the discount rate, the inflation rate and experience adjustments.

The actuarial gains and losses on obligations in France are as follow:

(in millions of euros)	2021	2020
Experience adjustments	437	(355)
Changes in demographic assumptions	1	-
Changes in financial assumptions*	(671)	(2,147)
ACTUARIAL GAINS AND LOSSES ON OBLIGATIONS	(233)	(2,502)
<i>Including:</i>		
Actuarial gains and losses on post-employment benefits	(110)	(2,356)
Actuarial gains and losses on other long-term benefits	(123)	(146)

* Financial assumptions mainly concern the discount rate, inflation rate and wage increase rate.

16.2 France (Regulated activities and Generation and supply)

The two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 4.1) are combined here into a single subtotal, "France", which primarily includes EDF and Enedis. Almost all of these companies' employees have IEG status, including the special IEG pension and other IEG benefits.

16.2.1 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2021	31/12/2020
Current employees	18,463	20,477
Retirees	16,973	15,012
OBLIGATIONS	35,436	35,489

16.2.2 Provision for employee benefits by nature

At 31 December 2021

<i>(in millions of euros)</i>	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2021	33,813	(13,411)	20,402
<i>Including:</i>			
Pensions*	26,196	(12,620)	13,576
Benefits in kind (electricity/gas)	4,925	-	4,925
Retirement gratuities	897	(776)	121
Other	1,795	(15)	1,780
Provisions for other long-term employee benefits at 31/12/2021	1,623	-	1,623
<i>Including:</i>			
Annuities following work-related accident and illness, and invalidity	1,362	-	1,362
Long service awards	230	-	230
Other	31	-	31
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2021	35,436	(13,411)	22,025

* Mainly EDF SA's fund assets (53% of pension obligations were covered by funds at 31 December 2021).

At 31 December 2020

<i>(in millions of euros)</i>	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2020	33,893	(13,470)	20,423
<i>Including:</i>			
Pensions*	25,951	(12,671)	13,280
Benefits in kind (electricity/gas)	5,294	-	5,294
Retirement gratuities	941	(784)	157
Other	1,707	(15)	1,692
Provisions for other long-term employee benefits at 31/12/2020	1,596	-	1,596
<i>Including:</i>			
Annuities following work-related accident and illness, and invalidity	1,339	-	1,339
Long service award	225	-	225
Other	32	-	32
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2020	35,489	(13,470)	22,019

* Mainly EDF SA's fund assets (53% of pension obligations were covered by funds at 31 December 2020).

16.2.3 Fund assets

For France, fund assets, managed under an asset/liability model, amount to €13,411 million at 31 December 2021 (€13,470 million at 31 December 2020) and concern the coverage of retirement gratuities and the specific benefits of the special pension system.

Fund assets break down as follows:

They consist of insurance contracts with the following risk profile:

- 67% in a hedging pocket consisting of bonds, designed to replicate variations in the obligation caused by changes in interest rates;
- 33% in a growth asset pocket consisting of international equities.

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
FUND ASSETS	13,411	13,470
Assets funding special pension benefits	12,620	12,671
<i>Including (%)</i>		
Listed equity instruments (shares)	33%	34%
Listed debt instruments (bonds)	67%	66%
Assets funding retirement gratuities	776	784
<i>Including (%)</i>		
Listed equity instruments (shares)	33%	37%
Listed debt instruments (bonds)	67%	63%
Other fund assets	15	15

At 31 December 2021, the equities held as part of fund assets are distributed as follows:

- approximately 64% of the total are shares in North American companies;
- approximately 19% of the total are shares in European companies;
- approximately 17% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

This distribution is relatively stable compared to the distribution at 31 December 2020.

At 31 December 2021, the bonds held as part of fund assets are distributed as follows:

- approximately 63% of the total are AAA and AA-rated bonds;
- approximately 37% of the total are bonds with A, BBB and other ratings.

Around 64% of bonds are sovereign bonds issued by Euro zone countries, and the balance mainly consists of bonds issued by financial and non-financial firms.

The performance of pension fund assets in France is +3% in 2021.

16.2.4 Future Cash Flows

Cash flows related to future employee benefits are as follows:

<i>(in millions of euros)</i>	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	1,305	1,297
One to five years	4,402	4,221
Five to ten years	5,171	4,626
More than ten years	41,036	25,292
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	51,914	35,436

At 31 December 2021, the average duration of employee benefit commitments in France is 21.5 years.

16.3 United Kingdom

The United Kingdom segment chiefly comprises EDF Energy.

16.3.1 Breakdown of obligations by type of beneficiary

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Current employees	5,837	5,702
Retirees	4,573	4,415
OBLIGATIONS	10,410	10,117

16.3.2 Fund assets

Pension obligations in the United Kingdom are partly covered by the external fund EDFG which resulted from the merger at 31 December 2021 of the three funds BEGG, EEGSG et EEPS and has a present value of €13,124 million at 31 December 2021 (€11,406 million at 31 December 2020).

These assets break down as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
BEGG pension fund*	n.a.	8,585
EEGSG pension fund*	n.a.	1,585
EEPS pension fund*	n.a.	1,236
EDFG pension fund*	13,124	n.a.
FUND ASSETS	13,124	11,406
<i>Including (%)</i>		
Listed equity instruments (shares)	10%	11%
Listed debt instruments (bonds)	60%	61%
Real estate properties	5%	6%
Cash and cash equivalents	5%	4%
Other	20%	18%

n.a.: not applicable.

* In 2021, these three plans were closed and merged into a single plan called "EDF group of the ESPs" (EDFG).

At 31 December 2021, the equities held as part of fund assets are distributed as follows:

- approximately 58% of the total are shares in North American companies;
- approximately 21% of the total are shares in European companies;
- approximately 21% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

At 31 December 2021, the bonds held as part of fund assets are distributed as follows:

- approximately 76% of the total are AAA and AA-rated bonds;
- approximately 24% of the total are bonds with A, BBB and other ratings.

Around 76% of all these bonds are sovereign bonds, mainly issued by the United Kingdom. The balance mainly consists of bonds issued by financial and non-financial firms.

The portion of sovereign bonds issued by the United Kingdom was 5 percentage points higher than at 31 December 2020.

16.3.3 Future cash flows

Cash flows related to future employee benefits are as follows:

<i>(in millions of euros)</i>	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	428	416
One to five years	1,847	1,769
Five to ten years	2,598	2,289
More than ten years	11,135	5,936
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	16,008	10,410

The average weighted duration of funds in the United Kingdom is 23.3 years at 31 December 2021.

Note 17 Other provisions and contingent liabilities

<i>(in millions of euros)</i>	Notes	31/12/2021			31/12/2020		
		Current	Non-current	Total	Current	Non-current	Total
Other provisions for decommissioning	17.1	95	1,872	1,967	120	1,744	1,864
Other provisions	17.2	3,245	3,570	6,815	2,675	3,630	6,305
OTHER PROVISIONS		3,340	5,442	8,782	2,795	5,374	8,169

17.1 Other provisions for decommissioning

The breakdown by company is as follows:

<i>(in millions of euros)</i>	EDF	EDF Energy	Edison	Framatome	Other	Total
OTHER PROVISIONS FOR DECOMMISSIONING AT 31/12/2021	770	123	188	443	443	1,967
Other provisions for decommissioning at 31/12/2020	772	128	172	412	380	1,864

Other provisions for decommissioning principally concern fossil-fired power plants, installations for the production of nuclear fuel assemblies, and dismantling of wind farms.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation. The provision recorded at 31 December 2021 reflects the most recent known cost estimates and includes rehabilitation costs for generation sites.

Provisions for decommissioning notably include €161 million for Basic nuclear facilities (INB) in France, in the amounts of €97 million for Framatome and

€64 million for Cyclife France. Dedicated assets have been set aside to cover these provisions as required by the regulations.

Dedicated assets of Framatome and Cyclife France

The dedicated assets of Framatome and Cyclife France (formerly SOCODEI) relating to Basic nuclear facilities (INB) in France have realisable values of €109 million in Framatome and €63 million in Cyclife France and the degree of coverage of provisions according to the regulations is 111% for Framatome and 98% for Cyclife France (by administrative prescription of 22 November 2021, Cyclife must by the 2022 year-end return to a coverage ratio of at least 100%).

17.2 Other provisions

Details of changes in other provisions are as follows:

(in millions of euros)	31/12/2020	Increases	Decreases		Changes in scope	Other changes*	31/12/2021
			Utilisations	Reversals			
Provisions for contingencies related to subsidiaries and investments	801	236	(465)	-	-	13	585
Provisions for tax liabilities (excluding income tax)	166	3	(55)	(2)	(1)	1	112
Provisions for litigation	392	68	(50)	(88)	1	4	327
Provisions for onerous contracts and losses on completion	1,890	267	(156)	(354)	1	3	1,651
Provisions related to environmental schemes	1,192	1,957	(1,578)	(8)	-	9	1,572
Other provisions for contingencies and losses	1,864	1,343	(549)	(163)	2	71	2,568
TOTAL	6,305	3,874	(2,853)	(615)	3	101	6,815

* Other changes principally concern foreign exchange effects resulting from the rise of the pound sterling against the euro.

Provision for onerous contracts

Provisions for onerous contracts primarily relate to multi-year agreements for the purchase or sale of energy and services:

- losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price;
- losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied;
- losses on gas-related service agreements are measured by comparing the costs of fulfilling a contract with the resulting economic benefits, based on market and sales assumptions.

Provisions for onerous contracts are mainly attributable to the Group's LNG activities (long-term LNG purchase contracts and a long-term regasification contract with Dunkerque LNG).

The revenues and margin on Framatome's long-term contracts are recorded under the percentage-of-completion method. When the estimated result upon completion is negative, the loss is immediately recorded in profit and loss, after deducting the loss already recognised under the percentage-of-completion method, and a provision is booked.

Provisions related to environmental schemes

Provisions related to environmental schemes include provisions to cover shortfalls in greenhouse gas emission rights, renewable energy certificates and energy savings certificates, based on the assigned obligations (see notes 5.4.3, 10.2, 20.1 and 20.2.1).

Through the **renewable energy certificates scheme**, the EDF group has an obligation to surrender renewable energy certificates, particularly in the United Kingdom and Belgium.

At 31 December 2021, a provision of €1,156 million was booked in connection with the obligation to surrender renewable energy certificates at that date, essentially concerning EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations is covered by purchases of certificates included in intangible assets (see note 10.2).

One of the main features of the fourth period (2021-2030) of the European Union **greenhouse gas emission quota system** (SEQE-EU or EU-ETS) is to achieve the

emission reduction targets set in the 2030 Climate and Energy framework, and the EU's contribution to the Paris Climate Agreement adopted in 2015. One key step was accelerating annual quota reductions to 43 million tonnes per year.

In the EDF group, the entities concerned by this European system are EDF, Edison, Dalkia, PEI and Luminus. Free emissions quota allocations for the Group stopped in 2020.

The volume of emissions at 31 December 2021 stood at 17 million tonnes (19 million tonnes for 2020, including EDF Energy).

Actual greenhouse gas emissions amounted to €380 million at 31 December 2021 (€260 million at 31 December 2021, including EDF Energy) and are included in provisions in the balance sheet.

In 2021, the Group surrendered 16 million tonnes in respect of emissions generated in 2020 under the EU ETS (in 2020 it surrendered 21 million tonnes in respect of emissions generated in 2019, including EDF Energy).

Now that Brexit has taken place, the United Kingdom is no longer a member of the European system (EU ETS) and has set up its own system (UK ETS – Emissions Trading Scheme). The UK ETS, which uses a bidding system, covers the same sectors as the EU ETS and operates under generally similar rules, with comparable accounting treatment.

The volume of EDF Energy's emissions at 31 December 2021 stood at 2 million tonnes (3 million tonnes for 2020). Actual greenhouse gas emissions amounted to €36 million at 31 December 2021 (€83 million at 31 December 2021) and are included in provisions in the balance sheet.

In 2021, EDF Energy surrendered 3 million tonnes in respect of emissions generated in 2020 under the UK ETS (in 2020 it surrendered 5 million tonnes in respect of emissions generated in 2019).

Other provisions for contingencies and losses

These provisions cover various contingencies and expenses related to operations (employers' matching contributions to employee profit sharing, restructuring operations, contractual maintenance obligations, etc.). No individual provision is significant.

In extremely rare cases, specific litigation covered by a provision may be unmentioned in the notes to the financial statements if such disclosure could cause serious prejudice to the Group.

17.3 Contingent liabilities

Accounting principles and methods

A contingent liability is:

- a potential obligation arising from past events, which will only be confirmed by the occurrence (or non-occurrence) of one or more uncertain future events that are not completely within the entity's control; or
- a present obligation arising from past events that is not recognised in the financial statements because an outflow of resources representing economic benefits is unlikely to be necessary to extinguish the obligation, or because the amount of the obligation cannot be measured reliably.

The principal contingent liabilities at 31 December 2021 are the following:

17.3.1 Tax inspections

EDF

For the period 2008 to 2019, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. In two rulings made in 2017 and one in 2019, Montreuil Administrative Court recognised the tax-deductibility of these liabilities and validated the position taken by the Company. The Minister appealed against two of these rulings. In January 2020, the Versailles Administrative Court upheld EDF's position for the year 2008, but the Minister appealed. In a decision of 11 December 2020 the Council of State overturned the Versailles court's decision and sent the case back before the same court. On 17 June 2021 the Court found against the Company and cancelled the first-instance judgements that had been in its favour. In execution of this decision, EDF paid €374 million in July 2021, and €85 million for the years 2014 and 2015. The Company has lodged an appeal against this decision before the Council of State.

EDF had recognised a net tax liability of €510 million in its 2020 financial statements in connection with this dispute. In view of the above payments, this liability was reduced to €41 million at 31 December 2021.

For the years 2012 to 2019, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *cotisation sur la valeur ajoutée des entreprises* (tax on corporate value added) and questioned the deductibility of long-term provisions.

EDF International

Following the tax inspections of EDF International for the years 2009 to 2014, the French tax authorities questioned the valuation of the bond convertible into shares issued to refinance the acquisition of British Energy. The total amount concerned was approximately €310 million. EDF International contested this reassessment.

In judgements of 2 July 2019 for the period 2009-2013 and 30 January 2020 for the year 2014, Montreuil Administrative Court confirmed the tax reassessments. EDF International therefore paid the tax in execution of these decisions, but also appealed against them. In a ruling of 25 January 2022, Versailles administrative court found in favour of EDF International and cancelled the first-instance judgments, thus nullifying the notified reassessments. This ruling has no consequences for the 2021 financial statements, as the total amounts already paid will be refunded to the Company in 2022.

17.3.2 Labour litigation

EDF and its subsidiaries are party to a number of labour lawsuits. The Group considers that none of these lawsuits, individually, is likely to have a significant impact on its financial results or financial position. However, because they relate to situations that could concern a large number of EDF's employees in France, any increase in such litigations could have a potentially negative impact on the Group's financial position.

17.3.3 Litigation with photovoltaic producers

Announcements in France in 2010 of a cut in purchase tariffs for photovoltaic electricity (the PV purchase tariff) triggered an upsurge in connection applications submitted to distribution network operators. By a decree of 9 December 2010 (the "moratorium decree") the French Government suspended the conclusion of new contracts with purchase obligations for a three-month period, and stated that any applications not approved by 2 December 2010 would have to be resubmitted at the end of this three-month period, based on a new tariff. The decision setting that tariff was issued on 4 March 2011, and significantly reduced the PV purchase tariffs. A tender system was developed in parallel.

A ruling given by the French Council of State on 16 November 2011 rejecting appeals against the moratorium decree generated a large volume of legal proceedings against Enedis and EDF in late 2011 which continued through 2012, 2013, 2014 and 2015. Since March 2016, new actions for compensation relating to the photovoltaic moratorium have been definitively barred.

In response to an application for a preliminary ruling, on 15 March 2017 the Court of Justice of the European Union (CJEU) confirmed that the decisions of 10 July 2006 and 12 January 2010 setting the PV purchase tariffs constituted State aid that had been implemented without prior notification to the European Commission, and was therefore illegal. The CJEU concluded that it was now up to the national courts to take the appropriate action.

On 18 September 2019, the Court of Cassation issued several decisions rejecting claims concerning both Enedis and EDF, judging the aid illegal because it had not been notified; consequently, the prejudice of producers who could not benefit from that aid is deemed not legally reparable. Since then, further Court of Cassation decisions have essentially confirmed its ruling of 18 September 2019 and rejected producers' appeals founded on state aid arguments.

In parallel to the compensation claims before civil courts, EDF and Enedis sought to apply their Civil Liability insurance policy, but the insurers refused their claim. The French Court of Cassation considered in a ruling of 9 June 2015 (for the Green Yellow case) that the insurance payment was due and that the distribution network operator was at fault. Following that ruling, Enedis and EDF brought action against their insurers in April 2017, applying to the courts for formal recognition of two partial serial claims. If the courts were to recognise the existence of two partial serial claims, a single excess and a single limit would apply for all claims with the same technical cause. In view of the favourable developments in cases before the Court of Cassation, EDF and Enedis decided to apply for this case to be removed from the court list on 17 February 2021, to suspend the procedure and draw up the final list of cases still outstanding.

17.3.4 ARENH dispute - Force majeure

In the crisis caused by the Covid-19 pandemic, some suppliers applied to the President of the Paris Commercial Court in 2020 for an emergency order suspending ARENH deliveries either totally, or partially, equivalent to the decline in electricity consumption by their customer portfolio during the crisis, citing the *force majeure* clause contained in the master ARENH agreement signed with EDF.

On 20, 26 and 27 May 2020, after summary proceedings the Paris Commercial Court issued provisional rulings on the applications for suspension of ARENH contracts made by four alternative suppliers (Total Energies, Gazel, Alpiq and Vattenfall). The urgent application judge ruled that *force majeure* was established, and ordered the suspension of deliveries for three of the applicants (Total Energies, Gazel, and Alpiq). EDF appealed against this ruling. On 28 July 2020, the Paris Court of Appeal upheld these Commercial Court decisions. On 24 September 2020 EDF filed an appeal before the Court of Cassation. Total Energies is the only remaining party in the ongoing proceedings.

Meanwhile, as a precautionary measure to protect its rights, on 2 June 2020 EDF notified the energy suppliers Alpiq, Gazel and Total Energies of the termination of their ARENH contracts. By an order of 1 July 2020, the President of the Paris Commercial Court declared this termination null and void. EDF appealed against that decision. On 19 November 2020, the Paris Court of Appeal overturned the Commercial Court's order and stated that there were no grounds for summary proceedings, thus restoring the effects of the termination.

Further summary proceedings were initiated in late September 2020 by Ohm Energie, seeking a suspension of payments due for ARENH volumes, claiming that deliveries had been continued illegally by EDF since it had requested suspension of ARENH deliveries from April to June 2020 due to *force majeure*. On 23 October 2020 the Paris Commercial Court rejected all of Ohm Energie's claims.

In parallel, seven cases concerning the substance of the matter have been brought by suppliers, claiming compensation from EDF for the prejudice caused by its allegedly unlawful refusal to apply the *force majeure* clause. The suppliers concerned are Hydroption, Vattenfall, Priméo Energie Grands Comptes and Priméo Energie Solutions, Arcelor Mittal Energy, Plüm Energy et Entreprises et Collectivités, TotalEnergies and Ekwater.

On 13 April 2021, the Paris Commercial Court issued a first judgement on the merits in the Hydroption case, ordering EDF to pay the claimant €5.88 million in damages. The court considered that the conditions for *force majeure* were fulfilled and concluded that in continuing its ARENH deliveries against Hydroption's wishes EDF had committed a breach of contract for which it could be held liable. On 15 October 2021, the Paris Court of Appeal overturned the Commercial Court's judgement insofar as it considered EDF liable and ordered it to pay damages to Hydroption, considering that the exemption clause of *force majeure* was not established, and that EDF was not obliged to satisfy a request for suspension of the contract. On 2 December 2021, the Toulon Commercial Court placed Hydroption SAS in liquidation. The liquidator has not taken an appeal to the Court of Cassation.

The Paris Commercial Court issued two more judgements on the merits on 30 November 2021, in the Total Energies and Ekwater cases, ordering EDF to pay these companies damages totalling several dozen million euros.

The other cases are still ongoing.

17.3.5 Edison

Sale of Ausimont (site de Bussi)

Several legal actions before the civil, administrative and criminal courts were begun following the sale by Edison of the Ausimont SpA industrial complex to Solvay Solexis SpA in 2002. The following proceedings are still ongoing:

- Two administrative cases:
 - ▷ On 28 February 2018, the Province of Pescara notified Solvay Specialty Polymers Italy SpA (formerly Solvay Solexis SpA) and Edison SpA of the launch of an administrative procedure to determine who was responsible for the pollution of the land outside the industrial complex belonging to Ausimont SpA which had been sold. The Province also ordered Edison to remove waste that was on the land concerned. Edison first appealed against this order before Pescara regional administrative court, and then before the Italian Council of State. In April 2020 the Council of State rejected the claim and Edison, considering the ruling unfair and unlawful, filed applications for its annulment before the Italian Court of Cassation, the Italian Council of State and the European Court of Human Rights (ECHR). The application before the Council of State has been rejected, while the case before the ECHR is still in process.

Edison has nonetheless begun work to make the site safe in agreement with the competent Public Administrations. In particular, Edison has completed the prevention measures (covering) of the polluted areas, reactivated the pump and stock system for the shallow waters and conducted further deep inspections on the soils. Furthermore, the Company has recently submitted a plan to the Ministry for the Environment for the first phase of environmental remediation relating to the disposal and management of waste.

On 11 June 2021 the Council of State published a ruling rejecting the appeal by the Ministry for the Environment against the decision of the Abruzzo regional administrative court concerning annulment of the award of the integrated contract for remediation work in these areas to the Belgian company Dec Deme.

Edison, which had already started the aforementioned work to make these areas safe and clean following the decision of the Council of State of

April 2020, is currently discussing the cleanup and waste removal operations under its responsibility with the relevant bodies,

- ▷ in an announcement of 18 December 2019, the Province of Pescara ordered Edison SpA to clean up the land located inside the industrial complex. Edison challenged this order before the Pescara regional administrative court and the proceedings are ongoing. While awaiting the court's decision, Edison has signed a transitional agreement with the current owners to define the practicalities for the transfer and management of existing power plants and the environmental remediation activities;
- one arbitration case: in 2012, arbitration proceedings were launched by Solvay SA and Solvay Specialty Polymers Italy SpA (the purchaser of Ausimont) for violation by Edison of the representations and warranties in environmental matters concerning the Bussi and Spinetta Marengo sites contained in the sale agreement.

At the end of June 2021, the Arbitral Tribunal partial award, largely granting the claims asserted by Solvay Specialty Polymers Italy in relation to the environmental warranties made by Montedison under the sale contract for Ausimont signed in 2001, ordered Edison to pay compensation of €91 million for the period from May 2002 (closing date) to December 2016.

Edison's appeal to the Swiss federal court of Lausanne was rejected in January 2022. Sentence enforcement proceedings are now in progress before the Milan Court of Appeal.

The Arbitral Tribunal postponed the quantification of the damages suffered by Solvay Specialty Polymers Italy in the period after December 2016 and the legal fees incurred by the parties to a further phase of the arbitration, unless the parties reach an agreement in this respect. The award carries a dissenting opinion by one of the members of the Arbitral Tribunal.

- One civil case: on 8 April 2019, the Italian Ministry for the Environment brought a civil action against Edison, claiming damages for environmental disaster. These proceedings are ongoing and are currently in the provisional investigation phase.

Mantua - criminal and environmental proceedings

Criminal proceedings

The Public Prosecutor's Office of Mantua has decided to initiate criminal proceedings against some executive directors working or having worked for Edison since 2015 and some of Edison's representatives, due to alleged environmental offences, also on the basis of Legislative Decree 231 of 2001, which allegedly occurred in certain areas of the Mantua petrochemical plant. Such orders of the Province of Mantua were confirmed by the Council of State's ruling of April 2020 as described below. These proceedings are ongoing.

The Mantua petrochemical plant – which Edison (as the successor of Montedison) has not owned or managed since 1990 – is subject to a large-scale and complex program of environmental clean-up and restoration activities which also regarded all of the areas targeted by the procedure initiated by the Public Prosecutor. The ENI group has initiated these activities. After the transfer of the clean-up projects to Edison in June of last year, following the previously mentioned ruling of the Council of State, Edison is carrying out large part of the activities.

Environmental procedure

Over the past few years, the Italian province of Mantua notified Edison of eight orders to rehabilitate the land and the whole Mantua petrochemical site sold by Montedison to the ENI group in 1990, despite two settlement agreements concerning these environmental issues signed by ENI and the Italian Ministry for the Environment.

Edison appealed against all these rulings before the Brescia Division of the Lombardy regional administrative court, but lost its appeal in August 2018. Edison then took the matter to the Italian Council of State, which rejected Edison's appeal in a ruling of 1 April 2020 confirming the first-instance decisions. Edison pursued its appeal before the ECHR, and the proceedings are ongoing.

However, as mentioned above, Edison has already begun cleanup work on the site, taking over from the previous operators and conducting a series of tenders.

17.3.6 Investigations by France's Competition Authority ("ADLC")

France's Competition Authority (the ADLC) is currently investigating the EDF group in relation to four separate matters.

The first, relating to the commercial practices of EDF and some of its subsidiaries in the energy services markets, follows a complaint filed on 17 October 2016 by Xélan. Following this complaint, the ADLC conducted search and seizure operations at the premises of EDF and several of its subsidiaries on 22 and 23 November 2016. This investigation is still ongoing.

The second investigation follows a complaint filed by Engie on 19 June 2017 relating to EDF's commercial practices regarding retail electricity and gas sales, and specifically the circumstances in which EDF gave electricity suppliers, upon request, access to its file of customers paying the regulated "Green" and "Yellow" tariffs from the end of 2015, when these tariffs were about to be discontinued. Documents collected during search and seizure operations in November 2016 were used in the Engie proceedings. On 27 May 2021 EDF, Dalkia, Dalkia Smart Building, Citelum and Cham were notified of the ADLC's objections concerning the markets for retail electricity and gas supply, multi-technique management/maintenance and energy optimisation services, and energy control measures leading to issuance of energy savings certificates. The ADLC's decision is awaited, after a meeting was held before the ADLC's panel in November 2021.

The third investigation follows an ex-officio referral to the ADLC on 4 November 2019 and concerns the formation of a partnership for heat network operations. On

3 May 2021 EDF, Dalkia, Électricité de Strasbourg, ES Services Énergétiques and EDEV were notified of the ADLC's objections and responded on 16 July 2021. This procedure, which allows both sides to present their arguments, will continue in 2022.

The fourth investigation, relating to EDF's pricing policy for its electricity supply offers to non-residential customers with a connection capacity of less than 36kVa, follows a complaint by Plüm Energie dated 14 September 2020. This complaint was accompanied by an application for precautionary interim measures, intended to make the ADLC take urgent action. On 18 February 2021, the ADLC rejected Plüm's application for interim measures. The investigation on the merits of the complaint is ongoing.

Finally, in a decision of 18 January 2022 the ADLC dismissed a complaint and application for interim measures made against EDF by ANODE (the national association of retail energy operators). This complaint concerned EDF's refusal to provide access to the database of non-residential customers concerned by discontinuation of the "blue" regulated sales tariffs, who were switched automatically to a follow-on market-price contract at 31 December 2020. However the ADLC considered that ANODE's arguments were not backed up by sufficient evidence proving the existence of the alleged practices. This decision is open to appeal for a one-month period from its notification to the parties.

Should the ADLC conclude in any of these investigations, after examining the merits of the matter, that anti-competitive practices have been involved, the possible penalties in application of Article L. 464-2 of the French Commercial Code include a fine of up to 10% of the Group's worldwide sales excluding taxes.

A provision was recognised at 31 December 2021.

Note 18 Financial assets and liabilities

Accounting principles and methods

Financial assets comprise equity instruments (particularly non-consolidated investments), debt securities, loans and receivables at amortised cost, derivative assets (see note 18.7) and cash and cash equivalents (see note 18.2).

The classification and measurement of financial instruments depend on the business model and the instruments' contractual characteristics. They are carried at amortised cost, fair value through other comprehensive income (OCI), or fair value through profit and loss.

Financial liabilities comprise loans and other financial liabilities, bank credit and derivative liabilities (see note 18.7).

Financial assets and liabilities are recorded in the balance sheet as current if they mature within one year and non-current if they mature after one year, apart from derivatives held for trading, which are all classified as current.

Derecognition of financial assets and liabilities

The Group derecognises a financial asset when:

- the contractual rights to the cash flows generated by the asset expire; or
- the Group transfers the rights to receive contractual cash flows related to the financial asset through the transfer of substantially all of the risks and rewards associated with ownership of the asset.

Any interest created or retained by the Group in transferred financial assets is recorded as a separate asset or liability.

The Group derecognises a financial liability when its contractual obligations are extinguished, cancelled or expire. When a debt is renegotiated with a lender the Group derecognises the debt and recognises a new liability when the new terms are substantially different; otherwise, the book value is recalculated. In either case, the impacts of the debt renegotiation are recorded in profit and loss.

18.1 Financial assets

Accounting principles and methods

Financial assets comprise debt and equity securities. The accounting treatment applied depends on their contractual characteristics and business model

Financial assets carried at fair value through OCI with or without recycling

Financial assets carried at fair value through OCI comprise:

- non-consolidated investments for which the Group has irrevocably opted to recognise subsequent fair value changes in OCI, with no recycling to profit and loss in the event of sale. Only dividends received from these investments are recognised in the income statement, under "Other financial income";

- debt securities (such as bonds) invested under a mixed "collect and sell" business model for which contractual cash flows consist entirely of principal and interest payments reflecting the time value of money and the credit risk associated with the instrument (the IFRS 9 "SPPI" test – Solely Payment of Principal and Interest). Changes in fair value are recorded directly in OCI with recycling and transferred to profit and loss when the securities are sold. For these debt securities, interest income is calculated at the effective interest rate and credited to the income statement under the heading "Other financial income".

Upon **initial recognition**, these financial assets are recorded at fair value plus transaction costs attributable to their acquisition.

At each reporting date, they are adjusted to fair value based on quoted prices where possible, or using the discounted future cash flow method or by reference to external sources otherwise. Changes in the fair value of these instruments are recorded directly in OCI with recycling (for debt securities) or OCI with no recycling (for equity instruments) in the income statement.

Financial assets carried at fair value through profit and loss

Financial assets carried at fair value through profit and loss comprise:

- assets acquired from inception with the intention of resale in the short term;
- derivatives not classified as hedges (derivatives held for trading) (see note 18.7);
- equity instruments (non-consolidated investments) which the Group has not irrevocably opted to classify as at fair value through OCI with no recycling;
- debt securities that do not meet the requirements of the SPPI test, regardless of their business model. This chiefly concerns shares in investment funds.

These assets are recorded **at the transaction date** at fair value, which is generally equal to the amount of cash paid out. Transaction costs directly attributable to the acquisition are recorded in the income statement.

At each reporting date, they are adjusted to fair value based on quoted prices where possible, or using recognised valuation techniques such as the discounted cash flow method or reference to external sources otherwise. Changes in the fair value of these instruments are recorded in the income statement under the heading "Other financial income and expenses".

Financial assets carried at amortised cost

Loans and financial receivables are carried at amortised cost if the business model involves holding the instrument in order to collect contractual cash flows which consist entirely of principal and interest.

The interest received is calculated under the effective interest rate method and recorded in "Other financial income" in the income statement.

Loans and financial receivables that are not eligible for classification at amortised cost are carried at fair value through profit and loss, and recorded in "Other financial income and expenses" in the income statement.

Impairment model

The impairment model is based on expected credit loss (ECL). The Group applies a rating-based approach for counterparties with low credit risk. In application of the risk management policy, the Group's bond portfolio consists almost entirely of instruments issued by low-risk counterparties rated "Investment Grade".

In this situation, the ECL is estimated over a 12-month horizon following the year-end.

The threshold indicating a significant increase in credit risk is reached when the counterparty ceases to be rated "Investment Grade". The significant increase in the default risk may lead to reassessment of the ECL over the instrument's residual life.

For loans and receivables, the Group has chosen an approach based on the probability of default by the counterparty and assessment of changes in the credit risk.

18.1.1 Breakdown between current and non-current financial assets

Current and non-current financial assets break down as follows:

(in millions of euros)	31/12/2021			31/12/2020		
	Current	Non-current	Total	Current	Non-current	Total
Instruments at fair value through OCI with recycling	10,519	5,810	16,329	13,044	5,696	18,740
Instruments at fair value through OCI with no recycling	37	253	290	34	228	262
Instruments at fair value through profit and loss	2,855	25,369	28,224	2,556	22,807	25,363
Debt and equity securities	13,411	31,432	44,843	15,634	28,731	44,365
Trading derivatives – Positive fair value	20,061	-	20,061	5,038	-	5,038
Hedging derivatives – Positive fair value	4,522	5,388	9,910	1,625	3,814	5,439
Loans and financial receivables*	1,943	18,789	20,732	1,235	15,070	16,305
CURRENT AND NON-CURRENT FINANCIAL ASSETS	39,937	55,609	95,546	23,532	47,615	71,147

* Including impairment of €(299) million at 31 December 2021 (€(432) million at 31 December 2020).

The increase in the positive fair value of trading derivatives (+€15.0 billion) is explained by an increase in the value of derivatives used in the trading activity, principally associated with commodity market price movements observed in 2021, and to a lesser extent the higher volumes contracted.

18.1.2 Debt and equity securities

Details of debt and equity securities

Financial assets are monitored and managed by the Group with two main objectives:

- **dedicated assets set aside in France for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste, as required by Article L. 594 of France's Environment Code.** These assets consist of diversified investments in bonds, monetary and equity investment funds, and equity investments held by EDF

Invest. The general management policy for dedicated assets and a breakdown of the portfolio is presented in note 15.1.2;

- **assets managed according to a liquidity-oriented policy** ("liquid assets"). These are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash. EDF's monetary investment funds included in liquid assets amount to €2,597 million at 31 December 2021 (€2,441 million at 31 December 2020).

Details of debt and equity securities are shown in the table below:

	31/12/2021				31/12/2020
	At fair value through OCI with recycling	At fair value through OCI with no recycling	At fair value through profit and loss	Total	Total
<i>(in millions of euros)</i>					
Debt and equity securities					
EDF dedicated assets	6,299	-	24,714	31,013	28,398
Liquid assets	9,927	-	2,810	12,737	15,028
Other assets*	103	290	700	1,093	939
TOTAL	16,329	290	28,224	44,843	44,365

* Investments in non-consolidated companies.

Changes in debt and equity securities

<i>(in millions of euros)</i>	31/12/2020	Net increases	Changes in fair value	Changes in scope	Translation adjustments	Other	31/12/2021
Instruments at fair value through OCI with recycling	18,740	(2,357)	(276)	7	178	37	16,329
Instruments at fair value through OCI with no recycling	262	6	16	1	1	4	290
Instruments at fair value through profit and loss	25,363	(338)	3,200	55	15	(71)	28,224
TOTAL DEBT AND EQUITY SECURITIES	44,365	(2,689)	2,940	63	194	(30)	44,843

Changes in fair value recorded in equity

Changes in the fair value of debt and equity securities were recorded in equity (EDF share) over the period as follows:

	2021			2020		
	Gross changes in fair value recorded in OCI with recycling ⁽¹⁾	Gross changes in fair value recorded in OCI with no recycling ⁽¹⁾	Gross changes in fair value recycled to profit and loss ⁽²⁾	Gross changes in fair value recorded in OCI with recycling ⁽¹⁾	Gross changes in fair value recorded in OCI with no recycling ⁽¹⁾	Gross changes in fair value recycled to profit and loss ⁽²⁾
<i>(in millions of euros)</i>						
EDF dedicated assets	(202)	-	42	224	-	162
Liquid assets	(81)	-	21	(29)	-	13
Other assets	-	15	-	-	(34)	-
DEBT AND EQUITY SECURITIES ⁽³⁾	(283)	15	63	195	(34)	175

(1) +/-: increase/(decrease) in equity (EDF share).

(2) +/-: increase/(decrease) in income (EDF share).

(3) Excluding associates and joint ventures.

In 2021, gross changes in fair value recorded in OCI with recycling principally concern EDF (€(346) million, including €(244) million for dedicated assets). In 2020, gross changes in fair value recorded in OCI with recycling principally concern EDF (€20 million, including €62 million for dedicated assets).

No significant impairment was recorded in 2021.

18.1.3 Loans and financial receivables

Loans and financial receivables consist of the following:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Amounts receivable from the NLF	15,986	13,034
Loans and financial receivables – other	4,746	3,271
LOANS AND FINANCIAL RECEIVABLES	20,732	16,305

At 31 December 2021 loans and financial receivables mainly include:

- amounts representing reimbursements receivable from the Nuclear Liabilities Fund (NLF) and the British government for coverage of long-term nuclear obligations, totalling €15,986 million at 31 December 2021 (€13,034 million at 31 December 2020), discounted at the same rate as the provisions they finance (see note 15.2);
- other loans and financial receivables notably include:
 - the overfunding of EDF Energy's EDFG pension scheme by €2,733 million at 31 December 2021, compared to €1,725 million at 31 December 2020 (see note 16.1.1),
 - an amount of €282 million representing the advance payments made by Luminus to Synatom to cover long-term nuclear obligations (€263 million at 31 December 2020 and see note 15.3). In Luminus' financial statements these amounts are discounted at the same rate as the provisions they fund. This receivable is equal to the fair value of the amounts held by Synatom on behalf of Luminus as fund assets,
 - loans made by EDF Renewables in the course of its project development activity, mainly in connection with wind farms in France, the United Kingdom and North America, amounting to €525 million at 31 December 2021 compared to €382 million at 31 December 2020.

Changes in loans and financial receivables

<i>(in millions of euros)</i>	31/12/2020	Net increases	Discount effect	Changes in scope	Translation adjustments	Other	31/12/2021
Loans and financial receivables	16,305	137	943	(19)	1,140	2,226	20,732

Other changes in loans and financial receivables principally correspond to the changes in the receivable representing amounts reimbursable by the Nuclear Liabilities Fund (NLF) and the British government, and the surplus funding of EDF Energy's EDFG pension scheme.

18.2 Cash and cash equivalents

Accounting principles and methods

Cash and cash equivalents comprise immediately available liquidities and very short-term investments that are readily convertible (e.g. in monetary funds) into a known amount of cash, usually maturing within three months or less of the acquisition date, and with negligible risk of fluctuation in value.

These items are held to cover short-term obligations rather than for short-term investments or other purposes. When they mature in more than 3 months, they are included in Liquid assets in Debt and equity securities (see note 18.1.2).

"Cash equivalents" are recorded at fair value, with changes in fair value included in the heading "Other financial income and expenses".

Cash and cash equivalents include the following amounts recorded in the balance sheet:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Cash	9,178	5,832
Cash equivalents	741	438
CASH AND CASH EQUIVALENTS	9,919	6,270

Cash restrictions

Cash and cash equivalents include €198 million of cash subject to restrictions at 31 December 2021 (€242 million at 31 December 2020) (see note 1.3.5).

18.3 Financial liabilities

Accounting principles and methods

Loans and other financial liabilities are carried at amortised cost, adjusted for changes in the value of the risks hedged when they are covered by a fair

value hedge (see note 18.7). Interest expenses are calculated at the effective interest rate and recorded in the income statement in "Cost of gross financial indebtedness" over the duration of the loan or financial liability.

18.3.1 Breakdown between current and non-current financial liabilities

Current and non-current financial liabilities break down as follows:

(in millions of euros)	31/12/2021			31/12/2020		
	Non-current	Current	Total	Non-current	Current	Total
Loans and other financial liabilities	54,334	15,072	69,406	54,066	11,525	65,591
Trading derivatives – negative fair value*	-	22,027	22,027	-	5,125	5,125
Hedging derivatives – negative fair value*	2,209	7,915	10,124	1,833	959	2,792
FINANCIAL LIABILITIES	56,543	45,014	101,557	55,899	17,609	73,508

* See note 18.7.

The increase in the negative fair value of trading derivatives (+€16.9 billion) is explained by the increase in the value of derivatives used in the trading activity, principally associated with the changes in commodity market prices observed in 2021, and to a lesser extent the increase in volumes contracted.

18.3.2 Loans and other financial liabilities

18.3.2.1 Changes in loans and other financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued Interest	Total
Balances at 31/12/2020	50,196	3,297	6,571	4,307	1,220	65,591
Increases	1,867	938	4,135	764	119	7,823
Decreases	(3,426)	(769)	(422)	(729)	(188)	(5,534)
Translation adjustments	531	77	201	50	1	860
Changes in scope of consolidation	-	148	(26)	(2)	-	120
Changes in fair value	74	1	(19)	-	-	56
Other changes*	-	(2)	552	(53)	(7)	490
BALANCES AT 31/12/2021	49,242	3,690	10,992	4,337	1,145	69,406

* Other movements include the reclassification at 1 January 2021 of short positions relating to margin calls on derivatives, which were previously netted and included in other financial liabilities, amounting to €281 million, and the commitment to redeem perpetual subordinate bonds amounting to €267 million (see note 14.4.1).

The principal **bond**-related operations of 2021 were:

- a senior bond issue on November 2021 with gross value of €1.8 billion (see note 18.3.2.2);
- bond redemptions of €3.4 billion during the year, comprising €2.0 billion in January 2021 and €1.4 billion in April 2021.

At 31 December 2021, EDF's **other financial liabilities** include negotiable debt instruments amounting to €5,117 million, and an amount of €1,695 million recognised in respect of the cash received for debt securities transferred to banks under repurchase agreements. These operations do not affect the net indebtedness.

A breakdown of the issuance and repayments of borrowings as presented in the cash flow statement is presented below:

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Termination of hedging derivatives	31/12/2021
Issuance of borrowings	1,867	938	4,135	-	3	6,943
Repayments of borrowings	(3,426)	(769)	(422)	(729)	186	(5,161)

18.3.2.2 Principal borrowings of the Group

The Group's principal borrowings (excluding Green Bonds and *OCEANEs*) at 31 December 2021 are as follows:

Type of borrowing (in millions of currencies)	Entity	Issue*	Maturity	Issue amount	Currency	Rate
Euro MTN	EDF	01/2012	01/2022	2,000	EUR	3.88%
Euro MTN	EDF	09/2012	03/2023	2,000	EUR	2.75%
Euro MTN	EDF	09/2009	09/2024	2,500	EUR	4.63%
Euro MTN	EDF	11/2010	11/2025	750	EUR	4.00%
Bond	EDF	01/2017	01/2027	107,900	JPY	1.09%
Euro MTN	EDF	03/2012	03/2027	1,000	EUR	4.13%
Bond	EDF	09/2018	09/2028	1,800	USD	4.50%
Euro MTN	EDF	04/2010	04/2030	1,500	EUR	4.63%
Euro MTN	EDF	10/2018	10/2030	1,000	EUR	2.00%
Euro MTN	EDF	07/2001	07/2031	650	GBP	5.88%
Euro MTN	EDF	02/2003	02/2033	850	EUR	5.63%
Euro MTN	EDF	06/2009	06/2034	1,500	GBP	6.13%
Euro MTN	EDF	10/2016	10/2036	750	EUR	1.88%
Bond	EDF	09/2018	09/2038	650	USD	4.88%
Bond	EDF	01/2009	01/2039	1,750	USD	6.95%
Bond	EDF	01/2010	01/2040	850	USD	5.60%
Euro MTN	EDF	11/2010	11/2040	750	EUR	4.50%
Euro MTN	EDF	10/2011	10/2041	1,250	GBP	5.50%
Bond	EDF	01/2014	01/2044	1,000	USD	4.88%
Bond	EDF	10/2015	10/2045	1,500	USD	4.75%
Bond	EDF	10/2015	10/2045	1,150	USD	4.95%
Bond	EDF	09/2018	09/2048	1,300	USD	5.00%
Euro MTN	EDF	12/2019	12/2049	1,250	EUR	2.00%
Euro MTN	EDF	09/2010	09/2050	1,000	GBP	5.13%
Euro MTN	EDF	10/2016	10/2056	2,164	USD	4.99%
Euro MTN	EDF	11/2019	12/2069	2,000	USD	4.50%
Bond	EDF	01/2014	01/2114	700	USD	6.00%
Bond	EDF	01/2014	01/2114	1,350	GBP	6.00%

* Date funds were received.

At 31 December 2021, the Group's principal Green Bonds (see note 20.3.1) are as follows:

Type of borrowing (in millions of currencies)	Entity	Issue	Maturity	Issue amount	Currency	Rate
Bond (Green Bond)	EDF	10/2015	10/2025	1,250	USD	3.63%
Euro MTN (Green Bond)	EDF	10/2016	10/2026	1,750	EUR	1.00%
Euro MTN (Green Bond)	EDF	11/2021	11/2033	1,850	EUR	1.00%

On 23 November 2021, the Group raised €1.75 billion from a senior bond issue that will mature on 29 November 2033 and has a fixed coupon of 1%.

On 8 September 2020, EDF made an offering of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). The key features of this issue are as follows:

Type of borrowing (in millions of currencies)	Entity	Issue	Maturity	Issue amount	Currency	Rate
<i>OCEANEs Vertes</i> Green Bonds	EDF	09/2020	09/2024	2,400	EUR	0%

Holders of these bonds have the right to convert them into new EDF shares and/or exchange them for existing EDF shares.

The conversion and/or exchange ratio was set at one share per bond, subject to the standard adjustments including anti-dilution and dividend protections as described in the terms of the issue. For the 2020 dividend distribution to EDF shareholders, the conversion/exchange rate was raised to 1.018 EDF share per bond from 7 June

2021, and when the interim dividend for 2021 was paid, the conversion/exchange ratio was raised to 1.042 EDF share per bond from 2 December 2021.

The bonds may be redeemed prior to maturity at the option of the Company, subject to certain conditions.

Unless previously converted, exchanged, redeemed or repurchased and cancelled, the bonds will be redeemed at nominal value when they reach maturity.

18.3.3 Loans and financial liabilities by maturity, currency and interest rate

18.3.3.1 Maturity of loans and financial liabilities

<i>(in millions of euros)</i>	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued interest	Total
Less than one year	2,845	512	10,270	654	790	15,071
From one to five years	11,039	1,877	335	2,071	122	15,444
More than five years	35,358	1,301	387	1,612	233	38,891
LOANS AND OTHER FINANCIAL LIABILITIES AT 31/12/2021	49,242	3,690	10,992	4,337	1,145	69,406

The non-discounted lease liability matures as follows:

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				
	Total	< 1 year	1-5 years	> 5 years	Total
NON-DISCOUNTED CONTRACTUAL CASH FLOWS	4,899	722	2,217	1,960	4,883

18.3.3.2 Breakdown of loans and other financial liabilities by currency

The breakdown of loans and other financial liabilities by currency includes the effect of derivatives classified as hedges (of debts in foreign currencies and net investments in foreign subsidiaries) under IFRS 9.

At 31 December 2021

<i>(in millions of euros)</i>	31/12/2021				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
	amount	% of debt	amount	amount	% of debt
Euro (EUR)	38,003	55%	11,119	49,122	71%
American dollar (USD)	18,128	26%	(12,910)	5,218	7%
Pound sterling (GBP)	10,018	14%	2,410	12,428	18%
Other	3,257	5%	(619)	2,638	4%
LOANS AND OTHER FINANCIAL LIABILITIES	69,406	100%	-	69,406	100%

At 31 December 2020

<i>(in millions of euros)</i>	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
	amount	% of debt	amount	amount	% of debt
Euro (EUR)	36,241	55%	11,798	48,039	73%
American dollar (USD)	16,735	26%	(10,958)	5,777	9%
Pound sterling (GBP)	9,996	15%	537	10,533	16%
Other	2,619	4%	(1,377)	1,242	2%
LOANS AND OTHER FINANCIAL LIABILITIES	65,591	100%	-	65,591	100%

18.3.3.3 Breakdown of loans and other financial liabilities by type of interest rate

The breakdown of loans and other financial liabilities by type of interest rate includes the effect of derivatives classified as hedges under IFRS 9.

Floating-rate loans indexed on the LIBOR USD that have not yet been "switched" to the interbank interest rate benchmark reform (see note 1.2.1) amount to a total €224 million before derivatives, and €17 million including the effect of derivatives.

At 31 December 2021

(in millions of euros)	31/12/2021				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
	amount	% of debt	amount	amount	% of debt
Fixed rates	64,335	93%	(15,434)	48,901	70%
Floating rates	5,071	7%	15,434	20,505	30%
LOANS AND OTHER FINANCIAL LIABILITIES	69,406	100%	-	69,406	100%

At 31 December 2020

(in millions of euros)	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
	amount	% of debt	amount	amount	% of debt
Fixed rates	60,667	92%	(15,217)	45,450	69%
Floating rates	4,924	8%	15,217	20,141	31%
LOANS AND OTHER FINANCIAL LIABILITIES	65,591	100%	-	65,591	100%

A large portion of the EDF group's fixed-rate loans is swapped to variable rates.

18.3.4 Early repayment clauses

Project financing loans to EDF Renewables from non-Group parties generally include early repayment clauses, mainly applicable when the project company concerned fails to maintain a minimum Debt Service Coverage Ratio (DSCR). In general, early repayment clauses are activated when this ratio falls below 1.

In other Group entities, certain clauses contained in contracts for financing or other commitments may make reference to Group ratings but are not classified as covenants.

Four borrowings with a combined total of €1,150 million contain a rendez-vous clause requiring contact between the borrower and lender if the borrower's rating falls below a specified level, possibly leading to renegotiation of the terms of the loan.

No early repayment took place in 2021 as a result of any Group entity's failure to comply with contractual clauses concerning loans.

These three credit facilities incorporate an adjustment mechanism that links their cost to three of the Group's sustainability KPIs: direct CO₂ emissions, use of online consumption monitoring tools by its French residential customers (as a proxy for EDF's success in getting French residential customers actively engaged with their energy consumption), and electrification of its light vehicle fleet.

On 30 October 2020 EDF and Standard Chartered Bank signed a €200 million renewable credit facility. The cost of this facility will be indexed on three EDF group sustainability KPIs: EDF's direct CO₂ emissions, electrification of its light vehicle fleet, and use of online consumption monitoring tools by its French residential customers (see note 20.3.3).

On 23 December 2021 EDF announced the syndication of a new €1.5 billion revolving credit facility with an initial maturity of three years. The cost of this facility will be indexed on four Group ESG KPIs, with a particular focus on its social responsibility.

This new credit line, in which 9 European and North American relationship banks are participating, reaffirms the central role of sustainable finance tools in EDF's financing strategy.

At 31 December 2021, the Group has unused credit lines with various banks totalling €13,039 million (€11,110 millions at 31 December 2020), including €9,348 million of credit lines indexed on ESG criteria.

18.4 Unused Credit lines

In 2019, EDF signed 3 renewable credit lines, each one for €300 million, respectively with BBVA, the Cr dit Agricole group and Soci t  G n rale CIB.

(in millions of euros)	31/12/2021				31/12/2020
	Maturity				
	Total	< 1 year	1-5 years	> 5 years	Total
CONFIRMED CREDIT LINES	13,039	1,719	10,899	421	11,110

18.5 Fair value of financial instruments

Accounting principles and methods

Financial instruments are stated at fair value, which corresponds to the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction on the principal or most advantageous market at the measurement date. The valuation methods for each level are generally as follows:

- level 1 (unadjusted quoted prices): prices accessible to the entity at the measurement date on active markets, for identical assets or liabilities;
- level 2 (observable data): data concerning the asset or liability, other than the market prices included in initial level 1 input, which are directly observable (such as a price) or indirectly observable (i.e. deduced from observable prices);
- level 3 (non-observable data): data that are not observable on a market, including observable data that have been significantly adjusted.

The distribution of financial assets and liabilities in the balance sheet by level is as follows:

At 31 December 2021

<i>(in millions of euros)</i>	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,889	1,889	3	1,413	473
Debt securities	42,954	42,954	2,607	40,225	122
Hedging derivatives	9,910	9,910	153	9,757	-
Trading derivatives	20,061	20,061	249	19,349	463
Cash equivalents	741	741	34	707	-
FINANCIAL ASSETS CARRIED AT FAIR VALUE	75,555	75,555	3,046	71,451	1,058
Receivables from the NLF	15,986	15,986	-	15,986	-
Other loans and financial receivables	4,746	4,746	-	4,746	-
FINANCIAL ASSETS CARRIED AT AMORTISED COST	20,732	20,732	-	20,732	-
Hedging derivatives	10,124	10,124	4	10,120	-
Trading derivatives	22,027	22,027	322	21,216	489
FINANCIAL LIABILITIES CARRIED AT FAIR VALUE	32,151	32,151	326	31,336	489
Loans and other financial liabilities	69,406	78,114	-	78,114	-
FINANCIAL LIABILITIES CARRIED AT AMORTISED COST	69,406	78,114	-	78,114	-

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

At 31 December 2020

<i>(in millions of euros)</i>	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,563	1,563	24	1,121	418
Debt securities	42,802	42,802	2,423	40,337	42
Hedging derivatives	5,439	5,439	59	5,372	8
Trading derivatives	5,038	5,038	289	4,057	692
Cash equivalents	438	438	343	95	-
FINANCIAL ASSETS CARRIED AT FAIR VALUE	55,280	55,280	3,138	50,982	1,160
Receivables from the NLF	13,034	13,034	-	13,034	-
Other loans and financial receivables	3,271	3,271	-	3,271	-
FINANCIAL ASSETS CARRIED AT AMORTISED COST	16,305	16,305	-	16,305	-
Hedging derivatives	2,792	2,792	1	2,791	-
Trading derivatives	5,125	5,125	290	4,645	190
FINANCIAL LIABILITIES CARRIED AT FAIR VALUE	7,917	7,917	291	7,436	190
Loans and other financial liabilities	65,591	75,680	-	75,680	-
FINANCIAL LIABILITIES CARRIED AT AMORTISED COST	65,591	75,680	-	75,680	-

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

18.6 Market and counterparty risks

As an operator in the energy sector worldwide, the EDF group is exposed to financial market risks, energy market risks and counterparty risks. All these risks could generate volatility in the financial statements.

A more detailed description of these risks and the sensitivity analyses required by IFRS 7 can be found in section 5.1.5 "Management and control of market risks" of Universal Registration Document 2021.

Financial market risks

The main financial market risks to which the Group is exposed are the liquidity risk, the foreign exchange risk, the interest rate risk and the equity risk.

The objective of the Group's liquidity risk management is to seek resources at optimum cost and ensure their constant accessibility.

The foreign exchange risk relates to the diversification of the Group's businesses and geographical locations, and results from exposure to the risk of exchange rate fluctuations. These fluctuations can affect the Group's translation differences, balance sheet items, financial expenses, equity and net income.

The interest rate risk results from exposure to the risk of fluctuations in interest rates that can affect the value of assets invested by the Group, the value of the liabilities covered by provision, or its financial expenses.

The Group is exposed to equity risks, particularly through its dedicated asset portfolio held for secure financing of long-term nuclear commitments, through external pension funds, and to a lesser extent through its cash assets and directly-held investments.

Energy market risks

The EDF group operates on deregulated energy markets, mainly in Europe, through its generation and supply activities. This exposes the Group to price variations on the wholesale markets for energy (electricity, gas, coal, oil products) and the CO₂ emissions quota market, with a potentially significant impact on the financial statements.

Counterparty risks

Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

Regarding the customer risk, which is another component of the counterparty risk, a statement of receivables not yet due and overdue is shown in note 13.3.1.

18.7 Derivatives and hedge accounting

Accounting principles and methods

The Group uses derivatives such as swaps and forward contracts to hedge its interest rate, foreign exchange, energy and commodity risks.

In accordance with IFRS 9, hedge accounting can be applied to derivatives when they meet certain eligibility criteria. Some derivatives classified as "own use" are excluded from application of IFRS 9.

Derivatives not covered by IFRS 9: "own use" contracts

Forward purchase and sale contracts for physical delivery of energy or commodities are considered to fall outside the scope of application of IFRS 9 when they are entered into as part of the Group's normal business activity ("own use"). This is demonstrated to be the case when all the following conditions are fulfilled:

- a physical delivery takes place under all such contracts;
- the volumes purchased or sold under these contracts correspond to the Group's operating requirements;
- the contracts cannot be considered as options as defined by the standard. In the specific case of electricity sale contracts, the contract is equivalent to a firm forward sale or can be considered as a capacity sale.

The Group considers that transactions negotiated with a view to balancing the volumes between electricity purchase and sale commitments are part of its normal business as an integrated electricity operator, and are thus outside the scope of IFRS 9.

Measurement and recognition of derivatives

Derivatives are initially recorded at fair value, based on quoted prices and market data available from external sources. If no quoted prices are available, the Group may refer to recent comparable transactions or, if no such transactions exist, base its valuation on internal models that are recognised by market participants, giving priority to information directly derived from observable data such as over-the-counter listings.

In application of IFRS 13, the fair value of derivatives incorporates the counterparty credit risk for derivative assets and the own credit risk for derivative liabilities.

Derivatives classified as hedges

The EDF group uses derivatives to hedge its foreign exchange and interest rate risks, as well as risks related to certain commodity contracts.

The Group applies the criteria defined by IFRS 9 to identify operations subject to hedge accounting, particularly regarding the existence of formal documentation from their inception and compliance with hedge effectiveness requirements.

The hedging relationship ends when it ceases to satisfy the above criteria. This includes situations in which the hedging instrument expires or is sold, terminated or exercised, or when the risk management objectives initially defined are no longer met.

Only derivatives external to the Group, and internal derivatives that are matched with similar transactions external to the Group, qualify for hedge accounting.

The Group uses the following categories for hedges:

- fair value hedge;
- cash flow hedge;
- net foreign investment hedge.

Hedge categories

Fair value hedge

This is a hedge of exposure to changes in the fair value of an asset or liability recorded in the balance sheet, or a firm commitment to purchase or sell an asset. Changes in the fair value of the hedged item attributable to the hedged component of that item are recorded in profit and loss and offset by corresponding variations in the fair value of the hedging instrument. Only the ineffective portion of the hedge has an impact on profit and loss.

Some loans and financial liabilities, and some commodity contracts, are covered by a fair value hedge. In such cases their balance sheet value is adjusted for changes in fair value attributable to the hedged risks (foreign exchange, interest rate and price risks).

Cash flow hedge

This is a hedge of exposure to variability in cash flows associated with an asset or liability or a highly probable future transaction for which variations in cash flows generated by the hedged item are offset by changes in the value of the hedging instrument.

The effective portion of accumulated changes in the hedging instrument's fair value is recorded in equity, and the ineffective portion (i.e. changes in the fair value of the hedging instrument in excess of changes in the fair value of the hedged item) is recorded in profit and loss.

When the hedged cash flows materialise, the amounts previously recognised in equity are recycled to profit and loss in the same way as for the hedged item, or are treated as an adjustment to the value of the non-financial asset acquired.

Net foreign investment hedge

This is a hedge of exposure to the foreign exchange risk related to a net investment in an entity which does not have the same functional currency as the Group. The effective portion of accumulated changes in the hedging instrument's fair value is recorded in equity until the disposal or liquidation of the net investment, when it is included in the gain or loss on disposal. The ineffective portion (defined in the same way as for cash flow hedges) is recorded directly in profit and loss.

This risk is hedged in the EDF group level either by matching it with debts in the same currency, or by using derivatives.

Trading derivatives

Trading derivatives comprise:

- derivatives subscribed for economic hedging that do not qualify as hedges for accounting purposes; changes in the value of these instruments are reported in profit and loss. When the derivatives are used for economic hedging of negotiable debt instruments and purchased bonds, they are included in "Other financial income and expenses". When the derivatives are used for economic hedging of generation and supply operations, they are included in "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" (see note 6);
- derivatives used in trading activities; changes in the fair value of these instruments are included in sales (see note 5.1).

18.7.1 Breakdown of hedging and trading derivatives

The fair value of hedging and trading derivatives reported in the balance sheet breaks down as follows:

<i>(in millions of euros)</i>	<i>Notes</i>	31/12/2021	31/12/2020
Positive fair value of hedging derivatives	18.1.1	9,910	5,439
Negative fair value of hedging derivatives	18.3.1	(10,124)	(2,792)
FAIR VALUE OF HEDGING DERIVATIVES		(214)	2,647
Positive fair value of trading derivatives	18.1.1	20,061	5,038
Negative fair value of trading derivatives	18.3.1	(22,027)	(5,125)
FAIR VALUE OF TRADING DERIVATIVES		(1,966)	(87)

The fair value of hedging and trading derivatives by type of risk hedged is shown below:

<i>(in millions of euros)</i>	<i>Notes</i>	31/12/2021	31/12/2020
Hedging derivatives – interest rate risk	18.7.2	3,613	3,149
Hedging derivatives – foreign exchange risk	18.7.3	407	(733)
Hedging derivatives – commodity risks	18.7.4	(4,234)	231
FAIR VALUE OF HEDGING DERIVATIVES		(214)	2,647
Trading derivatives – interest rate risk	18.7.2	(27)	(25)
Trading derivatives – foreign exchange risk	18.7.3	(45)	4
Trading derivatives – commodity risk	18.7.4	(1,894)	(66)
FAIR VALUE OF TRADING DERIVATIVES		(1,966)	(87)

The fair value of hedging derivatives by type and purpose of hedge is shown below:

<i>(in millions of euros)</i>	<i>Notes</i>	31/12/2021	31/12/2020
Fair value hedges of loans and liabilities		3,148	3,724
Cash flow hedges of loans and liabilities		614	(1,738)
Sub-total	19.2	3,762	1,986
Fair value hedges of commodity contracts		(492)	6
Cash flow hedges of commodity contracts		(3,564)	170
Sub-total		(4,056)	176
Net foreign investment hedges		94	280
Fair value hedges of dedicated assets		(14)	205
FAIR VALUE OF HEDGING DERIVATIVES		(214)	2,647

18.7.2 Interest rate derivatives

The Group is exposed to the risk of fluctuations in interest rates that can affect the value of its loans and financial liabilities, its assets (liquid assets and dedicated assets), and its future financial expenses.

The Group hedges its exposure to changes in the fair value of fixed-rate debts, many of which are converted to floating rates. The derivatives used for these hedges are

fixed/floating interest rate swaps and cross-currency swaps, with changes in fair value recorded in profit and loss symmetrically to changes in the value of the hedged debts.

The Group also hedges its floating-rate debt against future changes in interest rates by using floating/fixed interest rate swaps for cash flow hedges.

Details of interest rate derivatives used in a hedging relationship or designated as trading derivatives are shown below:

(in millions of euros)	Notional at 31/12/2021			Notional at 31/12/2020		Fair Value	
	< 1 year	1-5 years	> 5 years	Total	Total	31/12/2021	31/12/2020
Fixed rate payer/floating rate receiver	47	1,317	4,540	5,904	5,923	264	(144)
Floating rate payer/fixed rate receiver	1,659	5,682	13,648	20,989	20,678	2,976	4,143
Floating rate/floating rate	-	1,021	1,413	2,434	2,308	69	3
Fixed rate/fixed rate	60	638	8,668	9,366	9,598	304	(853)
Interest rate swaps	1,766	8,658	28,269	38,693	38,507	3,613	3,149
INTEREST RATE DERIVATIVES – HEDGING	1,766	8,658	28,269	38,693	38,507	3,613	3,149
Interest rate operations	-	-	518	518	515	-	8
Interest rate swaps	398	328	280	1,006	1,124	(27)	(33)
INTEREST RATE DERIVATIVES – TRADING	398	328	798	1,524	1,639	(27)	(25)

The fair value of interest rate/exchange rate cross-currency swaps comprises the interest rate effect only.

The notional value of cross-currency swaps is included both in this note and the note on currency derivatives (see note 18.7.3).

There are several types of hedged item:

- liabilities in foreign currencies, for which cross-currency swaps are used in cash flow hedge;
- financial assets subscribed in foreign currencies;
- purchases of commodities and fuels, for which the Group hedges the associated foreign exchange risk;
- net investments in subsidiaries in foreign currencies.

Details of currency derivatives used in a hedging relationship or designated as trading derivatives are shown in the following tables. The notional value of cross-currency swaps is included both in this note and the note on interest rate hedging derivatives (see note 18.7.2).

18.7.3 Currency derivatives

The Group is exposed to the risk of exchange rate fluctuations due to the diversification of its businesses, supply contracts in foreign currencies for goods and services, and its geographical locations. These fluctuations can affect the Group's translation differences recognised in equity, balance sheet items, financial expenses, equity and net income.

At 31 December 2021

(in millions of euros)	Notional amount to be received at 31/12/2021				Notional amount to be given at 31/12/2021				Fair value
	< 1 year	1-5 years	> 5 years	Total	< 1 year	1-5 years	> 5 years	Total	31/12/2021
Forward exchange transactions	3,251	652	-	3,903	3,273	629	-	3,902	-
Swaps	23,421	6,506	17,195	47,122	23,362	6,311	16,921	46,594	406
Options	553	119	-	672	556	113	-	669	1
CURRENCY DERIVATIVES – HEDGING	27,225	7,277	17,195	51,697	27,191	7,053	16,921	51,165	407
Forward transactions	7,003	7,872	-	14,875	6,982	7,772	-	14,754	84
Swaps	24,729	4,018	263	29,010	24,810	4,048	257	29,115	(128)
Options	-	-	-	-	-	-	-	-	-
CURRENCY DERIVATIVES – TRADING	31,732	11,890	263	43,885	31,792	11,820	257	43,869	(44)

At 31 December 2020

(in millions of euros)	Notional amount to be received at 31/12/2020				Notional amount to be given at 31/12/2020				Fair value 31/12/2020
	< 1 year	1-5 years	> 5 years	Total	< 1 year	1-5 years	> 5 years	Total	
Forward exchange transactions	1,480	91	-	1,571	1,473	91	-	1,564	(1)
Swaps	20,394	6,891	16,368	43,653	20,090	6,933	17,152	44,175	(745)
Options	355	-	-	355	326	-	-	326	13
CURRENCY DERIVATIVES – HEDGING	22,229	6,982	16,368	45,579	21,889	7,024	17,152	46,065	(733)
Forward transactions	3,389	6,490	-	9,879	3,380	6,491	-	9,871	4
Swaps	14,576	5,180	275	20,031	14,606	5,162	255	20,023	-
Options	10	-	-	10	11	-	-	11	-
CURRENCY DERIVATIVES – TRADING	17,975	11,670	275	29,920	17,997	11,653	255	29,905	4

The notional value of cross-currency swaps shown in this note is also included in the note on interest rate derivatives (see note 18.7.2).

18.7.4 Commodity derivatives

The Group is exposed to price variations on the wholesale markets for energy (electricity, gas, coal, oil products) and the CO₂ emissions quota market with a potentially significant impact on the financial statements.

The Group hedges its forecast sales and purchases of electricity, gas, and coal using futures, forwards, options and swaps, essentially through cash flow hedges.

Details of commodity derivatives used for hedging are as follows:

		31/12/2021				31/12/2020		
		Net notional						
(in millions of euros)	Units of measure	< 1 year	1-5 years	> 5 years	Total	Fair value	Net notional	Fair value
Electricity	TWh	(22)	(9)	-	(31)	(3,808)	(25)	35
Gas	Millions of therms	738	205	-	943	(925)	2,131	102
Oil products	Thousands of barrels	4,763	9,334	-	14,097	166	9,610	18
CO ₂	Thousands of tonnes	3,147	4,077	-	7,224	333	7,925	76
Coal	Millions of tonnes	-	-	-	-	-	(1)	-
COMMODITY DERIVATIVES – HEDGING						(4,234)		231

The negative fair value of commodity derivatives used for hedging at 31 December 2021 (€4.2 billion) is mainly explained by the wider contractual market price/exercise price spread on electricity hedging instruments, and to a lesser extent on gas hedging instruments, due to the rise in commodity prices in 2021, particularly at the end of the year.

Details of commodity derivatives used for trading are as follows:

(in millions of euros)	Units of measure	31/12/2021		31/12/2020	
		Net notional	Fair value	Net notional	Fair value
Electricity	TWh	(111)	(1,719)	(174)	(380)
Gas	Millions of therms	47,423	630	(6,803)	310
Oil products	Thousands of barrels	6,812	17	24,301	58
CO ₂	Thousands of tonnes	(7,880)	(628)	3,355	(55)
Coal and freight	Millions of tonnes	-	(48)	1	(7)
Other commodities		-	(146)	-	8
COMMODITY DERIVATIVES – TRADING			(1,894)		(66)

These instruments mainly include contracts included in EDF Trading's portfolio.

These factors also explain the difference in the fair value between 2021 and 2020, essentially concerning hedges undertaken for the France – Generation and Supply, United Kingdom and Italy segments.

18.7.5 Impact of hedging derivatives on comprehensive income

Changes in the fair value of hedging derivatives included in equity (EDF share) and profit and loss are detailed below:

	2021			2020		
(in millions of euros)	Gross changes in fair value recorded in equity ⁽¹⁾	Gross changes in fair value transferred to income – Recycling ⁽²⁾	Gross changes in fair value transferred to income – Ineffectiveness	Gross changes in fair value recorded in equity ⁽¹⁾	Gross changes in fair value transferred to income – Recycling ⁽²⁾	Gross changes in fair value transferred to income – Ineffectiveness
Interest rate hedging	(98)	-	-	(24)	-	-
Exchange rate hedging	2,684	720	(38)	(850)	51	13
Net foreign investment hedging	(1,078)	(405)	-	661	-	-
Commodity hedging	(7,356)	(2,198)	(2)	644	430	(14)
HEDGING DERIVATIVES ⁽³⁾	(5,848)	(1,883)	(40)	431	481	(1)

(1) +/(): increase/(decrease) in equity (EDF share).

(2) +/(): increase/(decrease) in net income (EDF share).

(3) Excluding associates and joint ventures.

The gross change in the fair value of hedging instruments recognised in equity (EDF share), including recycling, is €(3,965) million in 2021 (€(50) million in 2020).

In 2021 this change is explained by the gross fair value changes in net foreign investment hedges, amounting to €(673) million, and interest rate, exchange rate and commodity hedges, amounting to €(3,292) million (€(711) million in 2020 – see the consolidated statement of comprehensive income).

The amount transferred to operating profit before depreciation and amortisation in 2021 is (2,198) million in respect of commodity hedges comprises:

- €(1,242) million for electricity hedging contracts, mainly concerning the United Kingdom and the France – Generation and supply segments;
- €(938) million for gas hedging contracts, concerning the France – Generation and supply and United Kingdom segments;
- €(18) million for other hedging contracts.

18.7.6 Offsetting of financial assets and liabilities

Accounting principles and methods

A financial asset and financial liability must be netted if the entity currently has a legally enforceable right to do so and intends either to settle the net amount or to realise the asset and settle the liability simultaneously.

At 31 December 2021

(in millions of euros)	As reported in balance sheet	Balance without offsetting	Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
			Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	Net amount recognised after offsetting under IAS 32	Financial instruments	Fair value of financial collateral	Net amount
Fair value of derivatives – assets	29,971	3,948	70,140	(44,117)	26,023	(1,645)	(8,309)	16,069
Fair value of derivatives – liabilities	(32,151)	(5,316)	(70,952)	44,117	(26,835)	1,645	5,996	(19,194)

At 31 December 2020

(in millions of euros)	As reported in balance sheet	Balance without offsetting	Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
			Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	Net amount recognised after offsetting under IAS 32	Financial instruments	Fair value of financial collateral	Net amount
Fair value of derivatives – assets	10,477	2,956	11,091	(3,570)	7,521	(1,672)	(2,797)	3,052
Fair value of derivatives – liabilities	(7,917)	(2,927)	(8,560)	3,570	(4,990)	1,672	568	(2,750)

Note 19 Financial indicators

The financial indicators are not defined by the accounting standards and are not directly visible in the Group's financial statements. The principal financial indicators are the following.

19.1 Net income excluding non-recurring items

Net income excluding non-recurring items corresponds to the Group's share of net income (EDF net income) excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.

The following tables show the transition from EDF net income to net income excluding non-recurring items:

At 31 December 2021

(in millions of euros)	Notes	2021			EDF net income
		Gross value	Income taxes	Non-controlling interests	
Net income					5,113
Changes in the fair value of debt and equity instruments ⁽¹⁾	8.3	(2,804)	776	3	(2,025)
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	6	215	(66)	-	149
Impairment ⁽²⁾		872	(177)	(87)	608
• Impairment of fixed assets	10.8.1 and 10.8.2	653	(177)	(87)	389
• Impairment of investments in associates and joint ventures	12.3	219	-	-	219
Other items		1,054	(152)	(30)	872
• Other operating income and expenses	7	1,123	(220)	(30)	873
• Tax revaluation of assets in Italy		-	(103)	-	(103)
• Increase in the income tax rate in the UK	9.2	-	359	-	359
• Recognition of deferred tax assets in the United States	9.2	-	(191)	-	(191)
• Other		(69)	3	-	(66)
NET INCOME EXCLUDING NON-RECURRING ITEMS					4,717

(1) Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.

(2) In 2021, impairment includes €(445) million concerning assets of the Dungeness power plant.

The net income excluding non-recurring items amounts to €4,717 million at 31 December 2021, down by €2,748 million compared to 2020.

At 31 December 2020

(in millions of euros)	Notes	2020			EDF net income
		Gross value	Income taxes	Non-controlling interests	
Net income					650
Changes in the fair value of debt and equity instruments*	8.3	(1,248)	377	(2)	(873)
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	6	175	(51)	-	124
Impairment		1,111	(156)	(111)	844
• Impairment of fixed assets	10.8.1 and 10.8.2	799	(156)	(102)	541
• Impairment of investments in associates and joint ventures	12.3	195	-	(6)	189
• Impairment of Edison's E&P operations (application of IFRS 5)	3.2.2	117	-	(3)	114
Other items		809	414	1	1,224
• Other operating income and expenses	7	487	(153)	1	335
• Tax litigations	9.2	-	537	-	537
• Change of income tax rate in the UK	9.2	-	121	-	121
• Accelerated depreciation of thermal power plants in France	10.3	250	(80)	-	170
• Other		72	(11)	-	61
NET INCOME EXCLUDING NON-RECURRING ITEMS					1,969

* Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.

19.2 Net indebtedness

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are

Net indebtedness are as follows:

(in millions of euros)	Notes	31/12/2021	31/12/2020
Loans and other financial liabilities	18.3.2	69,406	65,591
Derivatives used to hedge liabilities	18.7.1	(3,762)	(1,986)
Cash and cash equivalents	18.2	(9,919)	(6,270)
Debt and equity securities – liquid assets	18.1.2	(12,737)	(15,028)
Net indebtedness of assets held for sale	3.2.1	-	(17)
NET INDEBTEDNESS		42,988	42,290

The Group's net indebtedness amounts to €42,988 million at 31 December 2021 (€42,290 million at 31 December 2020). The ratio of net indebtedness to operating profit before depreciation and amortisation at 31 December 2020 is 2.39.

Note 20 Sustainable development and climate action

Introduction and background

Following the adoption in May 2020 of its *raison d'être*, "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development", and in line with its CAP2030 strategy, the Group revised the architecture of its Corporate Social Responsibility (CSR) commitments. 16 CSR commitments were defined around four key issues: Carbon neutrality and Climate, Preserving the planet's resources, Wellbeing and Solidarity, and Responsible development. This CSR grid is applied to all projects in the commitment phase, to make sure they are aligned with the Group's *raison d'être*.

The Group's financial statements reflect issues relating to climate change and sustainable development through the dimensions presented below: implementation of its investment and divestment strategy and a sustainable financing strategy; expenditure incurred specifically in response to environmental issues, particularly under applicable laws and regulations; and the valuation methods used for the Group's assets and liabilities.

Concerning regulations, on 10 December 2021 the European Union adopted the Delegated Act supplementing Article 8 of European regulation 2020-852 of 18 June 2020 which aims to classify economic activities based on their contribution to the achievement of environmental objectives. This "Taxonomy regulation" is part of the European strategy to promote emergence of sustainable finance that contributes to attainment of carbon neutrality by 2050, particularly by encouraging capital inflows into sustainable investments. It is applicable from 31 December 2021 and requires groups subject to the non-financial reporting obligation, as is the case for the EDF group, to publish three new indicators: the share of sales, capital expenditure and operating expenditure associated with European taxonomy-eligible, then taxonomy-aligned economic activities. The laws applicable at 31 December 2021 do not cover nuclear electricity generation, which is a dominant activity for the Group, nor do they cover activities relating to natural gas. After several months of debate, a draft Delegated Act specifically for nuclear and gas operations was sent to the 27 member states of the European Union on 31 December 2021 for a consultation period that ended on 21 January 2022. The final Delegated Act was published on 2 February 2022 and must be approved or rejected by the European Parliament within four months.

The results of the Group's work to establish these three indicators are presented in the Group's report on its non-financial performance, in section 3.8.3 "Details on the taxonomy" of the 2021 Universal Registration Document.

readily convertible into cash and are managed according to a liquidity-oriented policy.

20.1 Regulatory expenses

The regulatory frameworks and accounting principles for greenhouse gas emission rights, renewable energy certificates and energy savings certificates are presented respectively in notes 5.4.3, 10.2 and 17.2.

20.1.1 Greenhouse gas emission rights

EU Emissions Trading System (EU ETS)

The European Union's Emissions Trading System (EU ETS) exists to fight climate change and reduce greenhouse gas emissions.

This system, which applies in all EU countries, sets an annual cap on emissions. Businesses (including EDF) receive or buy emission quotas, then the following year surrender to the European Commission a number of greenhouse gas emission rights corresponding to their Scope 1 emissions for the year elapsed, such as direct greenhouse gas emissions from production of the goods sold (e.g. electricity, heat, steel, paper, etc.). Fines are payable if there is a shortfall (€110 per tonne of CO₂ not covered by quotas, and an obligation to cover these amounts by quota the following year).

The cap is being progressively reduced in order to bring down the total emissions in Europe.

The legislative framework of the EU-ETS for the fourth trading period (2021-2030) has been tightened up to achieve the emission reduction targets set in the 2030 Climate and Energy framework, and the EU's contribution to the Paris Climate Agreement adopted in 2015 (which set a general target of a 40% cut in emissions compared to 1990 levels for the whole EU)⁽¹⁾. One key step was accelerating annual quota reductions to 43 million tonnes per year (2.2% below the allocations for 2010).

The European Commission also presented a package of proposals on 14 July 2021 entitled "Fit for 55", intended to bring the European Union closer to the augmented target of cutting CO₂ emissions by at least 55% (compared to 1990 levels) by 2030. The quota system is likely to change after a process of negotiation in the European institutions that is expected to last between 12 and 18 months.

In the EDF group, the entities concerned by application of these European regulations are EDF, Edison, Dalkia, PEI and Luminus. The Group no longer receives free emissions quota allocations.

The volume of emissions at 31 December 2021 stood at 17 million tonnes (19 million tonnes for 2020 including EDF Energy).

(1) The current EU ETS allocations trajectory does not yet include changes to be made in application of the Fit for 55 package.

Actual greenhouse gas emissions amounted to €380 million at 31 December 2021 (€260 million at 31 December 2020 including EDF Energy) and are included in provisions in the balance sheet.

In 2021, the Group surrendered 16 million tonnes in respect of emissions generated in 2020 under the EU ETS (in 2020 it surrendered 21 million tonnes in respect of emissions generated in 2019, including EDF Energy).

British Emissions Trading Scheme (UK ETS)

Now that Brexit has taken place, the United Kingdom is no longer a member of the European system (EU ETS) and has set up its own system (UK ETS – Emissions Trading Scheme). The UK ETS, which uses a bidding system, covers the same sectors as the EU ETS and operates under generally similar rules, with comparable accounting treatment.

The volume of emissions at 31 December 2021 stood at 2 million tonnes (3 million tonnes for 2020). Actual impacts of greenhouse gas emissions amounted to €36 million at 31 December 2021 (€83 million at 31 December 2020) and are included in provisions in the balance sheet.

In 2021, EDF Energy surrendered 3 million tonnes in respect of emissions generated in 2020 under the UK ETS (in 2020 it surrendered 5 million tonnes in respect of emissions generated in 2019).

20.1.2 Renewable energy certificates (green certificates)

To encourage use of renewable energy produced from renewable sources, every EU member state has set itself national targets for consumption of electricity from renewable sources. Guarantee of Origin certificates prove the renewable origins of the electricity, which transits through the grid. They are sold by operators of renewable energy plants and bought by customers who want to use renewable-source electricity.

There are two ways for States to meet their targets:

- incorporating the costs of these certificates into the sale price for electricity (this is the approach taken in France);
- introducing an obligation to surrender a certain volume of renewable energy certificates depending on the level of sales to customers (as is the case in the United Kingdom, Italy and Belgium).

The renewable energy certificate system may apply to:

- non-obligated electricity producers when the obligation applies to sales (EDF Renewables);
- obligated electricity producers when the obligation applies to generation;
- electricity producers who are also sellers of electricity when the obligation applies to energy sales (EDF Energy, Edison and Luminus).

A provision of €1,156 million was recognised at 31 December 2021 concerning the obligations for renewable energy certificates to be surrendered at that date, essentially by EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations are covered by purchased certificates recorded in intangible assets.

Although the United Kingdom is no longer a member of the European Union, it is still concerned by this system.

20.1.3 Energy savings certificates

In all its subsidiaries, the Group is engaged in a process to control its energy consumption through various measures developed by national legislation in application of European Union Directives and national laws.

In France, the Law of 13 July 2005 introduced a system of energy savings certificates, imposing energy savings obligations on suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level. At the end of the period concerned, obligated actors are required to present energy savings certificates that correspond to their obligatory energy savings, otherwise sanctions apply. These certificates are obtained in return for energy savings operations conducted directly or indirectly, or purchased from other obligated or “eligible” economic actors.

Initially planned for the period 2018-2020, the fourth period of France’s energy savings certificates scheme was extended by one year (by law no. 2019-1147 of 8 November 2019 on Energy and the Climate) (see note 5.4.3). This fourth period (2018-2021) ended on 31 December 2021. Decree 2021-712 on the fifth period of the energy savings certificates scheme (2022-2025) was published in the *Journal officiel* of 5 June 2021.

Despite a substantially higher energy savings target in the fourth period, the EDF group is on track to meet its obligation by the time the authorities finalise the energy savings certificate accounts for the fourth period, and should even begin the fifth period (1 January 2022 – 31 December 2025) with advance stocks.

To meet this obligation, three sources are available to the EDF group: supporting consumers in energy efficiency operations (in 2021, for example, 222,000 renovation projects were completed), funding State-approved energy savings programmes, and purchasing certificates from eligible actors.

In the United Kingdom for example, EDF Energy helps companies explore and develop solutions by enabling them to save energy, carbon and costs, particularly through its Powershift flexibility platform.

20.2 Valuation of assets and liabilities

20.2.1 Provisions for contingencies and losses incorporating environmental issues

Provisions related to nuclear generation comprise provisions for back-end nuclear cycle expenses (management of spent fuel and radioactive waste), provisions for plant decommissioning and provisions for last cores. Obligations can vary noticeably depending on each country’s legislation and regulations, and the technologies and industrial scenarios involved. Details of these provisions are provided in notes 15 and 17.

Provisions related to environmental schemes include provisions for greenhouse gas emission rights, renewable energy certificates and energy savings certificates. In 2021, these provisions totalled €1,572 million (€1,192 million in 2020, see note 17.2).

Contingent liabilities also exist in connection with environmental litigation, such as the dispute concerning the Ausimont SpA industrial complex. These liabilities are described in note 17.3.

20.2.2 Valuation of assets

Climate issues are taken into account in valuing long-term assets through impairment testing. The long-term scenarios used for electricity prices in countries where the Group does business are consistent with the trajectories of European decarbonisation targets, particularly as set in the Paris climate agreement (see note 10.8).

The Group controls and operates thermal (gas-fired, coal-fired, oil-fired) electricity generation plants principally in France and Italy, to a smaller extent in Brazil and Belgium, and to a now marginal degree in England (since the sale of West Burton B in 2021, see note 3.1). The net book value of the assets concerned is €5.0 billion at 31 December 2021, including €4.1 billion for assets in France and €0.8 billion for assets in Italy.

In mainland France, the electricity generated by EDF’s fleet of thermal power plants (CCGT, CT, and coal, with net book value of €1.9 billion) accounted for around 2.59% of EDF’s total electricity output in 2021. These plants operate in semi-baseload and peak periods and are used to variable degrees throughout the year, playing a significant role in system security when there are tensions on the supply-demand balance.

With the end of coal-fired generation in application of the Multi-year energy programme, the coal-fired plant at Le Havre (0.6GW) was closed at 1 April 2021 (see note 10.3) and the Cordemais plant is due to cease operations in 2026 at the latest.

EDF is modernising its fleet of natural gas CCGT plants (Blénod, Martigues, Bouchain) to reduce air emissions of CO₂, NO_x and SO₂. The Bouchain plant in particular produces CO₂ emissions of around 360g/kWh on average.

In the island territories, electricity is principally generated by an oil-fired fleet (with net book value of €2.2 billion), and to a smaller degree hydroelectric plants and renewable energy plants. Where required by the Multi-year energy programme, EDF intends to operate new plants running on liquid biomass, or to convert its existing plants to run on bioliquid.

In Italy, Edison's thermal fleet consists of CCG plants. In keeping with the "National plan for energy and the climate" supporting development of gas-based electricity generation and its integration with renewable energy generation, in 2019 Edison started to build the first new-generation CCG plant at the Marghera Levante site (780MW). This was followed in 2020 by the start of work on a 760MW greenfield project at Presenzano (in Campania), using the same technology, for low environmental impact (CO₂ emissions 40% below the national average, and a 70% reduction in NO_x emissions). These two facilities should be commissioned in 2022 and 2023 respectively.

20.3 Sustainable financing

20.3.1 Green Bonds

Since 2013 the Group has made six Green Bond issues for a value equivalent to €8.7 billion, in order to support its development in renewable energies. It has invested around €2.5 billion per year to such operations.

After the two Green Bond issues chiefly intended to finance the building of new wind and solar power projects by its subsidiary EDF Renewables (€1.4 billion in November 2013 and \$1.25 billion in October 2015), the Group expanded its Green Bond Framework to finance investments in the renovation and modernisation of its hydropower assets in mainland France.

The new Framework was first applied to a €1.75 billion issue in October 2016 and then to a JPY 26 billion issue in two tranches in January 2017. The Group extended the scope of its Green Bond Framework further in early 2020 by opening it up to international hydropower assets, energy efficiency projects and biodiversity conservation projects.

On 8 September 2020, EDF made a landmark offering of unsecured senior Green Bonds convertible into new shares and/or exchangeable for existing shares of the Company (*OCEANes Vertes*) maturing in 2024, for the nominal amount of approximately €2.4 billion.

On 23 November 2021, EDF launched a senior Green Bond issuance maturing in 2033, for a total amount of €1.75 billion with a fixed 1% coupon.

The Green Bonds are included in the Group's borrowings, see note 18.3.2. Allocation of the funds raised by EDF's Green Bond issues is certified by one of the Statutory Auditors: see section 6.7 of the Universal Registration Document.

20.3.2 Social bonds (social hybrid notes)

On 26 May 2021 EDF launched an issue of Euro-denominated perpetual social hybrid notes with total nominal value of €1.25 billion and an initial coupon of 2.625% and a first redemption at the option of EDF on 1 June 2028.

The funds raised will be used to finance eligible projects, as defined in the EDF group's Social Bond Framework. These projects include capital expenditure contracted with Small and Medium-Sized Enterprises (SMEs) which contributes to the development and maintenance of electricity generation and distribution assets in Europe (including the United Kingdom). To qualify for funding, SMEs must meet three criteria: (1) a workforce of fewer than 250 people; (2) annual sales of less than €50 million or a balance sheet total of less than €43 million; (3) a 25% or lower ownership interest in a group. Criterion (3) makes EDF's definition more restrictive than the EU definition.

The Social Bond Framework's compliance with the Social Bond Principles published by the International Capital Markets Association (ICMA) was validated by S&P Global in a Second Party Opinion published in May 2021. EDF's social bond programme is in line with the Group's CSR objectives regarding responsible development of local areas and responsible development of industrial sectors.

A provisional impact report on these investments was published on the EDF group's website on 10 November 2021.

Allocation of the funds raised by EDF's social bonds is audited by one of its Statutory Auditors (see section 6.8 of the 2021 Universal Registration Document).

These perpetual social hybrid notes are recorded in equity (see note 14.4).

20.3.3 Credit lines indexed on ESG criteria

The EDF group is strongly committed to corporate social responsibility (CSR) and advocates closer ties between non-financial performance and financing strategy.

The credit lines indexed to the Group's sustainable development performance incorporate a cost adjustment mechanism.

EDF SA has a €4 billion "green" syndicated credit line with more than 20 banks that incorporate a margin adjustment mechanism linked to Group performance on three KPIs: direct CO₂ emissions, French residential customers' use of online consumption monitoring tools, and electrification of EDF's light vehicle fleet.

In December 2021 EDF also signed a new €1.5 billion "social" credit facility with 9 banks. The initial maturity is three years and the cost will be indexed on four KPIs focused on EDF's Fair and Inclusive Transition principles in favour of all stakeholders: employees, customers, suppliers and the communities where the Group operates.

At the end of 2021, the Group also signed 15 renewable bilateral credit lines indexed on ESG criteria (incorporating a cost adjustment mechanism based on the Group's performance on certain KPIs or its rating by a nonfinancial ratings agency), amounting to a total €3.84 billion.

At 31 December 2021, undrawn ESG-indexed renewable credit lines (including syndicated credit facilities), which were undrawn, totalled over €9.3 billion, or 72% of the EDF group's total undrawn credit facilities (see note 18.4).

The selected KPIs reflect the EDF group's major environmental commitments, principally cutting greenhouse gas emissions (CO₂) by 50% by 2030, closing down coal-fired plants in France and the United Kingdom with a view to achieving carbon neutrality by 2050, and completing electrification of the whole EDF group vehicle fleet by 2030. The focus on consumption monitoring tools reflects the Group's ambition to provide its customers with energy solutions appropriate to their needs.

20.4 Carbon-free investments

In 2021 the Group continued its programme of gross operating investments, which amounted to €18.3 billion and included €17.6 billion of gross investments in intangible assets and property, plant and equipment (see notes 4 and 10.7) and €0.7 billion of gross financial investments.

In 2021, nearly 94% of the Group's investments were in line with its net-zero trajectory (94% in 2020), with 50% of investments concerning the nuclear sector (51% in 2020). 40% of the Group's investments are aligned with the European sustainable taxonomy (43% in 2020 applying the method based on the March 2020 TEG (technical expert group) report). This notably covered investments in networks, renewable energy production (hydropower, solar power, wind power) and certain energy services (presented in the Group's report on its non-financial performance, in section 3.8.3 "Details on the taxonomy" of the 2021 Universal Registration Document).

Also, through its investments in new activities EDF is an actor in the energy transition. The Innovation and Pulse Programmes Division (DIPP) was set up in 2021 to bring out and develop new growth levers for the EDF group. It pursues that objective by investing in startups and venture capital funds dedicated to innovation (the EDF Pulse Ventures programme), and by developing intrapreneurial projects (the EDF Pulse Incubation programme). These programmes already existed in different forms and in the last ten years several subsidiaries have been opened by the Group, such as Hynamics in 2019, a company that produces and sells low-carbon hydrogen produced by water electrolysis to meet the needs of the heavy-duty transport industry.

The Group's *raison d'être* is also expressed in the management policy for its portfolio of dedicated assets held to finance long-term nuclear expenses in France (€37.5 billion at 31 December 2021), and the introduction of a responsible investor's charter with three focal points (compliance with the United Nations' Principles for Responsible Investment; respect of the major international agreements on human rights; and annual reporting on responsible investments). This charter is applicable both to assets managed directly and assets managed by specialist companies under delegated management arrangements.

20.5 Expenses for protection of the environment and climate

The Group is continuing its commitments to address environmental issues, for example through the following actions.

20.5.2 Other expenses for protection of the environment and climate

Accounting principles and methods

Other expenses for protection of the environment and climate are identifiable expenses incurred to prevent, reduce or repair damage that has been or may be caused by the Group as a result of its activities. These expenses are treated as follows:

- they are **capitalised** if they are incurred to prevent or reduce future damage or protect resources (e.g. expenses for structures to facilitate the passage of migrating fish, effluent treatment installations, etc.);

20.5.1 Research and development (R&D)

Given the goal of carbon neutrality by 2050, and the fact that electricity is a major lever in action to decarbonise the French economy, R&D has a crucial role to play in the electricity, climate, digital and societal transition.

In 2021, the EDF group's total R&D budget amounted to €661 million, 99% of EDF's R&D budget is dedicated to achieving the net zero goal, and the energy system transition.

The R&D budget is particularly channelled into research into energy efficiency, uses of electricity as a substitute for fossil fuel-based energies, renewable energies and their insertion into the grid, energy storage and production, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of all forms of pollution.

Research concerning electricity storage, enhancement of energy performance diagnosis methods, improvement of techniques for urban heating and cooling networks, platforms for sharing studies relevant to the ecological transition, and increasing safety at nuclear power plants is supported by public subsidies, notably from the European Union.

Accounting principles and methods for R&D are presented in note 10.2.

- they are booked as environmental liabilities and increases to **provisions for environmental risks** if they correspond to an obligation that exists at the year-end and it is probable or certain at the reporting date that they will lead to an outflow of resources;
- they are recognised as expenses if they are **operating expenses** for the units in charge of environmental concerns, environmental supervision, environmental duties and taxes, processing of liquid and gas effluents and non-radioactive waste, or research unrelated to an investment.

All of the Group's functions, employees, activities and projects are mobilised to fulfil EDF's objective of being an environmentally responsible company. Some of the actions concerned are presented below.

Action for biodiversity

The EDF group has been committed to action for biodiversity since 2006 with a dedicated policy, and today its biodiversity ambitions are reflected in formal commitments made through two initiatives, *Entreprises engagées pour la nature* (Committed companies for nature) and "Act4nature international". These voluntary commitments cover some twenty actions to reduce contributions to major pressure points on biodiversity (as identified by IPBES, the biodiversity equivalent of the IPCC), recreate biodiversity-friendly spaces and conditions, further improve and share knowledge, strengthen biodiversity governance and raise employee awareness.

In addition to these commitments, between 2013 and 2021, the Group undertook more than 55 operations (through EDF hydro and its hydropower activities) to facilitate fish migration at ecologically sensitive sites in mainland France ("list 2" sites for the purposes of the national law on water and aquatic environments), installing fish passes and fish ladders and removing river weirs.

Action for employees and vehicle fleet electrification

Consistent with its ambitions for the environment and the climate, the Group works to raise awareness among its employees and educate them about environmental and sustainable development issues. In 2021 its "Environment and sustainable development" training offering comprising courses on environmental management, standards and regulations, and environmental analysis, provided 3,593 employees with 24,683 hours of training.

In addition, the rollout at Group level of the "Climate Collage" collaborative workshop, led in person or online by volunteer employees after internal training, gave 22,000 employees greater awareness of the issues of climate disruption.

As the first French Group to sign the EV100 initiative, EDF made a commitment to have a fully-electric light vehicle fleet by 2030. By the end of 2021 the worldwide fleet numbered close to 45,000 light vehicles (especially in Europe) and more than 17.3% were already electric (over 7,750 electric vehicles, an increase of more than 2,100 from 2020). Joining the EV100 initiative is also an encouragement for Group employees to control their energy consumption and reduce their carbon footprint, as it gives them access to competitive offers from car suppliers and offers for recharging services sold by EDF group subsidiaries.

For 2021, the vehicle fleet electrification indicator accounts for 20% of EDF SA's profit-sharing criteria and 10% of Enedis' profit-sharing criteria for their respective fleets.

Note 21 Off-balance sheet commitments

This note presents off-balance sheet commitments given and received by the Group at 31 December 2021. The amounts of commitments correspond to non-discounted contractual values.

21.1 Commitments given

The table below shows off-balance sheet commitments given by the Group that have been valued. Other commitments are described separately in the detailed notes.

<i>(in millions of euros)</i>	Notes	31/12/2021	31/12/2020
Operating commitments given	21.1.1	54,268	42,235
Investment commitments given	21.1.2	16,996	16,494
Financing commitments given	21.1.3	5,837	5,536
TOTAL COMMITMENTS GIVEN		77,101	64,265

In almost all cases, these are reciprocal commitments, and the third parties concerned are under a contractual obligation to supply the Group with assets or services related to operating, investment and financing activities.

21.1.1 Operating commitments given

Operating commitments given by the Group are as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Fuel and energy purchase commitments*	37,908	24,715
Operating contract performance commitments given	16,047	17,151
Operating lease commitments as lessee	313	369
TOTAL OPERATING COMMITMENTS GIVEN	54,268	42,235

* Excluding gas purchases and related services.

21.1.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, the Group has entered into long-term contracts for purchases of electricity, gas, other energies and commodities and nuclear fuel, for periods of up to 20 years.

At 31 December 2021, fuel and energy purchase commitments mature as follows:

The Group has also entered into long-term purchase contracts with a certain number of electricity producers, by contributing to the financing of power plants.

<i>(in millions of euros)</i>	31/12/2021					31/12/2020
	Maturity					
	Total	< 1 year	1 to 5 years	5 to 10 years	> 10 years	Total
Electricity purchases and related services ⁽¹⁾	24,557	4,495	6,871	4,882	8,309	10,574
Other energy and commodity purchases ⁽²⁾	346	82	159	105	-	308
Nuclear fuel purchases	13,005	1,585	5,620	4,337	1,463	13,833
FUEL AND ENERGY PURCHASE COMMITMENTS	37,908	6,162	12,650	9,324	9,772	24,715

(1) Including commitments given by controlled entities to joint ventures, amounting to €487 million at 31 December 2021 (€533 million at 31 December 2020).

(2) Excluding gas purchases and related services (see note 21.1.1.1.4).

21.1.1.1 Electricity purchases and related services

Electricity purchase commitments at 31 December 2021 mainly concern EDF and EDF Energy. In the case of EDF many of these commitments are borne by the Island Energy Systems (SEI), which have made commitments to purchase the electricity generated using bagasse and coal.

The change over the year is mainly explained by the €12 billion increase in EDF Energy's purchase commitments due to higher electricity prices and the volumes involved, particularly after signature of the 15-year power purchase agreement with RWE (for renewable energy to be produced once the Sofia offshore wind farm off the British coast is commissioned). The €2 billion increase in EDF and Luminus' purchase obligations is explained by the rise in volumes and contract prices over the year.

In addition to the obligations reported above and under Article 10 of the Law of 10 February 2000, in mainland France, EDF is obliged, at the producer's request and subject to compliance with certain technical features, to purchase the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydro-electric plants, photovoltaic power, etc.). The additional costs generated by this obligation are offset, after validation by the CRE, by the CSPE. These purchase obligations total 54TWh for 2021 (59TWh for 2020), including 7TWh for co-generation (7TWh for 2020), 25TWh for wind power (31TWh for 2020), 11TWh for photovoltaic power (11TWh for 2020) and 4TWh for hydropower (4TWh for 2020).

21.1.1.2 Other energy and commodity purchases

Purchase commitments for other energies and commodities mainly concern purchases of biomass fuel used by Dalkia in the course of its business.

21.1.1.3 Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover the EDF group's needs for uranium and fluorination, enrichment and fuel assembly production services.

21.1.1.4 Gas purchases and related services

Gas purchase commitments are principally undertaken by Edison and EDF. The volumes concerned for both entities at 31 December 2021 are as follows:

(in billions of m ³)	31/12/2021				31/12/2020
	Maturity				Total
	Total	< 1 year	1 to 5 years	> 5 years	
Edison	137	13	48	76	124
EDF	23	2	7	14	26

Gas purchase contracts

Edison has entered into agreements to import natural gas from Russia, Libya, Algeria, Azerbaijan and Qatar, for a total maximum volume of 13.4 billion m³ per year. The residual terms of these contracts vary between 1 and 23 years.

The contract with Algeria was renewed in 2019 for 1 billion m³ per year until 2027. The long-term contract for gas from Russia terminated in 2019 and Edison signed a new contract for 1 billion m³ for 2020, 2021, then for 2022.

EDF has entered into an import contract for LNG from the United States, concerning an annual supply of 0.7 million tonnes of LNG (1 billion m³ of natural gas per year) for a 20-year period from May 2020.

In 2020, EDF signed a new 5-year contract for 3 billion m³ from Norway.

Some contracts contain "take-or-pay" clauses committing the buyer to pay for a minimum volume of gas every year, whether or not it actually takes delivery of that volume.

Gas-related service contracts

Under the contract with Terminale GNL Adriatico, Edison also benefits from approximately 80% of the terminal's regasification capacities until 2034.

Under the contract with the Dunkerque LNG methane terminal, EDF benefits from approximately 61% of the terminal's regasification capacities until 2037, in return for payment of an annual premium of approximately €150 million. A provision for onerous contracts has been recorded in connection with this contract.

Other commitments and risks

Edison has signed a contract for LNG supplies from the United States (1 million tonnes per year). Deliveries under this contract will only start in 2023.

21.1.1.2 Operating contract performance commitments given

At 31 December 2021, these commitments mature as follows:

(in millions of euros)	31/12/2021				31/12/2020
	Maturity				Total
	Total	< 1 year	1 to 5 years	> 5 years	
Operating guarantees given	8,693	3,019	2,270	3,404	9,185
Operating purchase commitments ⁽¹⁾	7,173	4,069	2,433	671	7,720
Other operating commitments	181	46	73	62	246
OPERATING CONTRACT PERFORMANCE COMMITMENTS GIVEN ⁽²⁾	16,047	7,134	4,776	4,137	17,151

(1) Excluding fuel and energy.

(2) Including commitments given by controlled entities to joint ventures, amounting to €1,928 million at 31 December 2021 (€1,714 million at 31 December 2020).

In the course of its business, the Group provides contract performance guarantees, generally through the intermediary of banks.

Operating guarantees given at 31 December 2021 mainly consist of guarantees given by EDF Renewables in connection with its development projects, Edison and EDF.

The change in these guarantees is essentially explained by the termination of the Group's guarantee covering the differential between the value of UK pension obligations under the Trustees' method and under IAS 19, following renegotiation leading to new agreements signed on 31 December 2021 and applied from January 2022. It also results from new EDF Renewables projects in development (particularly in the United States) and arrangement of new guarantees by Edison and Framatome in the course of their operational activities.

21.1.1.2.1 Operating guarantees given

Operating guarantees given are as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
EDF Renewables	3,024	2,447
Edison	1,882	1,657
EDF	1,228	2,496
Framatome	1,087	573
EDF Energy	571	1,055
Other entities	901	957
TOTAL	8,693	9,185

21.1.1.2.2 Operating purchase commitments

Operating purchase commitments are as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
EDF	3,360	3,524
Framatome	1,399	1,659
Enedis	794	845
EDF Renouvelables	544	391
EDF Energy	381	591
Other entities	695	710
TOTAL	7,173	7,720

21.1.1.3 Lease commitments as lessee

At 31 December 2021, lease commitments as lessee break down as follows:

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				
	Total	< 1 year	1 to 5 years	> 5 years	Total
LEASE COMMITMENTS AS LESSEE	313	55	146	112	369

The only remaining off-balance sheet lease commitments are:

- leases that are exempt from recognition in application of IFRS 16. The total amount concerned at 31 December 2021 is €204 million (€191 million at 31 December 2020);

- leases of assets that have not yet been made available to the Group (principally real estate and LNG tankers under construction). The right-of-use assets and the lease liability will be recognised in the balance sheet when the leased asset is made available. The total amount concerned at 31 December 2021 is €109 million (€178 million at 31 December 2020).

21.1.2 Investment commitments given

At 31 December 2021, details of investment commitments are as follows:

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				
	Total	< 1 year	1 to 5 years	> 5 years	Total
Commitments related to acquisition of tangible and intangible assets	15,905	8,566	6,921	418	15,625
Commitments related to acquisition of financial assets	929	84	734	111	716
Other commitments related to investments	162	128	34	-	153
TOTAL INVESTMENT COMMITMENTS GIVEN*	16,996	8,778	7,689	529	16,494

* Including commitments given by controlled entities to joint ventures, amounting to €194 million at 31 December 2021 (€212 million at 31 December 2020).

21.1.2.1 Commitments related to acquisition of tangible and intangible fixed assets

The commitments related to acquisition of tangible and intangible fixed assets are as follows:

(in millions of euros)	31/12/2021	31/12/2020
EDF	4,109	4,284
EDF Energy	6,346	5,966
Enedis	2,568	2,461
EDF Renouvelables	1,431	1,369
Framatome	520	462
Other entities	931	1,083
TOTAL	15,905	15,625

The increase in commitments given related to acquisition of tangible and intangible fixed assets is explained by the higher commitments given by EDF Energy (mainly due to the significant rise by the pound sterling against the euro), Enedis (higher purchase commitments for electric equipment combined with a decline in commitments for the Linky meter as its general rollout has now ended), and EDF Renewables (development of new projects in the United States, the United Kingdom and France, offset by progress and commissioning of solar power plants and wind farms, especially in the United States). The lower level of commitments given by Edison relates to progress on construction of the two new-generation CCGT power plants at Presenzano and Marghera Levante.

21.1.2.2 Commitments related to acquisition of financial assets

The main share purchase commitments that cannot be valued concern Luminus.

Luminus signed an amendment to the shareholder pact on 26 October 2015 defining a liquidity clause for the investments held by its minority shareholders, which could, in certain conditions under the control of EDF, result in sale of their shares through an IPO, or purchase of their shares by the Group at market value. This liquidity clause is valid at all times from 1 July 2018 to 31 December 2025.

Regarding the investment in EDF Investissements Groupe (EIG), C3 (a fully-owned EDF subsidiary) and NBI (Natixis Belgique Investissement, a subsidiary of the Natixis group) amended the agreements for their investment in EIG on 19 December 2018.

C3 now has a call option to buy EIG shares held by NBI at a fixed price, exercisable at any time until May 2026. Meanwhile, NBI has a put option to sell EDF all of its

EIG shares for a fixed amount of cash, exercisable subject to certain conditions between February 2024 and May 2025.

Due to their features, in compliance with IAS 32, NBI's put option and C3's call option are considered as derivatives and their net value is included in the positive or negative fair value of trading derivatives. At 31 December 2021, the fair value of these trading derivatives is not significant.

The increase in commitments related to acquisition of financial assets notably reflects EDF's subscription in equal shares with the State to the *Fonds France nucléaire* investment fund. EDF and the State each contributed €50 million to this fund, which has a target total investment of €200 million by 2023.

The purpose of the *Fonds France nucléaire* fund is to invest to support growth by SMEs and intermediate-sized businesses in the nuclear industry, as part of the national recovery plan "France Relance", through which the French government is providing €470 million of funding for various aspects of the nuclear industry, from modernisation of industrial facilities and skill reinforcement to research and development.

Framatome finalised its acquisition of Rolls-Royce Civil Nuclear Instrumentation & Control (I&C) on 8 November 2021 (see note 3.1).

21.1.2.3 Other commitments related to investments

Other commitments given related to investments at 31 December 2021 mainly comprise guarantees given by EDF Norte Fluminense in connection with its 51% investment in CES, the Company in charge of a hydroelectric dam on the Teles Pires river in Brazil.

21.1.3 Financing commitments given

Financing commitments given by the Group at 31 December 2021 comprise the following:

(in millions of euros)	31/12/2021				31/12/2020
	Maturity				
	Total	< 1 year	1 to 5 years	> 5 years	Total
Security interests in real property	3,986	1,739	474	1,773	4,179
Guarantees related to borrowings	1,265	30	668	567	949
Other financing commitments	586	478	31	77	408
TOTAL FINANCING COMMITMENTS GIVEN*	5,837	2,247	1,173	2,417	5,536

* Including commitments given by controlled entities to joint ventures, amounting to €1,597 million at 31 December 2021 (€1,156 million at 31 December 2020). These financing commitments to joint ventures mainly concern EDF Renewables.

Security interests and assets provided as guarantees mainly concern pledges or mortgages of tangible assets and shares representing investments in consolidated subsidiaries which own property, plant and equipment, for EDF Renewables.

The guarantees given for borrowings are essentially guarantees provided by EDF Renewables for its project financing.

21.2 Commitments received

The table below shows off-balance sheet commitments received by the Group that have been valued. Other commitments received are described separately in the detailed notes.

<i>(in millions of euros)</i>	Notes	31/12/2021	31/12/2020
Operating commitments received ⁽¹⁾	21.2.1	9,065	8,108
Investment commitments received	21.2.2	609	132
Financing commitments received	21.2.3	18	31
TOTAL COMMITMENTS RECEIVED ⁽²⁾		9,692	8,271

(1) Excluding commitments related to supplies of energy and related services (see note 21.2.1.4).

(2) Excluding commitments related to credit lines, which are described in note 18.4.

21.2.1 Operating commitments received

Operating commitments received by the Group at 31 December 2021 comprise the following:

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				Total
	Total	< 1 year	1 to 5 years	> 5 years	
Operating lease commitments as lessor	661	116	309	236	711
Operating sale commitments	6,360	1,704	3,372	1,284	5,903
Operating guarantees received	1,991	1,112	274	605	1,444
Other operating commitments received	53	25	16	12	50
OPERATING COMMITMENTS RECEIVED	9,065	2,957	3,971	2,137	8,108

21.2.1.1 Operating lease commitments as lessor

In 2021, the Group benefits from commitments as lessor in operating leases amounting to €661 million. These commitments mainly concern the Independent Power Projects (IPPs) and real estate leases.

21.2.1.2 Operating sale commitments

Operating sale commitments received exclude energy deliveries and principally concern firm orders made through contracts recorded on a percentage-of-completion basis at Framatome (construction and engineering contracts) and EDF Renewables (agreements for operation services, maintenance services, and development and sale of structured assets).

21.2.1.3 Operating guarantees received

Operating guarantees received principally concern Framatome, and relate to supply and technical assistance contracts for EDF's nuclear power plants with guarantees received from suppliers, particularly in connection with ARENH deliveries.

21.2.1.4 Electricity supply commitments

In the course of its business, the EDF group has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5GW;
- in execution of France's "NOME" Law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its existing nuclear power plants to other suppliers, until 31 December 2025. This has concerned a maximum volume of 150TWh each year since 1 January 2020. (see note 23).

21.2.2 Investment commitments received

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				Total
	Total	< 1 year	1 to 5 years	> 5 years	
INVESTMENT COMMITMENTS RECEIVED	609	416	193	-	132

The increase in investment and/or divestment commitments received is due to a guarantee received for a transfer of shares held by EDF under a repurchase agreement.

21.2.3 Financing commitments received

<i>(in millions of euros)</i>	31/12/2021				31/12/2020
	Maturity				Total
	Total	< 1 year	1 to 5 years	> 5 years	
FINANCING COMMITMENTS RECEIVED	18	2	16	-	31

Note 22 Related parties

Accounting principles and methods

Related parties include the French State, companies in which the State holds majority ownership and certain of their subsidiaries, and companies in which the EDF group exercises joint control or significant influence. They also include members of the Group's management and governance bodies.

Details of transactions with related parties are as follows:

(in millions of euros)	Associates and joint ventures		Joint operations		French State or State-owned entities*		Group Total	
	31/12/2021	31/12/2020	31/12/2021	31/12/2020	31/12/2021	31/12/2020	31/12/2021	31/12/2020
Sales	797	355	-	-	2,501	2,082	3,298	2,437
Energy purchases	4,196	3,885	2	1	2,441	2,114	6,639	6,000
External purchases	16	13	7	7	343	348	366	368
Financial assets	160	179	-	-	-	-	160	179
Other assets	844	495	-	-	630	593	1,474	1,088
Financial liabilities	-	-	-	-	-	-	-	-
Other liabilities	1,367	1,114	1	1	623	600	1,991	1,715

* Excluding tax and social liabilities and the CSPE receivable.

22.1 Transactions with entities included in the scope of consolidation

Transactions with the principal associates (CTE (the company that owns RTE) and Taishan) are presented in note 12.

Transactions with other associates, joint ventures, and partner entities in joint arrangements with the Group mainly consist of sales and purchases of energy.

22.2 Relations with the French State and State-owned entities

22.2.1 Relation with French State

The French State holds 83.88% of the capital of EDF at 31 December 2021, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, the EDF group is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (Cour des comptes) or Parliament, and verifications by the French General Finance Inspectorate (*Inspection générale des finances*).

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions assigned to EDF by the lawmaker for an unlimited period. The Law of 9 August 2004 does not stipulate the duration of the contract.

22.2.2 Relations with ENGIE

Enedis and GRDF share a common service function, defined by Article L. 111-71 of the French Energy Code. Its missions in the electricity and gas distribution sector are plant construction, site project management, network operation and maintenance, and metering operations. This service is not a legal entity in its own right.

Enedis and GRDF are bound by an agreement that defines their relations within this service function, its competences, and the resulting division of costs. The agreement

has an unlimited term and can be terminated at any time subject to 18 months' notice: in such a case, the parties undertake to renegotiate the agreement during the notice period. It is updated regularly.

Enedis and GRDF have been progressively reorganising their mixed activities for several years with a view to ending this agreement:

- in 2014 each entity became responsible for reading its own meters and doing work on its own meter panels;
- in 2018, certain support activities were separated (vehicles and machines, litigation and insurance, training and recruitment, office purchases) and two mixed entities were created, one for employment contracts, studies and medical/social matters, and the other for IT and telecoms.

In July 2021, on completion of work begun in 2020, the Governance board decided to begin a project to modernise the four remaining mixed entities: the IT and telecoms operator, the human resources and medical/social matters service, the national accounting unit and the "Serval" operational logistics unit. Following this decision a detailed investigation of the project was initiated, involving all the employees concerned, and employee consultation was begun.

Concerning the common service of LPG distribution and supply in the cities of Ajaccio and Bastia in Corsica, ENGIE informed EDF in October 2020 that it was considering terminating its LPG activities in Corsica.

Article 96 of France's Finance Law for 2022 allows the State to bear part of the costs associated with conversion of the LPG networks to electricity or renewable energies, for a maximum period of twenty years to be set by official order.

This measure currently has no impact for EDF. Ultimately, the prospect of ending LPG distribution operations and converting uses to electricity will need investments to reinforce the electricity distribution networks.

22.2.3 Relations with public sector entities

The EDF group's relations with public sector entities mainly concern the two entities belonging to the former AREVA group (Orano and AREVA SA).

Transactions with Orano concern:

- the front-end of the nuclear fuel cycle (uranium supplies, conversion and enrichment services);
- the back-end of the nuclear fuel cycle (transportation, storage, processing and recycling services for spent fuel).

Front-end of the cycle

Several important agreements were negotiated between EDF and Orano:

- for supplies of natural uranium: Orano Mining contracts;
- for fluorination and enrichment of natural uranium into uranium 235: an Orano Chimie-Enrichissement contract (formerly Orano cycle contract).

22.3 Management compensation

The Company's key management and governance personnel are the Chairman and CEO, the members of the COMEX (Executive Committee) throughout 2021 or since their date of appointment if they joined the COMEX during the year, and the Directors. Directors representing the employees receive no remuneration for their services.

The total compensation paid by EDF and controlled companies to the Group's key management and governance personnel amounted to €12.3 million in 2021

Back-end of the cycle

Relations between EDF and Orano Recyclage (formerly Orano Cycle) concerning transportation, processing and recycling of spent fuels are described in note 15.1.1.1.

(€11.9 million in 2020). This amount covered short-term benefits (basic salaries, performance-related salary, profit share and benefits in kind), special IEG post-employment benefits where relevant, and the corresponding employer contributions, plus any director's fees.

EDF's key management and governance personnel benefit from no special pension system, starting bonus or severance payment entitlement except by contractual negotiation.

Note 23 Subsequent events

Exceptional regulatory measures and outlook for nuclear power generation in France

Exceptional regulatory measures

In view of the high increases in electricity market prices, France introduced a "tariff cap" limiting the raise in regulated sales tariffs to a maximum 4% (including taxes) at 1 February 2022 for residential customers compared to the tariffs in force at 1 August 2021. This tariff cap is founded on 2 articles of the Finance Law for 2022 (law 2021-1900 of 30 December 2021):

- under Article 29, a reduction in the TICFE tax (or CSPE) is applicable from 1 February 2022 for all customers (residential and business customers, on regulated-tariff or market-price contracts), although a legal minimum level must be maintained (€1/MWh for residential and small business customers). This reduction applies to quantities of energy delivered until 31 January 2023. The new TICFE tariffs have been set by decree;
- under Article 181, if the CRE, despite the reduction in the TICFE, proposes an increase in regulated sales tariffs for residential customers that exceeds 4% (including taxes) compared to the tariffs in force at 31 December 2021, as a dispensation from the Energy Code the French government may object to the proposal and through a joint decision by the Ministers for the Economy and Energy set the regulated sales tariffs, and tariffs for sales to the local distribution companies, at a lower level. If this happens, the law provides for a subsequent catch-up adjustment of regulated sales tariffs in 2023, to be smoothed over twelve months, to cover the loss of income for EDF in 2022. The same article also introduces a mechanism to compensate for losses borne by local electricity distribution companies on regulated-tariff offers and electricity suppliers on market-price offers.

On 13 January 2022 the French government also announced further exceptional measures to limit the rise in electricity tariffs for consumers in 2022. Details of their practical implementation are still forthcoming, but one main step is attribution of an additional volume of 20TWh to the ARENH scheme for 2022, over the period 1 April to 31 December 2022, at the price of €46.2/MWh. This measure, announced in January 2022, has two effects for the Group: i) it is necessary to purchase these 20TWh of ARENH volume for delivery to other suppliers, with a very significant negative price effect given current market prices; ii) the increased ARENH portion in relation to the market-price portion in the "cost stacking" method used to calculate regulated sales tariffs for 2022 will induce a decrease in sales prices to customers on both regulated-tariff and market-price contracts.

The additional measures also concern extension of the 4% regulated tariff increase cap (including taxes) to non-residential customers who are still eligible for the regulated tariff in mainland France and non-interconnected zones.

In a press release of 13 January 2022, the Group acknowledged the measures announced by the French Government to limit the rise in electricity tariffs for 2022. The Group stated that the financial consequences could not be accurately determined at this stage. Based on the information available to the Group at the press release date, the impact of these measures on EDF's 2022 EBITDA, compared

to a situation in which they were not implemented, was estimated at around €8.4 billion based on market prices at 31 December 2021, and around €7.7 billion based on market prices at 12 January 2022. EDF stated that the final impact on EBITDA would depend on the market prices over the implementation period, and that it would release information as soon as possible and regularly on adjustments to this estimate. In the meantime it withdrew its 2022 Net Financial Debt/EBITDA guidance.

The Group also stated that it was going to consider appropriate measures to strengthen its balance sheet structure, and any steps that could protect its interests.

In a decision of 18 January 2022, the CRE proposed an increase of 35.4% including taxes (44.5% excluding taxes) in the "blue" tariffs for residential customers and 35.9% including taxes (44.7% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2022. This proposed increase was driven primarily by the significant rise in prices on the energy market. If it had taken account of the maximum decrease in the TICFE confirmed by decree 2022-84 of 28 January 2022, this proposal would have been for a 20% increase (including taxes) in the "blue" tariffs for residential customers and a 20.9% increase (including taxes) in the "blue" tariffs for non-residential customers. In accordance with the tariff cap, this proposal was rejected by the ministers for the economy and energy, who set the increase in the "blue" tariffs for residential customers at 4% including taxes (24.3% excluding taxes) and the increase in the "blue" tariffs for non-residential customers at 4% including taxes (23.6% excluding taxes) through tariff orders of 28 January 2022, published in the *Journal officiel* of 30 January 2022 and implemented from 1 February 2022.

The CRE stated that the average price (excluding taxes) resulting from the new "blue" tariffs for residential customers in mainland France would have been €57.2/MWh under its tariff proposal, and will be €31.2/MWh in application of the tariff order of 28 January 2022. In accordance with Article 181 of the Finance Law for 2022, the difference will be covered by a catch-up adjustment in 2023, and suppliers to residential customers on market-price contracts and the local distribution companies will be entitled to compensation from 1 February 2022. The CRE also stated that it would assess the impact of the additional ARENH volumes in 2022 at a later date; this should result in a reduction to the catch-up adjustment planned for 2023, and the supplier compensation provided for in Article 181 of the Finance Law.

Various measures have also been taken by the British government in 2022 to limit the effects of the energy price crisis for UK consumers. On 3 February 2022 the British energy regulator OFGEM announced the new energy price cap for the Standard Variable Tariff (SVT), applicable from April 2022 for the following six months. The 54% increase announced is estimated to correspond to an average +£693 cost per year for a standard consumer profile. The British government announced parallel measures to reduce this burden for households: i) a £150 rebate on local taxes from April 2022, for 80% of households; ii) a £200 reduction on energy bills, to be applied by suppliers in October 2022, and subsequently paid by consumers in £40 instalments over 5 years from 2023. The associated costs will be financed by the state in the meantime.

Outlook for nuclear power generation in France

On 13 January 2022 EDF updated its estimated nuclear output in France for 2022 from 330-360TWh to 300-330TWh, following extension of outages for 5 of EDF's French nuclear reactors. During preventive maintenance checks on reactor 1 at the Civaux nuclear power plant, scheduled as part of its ten-year inspection, some defects were detected close to the welds on the pipes of the safety injection system (SIS) circuit. Preventive checks were then carried out on the Civaux 2, Chooz 1 and Chooz 2 reactors. They revealed similar defects at the Civaux 2 and Chooz 2 reactors. Checks and expert assessments of the Chooz 1 reactor are still in progress and will continue until a full assessment is completed. Preventive maintenance checks conducted during the ten-year inspection of reactor 1 at the Penly nuclear power plant also found similar defects on the SIS circuit.

Due to performance of checks, and the examination and implementation of technical solutions, EDF extended the maintenance outages of the Civaux 1, Civaux 2, Chooz 1, Chooz 2 and Penly 1 reactors. A control program for the entire nuclear fleet is under development, incorporating experience from the initial analyses as it is gained.

As part of its control programme on the French nuclear fleet, on 7 February 2022 EDF revised its 2022 nuclear output estimate from 300-330TWh to 295-315TWh, and stated that the 2023 French nuclear output estimate, currently 340-370TWh, would be updated as soon as possible.

On 11 February 2022, EDF updated its 2023 French nuclear output estimate from 340-370TWh to 300-330TWh. This estimate takes into account:

- a heavy industrial programme with 44 reactor outages for maintenance and inspection, including 6 ten-yearly inspections, plus two scheduled outages starting in 2022 that will continue into 2023;
- the continuation of the control and repair programme on the pipes potentially affected by the stress corrosion phenomenon, which is still ongoing.

The regulatory measures described above, and the new estimate of nuclear power output in France, will have significant effects on the Group's financial statements from 2022, but have no impact on the financial statements at 31 December 2021 (see particularly note 10.8 on France – Generation and Supply).

Exclusive Agreement to Acquire Part of GE Steam Power's Nuclear Activities

EDF and GE announced on 10 February 2022 that they had signed an exclusive agreement for EDF to acquire part of GE Steam Power's nuclear power activities. The proposed transaction would bring together GE's nuclear steam turbine technology and services expertise with EDF strengthening its commitment to the nuclear power sector, creating an industry-leading global steam turbine equipment

and services provider within EDF group. Today, GE Steam Power's nuclear steam turbines are installed in half of the world's nuclear power plants, including in all of EDF's nuclear plants in France.

The proposed transaction includes GE Steam Power's conventional island equipment for new nuclear power plants—including the world's most powerful steam turbine in operation, the Arabelle turbine – as well as maintenance and upgrades for existing nuclear power plants. The transaction would also include steam turbine technology to equip EPR (European Pressurized Reactors) and EPR 2 reactor and small modular reactors (SMR).

GE would retain a services-focused Steam Power business and continue to provide best-in-class services for more than 100GW of nuclear turbine islands in the Americas region, and it also retains GE Hitachi Nuclear Energy, a leading lifecycle provider for reactor island which will deploy Canada's first commercial, grid-scale SMR. GE remains committed to the nuclear sector and continues to invest in next-generation technology, which plays an important role in today's energy transition.

The nuclear activities and teams in the scope of the proposed transaction are based in about fifteen countries, with nearly 70 per cent of the workforce in France, including at GE Steam Power manufacturing sites like Belfort and La Courneuve.

Financial details of the proposed transaction were not disclosed. The proposed transaction is subject to consultation with employee representatives and other customary closing conditions, including regulatory reviews. The transaction is expected to close in the first half of 2023.

Launch of an action plan

As announced on 13 January 2022, EDF presented an action plan at the Board of Directors' meeting on 17 February 2022. This plan is designed to reinforce EDF's balance sheet structure in the context of the events of early 2022. It aims to continue the Group's strategy, founded on a balanced mix of nuclear and renewable energies, which develops energy efficiency services and which brings to customers even more innovations.

To finance this strategy, EDF plans to:

- submit a proposal to the Board of Directors as soon as possible, subject to market conditions, for a capital increase, maintaining preferential subscription rights. This would lead to the issuance of some 510 million new shares with total value of approximately €2.5 billion including the issue premium;
- propose a scrip option (payment in shares) for the 2022 and 2023 dividends.

The French State, EDF's largest shareholder, has informed the Board of its position on these two points, which will be covered in a separate communication;

- complete disposals of around €3 billion in total in the years 2022-2023-2024.



Note 24 Statutory Auditors' fees

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2021:

(in thousands of euros)	Deloitte network		KPMG network	
	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit - Statutory audit, certification, review of company and consolidated accounts				
EDF	2,840	27.9	2,942	15.9
Controlled entities ⁽¹⁾	5,033	49.4	14,276	77.3
Sub-total	7,873	77.2	17,218	93.2
Non-audit services ⁽²⁾				
EDF	832	8.2	520	2.8
Controlled entities ⁽¹⁾	1,493	14.6	735	4.0
Sub-total	2,325	22.8	1,255	6.8
TOTAL	10,198	100	18,473	100

(1) Fully consolidated subsidiaries and jointly controlled entities whose auditors' fees are included in the consolidated income statement.

(2) Services required by laws and regulations, and services supplied at the request of the Group. Non-audit services mainly correspond to (i) certifications of financial and accounting information or Independent Reports on social, environmental and societal information required under Article L. 225-102-1 of the French Commercial Code, (ii) services relating to disposals of entities, (iii) tax services authorised by local legislation, and (iv) operating process reviews and information system consulting services that are unrelated to the production of accounting and financial information.

Statutory Auditors' fees for 2020

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2020:

(in thousands of euros)	Deloitte network		KPMG network	
	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit - Statutory audit, certification, review of company and consolidated accounts				
EDF	2,794	24.6	2,945	16.2
Controlled entities ⁽¹⁾	4,560 ⁽³⁾	40.1	13,503	74.2
Sub-total	7,354	64.7	16,448	90.4
Non-audit services ⁽²⁾				
EDF	561	4.9	953	5.2
Controlled entities ⁽¹⁾	3,448	30.4	804	4.4
Sub-total	4,009	35.3	1,757	9.6
TOTAL	11,363	100	18,205	100

(1) Fully consolidated subsidiaries and jointly controlled entities whose auditors' fees are included in the consolidated income statement.

(2) Services required by laws and regulations, and services supplied at the request of the Group. Non-audit services mainly correspond to (i) certifications of financial and accounting information or Independent Reports on social, environmental and societal information required under Article L. 225-102-1 of the French Commercial Code, (ii) services relating to disposals of entities, (iii) tax services authorised by local legislation, and (iv) operating process reviews and information system consulting services that are unrelated to the production of accounting and financial information.

(3) The decrease results from a transfer between audit firms with no impact on the overall level of fees to the Group's auditors, and a change of statutory auditor for a significant French entity in the Group, which is now audited by the Group's statutory auditors and another audit firm.

6.2 Statutory auditors' report on the consolidated financial statements

For the year ended December 31, 2021

This is a translation into English of the statutory auditors' report on the consolidated financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.

This statutory auditors' report includes information required by European regulation and French law, such as information about the appointment of the statutory auditors or verification of the information concerning the Group presented in the management report. This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

To the Shareholders,

Opinion

In compliance with the engagement entrusted to us by your General Meeting, we have audited the accompanying consolidated financial statements of Électricité de France S.A. ("EDF", the "Company" or the "Group") for the year ended December 31, 2021.

In our opinion, the consolidated financial statements give a true and fair view of the assets and liabilities and of the financial position of the Group as at December 31, 2021 and of the results of its operations for the year then ended in accordance with International Financial Reporting Standards as adopted by the European Union.

The audit opinion expressed above is consistent with our report to the Audit Committee.

Basis for Opinion

Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described herein in the *Statutory Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report.

Independence

We conducted our audit engagement in compliance with independence requirements of the French Commercial Code (*Code de Commerce*) and the French Code of Ethics (*Code de Déontologie*) for statutory auditors for the period from January 1, 2021 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in Article 5(1) of Regulation (EU) No 537/2014.

Justification of Assessments – Key Audit Matters

Due to the global crisis related to the Covid-19 pandemic, the financial statements of this period have been prepared and audited under specific conditions. Indeed, this crisis and the exceptional measures taken in the context of the state of sanitary emergency have had numerous consequences for companies, particularly on their operations and their financing, and have led to greater uncertainties on their future prospects. Those measures, such as travel restrictions and remote working, have also had an impact on the companies' internal organization and the performance of the audits.

It is in this complex and evolving context that, in accordance with the requirements of Articles L.823-9 and R.823-7 of the French Commercial Code (*Code de Commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the consolidated financial statements.

Valuation of provisions related to nuclear generation in France – back-end of the nuclear cycle, plant decommissioning and last cores – and dedicated assets

Notes 1.3.4.2, 15, 18.1 and 20 to the consolidated financial statements

Key Audit Matter

As at December 31, 2021, the provisions recorded to cover obligations relating to nuclear power plants for which EDF is the operator in France total €46,442 million, including €26,052 million with respect to the back-end of the nuclear cycle (management of spent fuel and radioactive waste) and €20,390 million with respect to the decommissioning of nuclear power plants and last cores.

The valuation of these provisions depends on the regulatory context is described in Notes 1.3.4.2 and 15. It requires defining technical and financial assumptions and using complex calculation models.

They are updated and the assumptions taken into consideration in the models are reviewed at least once a year. As of 31 December 2021, the methodologies used to determine the discount rate changed in 2020 remain unchanged in 2021. These assumptions reflect management's best estimate at the reporting date of the impacts of the applicable regulation, the implementation of decommissioning and storage processes or changes in the main financial parameters. More specifically, they reflect the impacts of (i) the extension of amortization period for 1,300MW nuclear fleet, (ii) the studies carried out to prepare the dismantling plan of Fessenheim, on the nuclear plants in operation, and the updated scenario regarding interim spent fuel storage. Furthermore, the Company is required to allocate so-called "dedicated" assets to secure financing of certain categories of nuclear provisions in France. The realizable value of these assets should allow the Company's commitments relating to the decommissioning of nuclear power plants and long-term storage of radioactive waste in France to be covered (Notes 1.3.4.5, 15.1.2 and 18.1). The realizable value of these dedicated assets, for an amount of €37,454 million (or a net carrying amount of €35,172 million) as of December 31, 2021, was determined

Responses

We have analysed the measures for recognising provisions related to nuclear generation in France and gained an understanding of the industrial scenarios for decommissioning nuclear power plants and the technical solutions adopted in terms of management of spent fuel and radioactive waste. We have assessed the compliance of the methods for determining the provisions with regard to applicable accounting, legal and regulatory measures.

We have verified the calculation models used by the Company and assessed the assumptions adopted in terms of cost, forecast cash outflows and financial parameters (discount and inflation rates).

Our work also consisted in verifying the type of costs used to determine provisions and assessing the reconciliation of forecast costs and forecast cash outflows with industrial scenarios as well as the available studies and quotes, based on the current year change in assumptions.

We have also assessed the appropriateness of:

- margins for uncertainties and risks included in the provisions, to take into account the degree of control over decommissioning techniques and the management of spent fuel and radioactive waste.
- the series and mutualisation effects adopted in the quotes for decommissioning nuclear power plants in operation, for which the nominal cost represents €20,479 million to economic conditions at the end of the period, for a provision of €12,680 million in discounted value (note 15.1.1.5).

Concerning the inflation and discount rates and their calculation methods adopted by management described in note 15.1.1.5, we have verified their compliance with applicable accounting standards and regulatory measures, since 2020. We have reconciled the data used for this purpose with available market

based on the fair value of diversified equity and bonds investments, and the equity value of a non-listed assets portfolio managed by the division EDF Invest. These dedicated assets are classified as growth assets, fixed-income assets and yield assets and ought to be compliant with the chart of responsible investor implemented in 2021.

We considered the valuation of provisions related to nuclear generation and dedicated assets to be a key audit matter due to:

- the sensitivity of the assumptions on which the valuation of these provisions is based, notably in terms of cost, inflation and long-term discount rates, as well as the depreciation periods of nuclear power plants in operation, and forecast cash outflows; the modification of these parameters can lead to a material revision in the provisioned amounts;
- the negative impacts on the financial position of the Company (cash earmarked to increase the amount of dedicated assets) in the event of an increase in nuclear provisions in France, a change in the realisable values of dedicated assets or changes in the coverage rate of nuclear provisions for dedicated assets;
- it being specified that the valuation of provisions covers and includes uncertainties related to the fact that certain scenarios and technical solutions have never been implemented.

data or expertise-based documentation.

Concerning the securing of financing for certain of these provisions through dedicated assets, we have reconciled the realisable value of the dedicated assets in the portfolio at the reporting date with the available certificate of depository statements, and available external data and valuations. We have also assessed the accounting treatment and their valuation, in particular, the compliance with the IFRS 9 accounting standard of the impairment model described in the accounting principles and methods of the note 18.1.

Finally, we have verified the appropriateness of the disclosures given in the Notes for the provisions related to nuclear generation in France and the dedicated assets, notably regarding the sensitivity of the valuation of provisions to changes in macro-economic assumptions (note 15.1.1.5) and the climate and environmental matters taken into consideration (notes 20.2.1 et 20.4).

Valuation of goodwill, intangible assets with indefinite useful live, property, plants and equipments

Notes 1.3.4.1, 1.3.4.4, 10 and 20.2.2. to the consolidated financial statements

Key Audit Matter

As at December 31, 2021, the goodwill, intangible assets with indefinite useful live, tangible assets and investments in associates and joint ventures represent significant amounts of the Group's equity. They are mostly related to non-regulated activities.

Notes 1.3.4.4 and 10.8 describe the methodologies adopted and applied to determine if indicators exist showing that an asset may be subject to an impairment loss. These notes also describe the methods for performing impairment tests. Note 20.2.2. also describes how the impairment tests took into consideration climate and environmental matters. The tests and the determination of recoverable amounts are carried out annually at the cash-generating unit (CGU) level for those holding intangible assets with indefinite lives or goodwill. The recoverable amount corresponds, for the majority of these CGU, to the value in use determined based on the discounted value of future cash flows.

We considered in particular the valuation of non-regulated assets in France, the United Kingdom and in Italy, to be a key audit matter, due to the sensitivity of valuations to macro-economic, industry and financial assumptions to determine recoverable amounts and the estimates and judgments that they require from management.

In particular, as indicated in note 10.8.2, in a market environment with upward trends of power price, increasing European efforts towards decarbonized power mix and persistent low interest rates, a lowering demand for energy, in connection with energy efficiency policies and development of renewable energies, tariff increases limited by laws or strained power generation plants, may significantly decrease the recoverable amount of certain goodwill, intangible and tangible assets related to non-regulated activities and may lead to significant impairment losses.

Responses

As part of our work, we analysed the existence of indicators of impairment losses (or reversal of impairment losses) at the CGU level. We have also gained an understanding of the process for formulating estimates and assumptions made by management as part of impairment testing and we have also assessed the appropriateness of the valuation model.

We have verified, for the CGU tested, that the discounted future cash flow projections correspond to those generated by the assets included in these CGU and that they were consistent with (i) the CGU budget data, and, beyond, with the Group's long-term assumptions, (ii) past performances, (iii) market outlook and (iv) the expected operating life of the assets.

We have assessed, by conducting interviews with management, the different underlying assumptions (economic growth, price of raw material and CO₂, electricity demands, production capacities and interconnections and changes in energetic mix) on which the medium and long-term price assumptions are based, by substantiating them with external studies carried out by international organisms or experts in energy.

In particular, we have verified the underlying assumptions of the long-term price scenarios were on track with European targets for decarbonization, as described in note 10.8.2.

We have verified the determination methods and the consistency of the discount rate assumptions, based on the weighted average cost of capital (WACC) by geographic area and by activity and, in particular, analyzed, with the assistance of our internal experts, the consistency of risk-free rates and the risk premiums adopted by management with the underlying market assumptions.

Finally, we have assessed if notes 1.3.4.4 and 10.8 of the consolidated financial statements provide appropriate disclosure in particular in terms of assumptions adopted to perform impairment tests and sensitivity analyses.

Specific Verifications

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations of the Group's information given in the management report of the Board of Directors.

We have no matters to report as to its fair presentation and its consistency with the consolidated financial statements.

We attest that the consolidated non-financial statement required by Article L.225-102-1 of the French Commercial Code is included in the information pertaining to the Group presented in the management report, being specified that, in accordance with the provisions of Article L.823-10 of the code, we have not verified the fair presentation and the consistency with the consolidated financial statements of the information contained therein and should be reported on by an independent insurance services provider.

Report on Other Legal and Regulatory Requirements

Format of presentation of the consolidated financial statements intended to be included in the annual financial report

We have also verified, in accordance with the professional standard applicable in France relating to the procedures performed by the statutory auditor relating to the annual and consolidated financial statements presented in the European single electronic format, that the presentation of the consolidated financial statements intended to be included in the annual financial report mentioned in Article L.451-1-2, I of the French Monetary and Financial Code (code monétaire et financier), prepared under the responsibility of the Chief Executive Officer, complies with the single electronic format defined in the European Delegated Regulation N° 2019/815 of 17 December 2018. As it relates to consolidated financial statements, our work includes verifying that the tagging of these consolidated financial statements complies with the format defined in the above delegated regulation.

Based on the work we have performed, we conclude that the presentation of the consolidated financial statements intended to be included in the annual financial report complies, in all material respects, with the European single electronic format.

We have no responsibility to verify that the consolidated financial statements that will ultimately be included by your company in the annual financial report filed with the AMF are in agreement with those on which we have performed our work.

Appointment of the Statutory Auditors

We were appointed as statutory auditors of Electricité de France S.A. by the General meeting of June 6, 2005 for KPMG Audit and the by decision of the Board of Directors of April 25, 2002 for Deloitte & Associés.

As at December 31, 2021, KPMG Audit was in the 17th year of total uninterrupted engagement and Deloitte & Associés was in the 20th year of total uninterrupted engagement, which for both 17 years since securities of the Company were admitted to trading on a regulated market.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards as adopted by the European Union, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The consolidated financial statements were approved by the Board of Directors.

Statutory Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Objectives and audit approach

Our role is to issue a report on the consolidated financial statements. Our objective is to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As specified in Article L. 823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the statutory auditor exercises professional judgment throughout the audit and furthermore:

- Identifies and assesses the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control.
- Evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the consolidated financial statements.
- Assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the statutory auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the consolidated financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein.
- Evaluates the overall presentation of the consolidated financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtains sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. The statutory auditor is responsible for the direction, supervision and performance of the audit of the consolidated financial statements and for the opinion expressed on these consolidated financial statements.



FINANCIAL STATEMENTS

Statutory auditors' report on the consolidated financial statements

Report to the Audit Committee

We submit a report to the Audit Committee which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control regarding the accounting and financial reporting procedures that we have identified.

Our report to the Audit Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the

consolidated financial statements of the current period and which are therefore the key audit matters, that we are required to describe in this report.

We also provide the Audit Committee with the declaration provided for in Article 6 of Regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by Articles L.822-10 to L.822-14 of the French Commercial Code (code de commerce) and in the French Code of Ethics (*Code de Déontologie*) for statutory auditors. Where appropriate, we discuss with the Audit Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Paris La Défense, February 17, 2022

The Statutory Auditors

KPMG S.A.

Marie Guillemot

Michel Piette

Deloitte & Associés

Damien Leurent

Christophe Patrier

6.3 EDF SA financial statements at 31 December 2021

NB: Most figures in the tables are reported in millions of euros. The resulting approximation can lead to slight differences in totals or movements and changes.

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Income statement

(in millions of euros)		Notes	2021	2020
Sales *	4		53,001	44,315
Change in inventories and capitalised production			1,439	1,360
Operating subsidies	5		5,554	8,148
Reversals of provisions and impairment	6		3,649	2,823
Other operating income and transfers of charges	7		1,100	846
I TOTAL OPERATING INCOME			64,743	57,492
Purchases and other external expenses	8		43,528	36,213
Fuel purchases used		4,422		3,269
Energy purchases		21,752		16,783
Services and other purchases used		17,354		16,161
Taxes other than Income taxes	9		2,254	2,694
Personnel expenses	10		6,407	6,439
Depreciation, amortisation and provisions	11		7,507	7,514
Depreciation and amortisation	11.1	4,363		4,538
Provisions and impairment	11.2	3,144		2,976
Other operating expenses	12		2,480	2,738
II TOTAL OPERATING EXPENSES			62,176	55,598
OPERATING PROFIT (I - II)			2,567	1,894
III JOINT OPERATIONS			-	-
IV FINANCIAL RESULT	13		(1,465)	(2,503)
PROFIT OR LOSS BEFORE INCOME TAXES AND EXCEPTIONAL ITEMS (I - II + III + IV)			1,102	(609)
V EXCEPTIONAL RESULT	14		1,765	425
VI INCOME TAXES	15		(1,410)	406
PROFIT OR LOSS (I - II + III + IV + V + VI)			1,457	222

* Production of goods for export in 2021: €15,045 million; production of services for export in 2021: €392 million.

Balance sheet

ASSETS

		31/12/2021			31/12/2020
		Amortisation, depreciation and impairment			
(in millions of euros)	Notes	Gross values		Net values	Net values
Intangible assets	16-17	3,066	1,834	1,232	1,103
Property, plant and equipment owned by EDF	16-17	94,675	63,714	30,961	30,782
Property, plant and equipment operated under concessions	16-17	16,029	9,343	6,686	6,623
Tangible and intangible assets in progress	16-17	22,242	89	22,153	21,556
Investments and related receivables		60,974	709	60,265	59,345
Investment securities		25,403	258	25,145	24,393
Loans and other financial assets		23,829	146	23,683	16,282
Financial assets	18	110,206	1,113	109,093	100,020
TOTAL I FIXED ASSETS		246,218	76,093	170,125	160,084
Inventories and work-in-progress	19	11,242	289	10,953	10,541
Advances on orders	20	719	3	716	719
Trade and other receivables	20	24,198	382	23,816	22,113
Marketable securities	21	10,605	20	10,585	13,061
Cash instruments	20	2,529	-	2,529	1,814
Cash and cash equivalents	20-22	8,397	-	8,397	5,364
Prepaid expenses	20	1,015	-	1,015	987
TOTAL II CURRENT ASSETS		58,705	694	58,011	54,599
Deferred charges (III)		226	-	226	242
Bond redemption premiums (IV)		684	321	363	318
Unrealised foreign exchange losses (V)	23	1,324	-	1,324	872
TOTAL ASSETS (I + II + III + IV + V)		307,157	77,108	230,049	216,115

EQUITY AND LIABILITIES

<i>(in millions of euros)</i>	<i>Notes</i>	31/12/2021	31/12/2020
Capital		1,619	1,550
Capital-related premiums		17,952	16,506
Revaluation surplus		688	678
Reserves			
Legal reserves		155	155
Other reserves		2,977	2,977
Retained earnings		8,734	9,121
Profit or loss for the financial year		1,457	222
Interim dividend		(947)	-
Investment subsidies		167	160
Tax-regulated provisions		5,777	5,786
TOTAL EQUITY	24	38,579	37,155
Additional equity	25	12,857	11,473
Special concession liabilities	26	2,320	2,282
TOTAL I EQUITY AND CONCESSION ACCOUNTS		53,756	50,910
Provisions for risks	27	2,904	3,140
Provisions related to nuclear generation (back-end of the nuclear cycle, plant decommissioning and last cores)	28	46,442	44,822
Provisions for decommissioning of non-nuclear facilities	29	770	772
Provisions for employee benefits	30	11,867	11,616
Provisions for other expenses	31	1,424	1,526
Provisions for expenses		60,503	58,736
TOTAL II PROVISIONS		63,407	61,876
Financial liabilities	33	57,498	52,855
Advances and progress payments received	32	7,499	7,188
Operating, investment and other liabilities	32	40,315	34,673
Cash instruments	32	4,239	5,075
Deferred income	32	3,075	3,202
TOTAL III LIABILITIES	32	112,626	102,993
Unrealised foreign exchange gains (IV)	34	260	336
TOTAL EQUITY AND LIABILITIES (I + II + III + IV)		230,049	216,115

Cash flow statement

(in millions of euros)	Notes	2021	2020
Operating activities			
Profit/(loss) before income tax		2,867	(184)
Amortisation, depreciation and provisions		6,414	8,071
Capital (gains)/losses		(683)	(524)
Financial income and expenses		(1,401)	(780)
Changes in working capital ⁽¹⁾		3,128	719
Net cash flow from operations		10,325	7,302
Net financial expenses, including dividends received ⁽²⁾		1,154	841
Income taxes paid		(1,954)	(776)
Net cash flow from operating activities	(A)	9,525	7,367
Investing activities			
Investments in property, plant and equipment and intangible assets		(5,726)	(5,848)
Proceeds from sale of property, plant and equipment and intangible assets		11	15
Changes in financial assets ⁽³⁾		(5,438)	(4,424)
Net cash flow used in investing activities	(B)	(11,153)	(10,257)
Financing activities			
Issuance of Green Bonds convertible into new shares and/or exchangeable for existing shares (<i>Océanes vertes</i>) ⁽⁴⁾		-	2,569
Issuance of borrowings and underwriting agreements ⁽⁵⁾		7,952	9,928
Repayment of borrowings and underwriting agreements ⁽⁵⁾		(5,918)	(11,815)
Dividends paid	24	(84)	-
Issuance and redemption of perpetual subordinated bonds, net of expenses ⁽⁶⁾	2.2.1	1,240	2,081
Funding contributions received for assets operated under concessions		5	7
Investment subsidies		14	9
Net cash flow from financing activities	(C)	3,209	2,779
Net increase/(decrease) in cash and cash equivalent	(A)+(B)+(C)	1,581	(111)
CASH AND CASH EQUIVALENTS – OPENING BALANCE ⁽⁸⁾	22	(256)	(80)
Effect of currency fluctuations		(80)	(102)
Financial income on cash and cash equivalents		35	38
Other ⁽⁷⁾		281	(1)
CASH AND CASH EQUIVALENTS – CLOSING BALANCE ⁽⁸⁾	22	1,561	(256)

(1) The change in working capital in 2021 is principally explained by the €2,268 million excess CSPE compensation for EDF, which led to recognition of a CSPE liability at 31 December 2021 amounting to €294 million (see note 32(4)).

(2) The variation in this item is principally explained by the higher level of dividends received in 2021 compared to 2020 (see note 13), and income from investments included in dedicated assets.

(3) The change in financial assets is principally explained by the increase in loans to subsidiaries (see note 18) and the lower value of the marketable securities portfolio (see note 21).

(4) See the financial statements at 31 December 2020.

(5) In 2021, EDF transferred bonds under repurchase agreements for the amount of €2,790 million and made corresponding repayments of €(1,916) million. These operations are presented in the lines reporting issuance and repayment of borrowings. Apart from these repurchase operations, the change in 2021 in "Issuance of borrowings and underwriting agreements" and "Repayment of borrowings and underwriting agreements" was an increase of €3,047 million, notably explained by the €1,850 million issue of senior Green Bonds maturing on 29 November 2033 (see note 2.2.1) and income of €458 million from EDF's margin calls on derivatives with banking partners.

(6) €1,250 million issue value (see note 2.2.1) and a €(10) million issue premium.

(7) Other items at 31 December 2021 amount to €281 million and concern the reclassification at 1 January 2021 of debit balances relating to margin calls on derivatives, which were previously netted with credit balances to report the overall net position in the balance sheet (see note 32). In the cash flow statement, balances relating to margin calls on derivatives are presented in the Net cash flow from financing activities (see footnote 5 above).

(8) "Cash and cash equivalents – opening balance" and "Cash and cash equivalents – closing balance" do not include investment funds or negotiable debt instruments maturing in more than three months. Details of the variation in cash and cash equivalents are presented in note 22.

Notes to the financial statements

Électricité de France SA (EDF), the parent company of the EDF group, is a French *société anonyme* governed by French law and registered in France (22-30 avenue de Wagram, 75008 Paris), operating in electricity generation and electricity and gas supply. EDF also covers all the business activities of the Island Energy Systems (SEI) for Corsica and France's overseas departments.

EDF SA's financial statements at 31 December 2021 were prepared under the responsibility of the Board of Directors and approved by the directors at the Board meeting held on 17 February 2022. They will become final after approval at the General Shareholders' Meeting to be held on 12 May 2022.

Note 1 Accounting principles and methods

1.1 Accounting standards

EDF's financial statements are prepared in accordance with the accounting principles and methods defined in regulation 2014-03 of 5 June 2014 issued by the ANC (Autorité des normes comptables, France's Accounting Standards Authority) concerning the current national chart of accounts.

They also comply with the "Recommendations and observations for taking the consequences of the Covid-19 event into account in financial statements and positions established from 1 January 2020", published on 18 May 2020 by the ANC and last updated on 9 July 2021, and the update to ANC Recommendation 2013-02 of 7 November 2013 regarding measurement and recognition rules for retirement commitments and benefits.

The accounting and valuation methods applied are identical to those used in the financial statements for the year ended 31 December 2020 and incorporate the following two developments.

Interest Rate Benchmark Reform

This reform has been applicable since 1 January 2021. The principal interest rates concerned that are used by EDF are the Eonia, the Libor USD and the Libor GBP.

The modification of effective interest rates resulting from the reform is applied prospectively. There is no significant impact on profit and loss and the hedging relationships for the instruments concerned are continued.

This reform has no significant impact on EDF's net income for 2021, and its effects are mainly operational (renegotiation of contracts, fallback provisions, information system upgrades).

Due to its long-term fixed-rate borrowing position (see note 33.1), EDF's exposure is essentially concentrated in interest rate derivatives that are used to swap fixed-rate debt to floating rates. On these instruments, the reference rate curves for collateral agreements have been modified, replacing the Eonia by the Ester. This led to receipt of €22 million cash compensation, recognised in financial result.

Intragroup cash management, cash pooling and liquidity investment agreements were amended in 2021, replacing the Eonia by the Ester, and the Libor GBP by the Sonia.

Also, EDF adhered to the ISDA Fallback protocol in November 2021, and the Libor GBP was replaced by the Sonia for all the derivatives concerned from 1 January 2022.

For the USD Libor, the transition operations will take place in line with the end date for its publication i.e. by 30 June 2023.

Retirement indemnity commitments

At its meeting of 5 November 2021, the ANC's Committee updated its Recommendation 2013-02 of 7 November 2013 on measurement and recognition rules for commitments concerning retirement and similar benefits, introducing a choice regarding the spreading of rights earned under defined-benefit plans.

As a result, EDF has made a slight adjustment to its benefit attribution method for commitments for retirement gratuities. Under the chosen approach, rights earned are now allocated on a straight-line basis over the period prior to reaching retirement age. This change of method has a limited impact on provisions for the year (see note 24 (2)).

1.2 Management judgments and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in EDF's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

In a context characterised by volatility on the financial and energy markets, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of EDF's assets.

The principal operations for which EDF uses estimates and judgments are the following:

1.2.1 Depreciation period of nuclear power plants

In the specific case of the depreciation period of its French nuclear power plants, EDF's industrial strategy is to continue operation beyond 40 years, in optimum conditions as regards safety and efficiency.

EDF has therefore been making preparations for several years to extend the operation period, and making the necessary investments under its *Grand Carénage* industrial refurbishment programme which was approved in principle by the Board of Directors in January 2015.

The depreciation period of 900MW series power plants was extended from 40 years to 50 years in 2016 (except for Fessenheim where both reactors were permanently shut down in the first half of 2020) since all the technical, economic and governance conditions were fulfilled.

On 23 February 2021, the Nuclear Safety Authority (Autorité de sûreté nucléaire (ASN)) issued a resolution on the conditions for continued operation of EDF's 900MW reactors beyond their fourth 10-year inspection. The ASN considered that "the measures planned by EDF combined with those prescribed by ASN open the prospect of continued operation of these reactors for a further ten years following their fourth periodic safety review". This resolution ends the "generic" phase of the review, which concerns the studies and modifications of facilities common to all the 900MW reactors, which all have a similar design model.

After the pilot reactor Tricastin 1 in December 2019, Bugey 2, Bugey 4 and Tricastin 2 reached the milestone of 40 years of operation, and were restarted after a successful fourth 10-year inspection during 2021. Three other 10-year inspections were in progress at 31 December 2021 (Dampierre 1, Bugey 5 and Gravelines 1). The fourth 10-year inspection of Dampierre 1 was completed on 5 February 2022.

The depreciation period of other series (1,300MW and 1,450MW), which are more recent, remained at 40 years until 31 December 2020.

In 2021, the technical, economic and governance conditions for extending the depreciation period of 1,300MW-series plants were fulfilled, and consequently EDF proceeded to the corresponding change of estimate at 1 January 2021 for all its 1,300MW power plants (see note 2.1.1, Extension to 50 years of the depreciation period of the 1,300MW PWR series in France).

The depreciation period of the 1,450MW series (the four reactors at Chooz and Civaux), which are much more recent, currently remains at 40 years as the conditions for extension are not yet fulfilled.

These depreciation periods take into account the date of recoupling with the network after the most recent 10-year inspection.

1.2.2 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning technical processes, costs, inflation rates, long-term discount rates, the depreciation period of plants currently in operation and disbursement schedules.

These parameters are therefore re-estimated at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by EDF.

EDF considers that the assumptions used at 31 December 2021 are appropriate and justified. However, any future change in assumptions could have a significant impact on EDF's financial statements (see note 28).

The main assumptions and sensitivity analyses relating to nuclear provisions are presented in note 28.5.

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs also carries uncertainty factors such as:

- changes in the regulations, particularly on safety, security and environmental protection, and financing of long-term nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*);
- changes in the contractual terms for spent fuel management;
- changes in certain financial parameters such as discount rates and/or inflation rates;
- the depreciation period of nuclear facilities (calculation of decommissioning provisions for nuclear plants in operation is based on the depreciation period of the assets concerned, *i.e.* 50 years for 900MW and 1,300MW series power plants and 40 years for 1,450MW series power plants).

1.2.3 Pensions and other long-term and post-employment benefit obligations

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates, inflation rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2020 are presented in note 30.4. These assumptions are updated annually. EDF considers the actuarial assumptions used at 31 December 2021 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and EDF's net income.

1.2.4 Energy supplied but not yet measured and billed

As explained in note 1.3, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistic models and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

1.3 Sales

Sales essentially comprise income from energy sales (to final customers and as part of trading activities), and sales of services. EDF's energy sales revenues include delivery services through the energy distribution network purchased from the subsidiary Enedis and invoiced to end-customers.

Sales are recognised when delivery of goods has taken place or the service has been completed.

The quantities of energy delivered to EDF customers but not yet measured and billed at the end of the period are calculated based on the quantities used by the sites of the EDF balance-responsible entity less the quantities billed, after losses measured by a statistical method presented to the Commission de régulation de l'énergie (CRE), the French Energy regulation Commission. These quantities are valued using an average price determined by reference to energy invoiced in the previous month.

Sales of goods and services not completed at the balance sheet date are valued by reference to the stage of completion at that date.

Sales of energy to EDF Trading, the EDF group's trading company, are recorded at their contractually stipulated amount.

Capacity mechanism

French law 2010-1488 of 7 December 2010 on the new organisation of the electricity market introduced an obligation in France to contribute to guaranteeing power supply security from 1 January 2017.

A capacity mechanism was therefore set up in France to ensure secure power supplies during peak periods.

Operators of electricity generation facilities and load-shedding operators must have their capacities certified by RTE, and commit to a forecast level of availability for a given year of delivery. In return, they are awarded capacity certificates. Meanwhile, electricity suppliers and purchasers of power to compensate for network losses (obligated actors) must have capacity certificates equivalent to consumption by their customers in peak periods. Suppliers pass on the cost of the capacity mechanism to final customers through their sale prices.

The system is completed by registers for trading of capacities between actors.

Capacity auctions are held several times a year.

EDF is concerned by both aspects of this system, as an operator of electricity plants and as an electricity supplier.

The operations are recorded as follows:

- sales of certificates are recognised in income when the auctions or over-the-counter sales take place;
- the cost of the capacity mechanism passed on to final customers through regulated sales tariffs and market-price offers is recognised in sales revenues and when the electricity is delivered. In addition, the ARENH price, although it has not changed since first set up, is considered to have included a capacity value since 1 January 2017 when the capacity mechanism took effect, as the terms of transfer for the capacity guarantees associated with the ARENH system were defined by the French Energy Regulatory Commission CRE;
- stocks of certificates are stated either at their certification value (*i.e.* cost of certification by RTE) or at their purchase value on the markets;
- decreases in the stock of certificates are valued at the weighted average unit cost. The timing of recognition depends on the actor:
 - › operators of installations: when the auction sales take place,
 - › obligated actors: spread on a straight-line basis over the 5-month peak period;
- for obligated actors, if there is a shortfall in the stocks of capacity certificates, a provision is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation;
- at the closing date, if the realisable value of the stock of capacity certificates is lower than its net book value, impairment is recognised.

1.4 Intangible assets

1.4.1 Research and development expenses

Research expenses are recognised as expenses in the financial period incurred.

Development costs that meet the requirements for capitalisation laid down in Article 211-5 of the French national chart of accounts are included in intangible assets and amortised on a straight-line basis over their foreseeable useful life.

1.4.2 Other intangible assets

Other intangible assets mainly consist of software and storage capacity reservation costs.

Royalties paid for SaaS (Software as a Service) are generally charged to expenses as the services are provided. To qualify as intangible assets, expenses on SaaS contracts must confer a right of control to the user in addition to access to the software for a fixed period.

Intangible assets other than research and development expenses are amortised on a straight-line basis over their useful lives regardless of whether they are generated in-house or purchased.

1.5 Property, plant and equipment

EDF's property, plant and equipment is reported under two balance sheet headings, as appropriate to the business and contractual circumstances of the assets' use:

- property, plant and equipment owned by EDF, essentially nuclear generation facilities;
- property, plant and equipment operated under concessions.

1.5.1 Initial measurement

Property, plant and equipment is recorded at acquisition or production cost.

- The cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction of the asset.
- The cost of property, plant and equipment also includes the initial estimate of decommissioning costs. These assets are associated with the provisions recorded to cover decommissioning obligations. At the date of commissioning, property, plant and equipment is measured and recorded in the same way as the corresponding provision (see note 1.15).
- Decommissioning costs for nuclear generation installations also include last core costs (see note 1.15).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded in Property, plant and equipment, and subsequent payments by the partner are deducted from the accrued income.

EDF capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

Strategic safety spare parts for generation facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

The costs of work done during major inspections that are necessary for continued operation by generation assets are capitalised and amortised over a period corresponding to the time elapsing between two inspections.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

Borrowing costs attributable to the financing of an asset incurred during the construction period are recognised as expenses.

1.5.2 Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Company expects to draw future economic benefits from their use.

The expected useful lives for the main facilities are as follows:

- hydroelectric dams 75 years
- electromechanical equipment used in hydropower plants 50 years
- fossil-fired power plants
- (mainly CCGT-Combined Cycle Gas Turbine plants) 25 to 45 years
- nuclear generation facilities 40 to 50 years
- distribution installations (lines, substations) 20 to 45 years

1.5.3 Concession agreements

EDF is the operator for two types of concessions:

- public electricity distribution concessions in which the grantors are local authorities (municipalities or syndicated municipalities);
- hydropower concessions with the French State as grantor.

The accounting treatment of concessions is based on the 1975 accounting guide for concession operator firms, as there are no specific instructions in the national chart of accounts.

1.5.3.1 Public electricity distribution concessions

EDF is the concession operator for the island public distribution networks located in Corsica and France's overseas departments, under concession agreements based on standard concession specifications approved by the public authorities. Concession agreements signed since 2018 follow the concession model negotiated in 2017 with the National Federation of Licensing Authorities (Fédération nationale des collectivités concédantes et régies – FNCCR) and France Urbaine, while other concessions follow the concession model signed with the FNCCR in 1992 (and updated in 2007).

Concession assets are reported in the balance sheet assets as property, plant and equipment operated under concessions, regardless of their initial financing, at acquisition cost or their estimated value at the transfer date when supplied by the grantor. An offsetting liability is recognised for any assets supplied for nil consideration by concession grantors.

1.5.3.2 Hydropower concessions

Hydropower concessions follow standard rules approved by decree.

For concessions granted before 1999, hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc.), while for more recent concessions, they also include hydropower generation equipment and switching facilities (alternators, etc.).

Assets used in these concessions are recorded under "Property, plant and equipment operated under concessions" at acquisition cost.

Depreciation is calculated over their useful life, which is generally identical to the term of the concession, although electromechanical equipment is depreciated over a period of 50 years.

Additional depreciation is also booked in the balance sheet liabilities for assets operated under concessions (see note 1.14.2).

Most concessions that expired before 2012 were initially for 75 years and were renewed for terms of 30 to 50 years. However, the French government has not yet renewed 29 concessions that have expired. Since their expiry these concessions have thus been in the "rolling extension" situation defined by the law. If, at the expiry date of a concession, no new concession has been established, "the concession is extended on the existing terms until such time as a new concession is granted", so as to ensure continuity of operations in the meantime (Article L. 521-16 par. 3 of the French Energy Code).

When a concession is operated in these circumstances, a fee based on the "rolling extension" profits has been payable since 2019. This fee amounts to 40% of the normative earnings of the concession as defined by Article R. 523-5 of the French Energy Code, less corporate income tax.

1.6 Long-term asset impairment

At each reporting date, EDF assesses whether there is an indication that an asset could have significantly lost value. If so, an impairment test is carried out as follows:

- EDF measures any long-term asset impairment by comparing the carrying value of these assets, combined into groups where necessary, and their recoverable amount, usually determined using the discounted future net cash flow method. When this recoverable amount is lower than the value in the balance sheet, an amount equivalent to the difference is written off under "Depreciation and impairment";
- the discount rates used are based on the weighted average cost of capital (WACC) for each asset or group of assets concerned;
- future cash flows are calculated on the basis of the best available information at the valuation date;
 - for the first few years, the flows correspond to the Medium-Term Plan (MTP). Over the MTP horizon, energy and commodity prices are determined based on available forward prices, taking hedges into consideration,
 - beyond the MTP horizon, cash flows are estimated based on long-term assumptions prepared for each country and each energy, in a scenario development process that is updated annually. Medium and long-term electricity prices are constructed analytically by assembling blocks of assumptions, e.g. economic growth, commodity prices (oil, gas, coal) and CO₂, demand for electricity, interconnections, and developments in the energy mix (rise of renewable energies, installed nuclear capacity, etc.) with fundamental models of supply-demand balance. The Group refers in particular to external analyses for each assumption object (for example, for commodities and CO₂, which are primary factors in electricity prices, EDF compares its own scenarios with scenarios developed by organisations such

as the AIE, IHS, Wood Mackenzie or Aurora, bearing in mind that each of these analysts itself proposes a cone of scenarios corresponding to different macro-economic environments);

- income from capacity market mechanisms is also taken into consideration in valuing generation assets.

These calculations may be influenced by several variables:

- changes in discount rates;
- changes in market prices for energy and commodities and tariff regulations;
- changes in demand and EDF's market shares, and the attrition rate on customer portfolios;
- the useful life of facilities, or the duration of concession agreements where relevant;
- the growth rates used beyond the medium-term plans and where relevant the terminal values taken into consideration.

1.7 Financial assets

1.7.1 Investments

Investments are carried at acquisition cost.

Gains and losses on sales of investments are valued using the FIFO (first in first out) method.

Transfer duties, fees and commissions and legal fees related to acquisitions of investments are included in the cost of acquisition of the asset.

Expenses of this type relating to other shares are included in expenses. Tax-regulated amortisation of acquisition costs is recorded in an excess depreciation account.

When the book value of investments is higher than their value in use, impairment is recorded equivalent to the difference.

For investments in companies consolidated by the EDF group, value in use is principally determined by reference to the entity's equity value consolidated in the Group's financial statements. It also takes other factors into consideration where relevant, such as information gathered during impairment tests conducted by the Group.

1.7.2 Investment securities

EDF holds investment securities comprising financial assets intended to finance operations at the end of the nuclear cycle, for which provisions have been accrued. These assets are managed separately from other financial assets and investments in view of their specific objective, and consist of bonds, equities, collective investment funds and "reserved" funds.

Other investments also include treasury shares that cover obligations relating to debt instruments providing access to the Company's capital, acquired under a liquidity contract with an investment services company or through an external growth operation or capital reduction.

Shares are recorded at acquisition cost. Transfer duties, professional fees, commissions, legal expenses and purchasing costs are all charged to expenses, applying the option used for other investments.

Investment securities (shares and bonds) are recorded at acquisition cost. If the carrying amount of a security is lower than the acquisition cost, the unrealised capital loss is fully covered by a provision without being netted against potential gains on other securities. The carrying amount of listed securities is assessed individually, taking the stock market price into account. For unlisted securities, the

carrying amount is also assessed individually, mainly by reference to the growth prospects of the companies concerned and their share prices.

1.7.3 Other financial assets

EDF grants short-term loans in foreign currencies to its subsidiaries for the purposes of the Group's activities.

In order to reduce exposure to foreign exchange risks, EDF mainly finances these loans by short-term commercial paper issues in foreign currencies and in Euros, together with the use of currency hedging derivatives. Capitalised receivables are stated at nominal value. Impairment is recognised when the market value falls below the book value.

1.8 Inventories and work-in-progress

The initial cost of inventories includes all direct material costs (including the effect of hedging), labour costs and a share of indirect production costs.

Inventory consumption is generally valued under the weighted average unit cost method. Consumption of greenhouse gas emission rights and Energy Savings Certificates is valued under the FIFO (first in first out) method.

Inventories are carried at the lower of historical cost or net realisable value.

1.8.1 Nuclear fuel and materials

Inventory accounts include:

- nuclear materials, whatever their form during the fuel fabrication cycle;
- fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (e.g. fluorination, enrichment, fabrication, etc.).

In application of the concept of "loaded fuel" as defined in the ministerial order of 21 March 2007, the cost of inventories for fuel loaded in the reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

Nuclear fuel consumption is determined by component (natural uranium, fluorination, enrichment, fuel assembly fabrication) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories, applied to each component. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

1.8.2 Other operating inventories

Other operating inventories include:

- fossil fuels required for operation of fossil-fired power plants;
- operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- greenhouse gas emission rights and Energy Savings Certificates acquired for the generation cycle (see notes 1.19.1 and 1.19.2);
- gas stocks, valued at weighted average cost, including direct and indirect purchase costs, especially transport costs;
- certificates issued under the capacity mechanisms (capacity guarantees in France) (see note 3.5).

Impairment of spare parts depends mainly on the turnover of these parts.

1.9 Accounts receivable and marketable securities

1.9.1 Trade receivables

Trade receivables are initially stated at nominal value.

They also include the value of unbilled receivables for energy already supplied.

A write-down is recorded when, based on the probability of recovery assessed according to the type of receivable, the recoverable amount of receivables falls below their book value. Depending on the nature of the receivable, the risk associated with doubtful receivables is assessed individually or by reference to provision matrices based on credit loss histories. EDF does not bear the risks of non-payment for the delivery portion of these receivables, which is borne by Enedis.

1.9.2 Marketable securities

Marketable securities are initially recorded as assets at acquisition cost, and restated at the lower of historical cost or present value at year-end.

For listed securities, the present value is equal to the year-end stock market price. For unlisted securities, the market value is the probable trading value taking the Company's growth prospects into consideration.

Provisions are recorded to fully cover any unrealised losses, without netting against unrecorded unrealised gains.

Gains and losses on sales of marketable securities are valued using the FIFO (first in first out) method.

1.10 Bond issuance expenses and redemption premiums

Bond redemption premiums and any issue premiums are amortised in equal portions prorated to the duration of the bond (straight-line method), regardless of the redemption pattern, applying the option allowed by Article 212-10 of the national chart of accounts.

For the specific case of the OCEANE bond issue of September 2020, EDF decided to apply the "two separate operations" method for recognition of the issue premium, and the accrued interest method for amortisation, as allowed by the Article 212-10 of the national chart of accounts.

Commissions and external costs paid by EDF upon issuance of borrowings and included in "Deferred charges" are spread on a straight-line basis over the term of the related instruments.

1.11 Unrealised foreign exchange gains and losses

Foreign currency receivables and payables are translated into Euros at the year-end exchange rates. The resulting translation differences are recorded in the balance sheet under "Unrealised foreign exchange gains" and "Unrealised foreign exchange losses". Provisions are recorded to cover all unrealised exchange losses on foreign currency borrowings not hedged for exchange risks. Unrealised gains are not recognised in the income statement.

Unrealised gains and losses on currency derivatives classified as hedging instruments are recorded in the balance sheet in the revaluation surplus accounts, and netted with the unrealised foreign exchange gains and losses booked in respect of the hedged items, in compliance with ANC regulation 2015-05 of 2 July 2015 on forward financial instruments and hedging operations. Realised gains and losses on hedging derivatives are recognised in the income statement symmetrically to gains and losses on the hedged item.

Foreign exchange gains and losses on trade receivables and payables are recorded in operating income and expenses.

1.12 Tax-regulated provisions

This item mainly includes excess depreciation recorded for tax purposes and relates to:

- ordinary depreciation of generation and distribution facilities;
- exceptional depreciation of software developed in-house by the Company;
- amortisation of acquisition expenses for new investments by the Company.

1.13 Additional equity

Perpetual subordinated bonds issued by EDF in Euros and other currencies are recorded in compliance with the French Chartered accountants' body *Ordre des Experts Comptables* opinion 28 of July 1994, taking their specific characteristics into consideration.

As a result, they are classified as additional equity, since redemption is exclusively controlled by EDF.

Issuance expenses and issue premiums are amortised through the income statement, on a *pro rata* basis.

Interest paid on these bonds is recorded in the financial result.

1.14 Special concession liabilities

These liabilities relate mostly to public electricity distribution concessions for the Island Energy Systems (SEI), and hydropower concessions.

1.14.1 Special public electricity distribution concession liabilities - SEI

These liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, and comprise the following:

- the concession-granting authority's rights in existing assets (its right to recover all the concession assets), consisting of the value in kind of the facilities (the net book value of assets operated under concessions), less any as yet unamortised financing provided by the operator;
- the concession-granting authority's rights in assets to be replaced (the operator's obligations relating to assets due for replacement). These non-financial liabilities comprise:
 - › depreciation recorded on the portion of assets considered to be financed by the concession-granting authority,
 - › the provision for replacement, exclusively for assets due for replacement before the end of the concession. This is accrued over the asset's useful life, based on the difference between the asset's replacement value for identical capacity and functions, and the original value. The replacement value is adjusted at each year-end based on indexes from official publications, and the impact of the adjustment is spread over the residual useful life of the assets concerned. This provision is included in provisions for expenses.

When assets are replaced, amortisation recognised on the portion of assets considered to be financed by the concession-granting authority, and the provision for replacement established for the relevant asset, are cancelled and transferred to rights in existing assets. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's replacement to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

1.14.2 Special hydropower concession liabilities

These liabilities comprise:

- the value of assets remitted for nil consideration and contributions received;
- differences arising from revaluations in accordance with French legislation for fixed assets commissioned before 1 January 1959 and before 1 January 1977;
- additional depreciation to industrial depreciation for facilities that are to be returned for nil consideration at the end of the concession but whose useful life extends beyond the concession term.

Following the changes made to the accounting treatment of hydropower concessions at 1 January 2009, the 1959 revaluation reserve is transferred to equity when the assets concerned are retired.

The net revaluation reserve generated by the 1976 revaluation is taken to income over the residual useful life of the assets concerned.

The value of assets remitted for nil consideration and contributions received is transferred to the income statement over the assets' useful lives.

1.15 Provisions other than employee benefit provisions

EDF recognises provisions when it has a present obligation (legal or constructive) arising from a past event, an outflow of resources will probably be required to settle the obligation, and the obligation amount can be estimated reliably.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if EDF is virtually certain of receiving it.

Provisions are determined based on the Company's expectation of the cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Company, and if necessary experience of similar transactions or operations, or based on independent expert reports or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

1.15.1 Provisions related to nuclear generation

Decommissioning provisions for power plants in operation are associated with fixed assets.

The discount effect generated at each closing to reflect the passage of time is recorded in financial expenses.

Changes in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in cost estimate are recorded:

- as an increase or decrease in the corresponding assets, up to the net book value, if the provision was initially covered by balance sheet assets;
- in the income statement in all other cases.

Provisions related to nuclear generation mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management, for waste removal and conditioning (where relevant) and for long-term radioactive waste management are established in accordance with the obligations and final contributions specific to France;
- costs for decommissioning power plants;
- costs relating to fuel in the reactor when the reactor is shut down (provisions for last cores). These correspond to the cost of the fuel stock in the reactor that is not totally spent at the time of the final reactor shutdown and cannot be reused due to technical and regulatory constraints, the cost of processing for that fuel, and the cost of removal and storage of the resulting waste.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved.

Detailed information on the principles for determining provisions related to nuclear generation is given in note 28.

1.15.2 Other provisions

These provisions mainly cover:

- losses relating to multi-year agreements for the purchase or sale of energy:
 - › losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price,
 - › losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied,
 - › losses on gas-related service agreements are measured by comparing the costs of fulfilling contracts with the resulting economic benefits, based on market and sales assumptions;
- unrealised foreign exchange losses;
- risks relating to subsidiaries and affiliates;
- tax risks;
- litigation;
- decommissioning costs for fossil-fired and hydropower plants;
- costs of replacing assets operated under public electricity distribution concessions;
- provisions related to environmental schemes (see note 1.19).

In extremely rare cases, specific litigation covered by a provision may be unmentioned in the notes to the financial statements if such disclosure could cause serious prejudice to the Company.

1.16 Employee benefits

In accordance with the statutory regulations for companies in France's electricity and gas sector (IEG), EDF's employees are entitled to post-employment benefits (pension plans, retirement indemnities, etc.) and other long-term benefits (e.g. long-service awards).

1.16.1 Calculation and recognition of employee benefits

EDF recognises post-employment benefits granted to personnel as provisions.

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end to post-employment benefits and long-term benefits, taking into consideration the prospects for wage increases and the country's specific economic conditions.

Post-employment benefit obligations are valued mainly using the following methods and assumptions:

- retirement age, determined on the basis of the applicable rules, and the requirements to qualify for a full pension;
- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate for IEG sector employees;
- a discount rate that depends on the duration of the obligations, determined at the year-end date by reference to the market yield on high quality corporate bonds or the rate on government bonds whose duration is coherent with EDF's commitments to employees.

The amount of the provision takes into account the present value of the fund assets that cover these benefits, which is deducted from the benefit obligations.

Any actuarial gain or loss on post-employment benefit obligations in excess of 10% (the "corridor") of the obligations or fund assets, whichever is the highest, is recognised in the income statement progressively over the average residual working life of the Company's employees.

For other long-term benefits, actuarial gains and losses and the full past service cost are directly included in the provision, without application of the "corridor" rule.

The net expense booked during the year for employee benefit obligations includes:

- the current service cost, corresponding to additional benefit entitlements earned during the year;
- the net interest expense, corresponding to interest on obligations net of the return on fund assets;
- the income or expense corresponding to the actuarial gains and losses on long-term benefits and amortisation of actuarial gains or losses on post-employment benefits;
- the past service cost, including the income or expense related to amendments or settlements of benefit plans or introduction of new plans.

1.16.2 Post-employment benefit obligations

Since the financing reform for the IEG sector system took effect on 1 January 2005, the CNIEG (Caisse nationale des IEG, the sector's specific pension body) has managed not only the special IEG pension system, but also the industrial accident, invalidity and death insurance system for the sector.

The CNIEG is a social security body governed by private law, formed by the Law of 9 August 2004. It has legal entity status and reports to the French government, operating under the joint supervision of France's Ministers for the Budget, Social Security and Energy.

Under the funding arrangements introduced by the Law, EDF establishes pension provisions to cover entitlements not funded by France's standard systems (CNAV, AGIRC-ARRCO), to which the IEG system is affiliated, or by the CTA (*Contribution tarifaire d'acheminement*) levy on gas and electricity transmission and distribution services.

As a result of this funding mechanism, any change (whether favourable or unfavourable to employees) in the standard French pension system that is not passed on to the IEG pension system is likely to cause a variation in the amount of the provisions recorded by EDF to cover its obligations.

The benefits covered by pension provisions include:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (island public electricity distribution) (benefits earned before that date are financed by the CTA levy).

CNIEG management expenses payable by EDF for the administration and payment of retired employees' pensions are also included.

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind (energy): Article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at preferential prices. The obligation for supplies of energy to employees of EDF and Engie corresponds to the probable present value of kWh to be supplied to beneficiaries or their dependants during their retirement, valued on the basis of the unit cost (which mainly depends on the marginal production cost, the cost of delivery, and taxes). It also includes the payment made under the energy exchange agreement with Engie;
- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee

dies before reaching retirement. These obligations are almost totally covered by an insurance policy;

- bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26-§5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension, subject to a ceiling) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include help with the cost of studies, time banking for pre-retirement leave, and pensions for personnel sent on secondment to companies not covered by the IEG system.

1.16.3 Other long-term benefit obligations

These benefits concern employees currently in service, and include:

- annuities following incapacity, invalidity, industrial accident or work-related illness. Like their counterparts in the general national system, IEG employees are entitled to financial support in the event of industrial accident or work-related illness, and invalidity and incapacity annuities and benefits. The obligation is measured as the probable present value of future benefits payable to current beneficiaries, including any possible reversions;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

1.17 Derivatives

EDF uses derivatives in order to minimise the impact of foreign exchange risks and interest rate risks.

These derivatives comprise interest rate and currency derivatives such as futures, forwards, swaps and options traded on the over-the-counter market.

The application at 1 January 2017 of ANC regulation 2015-05 concerning forward financial instruments and hedging operations led to recognition of unrealised gains on the foreign exchange optimisation portfolio, and the unrealised gain or loss on currency derivatives classified as hedging instruments, in the balance sheet, in the revaluation surplus accounts created by the regulation. These accounts are netted with the unrealised foreign exchange gains or losses booked in respect of the hedged items.

Hedging derivatives correct the foreign exchange result or interest income on the corresponding asset or liability. If the foreign exchange risk is fully hedged, no provision is recorded. If it is only partly hedged, a provision is recorded for the entire unhedged portion of the unrealised loss.

For other instruments, when there is no hedging relationship, a provision is recorded for unrealised losses and unrealised gains are not recognised.

Instruments in the portfolio at the year-end are included in off-balance sheet commitments at the nominal value of the contracts.

1.18 Commodity contracts

Forward financial instruments on commodities are traded for hedging purposes. Gains and losses on these operations are included in sales or in the cost of energy purchases, symmetrically to the hedged items, in accordance with ANC regulation 2015-05 concerning forward financial instruments and hedging operations, which has been applicable since 1 January 2017.

Instruments in the portfolio at the year-end are included in off-balance sheet commitments at the quantities to be delivered or to be received under the contracts.

1.19 Environment

1.19.1 Greenhouse gas emission rights

EU Directive 2003/87/EC set up a greenhouse gas emission quota trading system for the European Union.

This system, which applies in all EU countries, sets an annual cap on emissions. Businesses (including EDF) receive or buy emission quotas, then the following year surrender to the European Commission a number of greenhouse gas emission rights corresponding to their Scope 1 emissions for the year elapsed, such as direct greenhouse gas emissions from production of the goods sold (e.g. electricity, heat, steel, paper, etc.). Fines are payable if there is a shortfall (€110 per tonne of CO₂ not covered by quotas, and an obligation to cover these amounts by quota the following year).

The cap is being progressively reduced in order to bring down the total emissions in Europe.

The legislative framework of the EU-ETS for the fourth trading period (2021-2030) has been tightened up to achieve the emission reduction targets set in the 2030 Climate and Energy framework, and the EU's contribution to the Paris Climate Agreement adopted in 2015 (which set a general target of a 40% cut in emissions compared to 1990 levels for the whole EU)⁽¹⁾. One key step was accelerating annual quota reductions to 43 million tonnes per year (2.2% below the allocations for 2010).

The European Commission also presented a package of proposals on 14 July 2021 entitled "Fit for 55", intended to bring the European Union closer to the augmented target of cutting CO₂ emissions by at least 55% (compared to 1990 levels) by 2030. The quota system is likely to change after a process of negotiation in the European institutions that is expected to last between 12 and 18 months.

EDF applies the accounting methods for greenhouse gas emission rights stipulated in ANC regulation 2012-03 of 4 October 2012, incorporated into Articles 615-1 to 615-22 of ANC regulation 2014-03.

The accounting treatment of emission rights depends on the holding intention.

Emission rights held to comply with regulatory requirements on greenhouse gas emissions (the "Generation" model) are included in inventories at acquisition cost, and the FIFO (first in first out) method is applied. A write-down is recorded when the generation cost of the electricity that includes the cost of the rights is higher than the present value of that electricity. At year-end, a "net presentation" principle is applied as follows:

- an asset is recognised in raw materials inventories if the quantities of greenhouse gas emissions are lower than the number of emission rights held in the portfolio. This corresponds to the rights available to cover future greenhouse gas emissions;
- a tax liability is recorded in the opposite situation, equivalent to the rights still needed to cover emissions already produced, valued at contractualised acquisition price for forward purchases deliverable before surrender, and at market value for the balance.

The net reporting principle assumes that the emission rights held in the portfolio will be the rights used to offset emissions produced. However, there is a limit to the fungibility of rights at EDF, as there are no transfers of rights between the island and mainland activities. This can lead to concurrent recognition of an asset and a liability.

1.19.2 Energy savings certificates

In France, the Law of 13 July 2005 introduced a system of Energy Savings Certificates. Suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level became subject to energy savings obligations, initially for a three-year period.

To meet this obligation, three sources are available to EDF: supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors.

EDF accounts for Energy Savings Certificates in compliance with Articles 616-1 to 616-25 of ANC regulation 2014-03 on the national chart of accounts.

EDF holds Energy Savings Certificates in order to meet the requirements of the regulations on energy savings. Consequently, EDF applies the "Energy Savings" model defined by ANC regulation 2014-03.

Certificates obtained or receivable are recorded in inventories at production or acquisition cost, and are valued under the FIFO (first in first out) method.

At the year-end, only the net position is presented in the financial statements:

- an asset is recognised (in work-in-progress and other inventories) if the energy savings achieved are greater than the energy savings obligations. This inventory corresponds to the certificates purchased, obtained or receivable that cover future energy savings obligations. It is consumed as and when energy sales are completed that generate energy savings obligations; or
- a liability (provision for other expenses) is recognised if the energy savings achieved are lower than the energy savings obligations. The liability corresponds to the cost of action yet to be taken to cover the obligations associated with energy sales completed. It is subsequently extinguished by making energy savings expenditures that enable the Company to obtain certificates, or by purchasing certificates.

Note 2 Significant events and transactions

2.1 Nuclear developments

2.1.1 Extension to 50 years of the depreciation period of the 1,300MW PWR series in France

EDF considers that all the technical, economic and governance conditions for bringing the depreciation period of 1,300MW-series PWR plants in France into line with its industrial strategy are now fulfilled.

The studies and work already completed, particularly concerning replacement of components and controlled equipment ageing, have given EDF sufficient assurance

of the 1,300MW plants' technical capacity to operate for at least 50 years. This is also supported by the international benchmark.

EDF has also made progress with the ASN on the question of the content of the fourth 10 year inspections of the 1,300MW series (a project included in the *Grand Carénage* programme). These inspections use a work methodology with ambitions focusing particularly on safety, similar to the fourth 10 year inspections of the 900MW series and incorporating the lessons learned from that series. In December 2019, the ASN's response to the Re-examination Orientation file for the fourth 10-year inspections of the 1,300MW reactors gave general approval for the themes selected and commitments made by EDF for these inspections.

Most importantly, the ASN approval published in February 2021 for the generic aspects of the continued operation of 900MW reactors for ten years following their fourth 10-year inspection, and the industrial success of the initial fourth 10-year inspections for such reactors (after the pilot reactor Tricastin 1 in December 2019,

(1) The current EU ETS allocations trajectory does not yet include changes to be made in application of the Fit for 55 package.

Bugey 2 and Bugey 4 reached 40 years of operation and were restarted after a successful fourth 10-year inspection during the first half of 2021 followed by Tricastin 2 in the second half of 2021), reinforce EDF's confidence that its inspection content for the 1,300MW series is appropriate and well controlled.

Once its fourth 10-year inspections are completed, the 1,300MW series of PWR plants will thus have reached a level of safety close to EPR safety level.

Also, extending operation of the 1,300MW-series plants beyond 40 years offers high profitability even in low long-term price scenarios, and in a range of sensitivity scenarios.

Finally, operating the 1,300MW-series plants for 50 years is consistent with France's Energy and Climate law of 8 November 2019 (which sets a target of 50% nuclear for France's electricity output by 2035), and the adoption decree of 21 April 2020 for France's multi-year energy programme (*Programmation pluriannuelle de l'énergie* (PPE)). A study for the energy future, *Futurs énergétiques 2050*, was conducted by France's national grid operator RTE at the request of the French government, examining electricity mix scenarios to achieve carbon neutrality in France by 2050. The related progress report published in June 2021, and the key results published on 25 October 2021, indicate a significant need for carbon-free generation capacity. For all scenarios relating to the post-2035 period, the study includes the assumption that EDF's existing nuclear power plant fleet will remain in operation beyond 50 years, and be shut down between 50 and 60 years of operation.

In view of all these factors, EDF considers that the best estimate for the depreciation period of the 1,300MW-series plants is now 50 years. This accounting estimate does not predetermine the ASN's future decisions to authorise continued operation, which will be given individually for each unit after each 10-year inspection, as currently applied and required by law.

EDF therefore changed the estimate at 1 January 2021 for all 1,300MW power plants.

This change of accounting estimate is applied prospectively, and has the following consequences for EDF's consolidated financial statements at 31 December 2021:

- at 1 January 2021, due principally to timing differences in the payment schedules, provisions relating to nuclear power generation were reduced by a total €1,016 million (see note 28), including €848 million covered by dedicated assets. This reversal from provisions is principally allocated to the net book value of the assets (€1,031 million, see note 17), with the balance allocated to profit and loss (€(15) million). It is largely taxable and generated a tax payment of €184 million;
- in 2021:
 - the 10-year extension of the depreciation period and the reduction in the value of assets at 1 January in line with the decrease in nuclear provisions have led to a lower depreciation charge than for a 40-year depreciation period, estimated at €494 million for the year (a €562 million decrease in allocations to operating provisions (see note 11.1 (1)) and €(68) million in excess depreciation recorded for tax purposes, recognised in exceptional items),
 - the decrease in nuclear provisions at 1 January 2021 led to a €33 million decrease in the cost of unwinding the discount,
 - the amounts of contributions received on jointly-operated power plants transferred to profit and loss decreased by €23 million,
 - the decrease in the nuclear provision for last cores had an impact of €57 million on the exceptional result due to reversal of the provision for a related tax litigation.

In total, the various effects in 2021 lead to a €546 million increase in the income before taxes, and a €221 million increase in net income.

2.1.2 Flamanville 3 EPR

Developments in 2020

The main developments in the Flamanville project in 2020 were the following:

The second hot functional test phase which started on 21 September 2019 was completed in February 2020. Hot functional testing checks plant performance under simulated normal operating conditions.

In the context of the Covid-19 pandemic, after a cluster of cases was identified in the Manche area, work on the Flamanville site was restricted to safety, security and

environment monitoring work only from mid-March. General activity on the site resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020.

Functional tests of the open reactor vessel were successfully completed between 21 May and 25 June 2020.

Following the ASN's decision of 8 October 2020 authorising partial commissioning of the EPR, the first fuel assemblies arrived at the site on 26 October and are stored in the reactor building pool.

In parallel, the upgrading work continued on non-penetration welds on the main secondary circuit that had quality deviations or did not meet the break preclusion requirements defined by EDF, and several welds were repaired in August 2020 once the ASN issued its first authorisations. EDF also decided to include the welds on the circuit supplying water to the steam generators in the scope of the repairs concerning the main secondary circuit. Qualification of the repair procedure for these welds began, with the objective of performing the work in the second half of 2021. At this stage, the repairs concerned a hundred welds in the secondary circuits.

A review was conducted in 2020 of the impact of France's first national lockdown on the Flamanville project. This did not lead to any change to the fuel loading dates or the construction cost announced in October 2019, but it showed that the project has no remaining margin in its schedule or cost. However, achievement of the targets depends on a number of factors, notably the ASN's examinations of EDF's proposed methods for repairing the main secondary circuit welds, particularly the qualification of welding robots for repairing the penetration welds.

Work on these repairs could not begin until the ASN made its final decision as to approval of the entire process involving remote-controlled robots, which was deferred to the first quarter of 2021. This phase of the project is among those in the critical path for on-schedule finalisation of the EPR.

Developments in 2021

The fuel assemblies required for the first fuel load continued to arrive during the first half of the year, and the entire first core is now stored in the Flamanville 3 reactor building pool.

The process of repairing the penetration welds on the main secondary circuit using remote-controlled robots was approved by the ASN on 19 March 2021, several weeks behind the expected date, and work began on the eight welds that were not compliant with the break preclusion principle. All eight were repaired in 2021, then subjected to stress-relieving heat treatment. Demonstration of the qualification of the stress-relieving heat treatment for repairs of VVP (steam discharge pipework circuit) penetration welds was validated by the ASN, which issued authorisation for its use in late 2021. Furthermore, four ARE (steam generator water supply circuit) penetration welds also require repair, and qualification of the repair process is under way at the ASN. This process is an adaptation of the process used for VVP penetration weld repairs.

For the non-penetration welds located on the main secondary circuit that had quality deviations (this concerns 45 VVP welds and 32 ARE welds), the ASN issued approval in April 2021 for the repair of a third batch of 6 welds. In the 3 batches authorised to date, 12 weld upgrades have been completed. In April the ASN gave approval for the related regulatory checks, which are currently in process.

In total, a hundred welds (penetration and non-penetration) on the main secondary circuit are concerned by repairs to the VVP and ARE pipework. The final stage of repair for most of these welds will be an optimised stress-relieving heat treatment, prior to the final verification. Repairing these welds remains one of the key challenges on the Flamanville 3 critical pathway.

On 2 March 2021 EDF declared a significant event to the ASN, concerning incomplete application of the 2006 design standards when installing three nozzles on the main primary circuit (these nozzles connect auxiliary circuits to the primary circuit). At the request of the ASN, three scenarios were examined by the Group's engineering teams. A file was sent to the ASN on 21 June 2021, stating that EDF's chosen solution is to install a "containment collar", and asking the ASN for its position on this solution, so that all the design and procurement activities could be launched by the end of 2021. In a letter of 8 October 2021 the ASN indicated that it had no objections to this solution in principle. Nonetheless the design file for the containment collar will be examined by the French Radiation protection and Nuclear Safety Institute IRSN (Institut de radioprotection et de sûreté nucléaire).

Also, after corrosion was observed on pressuriser valves at the EPR at Olkiluoto (Finland), EDF carried out equipment checks and also detected traces of corrosion on the Flamanville EPR's valves. The material used for certain components of the pilot control valves has been changed accordingly. Several corrosion stress tests were conducted to select the best material. The components are currently in production and will be installed on site during the first half of 2022. The ASN has been regularly informed of the technical choices, and made no objection to this strategy. The ASN and the IRSN are also continuing their examination of the operation and reliability of the pressuriser valves. EDF is due to respond to the IRSN's most recent questions so that it can finalise examination of the valve design by the end of the first half of 2022.

As the work advances, new technical matters emerge that could increase the completion cost and the risk of deferred timelines. In view of the progress made on operations and preparations for start-up, on 12 January 2022 EDF adjusted the schedule for the Flamanville 3 project. The fuel loading date has been deferred from late 2022 to the second quarter of 2023, and the estimated completion cost revised from €12.4 billion to €12.7 billion (in 2015 euros, excluding interim interest).

Before loading the fuel into the reactor vessel and carrying out the overall start-up tests, several operations remain to be carried out, mainly:

- completion of the weld repairs on the main secondary circuit;
- a new series of qualification tests of the installation before loading the fuel into the reactor;
- incorporation of experience gained from the technical issue handled at Taishan reactor 1;
- finishing work on the installation, and remittal of all the documents required for operation.

As announced in January 2022, inspections of the fuel assemblies concerned showed mechanical wear on certain assembly components. This kind of wear has already been observed in several reactors of the French nuclear fleet. For the future commissioning of Flamanville 3, a solution will be examined with the ASN.

2.1.3 Grand Carénage programme

Since 2014 EDF has been implementing its *Grand Carénage* industrial refurbishment programme designed to enhance reactor safety and extend nuclear fleet operating lifetimes beyond 40 years. The most recent estimate of the programme's cost for the period 2014 to 2025 was established on 29 October 2020 and amounted to €49.4 billion in current euros.

This cost estimate mainly reflected the first information about the additional works to be conducted, based on the fourth periodic review of the Group's 900MW reactors, a process that concluded with the ASN's decision issued on 23 February 2021. The work required covers studies, modification work and initially unplanned additional equipment to improve safety levels. This estimate also factored in the revised duration of scheduled maintenance outages for 10-year and partial inspections, building on prior year experience, and the impacts of the Covid-19 pandemic for the period 2020-2022 as estimated in 2020. The estimated cost of the *Grand Carénage* programme is regularly updated, and currently stands at €50.2 billion in current euros. This figure takes account of further work, studies and controls to be conducted, and a revaluation of certain costs. The industrial work will continue beyond 2025, and consequently the investment expenses will remain high beyond that date.

The principal events and industrial milestones of the *Grand Carénage* programme in 2021 were the following:

- on 23 February 2021, the ASN issued its opinion on the generic aspects of continued operation of 900MW reactors for ten years following their fourth 10-year inspection, considering that all the measures taken and recommended by EDF make this feasible. After Tricastin 1 in late 2019, Bugey 2, Bugey 4 and Tricastin 2 reached the milestone of 40 years of operation in 2021, and were restarted after a successful fourth 10-year inspection during 2021. Three other fourth 10-year inspections were in process at 31 December 2021 (Dampierre 1, Bugey 5 and Gravelines 1);
- the programme for preventive replacement of the main unit transformers continued. 150 of a total 174 main unit transformers have been replaced, i.e. 86% of the programme;

- the steam generators have been replaced at 27 of the total 32 900MW-series units;
- all 56 Emergency Diesel Generators are now in operation. The 56th (Paluel 1) was commissioned in February 2021.

2.1.4 Offer by EDF to the Indian nuclear operator NPCIL to build six EPRs at the Jaitapur site

On 22 April 2021, EDF remitted to NPCIL the binding French techno-commercial offer to supply engineering studies and equipment for the construction of six EPR reactors at the Jaitapur site, Maharashtra, India. This major milestone for EDF, its partners and the French nuclear industry provided a basis for discussions aimed at converging towards a binding framework agreement (see the press release of 23 April 2021).

2.1.5 Settlement agreement between EDF and AREVA

On 29 June 2021, EDF and AREVA reached a settlement agreement for the payment by AREVA to EDF of €563 million by 31 December 2021.

This settlement and the enforcement of two arbitration awards of 29 and 30 June 2021 put an end to all disputes between EDF and AREVA relating to the Framatome acquisition contract of 2017 and their business relations prior to the acquisition.

The agreement signed led to receipt of the sum of €563 million with recognition of exceptional income of €501 million (see note 14), and an adjustment of €(29) million to the value of the shares held in Framatome, with the balance of €33 million included in amounts collected for third parties in liabilities.

2.2 Financing operations

2.2.1 Social hybrid notes issue

EDF launched an issue of Euro-denominated perpetual social hybrid notes on 26 May 2021 for a total nominal amount of €1.25 billion with an initial coupon of 2.625% and a first redemption at the option of EDF on 1 June 2028.

EDF can redeem the social hybrid notes for cash at any time during the 60 days before the first interest reset date, which is expected to be in 7 years (i.e. in 2028), and at every coupon payment date thereafter.

These issues are recorded in additional equity (see note 25).

The proceeds raised are dedicated to the financing of eligible projects including capital expenditure engaged by EDF group for orders from SMEs which contribute to the development or maintenance of the EDF group's power generation or distribution assets in the European Union and the United Kingdom. In compliance with the social bond principles and the Sustainability Bond Guidelines of the ICMA (International Capital Market Association), this social hybrid notes issue is consistent with EDF's commitments and CSR (Corporate Social Responsibility) strategy for the responsible development of local areas and the expansion of industrial sectors.

Settlement took place on 1 June 2021, on which date the social hybrid notes were admitted to trading on the regulated market of Euronext Paris.

Allocation of the funds raised by EDF's social bond issues is certified by one of the Statutory Auditors: see section 6.8 of the 2021 Universal Registration Document.

2.2.2 Senior Green Bonds issue

On 23 November 2021, EDF launched a Euro-denominated senior Green Bond issue maturing on 29 November 2033, for a total nominal amount of €1.75 billion with a fixed 1% coupon (see note 33 (1)).

An amount equal to the net proceeds of the bonds will be directly or indirectly allocated to the financing and/or refinancing of new or existing Eligible Projects as defined in EDF's Green Bond Framework ⁽¹⁾.

Settlement took place on 29 November 2021, on which date the bonds were admitted to trading on the regulated market of Euronext Paris.

This issue was complemented by a further issue launched on 6 December 2021 for a total nominal amount of €100 million with the same coupon and maturity as the initial issue of 23 November 2021, and was fungible with the initial issue 40 days after the issue date (see note 33 (1)).

2.2.3 Signature of a new credit facility indexed on social indicators and syndicated with nine banks

On 24 December 2021 EDF announced the syndication of a new €1.5 billion revolving credit facility with an initial maturity of three years, the cost of which will be indexed on four of the Group's ESG KPIs, with a particular focus on its social responsibility.

This new credit line, in which nine full-service European and North American banks are participating, reaffirms the central role of sustainable finance tools in EDF's financing strategy. Bank of America and Natixis acted as ESG Coordinators, Crédit Agricole Corporate & Investment Bank as documentation agent and facility agent and Société Générale as syndication agent. Bank of America, BNP Paribas, Crédit Agricole Corporate & Investment Bank, Natixis, Société Générale and Wells Fargo also acted as Lead Arrangers and Bookrunners.

EDF is continuing its commitment to responsible finance, with €9.3 billion of ESG-indexed credit facilities (more than 75% of all its credit lines) at the end of 2021, and the ambition of reaching 100% in the years to come. Through this approach, which is aligned with its *raison d'être*, EDF is able to strengthen its dedication to innovative financing solutions and incorporate the Group's CSR commitments.

The indicators used for the syndicated credit facility relate to four areas of EDF's fair and inclusive transition principles in favour of all stakeholders:

- employees: the Group has set itself the goal of having 33% of women on Management Committees by 2026;

- customers: thanks to digital energy efficiency solutions, EDF is helping customers to better understand their consumption and reduce their energy bills;
- suppliers: in line with its Excell Plan, EDF is implementing an action plan to promote relocation and support for SMEs in the nuclear sector, as part of France's national recovery programme *France Relance*;
- communities: the Group is committed to ongoing dialogue with communities and local areas wherever it operates. To this end, it organises a dialogue and consultation process for new projects, in line with the Equator Principles, involving local communities throughout the project life cycle.

This new ESG-indexed credit line complements the range of sustainable finance tools that EDF has been developing for several years, particularly in the green and now social bond market, where the Group has established itself as a benchmark issuer with the equivalent of €10 billion issued since 2013.

2.3 Consequences of the Covid-19 pandemic

The economic disruption caused by the Covid-19 pandemic in 2020 had significant repercussions for many of EDF's activities in 2020, particularly nuclear power, workites and services.

For the half-yearly closing at 30 June 2020, then the annual closing at 31 December 2020, in-depth analyses were conducted in EDF's entities to prepare reliable estimates of the impacts of the pandemic on its financial statements, based on specific reporting and valuation principles explained in the 2020 half-year financial statements (see note 2.1) and 2020 annual financial statements (see note 2.1).

The impact of the Covid-19 pandemic on EDF's operating profit was estimated at €(862) million at 31 December 2020, reflecting the lower nuclear power output, a decrease in demand, and recognition of impairment on trade receivables.

Even though the Covid-19 pandemic continued to have effects during 2021, its impacts on operating profit at 31 December 2021 are not very significant, diffuse and not easily traceable.

Impairment of trade receivables

Analyses conducted to estimate credit losses on trade receivables at 31 December 2020 led to a €85 million increase to impairment of trade receivables for 2020 resulting from the pandemic, calculated under the principles presented in note 2.1.2 to the financial statements at 31 December 2020.

The risk analyses were updated at 31 December 2021 in view of the recovery levels observed over the year, and this led to recovery of a total €34 million from impairment of trade receivables (see note 11.2 (2)).

Note 3 Regulatory changes in France

The principal regulatory changes in 2021 are presented below. Changes in 2022 are presented in note 41.

3.1 Regulated electricity sales tariffs in France ("blue" tariffs)

In accordance with Article L. 337-4 of the French Energy Code, regulated electricity sales tariffs are set by the Ministers for Energy and the Economy following proposals by the French Energy Regulatory Commission (*Commission de régulation de l'énergie* or CRE).

France's Council of State ruled in decisions of 18 May and 3 October 2018 that the principle of regulated electricity sales tariffs is compatible with European Union law when such tariffs serve the general economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices.

In accordance with European Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity, the French Energy and Climate law of 8 November 2019 authorises continuation of regulated sales tariffs, but they are reserved for residential or business consumers with a subscribed power level of up to 36kVA, provided they have fewer than 10 employees and their annual sales, income or balance sheet total is below €2 million.

Tariff changes

In accordance with Article L. 337-4 of the French Energy Code, the French Energy Regulatory Commission "CRE" (*Commission de régulation de l'énergie*) is responsible for sending the Ministers for the Economy and Energy its reasoned proposals for regulated sales tariffs for electricity. If no objections are made within three months, the proposals are deemed to have been approved.

In a decision of 14 January 2021, the CRE proposed an increase of 1.61% including taxes (1.93% excluding taxes) in the "blue" tariffs for residential customers and 2.61% including taxes (3.23% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2021. This proposed increase takes particular account of the rising cost of energy supplies and capacity guarantees, the

(1) This Framework and its independent review by Vigeo Eiris are available in the "Sustainable Finance" of the Company's website (www.edf.fr).

"catch-up" adjustment to cover the cost-income differential on regulated sales tariffs in 2019 and 2020, movements in selling costs associated with unpaid receivable forecasts for 2021, particularly in the context of the Covid-19 pandemic, and adjustment of selling costs for non-residential customers who are still eligible for the regulated tariffs. This CRE proposal was confirmed by tariff decisions of 28 January 2021 that were published in the *Journal officiel* of 31 January 2021, and has applied since 1 February 2021.

In a decision of 8 July 2021, in view of changes in the TURPE tariff from 1 August 2021 and in application of the Energy Code, the CRE proposed an increase of 0.48% including taxes (1.08% excluding taxes) in the "blue" tariffs for residential customers and 0.38% including taxes (0.84% excluding taxes) in the "blue" tariffs for non-residential customers. The CRE has proposed that this change should apply from 1 August 2021.

The proposed tariff increase results from the increase in the TURPE network access tariffs from 1 August 2021 (+0.33% on regulated sales tariffs including taxes), the increase in the remuneration received by suppliers for the service of managing customers on behalf of the network operator, which is deducted from selling costs (-0.07% on regulated sales tariffs including taxes), and a new update of the "catch-up" adjustment for amounts not covered in 2019, so that the full amount will be recovered in two years, as the CRE had announced (+0.21% on regulated sales tariffs including taxes).

Comparability between periods is thus affected by the tariff changes introduced since 1 August 2020, presented in the table below:

Date of the CRE proposal	Increase in "blue" residential customer tariffs (incl. taxes/excl. taxes)	Increase in "blue" non-residential customer tariffs (incl. taxes/excl. taxes)	Date of the tariff decision	Date of application
02/07/2020	1.54%/1.82%	1.58%/1.81%	29/07/2020	01/08/2020
14/01/2021	1.61%/1.93%	2.61%/3.23%	28/01/2021	01/02/2021
08/07/2021	0.48%/1.08%	0.38%/0.84%	29/07/2021	01/08/2021
18/01/2022	4%/24.3%	4%/23.6%	28/01/2022	01/02/2022

"TURPE" Network access tariffs

Second TURPE 5 Distribution tariff

By a decision of 20 May 2020, the CRE adopted a +2.75% increase to the second TURPE 5 tariff for the medium and low-voltage network from 1 August 2020. This increase comprises +0.92% for inflation, +1.85% to balance the income and expenses adjustment account (CRCP ⁽¹⁾), and -0.02% in application of the Council of State's decision of 9 March 2018.

For transmission expenses, on 14 May 2020, the CRE adopted a decision reducing the TURPE 5 tariff for the high voltage network by -1.08% from 1 August 2020, comprising +0.92% for inflation, and -2% to balance the CRCP.

TURPE 6 Distribution tariff

The CRE issued two decisions of 21 January 2021 (published in France's *Journal Officiel* 0096 of 23 April 2021) on the TURPE 6 Transmission (high voltage) and TURPE 6 Distribution (medium voltage – low voltage), after the Higher Energy Council (*Conseil supérieur de l'énergie*) gave its approval. These tariffs apply from 1 August 2021 for a period of approximately 4 years.

For distribution expenses, in its tariff decision n° 2021-13 of 21 January 2021, the CRE set the margin on assets at 2.5% and the additional return on regulated equity at 2.3%. The average tariff increase is +0.91% at 1 August 2021 and +1.39% per year for the whole tariff period, assuming average annual inflation of 1.07%.

For transmission expenses, in its tariff decision n° 2021-12 of 21 January 2021, the CRE set a nominal pre-tax weighted average cost of capital (WACC) of 4.6% for the return on RTE's regulated asset base. The average tariff increase is +1.09% at 1 August 2021 and +1.57% per year for the whole tariff period, assuming average annual inflation of 1.07%.

3.2 Supplier commissioning

In application of the CRE's decision of 18 January 2018, energy suppliers receive remuneration from distribution network operators for the service of managing single-contract customers on their behalf.

The commissioning principle is identical for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs have given rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), with progressive reduction of this difference to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision set an amount it considered as a cap that can be passed on through the TURPE tariff.

However, Law 2017-1839 of 30 December 2017 introduced a measure intended to rule out the possibility of suppliers receiving remuneration from network managers for past customer management services.

3.3 Electricity equalisation fund

The TURPE tariff for the medium and low-voltage network is identical for every electricity network operator. It is determined on the basis of forecast expenses to be borne by Enedis, provided they correspond to an efficient network operator, and forecasts of the number of consumers connected to Enedis' networks, their consumption, and the power level subscribed.

As this tariff cannot always cover the specific needs of certain service zones, the Electricity Equalisation Fund (*Fonds de péréquation de l'électricité* or FPE) exists to compensate for disparities in network operating conditions. France's Energy Code requires electricity distribution costs resulting from public network operation to be shared between public distribution network operators. There are two equalisation mechanisms: one based on fixed amounts, the other set by the CRE based on analysis of the network operators' accounts. The calculation method for the fixed-rate allocation mechanism is defined by decree and ministerial order. At EDF, this concerns the Island Energy Systems (SEI).

On 28 July 2021, the CRE published its decision setting the final amount of the allocation from the Electricity Equalisation Fund to SEI, based on analysis of its accounts, at €195.3 million for 2021.

3.4 Compensation for public energy charges (CSPE)

Mechanism

The compensation mechanism for public energy service charges (*compensation des Charges de Service Public de l'Énergie*) resulted from a reform introduced by France's amended finance law for 2015, published in the *Journal officiel* on 30 December 2015. Under the legislative and regulatory framework, the public

(1) A mechanism to measure and offset main differences between the actual figures and the forecasts on which tariffs are based.

energy service charges (electricity and gas) were to be compensated via two State budget items included in France's finance laws from 2016 onwards. Compensation initially came from two State budget items, a special "energy transition" item and a "public energy service" item, but since 1 January 2021 public energy service charges have been compensated entirely through the general budget.

In compensation for the 2021 charges, France's initial finance law for 2021 introduced a €9.1 billion "public energy service" item in the general budget, to cover additional costs incurred on support contracts (purchase obligations and additional remuneration) for renewable energies and biogas, solidarity charges borne by gas and electricity suppliers, costs associated with support for non-renewable energy production (essentially cogeneration), and the cost of applying the standard national tariffs to zones that are not connected to France's mainland network.

Income generated by the domestic tax on the final consumption of electricity, now renamed the Compensation for Public Electricity Charges (CSPE), goes directly into the general budget. The CSPE tax is collected directly from final consumers of electricity in the form of an additional levy on the electricity sale price (collected by the suppliers), or directly from electricity producers that produce electricity for their own uses.

The level of the CSPE tax was set in 2016 at a full rate of €22.5/MWh, and eight reduced rates ranging from €12/MWh to €0.5/MWh depending on criteria of electro-intensiveness, business category and the risk of carbon leakage from installations (the risk of industries relocating to countries where greenhouse gas emissions are higher due to their electricity mix). These rates remain unchanged in 2021.

EDF's Public Service Charges

The amount of expenses to be compensated to EDF for 2021 is €5,472 million. The amounts received in 2021 from the State's General Budget totalled €8,085 million.

The surplus compensation principally results from changes in market prices between 2020 and 2021. The renewable electricity support charges to be compensated decreased significantly due to the rise in market prices in 2021, whereas the compensation received from the State (defined in the Finance Law for 2021 on the basis of 2020 market prices, which were particularly low) was very high.

Consequently, at 31 December 2021, EDF recognised an operating liability due to the State of €294 million (compared to a receivable of €1,974 million at 31 December 2020).

Delivery year	2017	2018	2019	2020	2021
Price (€/kW)	10.0	9.3	17.4	19.5	31.2

The delivery year 2022 was opened to auction in 2020, and ten auctions have been held since then, six of them in 2021. These capacity auctions resulted in the following prices, in chronological order:

- in 2020: €16.6/kW in April; €38.9/kW in June; €18.1/kW in October and €18.2/kW in December;
- in 2021: €28.3/kW in March; €28.2/kW in April; €28.8/kW in June; €29.9/kW in September and €31.5/kW in October and €23.9/kW in December.

3.6 Energy savings certificates

4th period of the French Energy Savings Certificates Scheme (2018-2021):

Initially planned for the period 2018-2020, the fourth period of France's energy savings certificates scheme was extended by one year (by law no. 2019-1147 of 8 November 2019 on Energy and the Climate). This period substantially raised the energy savings obligation levels (to 1,600TWhc for the "standard" obligations and 533TWhc for the obligations intended to benefit households in situations of energy poverty), and added a new chapter on antifraud measures concerning energy savings certificates (increasing the number and effectiveness of controls and sanctions).

During 2021 EDF also bore an amount of €255 million in repayment of excess amounts received in 2016 under the former CSPE mechanism.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 22 July 2021 the CRE published its decision 2021-230 of 15 July 2021 setting out a forecast of EDF's public service charges for 2022 (€7,620 million), a revised forecast of charges for 2021 (€7,142 million), and the actual charges recorded for 2020 (€8,034 million).

3.5 Capacity mechanism

The French capacity mechanism took effect on 1 January 2017. It was introduced by France's Energy Code to contribute to guaranteeing a secure power supply in France.

As a result of the capacity mechanism review clause, in 2021 RTE published a report on the mechanism's first few years of operation and performance. On the basis of this report, on 29 November 2021 RTE submitted rule change proposals to the CRE for its opinion. In decision 2021-370 of 16 December 2021, the CRE issued a favourable opinion of these proposals and of changes to certain parameters for delivery years 2023 and 2024 (the contribution by interconnections, the extreme temperature vector and the safety coefficient). The CRE considered that the proposed changes will simplify the capacity mechanism for all actors, and improve visibility for capacity market participants. The new rules were approved by decision of the Ministry for the Ecological Transition on 21 December 2021. They set the opening date for trading of capacity guarantees for delivery years 2023 and 2024 at 1 March 2022.

The auctions organised by EPEX Spot for delivery years 2023 and 2024 will be held from March 2022.

Another consultation phase is due to take place in 2022. It will concern structural changes to the capacity mechanism starting from delivery year 2025, which will require approval by the European Commission.

The trading sessions of 2020 registered a significant increase in capacity prices for the 2020s and subsequent years from the auction in June 2020. This is mainly explained by the market actors anticipating lower fleet availability for peak periods, in the context of the Covid-19 crisis. In 2021, prices generally remained high, sustained by electricity prices and tensions on the electricity system for the winter 2021-2022.

For delivery years 2017 to 2021, the mean market prices resulting from capacity auctions ahead of the delivery year were as follows:

If there is a shortfall in certificates surrendered at the end of the period, obligated actors must pay a fine of €15 per MWhc of shortfall.

In order to fulfil these obligations, EDF has made every effort to increase its number of energy savings certificates, taking advantage of the "Coup de pouce" operations launched in France early in 2019 (subsidies for insulation, financial aid for replacing oil heating by heat pumps, 50% additional energy savings subsidy for heat pump users, special offers for heat pump maintenance contracts, etc.).

Despite a substantial increase in the energy savings obligation in the fourth period of the scheme (2018-2021), the EDF group met its energy savings target and has a stock of certificates for the start of the fifth period (2022-2025).

5th period of the French Energy Savings Certificates Scheme (2022-2025):

Decree 2021-712 on the fifth period of the energy savings certificates scheme (2022-2025) was published in the *Journal officiel* of 5 June 2021. The decree makes the scheme more effective (for example by significantly reducing special measures and bringing calculations close to the real savings), increases funding for very vulnerable households (higher obligations intended to benefit households in situations of energy poverty, restriction of the scope to very vulnerable households, an increase in the penalties in this category to €20/MWhc) and encourages development of carbon-free energies:

- the overall obligation is increased by 17.2% to 2,500TWhc for this period (obligations intended to benefit households in situations of energy poverty: + 37% to 730TWhc, "standard" obligations: + 11% to 1,770TWhc);
- the Energy Savings Certificate coefficient (MWhc to be produced per MWh of energy sold) is reduced by 10.2% for electricity and increased by 51.8% for gas;
- for electricity and gas, the threshold below which no energy savings certificates are required is progressively reduced from the current 400GWh/year to 300GWh/year in 2022, 200GWh/year in 2023 and 100GWh/year in 2024 and subsequent years.

3.7 ARENH

The ARENH scheme for regulated access to historic nuclear power, set up in 2011, allows alternative suppliers to purchase electricity from EDF to supply their final customers, after signing a framework agreement, at a regulated price for set quantities determined under the provisions of the French Energy Code. This scheme is also open to network operators to cover their energy losses.

The ARENH price, determined by the Ministers for Energy and the Economy following a proposal by the CRE, has been fixed at €42/MWh since January 2012. This includes delivery of the electricity and has incorporated the associated capacity guarantees since 2017.

The maximum total volume that can be sold under the ARENH scheme to suppliers who apply to the scheme to cover the needs of their final customers is set at 100TWh per year (see note 41).

In decision 2021-339 of 8 November 2021, as required by the Energy Code, the CRE set out the method for allocating ARENH volumes if applications exceed the maximum total volume defined for 2022. In view of the current exceptional crisis in the electricity market, it also introduced reinforced checks and special rules for accepting the ARENH volumes applied for by suppliers.

The CRE stated that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to network operators) and they could enter into contracts with the parent company that replicate the ARENH scheme and terms of supply, particularly the curtailment rate for alternative suppliers.

The Energy and Climate law of 8 November 2019 introduced new measures. It raised the initial 100TWh ceiling for ARENH sales to 150TWh from 1 January 2020, allowing the French government to raise the maximum total volume of ARENH deliveries above 100TWh by ministerial order, and to revise the ARENH price by ministerial order during a transition period (see note 41).

ARENH applications during the November 2021 session for delivery in 2022 totalled 160.36TWh (excluding applications from EDF subsidiaries and network operators). The CRE scaled down certain applications (- 0.03TWh in total), bringing the total application volumes validated by the CRE to 160.33TWh, and curtailed each supplier's application. Further volumes were also sold by EDF to its subsidiaries through contracts that replicate the ARENH scheme, and to compensate for network electricity losses (26.4TWh).

Litigation relating to the ARENH scheme was also instigated in 2020 by some energy suppliers in the context of the Covid-19 pandemic. Details are provided in note 37.

As announced in the draft multi-year energy programme (PPE) published on 25 January 2019, in January 2020 the French government launched a call for contributions regarding the fundamental findings driving the plan to reform the economic regulations for existing nuclear facilities, and its construction and operating principles. The proposed new regulations would replace the ARENH scheme. Like many other actors in the sector, the EDF group participated in this consultation, which ended on 17 March 2020.

France's Minister for the Ecological and Inclusive Transition and Minister of the Economy and Finance then commissioned the CRE to carry out an assessment of the costs borne by the nuclear operator, and to determine fair remuneration for its nuclear activities under the government's potential future regulations for existing nuclear facilities. There were no significant developments in 2021 concerning the terms and conditions of these potential new regulations.

Income statement

Note 4 Sales

Sales are comprised of:

(in millions of euros)	2021	2020
Sales of energy *	50,390	41,692
electricity	42,906	37,456
gas	7,484	4,236
Sales of services and other	2,611	2,623
SALES	53,001	44,315

* Including a share of delivery costs for sales of electricity and gas.

The variation in electricity sales in 2021 is mainly due to:

- favourable effects, comprising:
 - the 25.3TWh increase in nuclear power output, an effect largely associated with the Covid-19 pandemic which had led to significant modulation of generation in 2020,
 - colder weather in 2021 than 2020;
- partly mitigated by changes in the customer portfolio.

The increase in sales is also explained by favourable price effects on market offers and sales at regulated tariffs. For the regulated tariffs, the price effect results from indexing of tariffs from 1 February 2020 (+3.0% on "blue" tariffs for residential customers and +3.1% on "blue" tariffs for non-residential customers), 1 August 2020 (+1.82% on "blue" tariffs for residential customers and +1.81% on "blue" tariffs for non-residential customers), 1 February 2021 (+1.93% on "blue" tariffs for residential customers and +3.23% on "blue" tariffs for non-residential customers) and 1 August 2021 (+1.08% on "blue" tariffs for residential customers and +0.84% on "blue" tariffs for non-residential customers).

The increase in gas sales principally relates to sales with EDF Trading in a context of substantial rises in market prices in 2021.

Note 5 Operating subsidies

(in millions of euros)

	2021	2020
OPERATING SUBSIDIES	5,554	8,148

CSPE

Operating subsidies mainly comprise the subsidy received or receivable by EDF in compensation for public energy charges (CSPE), recognised in the financial statements as income of €5,472 million for 2021 (€8,081 million for 2020). The significant decrease in 2021 in charges to be compensated mainly concerns charges to support electricity from renewable energy, and results from the increase in market prices observed between 2020 and 2021.

Closure of Fessenheim nuclear power plant

In accordance with the application for termination of operations and the declaration of the permanent shutdown of both reactors at Fessenheim nuclear power plant sent by EDF to the Minister for the Ecological and Inclusive Transition and to the ASN on 30 September 2019, EDF shut down reactor 1 on 22 February 2020 and reactor 2 on 30 June 2020.

On 27 September 2019, the French State and EDF signed a protocol agreement whereby the State will compensate EDF for the early closure of Fessenheim, which was decided due to the cap on nuclear power output set by the "Energy Transition for green growth" law of 17 August 2015.

The compensation paid under the terms of this protocol comprises:

- initial instalments to compensate for expenses incurred after the closure of the plant (end-of-operations expenditure, INB taxes, dismantling costs and staff redeployment costs), which will be paid over a maximum 4-year period following the closure. An amount of €370 million was received on 14 December 2020.

This compensation is recognised as income in profit and loss as and when the associated costs are incurred;

- subsequent payments corresponding to the lost income that would have been generated by future power generation up until 2041, based on Fessenheim's previous output figures and calculated "ex post" on the basis of nuclear power sale prices, particularly observed market prices. There is no reason to recognise such income in the financial statements at this stage.

Since its decoupling from the network, the Fessenheim plant has entered a post-operating phase that will last approximately five years. During that period, units 1 and 2 will continue to be operated and maintained as "defueled core" and "evacuated fuel" reactors. This will require a series of technical and administrative operations. A significant milestone was reached on 18 October 2021 when the last two packages of spent fuel were dispatched from Fessenheim unit 1 to the Orano site at La Hague.

All the post-operating expenses and income associated with the closure of the two units in 2020 are recognised in other operating income and expenses. At 31 December 2021, they mainly comprise:

- expenses of €126 million (salaries and social security charges for labour at the site amounting to €57 million, purchases of goods and services amounting to €54 million, taxes other than income taxes, mainly payroll taxes, energy taxes and local taxes amounting to €15 million);
- the compensation defined in the protocol for expenses that will be incurred after the closure, amounting to €57 million, recognised as an operating subsidy in the income statement under the methods explained above.

Note 6 Reversals of provisions and impairment

(in millions of euros)

	Notes	2021	2020
Reversals of provisions for risks ⁽¹⁾	27	628	387
Pensions and similar obligations	30	748	795
Spent fuel management	28	1,282	744
Long-term radioactive waste management	28	227	246
Decommissioning of nuclear power plants	28	186	181
Last cores	28	-	99
Decommissioning of thermal and hydropower plants		46	30
Other provisions for expenses		202	88
Reversals of provisions for expenses		2,691	2,183
Reversals of impairment ⁽²⁾		330	253
TOTAL REVERSALS OF PROVISIONS AND IMPAIRMENT		3,649	2,823

(1) Reversals of provisions in 2021 mainly concern energy supply and sale contracts.

(2) Including in 2021 a reversal of €34 million from impairment of trade receivables in connection with the Covid-19 pandemic; this impairment was initially booked during the crisis caused by the pandemic (see note 11.2 (2) and note 2.3).

Note 7 Other operating income and transfers of charges

(in millions of euros)	2021	2020
Other operating income *	1,024	745
Transfers of charges	76	101
OTHER OPERATING INCOME AND TRANSFERS OF CHARGES	1,100	846

* The change is mainly attributable to €241 million of income in 2021 reflecting inversion of the additional remuneration mechanisms in the fourth quarter as a result of higher market prices, which benefited producers of renewable energies.

Note 8 Purchases and other external expenses

(in millions of euros)	2021	2020
Fuel purchases used ⁽¹⁾	4,422	3,269
Energy purchases ⁽²⁾	21,752	16,783
Services and other purchases used ⁽³⁾	17,354	16,161
PURCHASES AND OTHER EXTERNAL EXPENSES	43,528	36,213

(1) Fuel purchases used include costs relating to raw materials for energy generation (principally nuclear fuels and fissile materials, to a lesser extent gas, and coal and oil in very small proportions), and purchases of services related to the nuclear fuel cycle. Fuel purchases used increased due to an increase in gas purchases, principally reflecting price effects with EDF Trading, as electricity output by CCG (Combined Cycle Gas) facilities was slightly lower in 2021 than in 2020.

This item also includes greenhouse gas emission rights used (see note 1.19.1):

- at 31 December 2021, the volume of emissions was 6 million tonnes (5 million tonnes in 2020);
- in 2021 EDF surrendered 5 million tonnes in respect of emissions generated in 2020 (6 million tonnes were surrendered in 2020 in respect of emissions generated in 2019).

(2) The increase in energy purchases is principally explained by higher electricity and gas purchases on the markets, partly counterbalanced by the decrease in electricity purchase obligations, principally for wind power.

(3) Service purchases include distribution network access fees invoiced by the subsidiary Enedis. Excluding delivery, service purchases increased by €919 million between 2020 and 2021, and in 2021 they include €548 million (compared to €383 million in 2020) of exceptional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR (see note 16 (4)).

Note 9 Taxes other than income taxes

Details of taxes other than income taxes are as follows:

(in millions of euros)	2021	2020
Taxes on salaries and wages	172	169
Energy-related taxes	1,180	1,242
Local Economic Contribution *	313	500
Property taxes *	288	469
Other taxes *	301	314
TOTAL TAXES OTHER THAN INCOME TAXES	2,254	2,694

* The lower level of taxes other than income taxes is principally attributable to reductions in generation taxes in France, introduced by the government as part of the national economic recovery plan.

Note 10 Personnel expenses

(in millions of euros)	2021	2020
Salaries and wages	3,720	3,694
Social contributions	2,687	2,745
PERSONNEL EXPENSES	6,407	6,439

In 2021, personnel expenses include €39 million of additional costs (€26 million in 2020) relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR (see note 16 (4)).

	2021			2020
	Executives	Non executives	Total	Total
IEG status	27,220	30,476	57,696	58,237
Other	2,047	2,292	4,339	4,225
AVERAGE WORKFORCE	29,267	32,768	62,035	62,462

Average workforce numbers are reported on a full-time equivalent basis.

Note 11 Operating depreciation, amortisation and provisions

11.1 Depreciation and amortisation

(in millions of euros)	2021	2020
Amortisation of intangible assets	332	296
Depreciation on property, plant and equipment:		
• owned by EDF ⁽¹⁾	3,687	3,925
• operated under concessions ⁽²⁾	318	292
Total depreciation and amortisation on fixed assets	4,337	4,513
Other depreciation and amortisation	26	25
TOTAL DEPRECIATION AND AMORTISATION	4,363	4,538

(1) Due to the 10-year extension of the depreciation period for the 1,300MW-series PWR plants, and reduction of the value of assets at 1 January in connection with the decrease in nuclear provisions, the depreciation expense is an estimated €562 million lower than if the depreciation period had remained at 40 years (see note 2.1.1).

Depreciation of coal-fired plants decreased by €78 million under the combined effect of i) a reduction resulting from closure of Le Havre plant at 31 March 2021 and ii) an increase resulting from modification of the depreciation schedule for the Cordemais plant from 1 July 2021, particularly following discontinuation of the Ecocombust project.

(2) This depreciation concerns the Island Energy Systems public electricity distribution concessions, and hydropower concessions.

11.2 Provisions and impairment

(in millions of euros)	Notes	2021	2020
Provisions for risks ⁽¹⁾	27	159	720
Pensions and similar obligations	30	915	798
Spent fuel management	28	1,185	625
Long-term radioactive waste management	28	126	107
Decommissioning of nuclear power plants and last cores	28	262	133
Decommissioning of thermal and hydropower plants		21	-
Other provisions for expenses		245	210
Provisions for expenses		2,754	1,873
Impairment ⁽²⁾		231	383
TOTAL PROVISIONS AND IMPAIRMENT		3,144	2,976

(1) The increase in 2021, similarly to 2020, principally concerns energy supply and sale contracts.

(2) Impairment in 2020 included €85 million of impairment on trade receivables, in connection with the Covid-19 pandemic. €34 million of that impairment was recovered in 2021 (see note 6 (2) and note 2.3).

Note 12 Other operating expenses

Other operating expenses amount to €2,480 million in 2021 (€2,738 million in 2020) and notably include losses on non-recoverable receivables, royalties on software, costs relating to Energy Savings Certificates used or consumed over the year, the net book value of assets demolished or scrapped, and additional remuneration paid to producers of electricity from renewable sources.

The increase in other operating expenses is notably explained by lower costs relating to Energy Savings Certificates and the increase in the additional remuneration paid to producers of electricity from renewable sources, due to the rise in market prices in the fourth quarter of 2021.

This additional remuneration was introduced by France's law on the Energy Transition for green growth. It is a support mechanism intended to guarantee reasonable remuneration for producers who sell their energy directly on the markets, by compensating for the differential between the revenues from those sales and a reference amount. This mechanism complements the purchase obligation system.

Note 13 Financial result

(in millions of euros)	2021	2020
Income from investments ⁽¹⁾	1,957	1,782
Income from other securities and receivables related to fixed assets ⁽²⁾	905	638
Interest and similar income and expenses	(1,264)	(1,408)
• Expenses on long-term financial liabilities after hedging	(1,635)	(1,717)
• Other	371	309
Foreign exchange result	(196)	(232)
Gains and losses on sales of marketable securities	(239)	(106)
Increases/Decreases in provisions and transfers of charges:	(2,628)	(3,177)
• Discount expense on employee benefits	(292)	(395)
• Discount expense on nuclear provisions ⁽³⁾	(2,090)	(3,558)
• Provision on investment securities ⁽⁴⁾	(104)	(49)
• Reversals from provisions, impairment and transfers of charges	282	535
FINANCIAL RESULT	(1,465)	(2,503)

(1) The change in dividends received principally concerns:

- EDF Holding SAS (the holding company which carries EDF Trading) (€603 million in 2021 and €443 million in 2020);
- C3 (the holding company which carries EDF Investissements Groupe) (€183 million in 2021 and €149 million in 2020);
- Enedis (€540 million in 2021 and €508 million in 2020);
- EDEV (€87 million in 2021 and €72 million in 2020);
- EDF Nam Theun Holding (€36 million in 2021 and €22 million in 2020);
- EDF PEI (€88 million in 2021 and €94 million in 2020);
- EDF Immo (€63 million in 2021 and €72 million in 2020);
- Framatome (€37 million in 2021 and €47 million in 2020);
- CTE (€130 million in 2021 and €184 million in 2020).

(2) In 2020, this item included income of €6 million for the cost of bearing the CSPE financial receivable. The CSPE receivable was fully repaid by the State in 2020.

(3) The lower discount expense on nuclear provisions in 2021 is explained by a 10bp decrease in the real discount rate in 2021, compared to a 20bp decrease in 2020, and also by the effect of extending the depreciation period of 1,300MW-series nuclear plants to 50 years (see note 2.1.1).

(4) The change is principally due to less favourable bond market trends in 2021 than 2020 (see note 18.1 (4)).

Note 14 Exceptional result

At 31 December 2021, the exceptional result is a net €1,765 million. The main items were the following:

- net gains of €1,070 million on sales of investment securities included in dedicated assets, undertaken in the course of operational portfolio management;
- income of €501 million corresponding to the settlement indemnity under the agreement signed by AREVA and EDF on 29 June 2021 (see note 2.1.5);
- as explained below, at 31 December 2020 EDF established a provision of €(538) million for tax litigation concerning the tax-deductibility of certain long-term liabilities following the Council of State's decision of 11 December 2020. On 17 June 2021 the Versailles Administrative Court found against the Company and cancelled the first-instance judgements that had been in its favour. In execution of this decision, EDF paid €85 million in June 2021 for the years 2014 and 2015 and €374 million in July 2021 for the years 2008 to 2010. €459 million of the provision was thus reversed (see note 31 (1)) and the corresponding expense was recognised as a tax expense. After these payments and reassessment of the risk in 2021, the provision amounts to €69 million at 31 December 2021. It concerns the financial years 2012-2013 and the period 2016-2021. The Company has lodged an appeal against the decision of 17 June 2021 before the Council of State.

- increases to provisions for expenses relating to ongoing litigation proceedings;
- net reversals of €30 million from excess tax depreciation.

At 31 December 2020, the exceptional result was €425 million. The main items were the following:

- net gains of €780 million on sales of investment securities included in dedicated assets, undertaken in the course of operational portfolio management;
- net reversals of €175 million from excess tax depreciation;
- recognition of a provision for tax litigation of €(538) million following the Council of State's decision of 11 December 2020. For the period 2008 to 2017, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. As stated in the 2019 financial statements, this recurrent reassessment, which is applied for each year, represented a cumulative financial risk of some €556 million in income taxes at 31 December 2019. In two rulings made in 2017 and one in 2019, Montreuil Administrative Court recognised the tax-deductibility of these liabilities and validated the position taken by the Company. The Minister appealed against two of these rulings. In January 2020, the Versailles Administrative Appeal Court upheld EDF's position for the year 2008, but the Minister again appealed. In a decision of 11 December 2020 the Council of State overturned the Versailles court's decision and sent the case back before the same court.

Note 15 Income taxes

15.1 Tax group

Since 1 January 1988, EDF and certain subsidiaries have formed a group subject to the tax consolidation system existing under French tax legislation (Articles 223A to 223U of the French Tax Code). The tax consolidation group comprises 285 subsidiaries in 2021, including Enedis, EDF International, EDF Renewables and Dalkia.

15.2 Income tax payable

Under Article 223A of the French Tax Code, EDF, as the head of the tax consolidated group, is the sole entity responsible for payment of income taxes and additional related contributions.

The tax consolidation agreement between the members of the tax group stipulates that the arrangement must be neutral in effect. In application of this principle, each subsidiary pays the consolidating company a contribution to group income tax equivalent to the tax it would have paid had it been taxed separately.

The tax consolidation agreement between EDF and the subsidiaries included in the tax group requires EDF to reimburse loss-making subsidiaries for the tax saving generated by their losses, as and when the entities concerned make taxable profits, in compliance with the standard rules for use of taxable losses.

The Company at the head of the tax group, EDF, recorded an income tax expense of €1,410 million for 2021 (after an income tax receivable of €406 million for 2020).

This expense breaks down as follows:

- tax charge of €741 million on the taxable profit for 2021, including a €325 million tax charge caused by extension to 50 years of the depreciation period of the 1,300MW-series PWR nuclear plants in France (see note 2.1.1);
- tax charge of €867 million on the exceptional result, which includes €459 million relating to the tax litigation described in note 14;
- tax receivable of €198 million corresponding to adjustments resulting from the tax consolidation.

15.3 Deferred taxes

Deferred taxes are not recognised in EDF's parent company financial statements. Deferred taxes result from differences between the accounting bases and tax bases of items. They generally arise as a result of timing differences:

- deferred tax assets reflect expenses which will be tax deductible in future years or losses carried forward which will reduce taxable income in the future;
- deferred tax liabilities reflect either advance tax deduction of future accounting expenses or accounting revenues that will be taxable in future years and will increase taxable income in the future.

EDF, as head of the tax group, includes tax losses generated at group level in its deferred tax positions.

Changes in the basis for deferred taxes are as follows:

(in millions of euros)	31/12/2021	31/12/2020	Variation
1. Timing differences generating a deferred tax asset			
• Non-deductible provisions ⁽¹⁾	(15,469)	(16,589)	1,120
• Financial instruments and unrealised exchange gains	(5,656)	(4,717)	(939)
• Other	(457)	(529)	72
Total deferred tax assets subject to the standard rate	(21,582)	(21,835)	253
2. Timing differences generating a deferred tax liability			
• Financial instruments and unrealised exchange losses	2,450	2,224	226
• Other	2,723	2,678	45
Total deferred tax liabilities subject to the standard rate	5,173	4,902	271
• Capital gains not yet taxed	-	-	-
• Provisions for losses taxable at 15%	(11)	(25)	14
Total deferred tax assets subject to the reduced rate	(11)	(25)	14
BASIS FOR DEFERRED TAXES	(16,420)	(16,958)	538
Net future tax asset at standard rate ⁽²⁾	4,237	4,510	(273)
Net future tax asset at reduced rate	2	4	(2)

(1) Mainly concerning post-employment benefits for personnel, and unrealised tax savings resulting from the future deductibility of expenses whose deductibility is provisionally being challenged in ongoing tax litigations.

(2) Applying a corporate income tax rate of 25.82% to long-term timing differences.

Balance sheet

Note 16 Gross values of intangible and tangible fixed assets

(in millions of euros)	Gross value at 31/12/2020	Increases	Decreases	Gross value at 31/12/2021
Software	2,384	449	65	2,768
Other	285	14	1	298
Intangible assets	2,669	463	66	3,066
Land	119	2	1	120
Building	11,995	305	72	12,228
Nuclear power plants	63,437	3,934	1,473	65,898
Machinery and plant other than networks	13,407	263	199	13,471
EDF-owned networks	1,125	32	2	1,155
Other	1,738	145	80	1,803
Property, plant and equipment owned by EDF ⁽¹⁾	91,821	4,681	1,827	94,675
Land	48	-	-	48
Buildings	10,786	97	86	10,797
Machinery and plant other than networks	1,813	79	26	1,866
Concession networks	3,153	175	31	3,297
Other	20	1	-	21
Property, plant and equipment operated under concessions ⁽²⁾	15,820	352	143	16,029
Tangible assets	17,431	5,140	4,781	17,790
Intangible assets	1,189	651	470	1,370
Advances and progress payments on orders	3,020	62	-	3,082
Assets in progress ⁽³⁾	21,640	5,853	5,251	22,242
TOTAL INTANGIBLE AND TANGIBLE FIXED ASSETS ⁽⁴⁾	131,950	11,349	7,287	136,012

(1) Property, plant and equipment owned by EDF include the €1,913 million impact of 56 emergency diesel generators (€1,224 million for the 35 such generators commissioned in 2019, €645 million for the 20 generators commissioned in 2020 and €44 million for the last one commissioned in 2021, in line with the timetable approved by the ASN).

(2) Property, plant and equipment operated under concessions concern the Island Energy Systems public electricity distribution concessions, and hydropower concessions.

(3) Investments during the year mainly concern equipment for existing power plants under the Grand Carénage programme (for replacement of major components, particularly steam generators, and work done in connection with the 10-year and regular inspections), and construction of the EPR plant (Flamanville 3). Intangible assets in progress in 2021 include studies concerning the EPR 2 project, amounting to €707 million (€538 million in 2020) and the Small Modular Reactor (SMR) project, amounting to €69 million.

(4) The capitalised value of the Flamanville 3 EPR project in the financial statements at 31 December 2021 is €12,164 million* (€11,860 million in tangible assets in progress and €304 million in assets commissioned). In addition to the construction cost, this amount includes an inventory of spare parts and capitalised amounts totalling €529 million for related projects (notably the initial comprehensive inspection and North Area development), and €781 million of pre-operating expenses and other tangible assets related to the Flamanville project, giving a total construction cost at historical value of €10,854 million. Accumulated depreciation and amortisation recognised at 31 December 2021 in respect of assets in operation amounts to €98 million.

Also, on 12 January 2022 EDF announced that the schedule for the Flamanville 3 project was being adjusted and the estimated completion cost raised from €12.4 billion to €12.7 billion (in 2015 euros, excluding interim interest).

In its report of July 2020 on EPR technology, the French Court of Auditors (Cour des Comptes) stated that by its calculations, in addition to the construction cost of €12.4 billion (in 2015 euros) announced by EDF in its press release of 9 October 2019, there would be further costs that could reach €6.7 billion (in 2015 euros), including €4.2 billion of interest expenses which are treated as expenses under French GAAP. As stated above, the other capitalised project costs amount to €1.3 billion at 31 December 2021. The additional costs incurred for repairs to the main secondary circuit welds at Flamanville 3 are abnormal costs that cannot be included in the production cost of an asset. They are recorded in expenses and amount to €587 million in 2021, comprising €548 million of services and other purchases used (see note 8 (3)) and €39 million of personnel expenses (see note 10). The additional costs induced by the readjustment announced on 12 January 2022 will be recognised in other operating income and expenses.

* Interim interest is not capitalised in the parent company financial statements.

New nuclear reactors in France: the EPR 2 project

The EPR 2 project concerns a new pressurised water nuclear reactor that meets the objectives for third-generation reactor safety, aiming to incorporate design, construction and commissioning experience acquired from EPR reactors and the nuclear reactors currently in operation.

On 16 July 2019, the ASN issued an opinion that the safety levels of EDF's key design options for its EPR 2 were satisfactory. It stated that "the general safety objectives, the safety baseline requirements and the main design options are on the whole satisfactory".

The EPR 2 will also offer superior operating performance in terms of power (1,650MW compared to 1,450MW for the most powerful current reactor), output, availability and manoeuvrability.

The draft PPE published on 25 January 2019 by the Ministry for the Ecological and Inclusive Transition stated that the Government, together with the nuclear industry, would conduct a programme of work by mid-2021 to examine the questions of the cost of new nuclear energy production and its advantages and disadvantages in relation to other low-carbon generation methods, the possible financing models, the project management modalities for new reactor projects and public consultation, and matters relating to the management of waste generated by the potential new nuclear fleet, and that based on this information and depending on developments in the energy situation, the Government would make a decision regarding the suitability of launching a renewal programme for nuclear installations.

While awaiting a decision about the EPR 2, EDF was authorised by its Board of Directors on 16 December 2020 to continue the project until the end of 2022, with a cost budget of around €1 billion.

In 2021, EDF, working with the French authorities, finalised its contribution to the government-supervised work programme: formal provision of feedback from construction of the first EPRs, and demonstration of the French nuclear sector's ability to handle an industrial programme to build 3 pairs of reactors (using an adjusted EPR model incorporating feedback from the earliest EPR projects in France and internationally).

The analysis conducted covered justification of the need, an action plan to mobilise actors in the nuclear sector, estimation of anticipated costs, analysis of the possible options for the programme's leadership and funding (and their consequences as regards regulation and changes in the legal framework), identification of locations, consideration of questions relating to management of the waste produced by a new nuclear fleet and action to be taken, including interaction with the European Commission and public consultation.

The French Department for Energy and Climate DGEC audited this programme in the summer of 2021 and validated the methods used to estimate the schedule and costs.

The French President declared in a speech in November 2021 that France would restart a nuclear programme and build new reactors on French soil. On 10 February 2022 during a visit to Belfort in eastern France, he announced the

launch of a programme to construct 6 EPR 2 reactors by 2035, and begin studies for an additional 8 EPR 2 reactors by 2050. No investment decision has yet been taken, and the programme will require appropriate regulation and funding arrangements.

NUWARD, France's Small Modular Reactor (SMR) project

Regarding Small Modular Reactors (SMRs), development of the NUWARD™, a 340MW pressurised water plant with two 170MW units, continued in 2021. Power plants in this bracket are largely designed for the export market, to contribute to the widespread replacement of the oldest fossil-fired plants in the next few decades. These export sales will be backed up by a model plant in France, due to start construction by 2030.

Development, industrial production and marketing of the NUWARD will be supervised by EDF with engineering support from the CEA, Naval Group, and TechnicAtome. Given its export target, this development is the subject of an investigation into the viability of cooperation with one or more international partners, particularly European partners.

The conceptual design phase is currently in process, benefiting from public funding of €50 million granted by the French State as part of the "France Relance" national recovery plan.

Note 17 Depreciation, amortisation and impairment of intangible and tangible fixed assets

(in millions of euros)	Cumulative Amount at 31/12/2020	Increases	Decreases	Cumulative Amount at 31/12/2021
Software	1,426	318	64	1,680
Other	140	14	-	154
Intangible assets	1,566	332	64	1,834
Land and buildings	7,858	285	68	8,075
Nuclear power plants *	42,158	3,470	1,489	44,139
Machinery and plant other than networks	9,308	577	195	9,690
EDF-owned networks	563	32	2	593
Other	1,152	139	74	1,217
Property, plant and equipment owned by EDF	61,039	4,503	1,828	63,714
Land and buildings	6,754	152	84	6,822
Machinery and plant other than networks	1,104	37	23	1,118
Concession networks	1,328	89	25	1,392
Other	11	-	-	11
Property, plant and equipment operated under concessions	9,197	278	132	9,343
Tangible assets in progress	84	22	17	89
TOTAL DEPRECIATION, AMORTISATION AND IMPAIRMENT	71,886	5,135	2,041	74,980

* The increase in depreciation of nuclear power plants in 2021 is affected by the extension to 50 years of the depreciation period of the 1,300MW series PWR plants at 1 January 2021 (impact of €1,031 million, see note 2.1.1), as that led to a decrease in nuclear provisions (see note 28) with a corresponding adjustment to depreciation of the related assets in the case of provisions backed by assets.

Depreciation periods of nuclear plants in France

As stated in note 1.2.1, the depreciation period of nuclear power plants currently in operation in France, i.e. thirty-two 900MW reactors, twenty 1,300MW reactors and four 1,450MW reactors, is 50 years for 900MW-series plants (since 1 January 2016) and 1,300MW-series plants (since 1 January 2021), and 40 years for N4-series plants which do not yet fulfil the conditions for a longer depreciation period.

Under France's multi-year energy programme (PPE, standing for *Programmation Pluriannuelle de l'Énergie*) for the periods 2019-2028, adopted by decree 2020-456 of 21 April 2020, twelve French nuclear reactors are to be shut down by 2035, in addition to closure of the two reactors at Fessenheim which took place in the first half of 2020 in accordance with decree 2020-129 of 18 February 2020 terminating

the plant's operating licence. Consequently two 900MW reactors will be shut down in 2027 and 2028 ahead of their fifth 10-year inspection (two others could also be shut down early in 2025-2026 if certain conditions are fulfilled, notably concerning the price of electricity and security of supply). To select the two reactors concerned, priority will be given to shutdowns that minimise the economic and social impact, have the lowest impact on the electricity network, and do not entail closure of an entire site. At the request of the French government, based on these criteria, on 20 January 2020 EDF proposed to examine the possibility of shutting down pairs of reactors at the sites of Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin. The PPE also stipulates that early reactor shutdowns will be confirmed 3 years prior to implementation. Consequently, notwithstanding the depreciation periods indicated above, adoption of the PPE in April 2020 has led to re-estimation of nuclear provisions since 2020 by reference to various scenarios for the early

shutdowns of two 900MW reactors, resulting in a €29 million increase in nuclear provisions (mainly decommissioning provisions, due to the payment schedules being shortened by a few years). Accelerated depreciation schedules were also estimated based on these scenarios, leading to an increase in the depreciation expense recognised, with no significant impact on EDF's financial statements.

Depreciation period of coal-fired plants in France

In view of France's Energy and Climate law of 8 November 2019, the ends of the depreciation periods for the Le Havre and Cordemais coal-fired plants were changed at 1 June 2019, setting the closure of Le Havre at 1 April 2021 while Cordemais is to continue operating until 2026, considering a conversion to biomass as part of the Ecocombust project.

Le Havre power plant was permanently shut down on 31 March 2021.

On 8 July 2021, EDF announced it had decided to put an end to the Ecocombust project to develop fuel from class B "waste" wood as an alternative to coal, since the conditions for continuing the project were not fulfilled: the project cost could not guarantee an attractive price for the final product, and the industrial partner had recently withdrawn.

EDF began the Ecocombust project in 2015. Since late 2018 the project had consisted of adapting the Cordemais plant to use this alternative fuel, and creating a dedicated facility to produce pellets on site. EDF carried out successful technical and environmental feasibility studies.

The economics of the project were penalised by its very innovative nature, and the lack of experience with this type of product, as well as recently soaring commodity prices. Also, the partner with which EDF was holding discussions for the treatment of effluents from the pellet production facility decided to withdraw from the project. This meant the industrial commissioning date had to be deferred to 2024, as the Cordemais plant would not have been able to produce electricity from an alternative non-coal fuel during the period 2022/2024.

Cordemais will continue to operate until 2024, perhaps even 2026, to meet the requirements of the electricity system as defined by RTE, in compliance with the Energy and Climate law which allows the Cordemais plant to be used at full capacity for a maximum 750 hours a year. Consequently, the end of the depreciation period is currently unchanged at 2026, and the depreciation schedule was accelerated from the second half of 2021 to take account of the expected new operating arrangements. The investment expenditure on the Ecocombust project was written off at 30 June 2021.

17.1 Impairment tests on assets

Due to the integrated management and interdependence of the different generation facilities that make up the French fleet (nuclear, thermal and hydropower plants), independently of their maximum technical capacities, EDF considers the entire fleet as a single CGU.

Even when there is no indication of any loss of value, an impairment test is performed due to the highly significant value of this CGU in EDF's financial statements and its substantial exposure to market prices since the "yellow" and "green" regulated tariffs were discontinued on 1 January 2016.

The recoverable value of the generation fleet is estimated by discounting future cash flows under the Group's usual methodology, described in note 1.6, over the assets' useful life, using an after-tax WACC of 5.1% at 31 December 2021 (5.2% at 31 December 2020). For nuclear assets, EDF's benchmark model assumes an operating lifetime of 50 years for currently active plants, as it is the Company's strategy to keep plants in operation for at least 50 years. This takes account of the proposed early closures of two 900MW nuclear reactors included in France's multi-year energy programme.

The impairment test incorporates the latest forecasts concerning Flamanville 3 – see note 2.1.2 (which has a planned operating lifetime of 60 years) established in January 2022, with an adjusted schedule reflecting the progress on the project and preparation for its start of operation. The fuel loading date has been deferred from late 2022 to the second quarter of 2023, and the estimated completion cost has been raised from €12.4 billion to €12.7 billion in 2015 euros (excluding interim interest).

At 31 December 2021, this impairment test showed that the recoverable value was clearly higher than at 31 December 2020, due to the favourable impact of higher short-term, medium-term and long-term price scenarios, while other changes in assumptions used in the test had moderate or minor impacts.

The sensitivity dimension of the test was updated to incorporate the effect of announcements made by the Group on 13 January 2022 concerning the French government's decision to attribute an additional 20TWh of volume to the ARENH scheme for 2022 at the price of €46.2/MWh, on 13 January and 7 February about the downward revision of estimated nuclear power output in France for 2022, and on 11 February about the revision of estimated nuclear power output in France for 2023 (see note 41). These factors noticeably reduce the headroom calculated by the test, but it remains very positive.

The key assumptions in the test still concern the useful life of nuclear assets, the long-term market price scenario, the discount rate, changes in costs and investments, and the capacity revenue. Each of these assumptions was subjected to sensitivity analyses and the results did not call into question the existence of a positive difference between the book value and recoverable value.

Note 18 Financial assets

18.1 Change in financial assets

<i>(in millions of euros)</i>	Cumulative value at 31/12/2021	Cumulative value at 31/12/2020
Investments ⁽¹⁾	60,923	60,006
Receivables related to investments	51	51
Investment securities ⁽²⁾	25,201	24,347
Other investments	202	199
Loans to subsidiaries and other financial assets ⁽³⁾	23,829	16,422
Total financial assets, gross	110,206	101,025
Impairment of investments and related receivables	(709)	(712)
Impairment of investment securities ⁽⁴⁾	(404)	(293)
Total impairment	(1,113)	(1,005)
TOTAL FINANCIAL ASSETS, NET	109,093	100,020

(1) The change in investments essentially corresponds to:

- new investments by EDF Invest, including:
 - › subscription to the capital of C71 (a company that holds fibre optics located in public-initiative networks in France) (€374 million),
 - › subscription to the capital of 92 France (a company that holds a real estate asset in France) (€94 million),
 - › subscription to the capital of C82 (which holds a real estate asset in Germany which holds a real estate asset in Germany) (€44 million),
 - › subscription to the capital of C84 (a company that holds a real estate asset in Germany) (€41 million);
- subscriptions to the capital increases, including:
 - › subscription to the capital increase by C77 (a company that holds real estate assets in Europe) (€171 million),
 - › subscription to the capital increase by C79 (a company that holds a real estate asset in France) (€99 million),
 - › subscription to the capital increase by EDF Pulse Holding (€75 million),
 - › subscription to the capital increase by C72 (a company that holds Energy Assets Group (EAG)) (€74 million).

Also, at 31 December 2021, the value of the investment in Framatome was reduced by €14 million in accordance with signed price adjustment agreements. It is stated at €2,014 million at 31 December 2021, compared to €2,028 million at 31 December 2020.

- (2) Changes in investment securities correspond mainly to acquisitions and sales of dedicated assets over the period, which generated net gains of €1,070 million in 2021 (see note 14). These gains are reinvested in the dedicated asset portfolio.
- (3) Loans to subsidiaries at 31 December 2021 total €23,782 million, including €13,048 million for EDF International, €2,943 million for EDF Trading, €2,881 million for EDF Renewables, €1,997 million for Enedis, €1,788 million for Dalkia and €568 million for PEI.
- (4) The change in this item is mainly due to less favourable developments on the bond markets in 2021 than 2020, leading to recognition of impairment on investment securities and other investments during the year (see note 13 (4)).

18.2 Subsidiaries and investments of at least 50% of capital

<i>(in millions of euros)</i>	Gross book value of shares owned	Impairment recorded at 31/12/2021	% capital owned	Equity 2020	Net income 2020	Dividends received in 2021	Sales 2020
I. Subsidiaries							
● Holding companies							
EDEV	6,891	-	100	6,387	93	87	nm
EDF International	25,930	-	100	16,958	(1,084)	-	1
EDF Production Électrique Insulaire SAS	561	-	100	1,105	137	88	762
EDF Holding SAS	1,950	-	100	2,748	603	603	-
Société C3	11,196	-	100	11,527	192	183	-
EDF Immo	1,361	-	100	1,482	66	63	-
EDF group Support Services	nm	-	100	1	1	1	165
CTE *	2,705	-	50.1	5,289	359	130	-
C45	99	4	100	87	(2)	11	-
EDF Nam Theun Holding	437	-	100	427	21	36	-
C73	143	1	100	126	(9)	6	-
C74	123	45	100	105	(9)	3	-
C71	374	-	100	-	nm	-	-
C77	171	-	100	nm	nm	4	-
C79	110	nm	100	11	nm	3	-
Other companies	2,835	230	100	2,209	58	129	-
● Industrial and commercial companies							
France							
Centrale Électrique Rhénane de Gambenheim	3	-	50	9	-	-	5
Dalkia	967	140	99.9	421	(30)	-	2,109
Enedis	2,700	-	100	5,615	676	540	14,494
FRAMATOME	2,014	-	75.5	2,600	101	37	2,066
EDVANCE	12	-	80	41	20	10	603
● Other countries							
Emosson	14	14	50	140	-	-	-
Rheinkraftwerk Iffezheim (RKI)	3	-	50	93	3	-	13
Forces Motrices du Chatelôt	nm	-	50	8	nm	nm	3
● Other entities (GIE EIFER)	130	125	-	-	-	-	-
TOTAL I	60,729	559				1,934	

nm: not material (less than €500,000).

* CTE is the company that owns 100% of RTE.

18.3 Subsidiaries and investments under 50% of capital

(in millions of euros)	Gross book value of shares owned	Impairment recorded at 31/12/2021	% capital owned	Equity 2020	Net income 2020	Dividends received in 2021
I. Subsidiaries						
Total I Carried forward	60,729	559				1,934
II Investments						
II.1 Companies in which EDF has an interest of between 10% and 50%:						
• Industrial and commercial companies						
France						
Trimet France	130	94	35	296	34	10
Dalkia Investissements	63	56	50.0	16	1	nm
Total II.1	193	150				10
II.2 Companies in which EDF has an interest of less than 10%:						
Other companies						
• Other countries						
Force Motrice de Mauvoisin	1	-	10	121	5	nm
Total II.2	1	-				-
Total II	194	150				10
Total subsidiaries and investments, gross	60,923	709				1,944
TOTAL SUBSIDIARIES AND INVESTMENTS, NET	60,214					

nm: not material (less than €500,000).

18.4 Investment securities portfolio

(in millions of euros)	At start of year			At year-end		
	Gross book value	Net book value	Fair value	Gross book value	Net book value	Fair value
VALUE OF INVESTMENT SECURITIES	24,347	24,195	27,148	25,201	24,944	29,741

At 31 December 2021, the net value of the investment securities portfolio comprises €24,944 million of dedicated assets.

18.5 Treasury shares

A share repurchase programme was authorised by the General Shareholders' Meeting of 6 May 2021 for a duration of 18 months, within the limit of 10% of the total number of shares making up the Company's capital. This programme was implemented in 2021 for market making purposes through the liquidity contract.

(in millions of euros)	31/12/2020			Change in 2021	31/12/2021		
	Gross value	Impairment	Net value		Gross value	Impairment	Net value
TREASURY SHARES	10	-	10	2	14	(2)	12

At 31 December 2021, a total 1,174,554 treasury shares are included in "investment securities" at the net value of €12 million.

18.6 Financial loans and receivables related to investments

(in millions of euros)	Liquidity			Gross value at 31/12/2021	Gross value at 31/12/2020
	< 1 year ⁽¹⁾	1-5 years ⁽²⁾	> 5 years		
Receivables related to investments	2	-	49	51	51
Loans to subsidiaries and other financial assets ⁽³⁾	9,262	12,647	1,920	23,829	16,422
FINANCIAL LOANS AND RECEIVABLES RELATED TO INVESTMENTS	9,264	12,647	1,969	23,880	16,473

(1) Including €3.11 billion of loans to EDF International, €2.94 billion to EDF Trading and €1.88 billion to EDF Renewables, corresponding to maturities of drawings on credit lines.

(2) Including €9.94 billion of loans to EDF International and €1 billion to EDF Renewables, corresponding to maturities of drawings on credit lines.

(3) The changes are principally explained by loans to subsidiaries in 2021: €2.9 billion to EDF Trading, €2.2 billion to EDF International, €1.1 billion to Enedis and €0.8 billion to EDF Renewables.

Note 19 Inventories and work-in-progress

(in millions of euros)	31/12/2021			31/12/2020		
	Gross value	Provisions	Net value	Gross value	Provisions	Net value
Nuclear fuel	8,471	(39)	8,432	8,322	(33)	8,289
Other raw materials	126	-	126	265	(32)	233
Other supplies	2,000	(250)	1,750	1,963	(236)	1,727
Work-in-progress and other inventories *	645	-	645	292	-	292
TOTAL INVENTORIES	11,242	(289)	10,953	10,842	(301)	10,541

* The increase in the inventory of Work-in-progress and other inventories is mainly attributable to the stock of Energy Savings Certificates at 31 December 2021.

Note 20 Other current assets and cash

(in millions of euros)	Liquidity			Gross value at 31/12/2021	Gross value at 31/12/2020
	< 1 year	1-5 years	> 5 years		
Advances on orders	353	134	232	719	723
• Trade receivables:					
Amounts billed	2,532	-	-	2,532	2,389
Unbilled receivables ⁽¹⁾	16,816	-	-	16,816	13,684
• Other operating receivables ⁽²⁾	4,566	64	220	4,850	6,515
Total operating receivables	23,914	64	220	24,198	22,588
Cash instruments ⁽³⁾	892	823	814	2,529	1,814
Cash and cash equivalents ⁽⁴⁾	8,397	-	-	8,397	5,364
Prepaid expenses	305	224	486	1,015	987
TOTAL CURRENT ASSETS	33,861	1,245	1,752	36,858	31,476

(1) The increase mainly concerns receivables on EDF Trading in a context of rising prices, and receivables for energy supplied and not billed.

(2) Including €3,464 million of receivables on the State related to taxes other than income taxes. In 2020, other operating receivables included a €1,974 million receivable in compensation for public energy service charges (CSPE), compared to a €294 million liability in 2021 (see note 32 (4)).

(3) Unrealised gains on foreign exchange instruments, and on all debit balances relating to EDF's margin calls on derivatives with its banking partners (€36 million at 31 December 2021), which had no equivalent in 2020, when a net credit balance of €2,345 million was reported in the balance sheet liabilities (see note 32 (5)).

(4) The change in cash and cash equivalents mainly results from €2,822 million of negotiable debt instruments issued, net of redemptions, and €874 million resulting from the transfer of bonds to several banks under repurchase agreements, recognised via financial liabilities (see note 33 (2)).

Note 21 Marketable securities

(in millions of euros)	31/12/2021	31/12/2020	Variation
Investment funds	2,598	2,443	155
Short-term negotiable debt instruments in Euros and foreign currencies ⁽¹⁾	50	1,738	(1,688)
Shares received as guarantees ⁽²⁾	408	-	408
Bonds ⁽¹⁾	7,500	8,830	(1,330)
Accrued interest and other marketable securities	49	54	(5)
Total gross value	10,605	13,065	(2,460)
Provisions	(20)	(4)	(16)
TOTAL NET VALUE	10,585	13,061	(2,476)

(1) The decrease in negotiable debt instruments and bonds is explained by the aim of reducing the credit risk and increasing liquid assets (sight deposits, investment funds).

(2) This comprises €408 million of bonds received as a guarantee from a banking partner, recognised via financial liabilities (see note 33 (3)).

Note 22 Variation in cash and cash equivalents reported in the cash flow statement

(in millions of euros)	31/12/2021	31/12/2020	Variation
Marketable securities	10,605	13,065	(2,460)
Cash and cash equivalents	8,433 ⁽¹⁾	5,364	3,069
Sub-total in balance sheet assets	19,038	18,429	609
Euro investment funds	(2,598)	(2,443)	(155)
Negotiable debt instruments (Euro) maturing after 3 months	(50)	(937)	887
Negotiable debt instruments (non Euro) maturing after 3 months	-	(801)	801
Shares received as guarantees	(408)	-	(408)
Bonds	(7,500)	(8,830)	1,330
Treasury shares	-	-	-
Accrued interest	(49)	(54)	5
Marketable securities included in financial assets in the cash flow statement	(10,605)	(13,065)	2,460
Cash advances to subsidiaries (cash pooling agreements) included in "other operating receivables" in the balance sheet	-	-	-
Cash advances from subsidiaries (cash pooling agreements) included in "other operating liabilities" in the balance sheet	(6,872)	(5,620)	(1,252)
Cash and cash equivalents, closing balance in the cash flow statement *	1,561	(256)	1,817
Elimination of the effect of currency fluctuations			80
Elimination of net financial income on cash and cash equivalents and other items			(316)
NET VARIATION IN CASH AND CASH EQUIVALENTS IN THE CASH FLOW STATEMENT *			1,581

* See the Cash flow statement.

(1) Including €36 million corresponding to all debit balances relating to margin calls on derivatives at 31 December 2021 (see note 20 (3)).

As of 2018, the cash positions of all subsidiaries in the cash flow statement are classified by reference to criteria of autonomy.

An entity is considered non-autonomous when it is a holding company, generates the majority of its sales with EDF group entities, or does not have the status of employer.

The main subsidiaries classified as non-autonomous are C2, C3, EDF Holding et EDF International, and the main subsidiaries classified as autonomous are Enedis, PEI, Sofilo and GGF.

In the cash flow statement, the cash positions of autonomous subsidiaries are presented as a deduction from "Cash and cash equivalents". The cash positions of non-autonomous subsidiaries are included in the components of the changes in working capital.

Note 23 Unrealised foreign exchange losses

Unrealised foreign exchange losses amount to €1,324 million at 31 December 2021, principally reflecting:

- unrealised losses caused by currency movements (essentially in the US dollar and the pound sterling) amounting to €1,043 million at 31 December 2021 (€576 million at 31 December 2020) on liabilities and receivables in foreign currencies, and currency hedging instruments;
- the balance at 31 December 2021 of realised gains and losses on the settlement of hedging instruments with the subsidiary EDF International,

amounting to €281 million (€296 million at 31 December 2020). In accordance with the national chart of accounts, in application of the symmetry principle set out in Article 628-11, the net result (€311 million in 2019, no equivalent in 2020 or 2021) is recognised in unrealised foreign exchange losses and transferred to expenses over the residual life of the hedged item, symmetrically to the accounting treatment of gains and losses on the hedged item. A €15 million expense was accordingly recognised in the 2021 financial result (€15 million in 2020).

Note 24 Changes in equity

(in millions of euros)	Capital	Reserves and premiums	Retained earnings and interim dividends	Profit or loss for the financial year	Investment subsidies	Tax-regulated provisions	Total equity
At 31 December 2019	1,552	20,334	7,547	1,593	159	5,935	37,120
Allocation of 2019 net income	-	5	1,588	(1,593)	-	-	-
2020 profit	-	-	-	222	-	-	222
Dividend distribution	-	-	-	-	-	-	-
Interim dividend	-	-	-	-	-	-	-
Cancellation of treasury shares ⁽¹⁾	(2)	(22)	(14)	-	-	-	(38)
Other changes	-	(1)	-	-	1	(149)	(149)
At 31 December 2020	1,550	20,316	9,121	222	160	5,786	37,155
Allocation of 2020 net income	-	-	222	(222)	-	-	-
2021 profit	-	-	-	1,457	-	-	1,457
Capital increase of 7 June 2021	29	587	-	-	-	-	616
Dividend distribution	-	-	(651)	-	-	-	(651)
Capital increase of 2 December 2021	40	859	-	-	-	-	899
Interim dividend for 2021	-	-	(947)	-	-	-	(947)
Other changes ⁽²⁾	-	10	42	-	7	(9)	50
AT 31 DECEMBER 2021	1,619	21,772	7,787	1,457	167	5,777	38,579

(1) Following the decision by EDF's Board of Directors on 29 July 2020 to cancel 3,697,507 treasury shares via adjustment of equity. The amount concerned is €(38) million.

(2) "Other changes" include a €42 million adjustment to provisions for post-employment benefits relating to prior years, resulting from a change in the method for benefit attribution method for retirement gratuity commitments (see note 1.1).

24.1 Share capital

At 31 December 2021, EDF's share capital amounts to €1,619,338,374 comprising 3,238,676,748 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.88% by the French State, 14.77% by the public (institutional and private investors) and 1.32% by current and retired Group employees, with 0.03% held by EDF as treasury shares.

In June 2021, the payment of part of the dividend for 2020 in the form of a scrip dividend led to a €29 million increase in the share capital and an issue premium of €587 million following issuance of 57,908,528 new shares.

In December 2021, the payment of part of the interim dividend for 2021 in the form of a scrip dividend led to a €40 million increase in the share capital and an issue premium of €859 million following issuance of 80,844,641 new shares.

Under Article L. 111-67 of the French Energy Code, the French State must hold more than 70% of the capital of EDF at all times.

24.2 Dividends

At the General Shareholders' Meeting of 6 May 2021 it was decided to distribute an ordinary dividend of €0.21 per share in respect of 2020, offering shareholders the choice of payment in cash or shares (scrip option).

In application of Article 24 of the Company's articles of association, shareholders who have held their shares continuously for at least 2 years at the year-end and still hold them at the dividend distribution date benefit from a 10% bonus on their dividends. The number of shares carrying an entitlement to the bonus dividend cannot exceed 0.5% of the Company's capital per shareholder. The bonus dividend amounts to €0.231 per share.

The French government opted for the scrip dividend for 2020. The amount of the cash dividend paid to shareholders who did not opt for the scrip dividend for 2020 amounts to €36 million.

On 4 November 2021, EDF's Board of Directors decided to distribute an interim dividend of €0.30 per share in respect of 2021, payable in new shares (scrip option) or cash on 2 December 2021. The total amount of the interim dividend was €947 million.

The French government opted for the scrip dividend for this 2021 interim dividend.

The amount of the cash dividend paid to shareholders who did not take the scrip option for this 2021 interim dividend amounts to €48 million.

24.3 Bonds convertible into new shares and/or exchangeable for existing shares (OCEANEs)

On 8 September 2020, EDF made an offering of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*) with the nominal amount of €2,400 million and an issue value of €2,569 million (see note 2.4.1 to the financial statements at 31 December 2020). This operation has no impact on equity at 31 December 2021 because no subscriber exercised their option to convert or exchange these bonds.

Note 25 Additional equity

Additional equity at 31 December 2021 amounts to a net €12,857 million and consists of:

- perpetual subordinated bonds issued by EDF in January 2013 and January 2014 at the value of €4,579 million and €3,206 million respectively, net of redemptions;
- perpetual subordinated bonds issued by EDF in September 2018, valued at €1,250 million;
- perpetual subordinated bonds issued by EDF in November 2019, valued at €497 million;
- perpetual subordinated bonds issued by EDF in September 2020, valued at €2,084 million;

- perpetual subordinated bonds issued by EDF in June 2021, valued at €1,241 million (€1,250 million nominal, net of a €9 million redemption premium) (see note 2.2.1).

This net amount includes the effects of foreign currency variations, redemption premiums and the related amortisation.

Payments to bearers of perpetual subordinated bonds amounted to €578 million in 2021 (€512 million in 2020). This expense is recorded in "Expenses on long-term financial liabilities after hedging" (see note 13).

PERPETUAL SUBORDINATED BONDS

(in millions of currency units)

Issue date	Nominal amount net of redemptions	Currency	Redemption option	Rate
01/2013	1,250	EUR	12 years	5.38%
01/2013	1,250	GBP	13 years	6.00%
01/2013	2,098	USD	10 years	5.25%
01/2014	1,500	USD	10 years	5.63%
01/2014	1,000	EUR	12 years	5.00%
01/2014	750	GBP	15 years	5.88%
09/2018	1,250	EUR	6 years	4.00%
11/2019	500	EUR	8 years	3.00%
09/2020	850	EUR	6.5 years	2.88%
09/2020	1,250	EUR	10 years	3.38%
06/2021	1,250	EUR	7 years	2.63%



Note 26 Special concession liabilities

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
Value in kind of assets	107	106
Revaluation difference	758	790
Additional depreciation	377	324
Rights in hydropower concession assets	1,242	1,220
Value in kind of assets	2,008	1,918
Unamortised financing by the operator	(1,306)	(1,219)
Amortisation of grantor financing	370	354
Contributions received for concessionary plant assets under construction	6	9
Rights in public distribution concession assets *	1,078	1,062
TOTAL SPECIAL CONCESSION LIABILITIES	2,320	2,282

* Rights in public distribution concession assets concern the Island Energy Systems (SEI) public electricity distribution concessions.

Note 27 Provisions for risks

<i>(in millions of euros)</i>	31/12/2020	Increases		Decreases			31/12/2021
		Operating ⁽³⁾	Financial	Utilisations ⁽³⁾	Reversals ⁽³⁾	Financial	
Provisions for unrealised exchange losses ⁽¹⁾	512	-	267	-	-	(34)	745
Provisions for losses on contracts ⁽²⁾	2,233	122	-	(163)	(352)	-	1,840
Provisions for other risks	395	37	-	(72)	(41)	-	319
PROVISIONS FOR RISKS	3,140	159	267	(235)	(393)	(34)	2,904

(1) Provisions for unrealised exchange losses amount to €745 million at 31 December 2021 and principally concern the hybrid notes (€533 million) and other borrowings after hedging (€205 million). The amounts reversed from these provisions in 2021 mainly concern the hybrid notes (€264 million).

(2) Net reversals from provisions for onerous contracts, amounting to €393 million, principally concern a long-term contract for purchases of LNG.

(3) See notes 6 and 11.2.

Note 28 Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores

The provisions established by EDF for the nuclear generation fleet principally result from the Law of 28 June 2006 on long-term management of radioactive materials and waste, and the associated implementing provisions concerning secure financing of nuclear expenses.

In compliance with the accounting principles described in note 1.15.1:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;

- EDF also holds dedicated assets for secure financing of long-term obligations (see note 38).

The calculation of provisions incorporates a level of risks and unknowns that depend on the operations concerned. The valuation of costs also carries uncertainty factors as described in note 1.2.2.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores are as follows:

(in millions of euros)	31/12/2020	Increases		Decreases		Other changes ⁽²⁾	31/12/2021
		Operating ⁽³⁾	Financial ⁽¹⁾	Utilisations ⁽³⁾	Reversals ⁽³⁾		
Provisions for spent fuel management	11,322	1,185	505	(806)	(476)	89	11,819
• amount unrelated to the operating cycle	1,297	366	89	(15)	-	(11)	1,726
• amount outside the scope of the Law of 28 June 2006 *	1,076	42	54	(36)	-	-	1,136
Provisions for long-term radioactive waste management	13,300	126	854	(224)	(3)	180	14,233
Provisions for the back-end of the nuclear cycle	24,622	1,311	1,359	(1,030)	(479)	269	26,052
Provisions for the back-end of the nuclear cycle within the scope of the Law of 28 June 2006 *	23,546	1,269	1,305	(994)	(479)	269	24,916
Provisions for the back-end of the nuclear cycle outside the scope of the Law of 28 June 2006 *	1,076	42	54	(36)	-	-	1,136
Provisions for nuclear plant decommissioning	17,489	262	649	(186)	-	(484)	17,730
Provisions for last cores	2,711	-	83	-	-	(134)	2,660
Provisions for decommissioning and last cores	20,200	262	732	(186)	-	(618)	20,390
TOTAL PROVISIONS RELATED TO NUCLEAR GENERATION	44,822	1,573	2,091	(1,216)	(479)	(349)	46,442
Provisions for the back-end of the nuclear cycle within the scope of the Law of 28 June 2006 *	43,746	1,531	2,037	(1,180)	(479)	(349)	45,306
Provisions for the back-end of the nuclear cycle outside the scope of the Law of 28 June 2006 *	1,076	42	54	(36)	-	-	1,136

* Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application decrees concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations (see below).

(1) The discount effect comprises the €1,474 million cost of unwinding the discount, and the effects of the change in the real discount rate in 2021, recognised via the income statement for provisions with no related assets (€617 million) (cost of unwinding the discount).

(2) The change in in 2021 in provisions related to nuclear generation is mainly explained by the extension of the depreciation period of 1,300MW-series power plants, which had an impact of €(1,016) million at 1 January 2021 (see note 2.1.1), distributed as follows: €(916) million on provisions for decommissioning, €(214) million on provisions for last cores, and €114 million on provisions for long-term radioactive waste management.

This impact on provisions related to nuclear generation principally results from timing differences in payment outflows (the discount effect on provisions), and also includes a minor revision of estimates to reflect the increase in decommissioning waste to be sent for interim or final storage in certain years, which requires industrial solutions to smooth the waste dispatch flows.

The €(1,016) decrease in provisions related to nuclear generation is presented as follows:

- €(1,031) million in "Other movements" for changes in the provisions backed by assets;
- €15 million in "Operating Increases" for provisions adjusted via profit and loss.

"Other movements" also include the €495 million effects of the change in the real discount rate at 31 December 2021 for provisions backed by assets.

(3) See notes 6 and 11.2.

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Recyclage) and the French Atomic Energy Commission (Commissariat à l'énergie atomique or CEA) signed an agreement in December 2004 which transferred the management and financing of final shutdown, decommissioning and waste recovery and reconditioning for the UP1 reprocessing facility at Marcoule to the CEA. In return, EDF paid the CEA a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs;
- EDF, AREVA and AREVA NC (now Orano Recyclage) signed two agreements in December 2008 and July 2010 defining the legal and financial terms for the transfer to AREVA NC of EDF's contractual obligations regarding its financial contribution to the dismantling of La Hague installations and the recovery and conditioning of waste. In application of those agreements, EDF paid Orano Recyclage a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs.

28.1 Provisions for spent fuel management

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French State, is to process spent fuel, to recycle the separated plutonium in the form of MOX fuel (Mixed OXide of plutonium and uranium) and recycling of reprocessed uranium.

The quantities processed by Orano at the request of EDF, totalling approximately 1,100 tonnes per year, are determined based on the quantity of recyclable plutonium in the reactors that are authorised to load MOX fuel.

Consequently, provisions for spent fuel management cover the following services to be provided by Orano Recyclage:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter.

The processing expenses included in these provisions exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are measured based on forecast physical flows at the year-end, with reference to the contracts with Orano which define the terms for implementation of the framework agreement for the period 2008-2040. The most recent contract, signed on 5 February 2016, covers the period 2016-2023. These contracts contain price indexes that are revised annually.

Negotiations are currently in process with Orano Recyclage, notably concerning the amendment for the current period 2016-2023. At 31 December 2021, EDF used its best estimate of the costs to be incurred under this contract considering progress on the discussions with Orano. An additional provision of €267 million was recognised to cover the increase in processing costs for EDF associated with the various Orano projects, notably in view of changes concerning the new fission product concentrators.

In 2018, the Board of Directors approved resumption of reprocessed uranium recycling (which had been suspended in 2013 pending availability of a new industrial schema), with loading of the first fuel assemblies scheduled for 2023, subject to technical adaptations and the necessary authorisations from the Nuclear Safety Authority. The objective is to start recycling in certain 900MW units, and later in certain 1,300MW units. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018.

The 50-year operating life for the 1,300MW-series plants – reflected in the financial statements at 30 June 2021 by extension from 40 to 50 years of the depreciation period for the relevant units – which will entail industrial adaptations to allow enriched reprocessed uranium fuel to be loaded into 1,300MW reactors, and attainment of the significant industrial milestones for resumption of uranium

recycling, particularly commissioning the Tenex residual waste vitrification plant during the second half of 2021, confirm that all the industrial, regulatory and economic conditions for resumption of uranium recycling are now fulfilled. Consequently, from an accounting perspective, a portion of the provision related to storage of uranium from reprocessing was partly recovered, for an amount of €476 million based on a 50-year operating life for the units concerned).

Furthermore, the temporary storage of spent fuel is a key issue for the back-end of the nuclear cycle. Usage forecasts for Orano's intermediate storage facilities at La Hague for spent fuel from EDF's generation fleet suggest that the pools at La Hague could be saturated by 2030. Consequently, the long-term storage capacity for spent fuel is to be increased by construction of a centralised fuel storage pool under EDF's supervision (see below). Commissioning of the new pool is scheduled for 2034 and it will be operated by EDF. The following measures will also be taken to address storage needs.

For the period until the centralised storage pool is built, studies of transitional solutions were launched by Orano and EDF in 2019 in association with the ASN. The preferred solution is densification of the existing pools at Orano's La Hague site (with a related provision of €168 million at 31 December 2020 for this plan). A supplementary solution would be to use a dry storage facility for MOX fuel (Mixed OXide of plutonium and uranium) and reprocessed uranium.

Production issues at Orano's Melox plant are affecting the pace of reprocessing in the short and medium term, and the lower level of recycling has increased the quantities requiring storage in the medium term. As a result the provisions were increased in 2021 by €362 million in consideration of both these industrial solutions, based on a forecast storage capacity of approximately 3,100 tonnes as opposed to a situation involving neither densification nor dry storage.

Provisions for spent fuel management also cover long-term storage of spent fuel that cannot currently be recycled in existing industrial facilities or under construction: plutonium fuel (MOX) or uranium fuel derived from processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available. Dedicated assets are held in association with this provision, which is unrelated to the operating cycle as defined by the law of 2006 (see note 38). The provision is founded on a scenario involving construction, managed by EDF (as nuclear operator), of a centralised underwater storage site at La Hague. This project was presented during the public debate on the National Plan for Managing Radioactive Matter and Waste (PNGMDR) in 2019-2020, and is subject to a specific public consultation organised by France's National Public Debate Commission (CNDP) that began on 22 November 2021. This consultation was suspended on 3 February 2022, to take time to reinforce consultation practices so as to better cover the Manche county and the themes raised. The procedure will continue from 20 June to 8 July 2022.

28.2 Provisions for long-term radioactive waste management

These provisions concern the following future expenses:

- interim storage, removal and storage of radioactive waste packages resulting from spent fuel processing;
- direct storage, where relevant, of spent fuel that cannot be recycled in existing installations: specifically plutonium fuel (MOX) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis;
- characterisation, processing, conditioning and interim storage of radioactive waste resulting from decommissioning and certain operating waste, and removal and final storage of this radioactive waste;
- EDF's share of the costs of studies, construction, operation and maintenance, shutdown and surveillance of existing and future storage centres.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting in particular from plant decommissioning or spent fuel processing at La Hague (comprising all fuel in reactors at 31 December, irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by ANDRA.

The provisions for long-term radioactive waste management break down as follows:

(in millions of euros)		Storage centre ¹ s concerned	31/12/2021	31/12/2020
		Very low-level waste: CIRES – Morvilliers (Andra)		
Very low-level and low and medium-level waste	Low and medium-level waste: CSA – Soulaines (Andra)		3,093	2,856
Long-lived low-level waste	Project under examination: Soulaines (Andra)		394	365
Long-lived medium and high-level waste	Geological storage centre: the Cigéo project)		10,746	10,079
PROVISIONS FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT			14,233	13,300

Very low-level and low and medium-level waste

Very low-level waste and low and medium-level waste come from nuclear facilities in operation or in the process of being decommissioned:

- very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of metals (large components, piping, support structures, etc.) or rubble (concrete, earth, etc.). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA, commissioned in 2003;
- low and medium-level waste (gloves, filters, resins, materials, etc.) is stored at surface level at the Soulaines storage centre managed by ANDRA, commissioned in 1992.

The cost of removing, processing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of:

- current contracts with transporters, and ANDRA for operation of the existing storage centers;
- the costs of the plant run by the subsidiary Cyclife France (the Centraco site at Marcoule, commissioned in 1999) for processing some of this waste that can be melted prior to storage in the ANDRA's centers;
- an estimate of the cost of a centralised facility for temporary storage, segmentation and conditioning of major components like steam generators;
- the preliminary plans for temporary storage and segmentation of control rod cluster guide tubes prior to their long-term storage.

In 2019, the inventory assumptions were updated by a time series analysis of past waste removal and better characterisation of future volumes, leading to a €206 million increase in the provision (with an unfavourable effect of €132 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

In 2020, the assumptions concerning the shares of costs were reassessed, to reflect the long-term distribution between the three producers concerned of fixed storage costs for very low-level waste and low and medium-level waste. All the effects of this cost-share updating work led to a €179 million increase in the provision (with an unfavourable effect of €50 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

In addition, since 31 December 2020, to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the treatment, conditioning and interim storage of waste; many of these operations were previously included in the provisions for nuclear plant decommissioning and waste removal and conditioning (reclassification of €979 million applied at 31 December 2020).

In 2021, in addition to changing the technical assumptions underlying provisions so as to reflect the impacts of extending the depreciation period for 1,300MW-series plants (the modified timing of waste production from decommissioning results in an increase in decommissioning waste to be sent to storage in some years and industrial solutions are required to smooth the waste dispatch flows), the industrial scenario for management of decommissioning waste prior to storage was optimised by introducing prior processing to reduce the volumes stored. This had no significant impact on provisions.

Finally, for very low-level waste, in February 2020, following the public debate of 2019-2020 concerning the French National Plan for the Management of Radioactive Matter and Waste (PNGMDR), the conclusions of the Ministry for the Ecological and Inclusive Transition and the ASN opened up the possibility of a change in regulations that would allow recycling of very low-level metal waste after processing: "The Government will make changes to the regulatory framework applicable to the management of very low-level waste, in order to introduce a new possibility of targeted exceptions, allowing recycling, after fusion and decontamination and on a case by case basis, of very low-level radioactive metallic waste". The new regulations (issued in decrees by the Minister for the Ecological Transition) were published in the *Journal officiel* on 15 February 2022. Amid these developments, EDF is continuing its ongoing studies for construction of a segmentation and fusion facility to process and recycle very low-level radioactive metallic waste resulting from dismantling operations in France and other countries. This project, called Technocentre, is led by EDF in collaboration with Orano, with a target commissioning date of 2031.

Long-lived low-level waste

Long-lived low-level waste belonging to EDF essentially consists of graphite waste from the ongoing decommissioning of the former UNGG (natural uranium graphite gas-cooled) reactors.

As this waste has a long lifetime but is lower-level than long-lived medium and high-level waste, specific subsurface storage requirements apply under the French Law of 28 June 2006.

Following the initial geological investigations, in July 2015 ANDRA remitted a report on the proposed storage centre for long-lived low-level waste on a site located in the Soulaines region (Aube) in France. This report was submitted to the ASN for its opinion. Uncertainties remain about the site's capacity to accommodate all of the waste included in the baseline inventory of the long-lived low-level waste storage facility. Further studies were planned under the 2016-2018 period of the National Plan for the Management of Radioactive Matter and Waste (PNGMDR), concerning both the feasibility of this storage centre and the search for additional waste management solutions. The ASN's opinion on management of this waste, issued on 6 August 2020 after the work done over the period 2016-2018, and the orientations proposed by the head of the PNGMDR in the current elaboration phase of the fifth edition of the PNGMDR, set a horizon of 2023 for definition by ANDRA of several reference management scenarios, and of the needs for complementary concepts and the production of a file (equivalent to a Summary Preliminary Plan or *avant-projet sommaire* - APS) presenting the technical and safety options selected for storage of long-lived low-level waste.

Long-lived medium and high-level waste

Long-lived medium and high-level waste essentially comes from processing of spent fuel, and to a lesser extent waste resulting from nuclear plant decommissioning (metallic components that have been inside the reactor).

The French Law of 28 June 2006 requires reversible storage in deep geological layers for this type of waste.

The provision established for long-lived medium and high-level waste is the largest component of provisions for long-term radioactive waste management.

Until June 2015 the gross value and disbursement schedules for forecast expenses were based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by a working group formed under supervision of the State involving representatives of the administrations concerned, ANDRA and the producers of waste (EDF, Orano, CEA). EDF applied a reasonable approach to information supplied by this working group, leading to a benchmark cost, for storage of waste from all producers, of €14.1 billion under the economic conditions of 2003 (€20.8 billion under 2011 economic conditions, based on the 2011 inventory).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project.

On this basis, ANDRA drew up figures which, in compliance with the Law of 28 June 2006, were subjected to a consultation process with waste producers started in late 2014 by the French Department for Energy and Climate (Direction générale de l'énergie et du climat or DGEC). In April 2015 EDF and the other producers sent the DGEC their comments on ANDRA's report and a joint estimation of the target Cigéo storage cost due to divergences in the valuation of technical optimisations and their induced effects. All this information was included, together with the ASN's opinion, in a report submitted to the Minister for Ecology, Sustainable Development and Energy.

On 15 January 2016 the Ministry of Ecology, Sustainable Development and Energy issued a Ministerial Order setting the target cost for the Cigéo storage project at €25 billion under 2011 year-end economic conditions. The cost as defined constitutes an objective to be met by ANDRA, in compliance with safety standards set by the ASN, working in close liaison with the operators of nuclear installations.

In application of this Ministerial Order, the cost of the Cigéo project was to be regularly updated, at least at each key milestone in the course of the project's development (authorisation to create the facility, commissioning, end of the "pilot industrial phase", safety reviews) in accordance with the opinion of the ASN.

In April 2016 ANDRA sent the ASN a safety option report (DOS). The law of 11 July 2016 clarified the concept of reversibility.

On 11 January 2018, the ASN issued its opinion on the DOS. It considered that the Cigéo project had reached satisfactory overall technological maturity at that stage. This opinion included a requirement for examination of alternatives to the proposals for storage of bituminous waste at Cigéo. A group of experts appointed by the DGEC in September 2018 to draw up a report on current bituminous waste management concluded in September 2019 that various options were feasible (storage or neutralisation) but stressed the importance of continuing the studies in order to identify the most appropriate option.

The detailed design review by a group of independent experts, organised at the request of the DGEC, reported its conclusions at the end of 2020. While issuing a generally favourable opinion for the ANDRA's submission, the Group made a certain number of recommendations for finalisation of the detailed design studies and the application for authorisation to create the centre, calling for closer involvement of EDF, Orano and the CEA on these matters.

Under the schedule prepared by ANDRA, the application to develop Cigéo (classified as a basic nuclear facility), previously due to be made in 2021, should now be made in 2022. This will delay the granting of authorisation by an equivalent period, and it is now expected in 2025. However, producers are still currently working on the hypothesis that the first waste packages will be received in 2031.

In August 2020 ANDRA filed an application for a *Déclaration d'utilité publique* (DUP) officially recognising the public utility of the Cigéo storage centre. This was examined by the government departments and subjected to a public inquiry from 15 September to 23 October 2021, and the inquiry commissioners issued an unreservedly favourable opinion on 20 December 2021. Publication of the DUP decree, which will automatically confer compatibility on the planning documents, is expected in early 2022.

Finally, the French Finance Law for 2021, published in the *Journal officiel* of 30 December 2020, included a change to the tax treatment of this project (based on storage tax instead of the standard tax regime). The associated measures remain to be defined and managed by the Government to prevent any cost increase for the Cigéo project.

In addition, since 31 December 2020, to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the conditioning and interim storage of low and medium-level waste at the ICEDA storage facility (*installation de conditionnement et d'entreposage des déchets*

activés). These nuclear expenses were previously covered by the provisions for waste removal and conditioning.

This facility, constructed at the Bugey power plant, received its first waste packages in September 2020 after the ASN authorised its commissioning on 28 July 2020. The ASN's decision approving and governing the conditioning of long-lived medium-level waste into packages at the ICEDA facility was formally received on 19 July 2021. At the end of 2021 the first waste packages were sealed, in compliance with the authorisations granted and the commissioning schedule.

28.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the basic nuclear facilities (*installations nucléaires de base*, INB) it operates. The final shutdown and decommissioning process is governed by legal provisions and regulations set out in Articles L. 593-20 to L. 593-25 and R. 593-65 to R. 593-74 in France's Environment Code. It involves the following operations for each INB:

- a definitive shutdown declaration, to be made at least two years prior to the planned shutdown date;
- since the Energy Transition Law of 17 August 2015, the final shutdown of the INB, which takes place during its operating phase, is considered separately from dismantling, as a notable change of lesser importance (simply requiring a declaration by the operator to the Minister and the ASN);
- a dismantling plan compiled by the operator and sent to the Minister in charge of nuclear safety, which after examination by the authorities and a public inquiry, leads to a decree prescribing dismantling that authorises the start of dismantling operations;
- key-stage progress reviews submitted for the ASN's approval, with a safety file specific to the dismantling operations to be performed;
- an internal control process concerning significant changes introduced by the operator in the case of operations that must be declared to or approved by the ASN;
- finally, once these operations are complete, declassification of the facility, which removes it from the legal regime governing basic nuclear facilities.

The decommissioning scenario adopted by EDF complies with France's Environment Code, which requires as short a period as possible to elapse between final shutdown and dismantling in economically acceptable conditions and in compliance with the principles laid down in Article L. 1333-1 of the Public Health Code (radioprotection) and section II of Article L. 110-1 of the Environment Code (protection of the environment). The intended end-state is industrial use: the sites will be restored to their original condition and will be reusable for industrial facilities.

The ongoing dismantling operations mainly concern plants that were constructed and operated before the nuclear fleet currently in operation, known as "first-generation" plants, and the Superphenix plant and Irradiated Materials Workshop. These operations cover four different technologies: a heavy water reactor (Brennilis), a sodium-cooled fast-neutron reactor (the Superphenix at Creys-Malville), natural uranium graphite gas-cooled (UNGG) reactors (at Chinon, Saint-Laurent and Bugey) and a pressurised water reactor (PWR at Chooz). Each of them is a first for EDF, and apart from the PWR at Chooz, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. Decommissioning of the Chooz PWR is benefiting from past experience (essentially in the US and limited), but the plant has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific challenges.

Based on the ongoing decommissioning operations at permanently shut-down plants (particularly the experience gained from the Chooz PWR), the studies conducted for the Summary Preliminary Plan for the two 900MW reactors at Fessenheim, and the preparatory work for dismantling of Fessenheim, it was possible at the end of 2021 to establish a detailed reference estimate of future decommissioning costs for the nuclear fleet currently in operation ("second-generation" plants). However, neither EDF nor any other operator has begun a decommissioning programme on a scale comparable to the current PWR fleet, and as a result the estimates include both opportunities and risks, especially associated with the scale effect.

At Fessenheim, the two pressurised water reactors were shut down definitively on 22 February 2020 and 30 June 2020 respectively, in accordance with the law and before the end of their technical operating life. The Consolidated Preliminary Plan (*avant-projet consolidé* or APC) was finalised in late 2018, with more in-depth studies and derisking of the Summary Preliminary Plan (*avant-projet sommaire* or APS). The dismantling plan was sent to the ASN in September 2019 together with the declaration of the permanent shutdown of this INB. The studies conducted in 2019 and 2020 focused on preparing the dismantling plan, which was sent to the ASN on 2 December 2020. After the filing date, the ASN will examine the documents for a period of 3 to 5 years. 2021 was marked by the complete defueling of reactor 1, preparations for decontamination of the primary circuit which will take

place in 2022, dispatch of the first operating waste to the ICEDA facility, and dispatch of the uppermost parts of the steam generators to the subsidiary Cyclife Sweden for processing, in line with the objectives of the work and studies done in preparation for decommissioning of Fessenheim.

The decommissioning provisions cover future decommissioning expenses as described above (excluding the cost of removing and storing waste, which is covered by the provisions for long-term radioactive waste management).

Details of changes in decommissioning provisions for nuclear power plants are as follows:

(in millions of euros)	31/12/2020	Increases		Decreases		Other changes ⁽²⁾	31/12/2021
		Operating	Financial ⁽¹⁾	Utilisations	Reversals		
Provisions for decommissioning nuclear plants in operation	12,775	-	396	(7)	-	(484)	12,680
Provisions for decommissioning permanently shut-down nuclear plants	4,714	262	253	(179)	-	-	5,050
TOTAL DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	17,489	262	649	(186)	-	(484)	17,730

(1) Cost of unwinding the discount and effects of changes in the net discount rate for provisions without related assets.

(2) Other changes in provisions for decommissioning nuclear plants in operation notably include the impact of the extension to 50 years of the depreciation period for 1,300MW-series plants (see note 2.1.1), partly counterbalanced by the effects of the change in real discount rate at 31 December 2021.

For nuclear power plants currently in operation (PWR pressurized water reactor plants with 900MW, 1,300MW and N4 reactors)

Until 2013, provisions were estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost for decommissioning expressed in €/MW, confirming the assumptions defined in 1979 by the PEON Commission. These estimates had been confirmed from 2009 by a detailed study of decommissioning costs conducted by EDF at the representative site of Dampierre (four 900MW units), and its results were corroborated by an intercomparison with the study carried out by consultants La Guardia, based mainly on the Maine Yankee reactor in the US.

In 2014 the Dampierre study was reviewed by EDF to make sure that the previous calculations were still valid in view of recent developments and experience, both internationally and internally. For this revision, the decommissioning provisions for plants in operation were based on costs resulting from the Dampierre study, in order to incorporate best estimates and experience from inside and outside France. This change of estimate had no significant impact on the level of provisions at 31 December 2014.

Between June 2014 and July 2015, an audit of dismantling costs for EDF's nuclear fleet currently in operation was conducted by specialised consulting firms, at the request of the French Department for Energy and Climate (*Direction générale de l'énergie et du climat* or DGECE). On 15 January 2016 the DGECE published a summary of the audit report. It stated that although estimating the cost of decommissioning nuclear reactors is a demanding exercise due to relatively limited past experience, the prospects of changes in techniques, and the distant timing of the expenditure, overall, the audit confirmed EDF's estimate of decommissioning costs for its nuclear fleet currently in operation. The DGECE also made a number of recommendations to EDF following this audit.

In 2016, EDF revised the decommissioning estimate, in order to incorporate the audit recommendations and past experience gained from dismantling operations for first-generation reactors (particularly Chooz A).

A detailed analytical approach was used to revise this estimate, identifying all costs for the engineering, construction work, operation and waste processing involved in future decommissioning of reactors currently in operation. This led to figures based on detailed timetables for plant decommissioning. The approach adopted made it possible to explore more thoroughly the assessment of costs specific to the initial units of each series, estimated for each series based on transposition coefficients

applied to the baseline costs for the initial 900MW unit, and the series and mutualisation effects, as these costs and effects are inherent to the fleet's size and configuration.

The natures of the principal series and mutualisation effects used to arrive at the estimate are explained below.

Series effects (effects of work for the first-of-a-kind site on the following sites of the same series) are mainly of two types:

- first, in a fleet using the same technology, many of the studies do not need to be repeated each time;
- second, in a fleet using the same technology, robots and tooling can be largely reused from one site to another.

Mutualisation effects (effects between units in the same site, whether in operation or being decommissioned) are of several different types:

- some of them relate to the fact that several reactors may share common buildings and facilities on the same site, and these buildings and facilities will not have to be dismantled twice;
- certain costs are not higher when two or four reactors are dismantled on the same site. This is usually the case for surveillance costs, common equipment, and the cost of maintaining safe operating conditions on the site.

Due to mutualisation effects, dismantling a pair of reactors on the same site costs less than dismantling two standalone reactors on two different sites. In France, unlike other countries, there are no single reactors but sites with two or four, and in one case six reactors.

Series and mutualisation effects reduce the estimated decommissioning cost by 10% and 6% respectively compared to an estimate that ignores these effects. These effects vary depending on the series: they are greater when there are more units in a series (series effect) and more units on a site (mutualisation effect), leading to a combined effect (series and mutualisation effect) of over 16% for the 900MW series.

In particular, series and mutualisation effects explain why it is not appropriate simply to compare the average dismantling cost per reactor between the French fleet and other countries' nuclear fleets.

In contrast, the estimates only marginally reflect changes in productivity and the learning effect. The external audit of the decommissioning cost for the fleet currently in operation, ordered by the DGECE, considered that this approach resulted in a prudent estimation method.

For reasons of prudence, the estimate also includes an assessment of risks and uncertainties as follows:

- incorporation of uncertainties relating to each “elementary” block of costs, series effects, mutualisation effects, transposition coefficients and fleet expenses;
- incorporation of risks, corresponding to the completion risks (which are identifiable and quantifiable, but only contingent). An initial register of risks on the Fessenheim project was drawn up in 2021 based on the ongoing studies, and detailed assessment of these risks is continuing for one first-of-a-kind 900MW reactor on the Fessenheim site that has no specificities. Until the results are released, the financial impact of the risks and opportunities is included via a flat-rate increase.

The above method for assessing risks and uncertainties leads to an overall margin of some 15.7% for the whole fleet (19.5% for the first 900MW unit).

Since its in-depth revision in 2016 this cost estimate has been reviewed annually. The reviews have led to non-significant annual adjustments.

In 2021, to take account of the impacts of the longer depreciation period for 1,300MW-series plants, the sequence of operations for dispatching waste from decommissioning was adapted to reflect the increase in decommissioning waste to be sent for interim storage in certain years.

Also, the reference cost for decommissioning of the first 900MW units was updated following preliminary studies conducted in preparation for the decommissioning of Fessenheim, and experience gained at the beginning of the pre-dismantling phase. This update also incorporates optimisation of the industrial scenario for management of decommissioning waste before storage, involving prior processing to reduce the volumes stored. Extrapolation of these elements to the whole PWR fleet has a limited impact on the provisions for decommissioning nuclear plants in operation: they are increased by €149 million via adjustment to balance sheet assets.

EDF confirms its analyses through an international intercomparison, taking care to identify and characterise a number of factors that could distort direct comparisons, for example differences in the scope concerned by the cost estimate, or national and regulatory contexts.

Based on the estimates of the different types of cost, the benchmark cost to completion (in 2021 euros) for decommissioning of the first two 900MW units (Fessenheim) amounts to approximately €0.8 billion, giving an average of €0.4 billion per initial 900MW unit, compared to an average cost of €0.36 billion for the entire PWR fleet, including the series and mutualisation effects described above.

For permanently shut-down nuclear power plants

Decommissioning of shut-down reactors involves pilot operations corresponding to four different technologies, each with clear specificities: a PWR reactor at Chooz A located in a cave, UNGG (natural uranium graphite gas-cooled) reactors at Bugey, Saint-Laurent and Chinon, a heavy water reactor at Brennilis, a sodium-cooled fast neutron reactor at Creys-Malville, and the first-of-a-kind second-generation PWR reactor at Fessenheim.

The decommissioning costs are based on contractor quotes, which take account of accumulated industrial experience, unforeseeable and regulatory developments, and the latest available figures. They have been revised annually since 2015. In 2015 the industrial decommissioning strategy for UNGG plants was totally revised. The previously selected strategy was based on a scenario involving “underwater” dismantling of caissons (UNGG reactor buildings) for four of the reactors, with direct graphite storage in a centre currently under examination by ANDRA (see note 28.2 “Long-lived low-level waste”). Several new technical developments showed that the alternative “in-air” dismantling solution for the caissons would improve industrial control of operations and was apparently more favourable in terms of safety, radioprotection and environmental impact. The Company therefore selected a new “in-air” dismantling scenario as the benchmark strategy for all six caissons. This scenario includes a consolidation phase, building on experience acquired from dismantling the first caisson before beginning work on the other five. The decommissioning phase will ultimately be longer than previously planned, leading to a higher estimated cost due to the induced operating charges.

Updating the industrial decommissioning scenario for permanently shut-down power plants, particularly UNGG plants, led to a €590 million increase in the provision at 31 December 2015.

The review of decommissioning provisions for permanently shut-down plants in 2016 led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). In 2017 and 2018, this annual review gave rise to non-significant adjustments.

The amended industrial scenario for dismantling of the UNGG reactors in 2015 was presented to the ASN’s commissioners on 29 March 2016. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. A consensus was reached regarding “in-air” dismantling for all reactors, the usefulness of an industrial demonstrator, and the timetable for dismantling the first-of-a-kind reactor (Chinon A2), but discussions continued regarding the dismantling timetable for the other 5 reactors. EDF’s proposed schedule allowed for significant experience-based adjustments (after dismantling the first reactor) before beginning almost simultaneous dismantling of the other 5 reactors. On 12 February 2019, EDF presented all the information justifying the Group’s chosen timetable to the ASN’s commissioners. The ASN then issued draft decisions that were submitted to public consultation between July and November 2019, setting the deadline for filing regulatory applications for authorisation of dismantling work, and the dismantling schedule to be included in the applications. In those draft decisions, the ASN acknowledged that the required operations are complex, and that EDF’s proposed risk control strategy (industrial demonstrator, significant experience with a first reactor) is justified. However, it asked for work on the five reactors after the first-of-a-kind reactor to be brought forward slightly and begin no later than 2055.

In view of the ASN’s draft decisions, the nuclear provisions were increased in 2019 by a total €108 million: €77 million for decommissioning provisions for permanently shut-down nuclear power plants and €31 million for provisions for long-term radioactive waste management (long-lived low-level waste, very low-level and low and medium-level waste).

The ASN’s decisions concerning dismantling of UNGG reactors were published on 17 March 2020 and did not contradict the principles of the draft decisions of 2019. Consequently, the nuclear provisions for decommissioning of UNGG plants were not subjected to any particular re-estimation in 2020, and they reflect the best estimate of the industrial and technical scenario.

In 2020, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €45 million increase in provisions due to critical path delays following suspension of work during France’s first lockdown phase, and a major unforeseen event associated with suspension of segmentation work on vessel internals at Chooz A. The costs for decontamination of civil engineering work were also updated, leading to a €43 million increase in provisions for the entire scope of permanently shut-down plants.

In 2021, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €77 million increase in provisions following revision of the industrial decommissioning strategy for Chooz A. That strategy has shifted to a full continuous decommissioning scenario, dropping the period of cave runoff water surveillance between the end of installation dismantling and the start of final dismantling and decontamination work, as the quality of the water means this is no longer necessary. Also, the cost estimate for decommissioning of the APEC Fuel Storage Workshop at Creys-Malville – a facility operated by EDF with the principal activity of storing fuel from the Superphénix reactor – was updated based on Summary Preliminary Plan studies conducted in 2020-2021, leading to a €61 million increase in provisions.

Finally, in accordance with its powers under Article 594-4 of the Environment Code, in June 2020 the DGEC commissioned an external audit of the valuation of dismantling operations for EDF’s permanently shut-down nuclear facilities (a UNGG facility and management of long-lived low-level waste, Superphenix and Brennilis), conducted by a consortium of specialist firms. This audit took place from December 2020 to July 2021, and the audit report was posted on the Ministry for the Ecological Transition website in November 2021. Its conclusions (confirming the ASN’s observations during its inspection of complex project management, the conclusions of which were released in the first quarter of 2021) highlights “an organization with a structural focus on execution of dismantling projects”, an “annual estimation and revision process that is robust, and provides good traceability for the assumptions used and the original data”, and “a long-term industrial approach to overcome the small number of technological challenges that remain”. Finally, the report states that apart from a non-significant correction (taken into account in the 2021 provisions), “the provisions are coherent with the basic scenarios or the projects and cover the full scope of expenses for the scope audited”, and of “adequate sizing” through testing the sizing of EDF’s expenses and provisions.

At 31 December 2021, the gross amounts estimated under year-end economic conditions (amounts still to be spent) and the present value of those amounts are as follows, presented by type of reactor technology:

<i>(in millions of euros)</i>	Costs based on year-end economic conditions	Amounts in provisions at present value
Pressurised water reactor – PWR – Chooz A	288	259
Pressurised water reactor – PWR – Fessenheim *	829	707
Natural uranium graphite gas-cooled reactors – UNGG – Bugey, Saint Laurent, Chinon	5,478	3,136
Heavy water reactor – Brennilis	323	284
Sodium-cooled fast neutron reactor – Superphenix at Creys Malville	534	479

* Excluding interim storage and processing of steam generators.

Provisions for decommissioning of permanently shut-down nuclear plants also cover dismantling costs for related facilities such as the APEC Fuel Storage Workshop at Creys-Malville and the BCOT Operational Hot Unit at Tricastin.

Compared to decommissioning costs for the PWR technology, the cost at completion (all costs both settled and remaining) for decommissioning of the other reactors is higher, to different extents depending on their specific characteristics:

- costs are around twice as high for Brennilis (completion cost of approximately €0.88 billion for one reactor) due to its compactness, the fact that the core is encased in concrete and thus difficult to access, the absence of a fuel pool, which complicates remote-controlled segmentation, and the presence of zircaloy (a fire hazard), meaning that segmentation work takes longer and must be more closely supervised;
- costs are around twice as high for UNGG reactors (completion cost of approximately €6.6 billion for six reactors), because they require removal of 20 times more material than a PWR due to their size, and contain graphite which is hard to access and requires special handling such that specific remote-controlled equipment must be developed;
- costs are around four times as high for Creys-Malville (completion cost of approximately €1.8 billion for one reactor), due to processing of sodium for which elimination is very sensitive, and the size of the facilities, especially the reactor (with a vessel 20 times bigger than the vessel of the 1,300MW PWR).

The following progress has been made on decommissioning work:

- Chooz A: the reactor was shut down in 1991 and nuclear dismantling began in 2007 after the dismantling decree was issued. The final stage of dismantling began in 2016 and involves segmentation, conditioning and removal of reactor vessel internals, followed by dismantling of the vessel itself. These operations are due to be completed in 2024. Under the new full continuous decommissioning scenario, the plant should be declassified by late 2035 (not 2047 as previously expected);
- UNGG reactors: these six reactors were shut down between 1973 and 1994 and received their dismantling decrees between 2008 and 2010 (except for Chinon A1 and A2). Fuel removal and circuit draining have been completed for all these reactors, and dismantling operations are in process for the conventional and nuclear buildings in the periphery of the "reactor caissons". Following the ASN's decision of 2020, applications for dismantling permits will be submitted for all these reactors in 2022, to obtain new decrees allowing continuation of dismantling operations according to an "in-air" strategy. Opening of the top part of the first UNGG reactor caisson – Chinon A2 – is expected in 2033: the initial extractions of vessel internals and graphite blocks are due to start in 2040 and last 14 years. In parallel, the other UNGG sites are finalising their work to put the sites into a safe storage configuration (by 2035). A safe storage configuration state means that 80% of surfaces have been dismantled and the reactor caissons awaiting dismantling are safe: this will allow sufficient progress on the first reactor in this series to gain experience and ensure safety for the other five operations. Opening of the caissons after the first UNGG decommissioning is scheduled to take place in or after 2055;

- Creys Malville: this plant was shut down in 1998 and received its dismantling decree in 2006. The following key stages have been completed: removal of the fuel, dismantling of the machine room, drainage of the circuits, processing and elimination of the sodium used for cooling in all circuits, filling the reactor vessel, opening, extracting and segmenting the vessel caps, and the start of dismantling of the core vessel cap (which weighs several hundred tonnes). The next stages are dismantling the vessel internals (due to be completed in 2026), electromechanical dismantling in the reactor building, then decontamination (dismantling should end in 2038);
- Brennilis: this plant was shut down in 1985 and received a partial dismantling decree in 2011 allowing dismantling of all installations peripheral to the "reactor block". The following key stages have been completed: removal of the fuel, dismantling of the machine room, the fuel building, auxiliary buildings, heat exchangers and the effluent treatment station. The next stages are examination of the application for full dismantling authorisation, with a view to obtaining a dismantling decree in 2022 that would enable EDF to dismantle the reactor block (the end of these operations is currently forecast at 2040). The public inquiry began on 15 November 2021 as planned, for a 7-week period. The inquiry commissioner is expected to issue his opinion in mid-February 2022.

28.4 Provisions for last cores

These provisions cover the future expenses resulting from scrapping fuel that will only be partially irradiated when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints ("front-end" expenses);
- the cost of fuel processing, and waste removal and storage operations ("back-end" expenses). These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provisions from the commissioning date and an asset associated with the provision is recognised. In a decision of 11 December 2020, France's Council of State challenged the tax-deductibility of the consequences of immediate recognition of a provision for dismantling of the last core ("front-end" last core expenses) (see note 14).

In 2020 after the Fessenheim plant was definitively shut down, €99 million of the provision for last cores, concerning the two reactors at Fessenheim, was reversed with a corresponding reduction in the inventories of non-irradiated fuel in the reactor at the time of the shutdown, and in parallel, provisions for spent fuel management and long-term radioactive waste management were recognised for the cost of processing this fuel and storage of the waste that will result.

In 2021, apart from the effects of extending the depreciation period for 1,300MW-series plants at 1 January 2021 (see note 2.1.1), there were few changes in provisions for last cores.

28.5 Discount rate, inflation and sensitivity analyses

28.5.1 Calculation of the discount rate and inflation

The methodologies used to determine the discount rate changed as follows from 31 December 2020:

The discount rate is based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (OAT bond 0-20 year curve) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) - with yields that become close to the UFR after 50 years - plus a curve of the spreads of corporate bonds rated A to BBB. Based on the disbursements expected to meet nuclear obligations, a single equivalent discount rate is deduced by applying the discount rates from the interest rate curve constructed in this way to each flow as appropriate to its maturity. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.

The UFR was defined by the European Insurance and Occupational Pensions Authority (EIOPA) for very long-term insurance liabilities that will involve disbursements beyond market horizons. The UFR calculated for 2021 is 3.46%. This is used in the calculation methodology, in compliance with the decision by the French authorities, which in the ministerial order of 1 July 2020 amending the order of 21 March 2007 on secure financing of nuclear expenses (see below) changed the formula of the regulatory ceiling for the discount rate, such that it now refers to the UFR instead of the arithmetic 48-month average of the TEC 30-year rate. The UFR is considered more relevant for nuclear provisions in view of the very long-term maturities. The sovereign yield curve at 31 December 2021 indicates rates in a range of [-0.6%; 0.6%] ([-0.6%; 0.2%] in 2020) for outflows between 0 and 20 years, [0.6%; 3.1%] ([0.2%; 3.2%] in 2020) for outflows between 20 and 50 years, and a rate moving towards 3.46% (3.51% in 2020) for outflows after 50 years.

This change in calculation methodology for the discount rate provides the best assessment of the time value of money with regard to nuclear provisions, which are characterised by very long-term disbursement outflows, well beyond market horizons. This assessment is largely achieved through:

- use of an interest rate curve based on observed year-end market data with liquid horizons, converging over non-liquid horizons towards a very long-term rate with no cycle effect, *i.e.* yield data for all the maturities associated with nuclear provisions;
- use of a very long-term rate (calculated UFR) produced by an independent body and now adopted by the French authorities in setting the formula for regulatory ceiling, to take account of long trends in yield movements, in coherence with the distant disbursement horizon;

- reference to bond spreads that include corporate bonds rated A to BBB by ratings agencies, in order to construct a robust spread curve since there are few AA-rated bonds, particularly on long maturities, whereas most "Investment Grade" bonds are BBB-rated bonds and the great majority of them have longer maturities.

The inflation assumption is based on an inflation curve constructed by reference to inflation-indexed market products and economic forecasts, in long-term coherence with the inflation assumption underlying the UFR (2%), which leads to an inflation assumption of 1.7% at 31 December 2021, up by 50 base points from 31 December 2020, particularly reflecting break-even inflation rates.

The discount rate determined is thus 3.7% at 31 December 2021, assuming inflation of 1.7% (3.3% - mainly relating to the sovereign yield curve - and 1.2% at 31 December 2020), *i.e.* a real discount rate of 2.0% at 31 December 2021 (2.1% at 31 December 2020).

28.5.2 Regulatory discount rate limit

The discount rate must comply with two regulatory limits. Under the decree of 1 July 2020 on secure financing for nuclear expenses (which codified and updated the initial decree of 23 February 2007 as part of the Environment Code) and the ministerial order of 1 July 2020 on secure financing for nuclear expenses (which amended the initial ministerial order of 21 March 2007), it must be lower than:

- a regulatory maximum, expressed in real value, *i.e.* net of inflation; this value is equal to the unrounded value representative of expectations concerning the real long-term interest rate, as used for the calculation of the Ultimate Forward Rate (UFR) applicable at the date concerned published by the European Insurance and Occupational Pensions Authority (EIOPA), plus 150 bp. This maximum is applicable from 2024. Until 2024, the maximum is the weighted average of 2.3% and the above calculation. The weighting applied to the 2.3% rate is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023; and
- the expected rate of return on assets covering the liability (dedicated assets).

The maximum discount rate calculated by reference to the UFR in application of the order that took effect on 1 July 2020 is 2.80% at 31 December 2021 (2.66% at 31 December 2020).

The real discount rate used in the financial statements at 31 December 2021, calculated by the method presented above, is 2.0%.

28.5.3 Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

Provisions related to nuclear generation within the scope of the Law of 28 June 2006 (in millions of euros)	31/12/2021		31/12/2020	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
Spent fuel management	16,121	10,683	18,998	10,246
amount unrelated to the operating cycle	3,282	1,726	2,727	1,297
Long-term radioactive waste management	36,779	14,233	35,580	13,300
Back-end nuclear cycle expenses	52,900	24,916	54,578	23,546
Decommissioning of nuclear plants in operation	20,479	12,680	19,693	12,775
Decommissioning of shut-down nuclear plants	7,718	5,050	7,400	4,714
Last cores	4,349	2,660	4,258	2,711
Decommissioning and last core expenses	32,546	20,390	31,351	20,200
PROVISIONS RELATED TO NUCLEAR GENERATION WITHIN THE SCOPE OF THE LAW OF 28 JUNE 2006 *		45,306		43,746

* Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application decrees concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations.

The cumulative disbursements of nuclear expenses (based on gross values at year-end economic conditions) are distributed as follows:

Provisions related to nuclear generation within the scope of the Law of 28 June 2006 (in millions of euros)	2021		
	Costs based on year-end economic conditions		
	Disbursement expected within 10 years	Disbursement expected after 10 years *	Total
Spent fuel management	7,846	8,275	16,121
• amount unrelated to the operating cycle	540	2,742	3,282
Long-term radioactive waste management	5,116	31,663	36,779
Back-end nuclear cycle expenses	12,962	39,938	52,900
Decommissioning of nuclear plants in operation	347	20,132	20,479
Decommissioning of shut-down nuclear plants	2,903	4,815	7,718
Last cores	262	4,087	4,349
Decommissioning and last core expenses	3,512	29,034	32,546

* Over a 20-year and 50-year horizon, 20% and 41% respectively of cumulative disbursements (at year-end economic conditions) will concern long-term radioactive waste management provisions, and 32% and 96% respectively will concern decommissioning provisions.

This approach can be complemented by estimating the impact of a change in the discount rate on the discounted value.

The following table reports these details for the main components of EDF's provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

(in millions of euros)	Amounts in provisions at present value 31/12/2021	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
		+0.10%	-0.10%	+0.10%	-0.10%
Back-end nuclear cycle expenses:					
• spent fuel management	11,819	(120)	124	102	(107)
• long-term radioactive waste management	14,233	(472)	504	385	(413)
Decommissioning and last core expenses:					
• decommissioning of nuclear plants in operation	12,680	(291)	299	-	-
• decommissioning of shut-down nuclear plants	5,050	(88)	91	88	(91)
• last cores	2,660	(54)	55	-	-
TOTAL	46,442	(1,025)	1,073	575	(611)
Amount covered by dedicated assets	34,276	(917)	963	515	(548)

Note 29 Other provisions for decommissioning

Other provisions for decommissioning principally concern fossil-fired power plants.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference

to the charges recorded on past operations and the most recent estimates for plants still in operation.

The provision recorded at 31 December 2021 reflects the most recent known cost estimates and includes rehabilitation costs for generation sites.

Note 30 Provisions for employee benefits

Changes in provisions for employee benefits were as follows:

(in millions of euros)	31/12/2020	Increases		Decreases		Other changes ⁽⁶⁾	31/12/2021
		Operating ^{(1) (4)}	Financial ⁽³⁾	Operating ^{(2) (4)}	Financial ⁽⁵⁾		
Provisions for post-employment benefits	10,561	825	283	(667)	(166)	(42)	10,794
Provisions for long-term benefits	1,055	90	9	(81)	-	-	1,073
PROVISIONS FOR EMPLOYEE BENEFITS	11,616	915	292	(748)	(166)	(42)	11,867

(1) Including a past service cost of €581 million, amortisation of actuarial losses amounting to €326 million, and unvested benefits of €8 million.

(2) Including €(724) million for employers' contributions and €(24) million for actuarial gains.

(3) See note 13.

(4) See notes 6 and 11.2.

(5) For the expected return on fund assets.

(6) Other changes consist of a €(42) million adjustment to provisions for post-employment benefits relating to prior years, resulting from a change in the benefit attribution method for retirement gratuity commitments (see note 1.1).

Details of changes in the provisions:

(in millions of euros)	Obligations	Fund assets	Obligations net of fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
BALANCE AT 31/12/2020	32,418	(13,203)	19,214	(19)	(7,579)	11,616
Net expense for 2021	873	(166)	707	8	302	1,017
Other changes *	(42)	-	(42)	-	-	(42)
Change in unrecognised actuarial gains and losses	149	(228)	(79)	-	79	-
Contributions to funds	-	-	-	-	-	-
Benefits paid	(1,173)	449	(724)	-	-	(724)
BALANCE AT 31/12/2021	32,225	(13,148)	19,076	(11)	(7,198)	11,867

* See note 30 (6).

The actuarial gains and losses on obligations generated over 2021 amount to €149 million, including €626 million resulting from the effect of revised assumptions, and €(477) million of gains due to experience adjustments.

Post-employment and long-term employee benefit expenses:

(in millions of euros)	31/12/2021	31/12/2020
Current service cost ⁽¹⁾	581	485
Interest expenses (discount effect) ⁽²⁾	292	395
Expected return on fund assets	(166)	(212)
Amortisation of unrecognised actuarial gains and losses - post-employment benefits	221	185
Change in actuarial gains and losses - long-term benefits	81	94
Effect of plan curtailment or settlement	-	-
Past service cost - vested benefits	-	-
Past service cost - unvested benefits	8	10
NET CHARGES RELATED TO POST-EMPLOYMENT BENEFITS AND LONG-TERM BENEFITS	1,017	957
including:		
Operating expenses ⁽³⁾	891	774
Financial expenses	126	183

(1) The higher past service cost compared to 2020 essentially results from the impact of changes in actuarial assumptions on obligations at 1 January 2021, due to the decrease in the discount rate (-0.4%).

(2) The interest expenses (discount effect) of €292 million are €103 million lower than at 31 December 2020, as a result of the decrease in the discount rate between 1 January 2020 (1.3%) and 1 January 2021 (0.9%).

(3) In 2021, this amount corresponds to operating increases of €915 million net of reversals for actuarial gains and losses (€24 million).

30.1 Provisions for post-employment benefits

Details of these provisions are shown below:

(in millions of euros)	31/12/2020	Increases		Decreases		Other changes*	31/12/2021
		Operating	Financial	Operating	Financial		
Provisions for post-employment benefits	10,561	825	283	(667)	(166)	(42)	10,794
comprising:							
Pensions	7,162	456	214	(509)	(161)	-	7,162
CNIEG expenses	459	11	4	(14)	-	-	460
Benefits in kind (energy)	2,173	251	49	(118)	-	-	2,355
Retirement gratuities	71	41	5	(3)	(5)	(42)	66
Other benefits	697	66	11	(23)	-	-	751

* See note 30 (6).

(in millions of euros)	Obligations	Fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
Provisions for post-employment benefits at 31/12/2021	31,152	(13,148)	(11)	(7,198)	10,794
comprising:					
Pensions	23,779	(12,606)	-	(4,011)	7,162
CNIEG expenses	501	-	-	(41)	460
Benefits in kind (energy)	5,067	-	-	(2,712)	2,355
Retirement gratuities	602	(527)	-	(8)	66
Other benefits	1,203	(15)	(11)	(426)	751

(in millions of euros)	Obligations	Fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
Provisions for post-employment benefits at 31/12/2020	31,363	(13,203)	(19)	(7,579)	10,561
comprising:					
Pensions	23,757	(12,656)	-	(3,939)	7,162
CNIEG expenses	488	-	-	(29)	459
Benefits in kind (energy)	5,340	-	-	(3,167)	2,173
Retirement gratuities	630	(532)	(5)	(22)	71
Other benefits	1,148	(15)	(14)	(422)	697

30.2 Provisions for other long-term benefits for current employees

The amount of obligations for other long-term benefits awarded to current employees is identical to the corresponding balance sheet provisions. Details are as follows:

(in millions of euros)	31/12/2020	Increases		Decreases	31/12/2021
		Operating	Financial	Operating	
Provisions for other long-term benefits for current employees	1,055	90	9	(81)	1,073
comprising:					
Annuities following work-related accident and illness	900	78	8	(72)	914
Long service awards	135	9	1	(7)	138
Other	20	3	-	(2)	21

30.3 Fund assets

Fund assets, managed under an asset/liability model, amount to €13,148 million at 31 December 2021 (€13,203 million at 31 December 2020) and concern coverage of retirement gratuities and the specific benefits of the special pension system.

Investments under the contracts concerned break down as follows:

<i>(in millions of euros)</i>	31/12/2021	31/12/2020
TOTAL FUND ASSETS	13,148	13,203
Assets funding special pension benefits	12,606	12,656
(%)		
Equities	32%	33%
Bonds and monetary instruments	67%	67%
Real estate assets	1%	-
Assets funding retirement gratuities	527	532
(%)		
Equities	33%	37%
Bonds and monetary instruments	67%	63%
Assets funding other benefits	15	15

30.4 Actuarial assumptions

The main actuarial assumptions used for provisions for post-employment benefits and long-term employee benefits under the IEG system are summarised below:

- the discount rate is 1.30% at 31 December 2021 (0.90% at 31 December 2020);
- the inflation rate is estimated at 1.70% at 31 December 2021 (1.20% at 31 December 2020);
- the average residual period of employment is 19.3 years;
- the staff turnover rate is considered non-significant;
- the *tarif agent* (special energy price for EDF employees) includes changes in taxes based on that tariff;
- the expected return on fund assets covering past specific benefits under the special pension system is 1.29% for 2021 (1.77% for 2020);
- the expected return on fund assets covering retirement gratuities is 1.06% for 2021 (1.40% for 2020).

The discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations. For longer durations, the calculation also takes into consideration data from a wider selection of corporate bonds adjusted for comparability with the high-quality bonds,

The value of fund assets declined during the year, mainly as a result of less favourable conditions on the financial markets, particularly the bond markets.

given the smaller panel of bonds with these durations since 2017. The increase in the discount rate essentially relates to the increase in risk-free rates observed in 2021.

Changes in the economic and market parameters used led the Group to set the nominal discount rate at 1.30% at 31 December 2021 (0.90% at 31 December 2020).

The inflation assumption is based on an inflation curve constructed from economic forecasts and inflation-indexed market products.

As a result of changes in the economic and market parameters, the assumed average inflation rate used as the EDF group's benchmark for Euro zone countries is 1.7% at 31 December 2021 (1.2% at 31 December 2020).

The obligations are based on wage increase assumptions that are differentiated by age group and employee category, with an average annual rise of 2.8% including inflation for a projected full career.

The wage law used to calculate obligations refers to wage increases observed over the period 2015-2018 (adjusted for non-recurring effects), which are comparable to the wage increases observed in recent years.

The mortality table used to calculate obligations is based on the INSEE 2013-2070 generation table (produced by the French statistics office), corrected for differences in mortality between the general French population and the population covered by the IEG regime.

Note 31 Provisions for other expenses

(in millions of euros)	31/12/2020	Increases		Decreases		Other	31/12/2021
		Operating	Exceptional	Utilisations	Reversals		
Provisions for:							
• personnel expenses	69	24	-	(55)	(2)	-	36
• replacement of assets operated under concessions	270	10	-	-	-	1	281
• other expenses	1,187	237	360 ⁽²⁾	(663) ⁽¹⁾	(14)	-	1,107
PROVISIONS FOR OTHER EXPENSES	1,526	271	360	(718)	(16)	1	1,424

(1) Including €459 million reversed from provisions for tax litigations following the decision of 17 June 2021 cancelling the court decision of 11 December 2020 (see note 14).

(2) The exceptional increase at 31 December 2021 concerns ongoing litigation proceedings.

Note 32 Liabilities

EDF has changed the balance sheet presentation of margin call positions on derivatives with all banking partners to improve clarity. This change is applied prospectively in 2021. Instead of reporting a net position in the balance sheet as previously, the Company now presents separate positions that reflect EDF's debit and credit balances with each of its banking partners. At 31 December 2021, the

"cash instruments" item includes an amount of €2,691 million of credit balances relating to margin calls on derivatives (see note (4) below the table). Debit balances relating to margin calls on derivatives are included in "cash instruments" in the balance sheet assets in the amount of €36 million (see note 20 (3)).

(in millions of euros)	Maturity			Gross value at 31/12/2021	Gross value at 31/12/2020
	< 1 year	1 - 5 years	> 5 years		
Liabilities					
Bonds	2,826	10,983	33,763	47,572	47,346
Borrowings from financial institutions	149	844	398	1,391	1,340
Other borrowings	6,804	6	2	6,812	3,118
Other financial liabilities:					
• advances on consumption	-	5	21	26	26
• other	1,696	1	-	1,697	1,025
Financial liabilities (see note 33)	11,475	11,839	34,184	57,498	52,855
Advances and progress payments received ⁽¹⁾	7,499	-	-	7,499	7,188
Trade payables and related accounts ⁽²⁾	10,946	-	50	10,996	7,970
Tax and social security liabilities ⁽³⁾	8,630	-	-	8,630	8,110
Liabilities related to fixed assets and related accounts	2,070	-	-	2,070	1,938
Other liabilities ⁽⁴⁾	17,945	674	-	18,619	16,655
Operating, investment and other liabilities	39,591	674	50	40,315	34,673
Cash instruments ⁽⁵⁾	3,306	266	667	4,239	5,075
Deferred income ⁽⁶⁾	507	1,024	1,544	3,075	3,202
TOTAL LIABILITIES	62,378	13,803	36,445	112,626	102,993

(1) Advances and progress payments received principally include monthly standing order payments by EDF's residential and business customers, amounting to €7,071 million at 31 December 2021 (€6,782 million at 31 December 2020).

(2) The increase in 2021 mainly concerns liabilities to EDF Trading, in a context of rising prices.

(3) In 2021 this item includes an amount of €1,457 million for the CSPE that is collected by EDF on energy supplied but not yet billed (€1,448 million in 2020).

(4) Mainly the amount of current accounts, underwriting and cash pooling agreements with subsidiaries. At 31 December 2021, other liabilities also include a liability of €294 million relating to the CSPE compensation, in contrast to the receivable of €1,974 million at 31 December 2020 (see note 20 (2)).

(5) Cash instruments notably include unrealised losses on foreign exchange instruments, and all credit balances for EDF's margin calls on derivatives with banking partners (€2,691 million at 31 December 2021, compared to a net credit balance of €2,345 million reported at 31 December 2020).

(6) Deferred income at 31 December 2021 comprises the partner advances made to EDF under nuclear plant financing plans and the associated long-term contracts, amounting to €1,746 million (€1,713 million in 2020). Deferred income on long-term contracts also includes the advance paid to EDF in 2010 under the agreement with the Exeltium consortium. This advance is transferred to the income statement progressively on a straight-line basis over the term of the contract. Deferred income also includes the initial payment under the Fessenheim compensation protocol received on 14 December 2020, which will be transferred to the income statement as and when the expenses are incurred (see note 5).

Note 33 Financial liabilities

<i>(in millions of euros)</i>	Balance at 31/12/2020	New borrowings	Repayments	Translation adjustments (realised and unrealised)	Other	Balance at 31/12/2021
Bonds <i>(in euros)</i>	3,232	-	-	-	-	3,232
Bonds (non-Euro)	10,292	-	-	736	-	11,028
Euro-Medium Term Notes (EMTN) <i>(in euros)</i> ⁽¹⁾	19,733	1,850	(3,400)	-	-	18,183
Euro-Medium Term Notes (EMTN) <i>(non-euro)</i>	14,089	-	-	1,040	-	15,129
Bonds	47,346	1,850	(3,400)	1,776	-	47,572
Long-term loans <i>(in euros)</i>	1,340	400	(349)	-	-	1,391
Borrowings from financial institutions	1,340	400	(349)	-	-	1,391
Negotiable debt instruments <i>(in euros)</i>	2,071	2,391	-	-	-	4,462
Negotiable debt instruments <i>(non-euro)</i>	214	368	-	63	-	645
Contractual financial borrowings	833	2,788	(1,905)	(11)	-	1,705
Other borrowings ⁽²⁾	3,118	5,547	(1,905)	52	-	6,812
Total borrowings	51,804	7,797	(5,654)	1,828	-	55,775
Advances on consumption	26	-	-	-	-	26
Miscellaneous advances ⁽³⁾	110	19	(19)	-	675	785
Bank overdrafts	35	-	-	-	56	91
Deferred bank debits	8	-	-	-	-	8
Interest payable	872	-	-	-	(59)	813
Total other financial liabilities	1,025	19	(19)	-	672	1,697
TOTAL FINANCIAL LIABILITIES	52,855	7,816	(5,673)	1,828	672	57,498

(1) EDF issued a €1.75 billion senior Green Bond on 23 November 2021, complemented by a further €100 million issue on 6 December 2021 (see note 2.2.2).

(2) The change in other borrowings principally comprises €2,822 million resulting from issuance of negotiable debt instruments net of redemptions, and €874 million from transfers of bonds to several banks under repurchase agreements, with a corresponding effect recognised in cash and cash equivalents (see note 20 (4)).

(3) Mainly including €408 million of bonds received as guarantees from a banking partner, with a corresponding effect recognised in marketable securities (see note 21 (2)), and €267 million relating to the redemption option exercised by EDF at 22 January 2022 on the 2014 bond issue. EDF consequently reclassified the amount of €267 million from "Other equity" to "Financial liabilities", considering the redemption as certain.

33.1 Breakdown of loans by currency, before and after hedging instruments

<i>(in millions of euros)</i>	Debt structure in balance sheet				Impact of hedging instruments		Debt structure after hedging			
	Non-euro	In euros	% Non- euro	% of debt	Non-euro	In euros	Non-euro	In euros	% Non- euro	% of debt
Total I – Euros		28,973		52		21,583		50,556	100	91
CHF	550	532	2	1	(550)	(532)	-	-	-	-
GBP	7,385	8,789	33	16	(3,000)	(3,570)	4,385	5,219	100	9
HKD	2,416	274	1	-	(2,416)	(274)	-	-	-	-
JPY	137,000	1,051	4	2	(137,000)	(1,051)	-	-	-	-
NOK	1,000	100	-	-	(1,000)	(100)	-	-	-	-
USD	18,185	16,056	60	29	(18,185)	(16,056)	-	-	-	-
Total II – Non euro currencies		26,802	100	48		(21,583)		5,219	100	9
TOTAL I + II		55,775		100		-		55,775		100

The nominal value of hedging instruments included in off-balance sheet commitments (see note 35.1) has no effect on loans in the balance sheet.

33.2 Breakdown of loans by type of interest rate before and after hedging

(in millions of euros)	Debt structure in balance sheet			Impact of hedging instruments	Debt structure in balance sheet after hedging		
	Total	% 31/12/2021	% 31/12/2020		Total	% 31/12/2021	% 31/12/2020 *
Long-term borrowings and EMTN	48,570			(16,170)	32,400		
Short-term borrowings	6,812			-	6,812		
Borrowings at fixed rate	55,382	99	99	(16,170)	39,212	70	68
Long-term borrowings and EMTN	393			16,170	16,563		
Short-term borrowings	-			-	-		
Borrowings at floating rate	393	1	1	16,170	16,563	30	32
TOTAL	55,775	100	100	-	55,775	100	100

* The figures for 2020 include a correction concerning derivatives not taken into account.

Note 34 Unrealised foreign exchange gains

Unrealised foreign exchange gains at 31 December 2021 amount to €260 million (€336 million at 31 December 2020), of which €128 million concern a bond in pounds sterling that is entirely hedged by cross-currency swaps and €53 million concern bonds in US dollars that are entirely hedged by cross-currency swaps.

Other information

Note 35 Financial instruments

35.1 Off-balance sheet commitments related to currency and interest rate derivatives

EDF uses financial instruments to limit the impact of foreign exchange rate risks and interest rate risks.

(in millions of euros)	31/12/2021		31/12/2020	
	To be received (notional)	To be given (notional)	To be received (notional)	To be given (notional)
1 – Interest rate transactions				
Short-term interest rate swaps				
EUR	-	-	-	-
Long-term interest rate swaps				
EUR	9,323	9,323	10,385	10,385
USD	3,576	3,576	3,300	3,300
GBP	4,481	4,481	3,854	3,854
Sub-total	17,380	17,380	17,539	17,539
2 – Exchange rate transactions				
Forward transactions and forex options				
EUR	40,593	33,057	32,688	24,353
CAD	136	374	435	574
USD	23,312	24,617	16,671	20,643
GBP	9,354	14,199	6,138	8,903
CHF	142	404	192	361
ILS	440	554	354	405
PLN	213	253	137	177
JPY	123	741	79	835
CNY	1,075	797	102	102
MXN	105	105	102	101
Other currencies	921	1,016	637	740
Long-term currency swaps				
EUR	3,821	35,196	4,247	33,880
JPY	1,051	61	1,083	63
USD	17,118	1,812	15,807	1,709
GBP	17,505	2,334	15,120	2,557
CHF	532	-	509	-
ILS	90	90	86	86
PLN	12	21	14	14
NOK	100	-	96	-
MXN	-	-	-	10
HKD	274	-	254	-
Sub-total	116,917	115,631	94,751	95,513
3 – Securitisation swaps	-	-	62	62
4 – Operations on marketable securities	-	-	-	-
Purchases and sales of stock options				
TOTAL FINANCIAL OFF-BALANCE SHEET COMMITMENTS	134,297	133,011	112,352	113,114
5 – Commodity swaps				
Oil products (in thousands of barrels)	7,168	7,168	6,218	6,218

The amounts shown in the above table are the nominal values of contracts originally in euros or translated into euros or using 2021 year-end exchange rates (regardless of whether they are classified as hedges).

35.2 Impacts of financial instrument transactions on net income

(in millions of euros)	2021	2020
Instruments not classified as hedges		
Interest rate instruments *	130	141
Forex instruments	511	(274)
Instruments classified as hedges		
Interest rate instruments	739	710
Forex instruments	(82)	(118)

* Including interest on swaps.

35.3 Fair value of derivative financial instruments

The fair value of currency and interest rate swaps was calculated by discounting future cash flows using year-end market exchange and interest rates, over the remaining term of the contracts (market value includes accrued interest).

The book value of derivatives presented at nominal value in off-balance sheet commitments includes accrued interest, equalisation payments and premiums paid or received, plus translation adjustments, which are already booked in EDF's accounts. The difference between the resulting book value and market value of these instruments is the unrealised gain or loss.

The market value of derivative financial instruments presented at nominal value in off-balance sheet commitments at 31 December 2021 as calculated by EDF is as follows:

(in millions of euros)	Book value	Fair value
Interest rate hedges		
• Interest rate swaps	145	2,120
Exchange rate hedges		
• Forward exchange transactions, currency swaps and forex options	54	177
• Cross Currency Swaps	1,007	2,203
Commodity hedges		
• Oil products	-	98
TOTAL	1,206	4,598

Note 36 Other off-balance sheet commitments and operations

At 31 December 2021, off-balance sheet commitments related to operations, financing and investments (other than electricity supply commitments and partnership agreements) comprise the following:

(in millions of euros)	Maturity				31/12/2021	31/12/2020
	< 1 year	1-5 years	5-10 years	> 10 years		
Off-balance sheet commitments given	19,038	18,298	10,061	8,332	55,729	53,255
Operating commitments	11,578	13,785	9,566	6,921	41,850	36,784
• Fuel and energy purchase commitments	7,711	10,598	8,369	6,758	33,436	27,083
• Other operating commitments	3,867	3,187	1,197	163	8,414	9,701
Investment commitments	2,890	3,192	385	36	6,503	6,626
Financing commitments	4,570	1,321	110	1,375	7,376	9,845
Off-balance sheet commitments received	2,498	11,680	331	648	15,157	13,330
Operating commitments	1,193	873	331	248	2,645	2,848
Investment commitments	5	68	-	-	73	-
Financing commitments	1,300	10,739	-	400	12,439	10,482

36.1 Commitments given

In almost all cases, commitments given are reciprocal, and the third parties concerned are under an obligation to supply EDF with assets or services related to operating, investing and financing transactions.

At 31 December 2021, these commitments mature as follows:

(in millions of euros)	Maturity				31/12/2021	31/12/2020
	< 1 year	1-5 years	5-10 years	> 10 years		
Electricity purchases and related services	6,002	4,090	3,697	5,003	18,792	12,078
Nuclear fuel purchases	1,709	6,508	4,672	1,755	14,644	15,005
FUEL AND ENERGY PURCHASE COMMITMENTS	7,711	10,598	8,369	6,758	33,436	27,083

Electricity purchases and related services

Electricity purchase commitments mainly concern:

- Island Energy Systems (SEI), which has given commitments to purchase electricity generated from bagasse and coal, and electricity generated by the plants of EDF's subsidiary PEI;
- hedging contracts: these are forward purchases, for which the volumes and prices are set in contracts with EDF Trading.

In addition to the obligations reported above and under Article 10 of the Law of 10 February 2000, in mainland France EDF is obliged to purchase, at the producer's request and subject to compliance with certain technical features, the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydro-electric plants, photovoltaic power, etc.).

The additional costs generated by this obligation are offset, after validation by the CRE, by the CSPE. These purchase obligations total 54TWh for 2021 (59TWh for 2020), including 7TWh for co-generation (7TWh for 2020), 25TWh for wind power (31TWh for 2020), 11TWh for photovoltaic power (11TWh for 2020) and 4TWh for hydropower (4TWh for 2020).

Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover EDF's needs for uranium and fluorination, enrichment and fuel assembly fabrication services.

The decrease in nuclear fuel purchase commitments in 2021 is mainly explained by the execution of existing contracts, which was partly counterbalanced by adjustments to commodity prices.

36.1.2 Other operating commitments

These are mostly commitments undertaken by EDF when it signs orders relating to operations or contracts in progress, related guarantees, and commitments as lessee under irrevocable operating lease contracts principally for premises, equipment and vehicles. The corresponding rents are subject to renegotiation at intervals defined in the contracts.

The decrease in these commitments is mainly explained by fact that the guarantee for pension commitments in the United Kingdom, which was previously provided by EDF, is now given by EDF Energy.

36.1.3 Investment commitments

Investment commitments are mostly commitments for acquisitions of property, plant and equipment.

36.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, EDF has entered into long-term contracts for purchases of electricity, other energies and commodities and nuclear fuel, for periods of up to 20 years.

36.1.4 Financing commitments

These are financing commitments made by EDF to its subsidiaries. The decrease in these commitments principally concerns EDF International (decrease of €2,160 million for the financing of the Hinkley Point C project).

36.2 Commitments received

36.2.1 Operating commitments

These commitments mainly comprise:

- operating lease commitments received as lessor;
- operating guarantees received;
- operating sale commitments, essentially concerning engineering services for the Hinkley Point C project;
- personnel secondment commitments for Edvance.

36.2.2 Financing commitments

These commitments correspond to the total value of credit lines available to EDF from various banks.

36.3 Other types of commitment

36.3.1 Electricity supply commitments

In the course of its business, EDF has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5GW;
- in execution of France's "NOME" Law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its existing nuclear power plants to other suppliers, until 31 December 2025. This has concerned a maximum volume of 150TWh each year since 1 January 2020.

36.3.2 Gas purchases and related services

Gas purchase commitments are given by EDF in connection with its expanding gas supply business.

Gas purchases for supply, delivery and storage are mostly undertaken through long-term contracts and forward purchases from EDF Trading.

Note 37 Contingent liabilities

A contingent liability is:

- a potential obligation arising from past events, which will only be confirmed by the occurrence (or non-occurrence) of one or more uncertain future events that are not completely within the entity's control; or
- a present obligation arising from past events that is not recognised in the financial statements because an outflow of resources representing economic benefits is unlikely to be necessary to extinguish the obligation, or because the amount of the obligation cannot be measured reliably.

The principal contingent liabilities at 31 December 2021 are the following:

Tax inspections

For the years 2012 to 2019, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *Contribution sur la Valeur ajoutée des Entreprises* (tax on corporate value added) and questioned the deductibility of long-term provisions.

ARENH dispute - Force majeure

In the crisis caused by the Covid-19 pandemic, some suppliers applied to the President of the Paris Commercial Court in 2020 for an emergency order suspending ARENH deliveries either totally, or partially, equivalent to the decline in electricity consumption by their customer portfolio during the crisis, citing the *force majeure* clause contained in the master ARENH agreement signed with EDF.

On 20, 26 and 27 May 2020, after summary proceedings the Paris Commercial Court issued provisional rulings on the applications for suspension of ARENH contracts made by four alternative suppliers (TotalEnergies, Gazel, Alpiq and Vattenfall). The urgent application judge ruled that *force majeure* was established, and ordered the suspension of deliveries for three of the applicants (TotalEnergies, Gazel, and Alpiq). EDF appealed against this ruling. On 28 July 2020, the Paris Court of Appeal upheld these Commercial Court decisions. On 24 September 2020 EDF filed an appeal before the Court of Cassation. TotalEnergies is the only remaining party in the ongoing proceedings.

Meanwhile, as a precautionary measure to protect its rights, on 2 June 2020 EDF notified the energy suppliers Alpiq, Gazel and TotalEnergies of the termination of their ARENH contracts. By an order of 1 July 2020, the President of the Paris Commercial Court declared this termination null and void. EDF appealed against that decision. On 19 November 2020, the Paris Court of Appeal overturned the Commercial Court's order and stated that there were no grounds for summary proceedings, thus restoring the effects of the termination.

Further summary proceedings were initiated in late September 2020 by Ohm Energie, seeking a suspension of payments due for ARENH volumes, claiming that deliveries had been continued illegally by EDF since it had requested suspension of ARENH deliveries from April to June 2020 due to *force majeure*. On 23 October 2020 the Paris Commercial Court rejected all of Ohm Energie's claims.

In parallel, seven cases concerning the substance of the matter have been brought by suppliers, claiming compensation from EDF for the prejudice caused by its allegedly unlawful refusal to apply the *force majeure* clause. The suppliers concerned are Hydroption, Vattenfall, Priméo Energie Grands Comptes and Priméo Energie Solutions, Arcelor Mittal Energy, Plüm Energy and Plüm Entreprises et Collectivités, TotalEnergies and Ekwateur.

Under the contract with the Dunkerque LNG methane terminal, EDF also benefits from approximately 61% of the terminal's regasification capacities until 2037, in return for payment of an annual premium of approximately €150 million. A provision for onerous contracts is recorded in connection with this contract.

On 13 April 2021, the Paris Commercial Court issued a first judgement on the merits in the Hydroption case, ordering EDF to pay the claimant €5.88 million in damages. The court considered that the conditions for *force majeure* were fulfilled and concluded that in continuing its ARENH deliveries against Hydroption's wishes EDF had committed a breach of contract for which it could be held liable. On 15 October 2021, the Paris Court of Appeal overturned the Commercial Court's judgement insofar as it considered EDF liable and ordered it to pay damages to Hydroption, considering that the exemption clause of *force majeure* was not established, and that EDF was not obliged to satisfy a request for suspension of the contract. On 2 December 2021, the Toulon Commercial Court placed Hydroption SAS in liquidation. The liquidator has not taken an appeal to the Court of Cassation.

The Paris Commercial Court issued two more judgements on the merits on 30 November 2021, in the Total Energies and Ekwateur cases, ordering EDF to pay these companies damages totalling several dozen million euros.

The other cases are still ongoing.

Investigations by France's Competition Authority ("ADLC")

France's Competition Authority (the ADLC) is currently investigating the EDF group in connection with four separate matters.

The first, relating to the commercial practices of EDF and some of its subsidiaries in the energy services markets, follows a complaint filed on 17 October 2016 by Xélan. Following this complaint, the ADLC conducted search and seizure operations at the premises of EDF and several of its subsidiaries on 22 and 23 November 2016. This investigation is still ongoing.

The second investigation follows a complaint filed by Engie on 19 June 2017 relating to EDF's commercial practices regarding retail electricity and gas sales, and specifically the circumstances in which EDF gave electricity suppliers, upon request, access to its file of customers paying the regulated "Green" and "Yellow" tariffs from the end of 2015, when these tariffs were about to be discontinued. Documents collected during search and seizure operations in November 2016 were used in the Engie proceedings. On 27 May 2021 EDF, Dalkia, Dalkia Smart Building, Citelum and Cham were notified of the ADLC's objections concerning the markets for retail electricity and gas supply, multi-technique management/maintenance and energy optimisation services, and energy control measures leading to issuance of energy savings certificates. The ADLC's decision is awaited, after a meeting was held before the ADLC's panel in November 2021.

The third investigation follows an ex-officio referral to the ADLC on 4 November 2019 and concerns the formation of a partnership for heat network operations. On 3 May 2021 EDF, Dalkia, Electricité de Strasbourg, ES Services Energétiques and EDEV were notified of the ADLC's objections and responded on 16 July 2021. This procedure, which allows both sides to present their arguments, will continue in 2022.

The fourth investigation, relating to EDF's pricing policy for its electricity supply offers to non-residential customers with a connection capacity of less than 36kVa, follows a complaint by Plüm Energie dated 14 September 2020. This complaint was accompanied by an application for precautionary interim measures, intended to make the ADLC take urgent action. On 18 February 2021, the ADLC rejected Plüm's application for interim measures. The investigation on the merits of the complaint is ongoing.

Finally, in a decision of 18 January 2022 the ADLC dismissed a complaint and application for interim measures made against EDF by ANODE (the national association of retail energy operators). This complaint concerned EDF's refusal to provide access to the database of non-residential customers concerned by discontinuation of the "blue" regulated sales tariffs, who were switched automatically to a follow-on market-price contract at 31 December 2020. However, the ADLC considered that ANODE's arguments were not backed up by sufficient evidence proving the existence of the alleged practices. This decision is open to appeal for a one-month period from its notification to the parties.

Should the ADLC conclude in any of these investigations, after examining the merits of the matter, that anti-competitive practices have been involved, the possible penalties in application of Article L. 464-2 of the French Commercial Code include a fine of up to 10% of the Group's worldwide sales excluding taxes.

A provision was recognised at 31 December 2021.

Labour litigation

EDF is party to a number of labour lawsuits, primarily regarding working hours. EDF estimates that none of these lawsuits, individually, is likely to have a significant impact on its results or financial position. However, because they relate to situations that could concern a large number of EDF's employees, any increase in such litigations could have a potentially negative impact on EDF's financial position (although the risk has been mitigated by the signature of a 2016 agreement on fixed numbers of working days).

Note 38 Dedicated assets

38.1 Regulations

Articles L. 594-1 and following of France's Environment Code and their implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste. These regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. Dedicated assets are clearly identified and managed separately from the Company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The law requires the realisable value of dedicated assets to be higher than the value of the provisions corresponding to the present value of the long-term nuclear expenses defined in France's Environment Code.

The Decree of 1 July 2020 codified the regulatory obligations concerning dedicated assets in articles D594-1 and following of the Environment Code, complemented by the ministerial order of 21 March 2007 amended by the order of 1 July 2020. These documents define the list of eligible assets, which is largely based on France's Insurance Code and mainly includes unlisted assets. In particular, they authorise allocation to dedicated assets of the shares of CTE, which has held 100% of the capital of RTE since 31 December 2017 (see note 38.2.2 below).

EDF received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

Since the decree of 1 July 2020, EDF is no longer obliged to add to dedicated assets when the coverage rate of obligations, determined by the ratio of the assets' realisable value to the amount of the provisions concerned, is above 100%, and withdrawals from assets are not authorised unless that rate is above 120%. The decree also increased the maximum period for allocating funds to dedicated assets in the event of undercoverage, subject to authorisation by the administrative authority, to 5 years (instead of 3 years previously).

38.2 Strategic allocation and composition of dedicated assets

Given the regulations governing dedicated assets, they form a highly specific category of assets.

Dedicated assets are structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It takes into account regulatory constraints concerning the nature and liquidity of the dedicated assets, the financial outlook for the equity and bond markets, and the diversifying contribution of unlisted assets.

Several changes have been made to this strategic allocation in order to pursue the diversification into unlisted assets, particularly in 2010 when the shares in RTE (now held via CTE) were allocated to dedicated assets, and in 2013 when an unlisted asset portfolio (consisting of infrastructures, real estate and debt or equity funds) was set up. This portfolio is managed by EDF SA's "EDF Invest" Division.

On 29 June 2018 the Board of Directors validated the principle of strategic allocation for dedicated assets:

- yield assets (target of 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- growth assets (target of 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- fixed-income assets (target of 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually by 2025.

38.2.1 Growth assets and fixed-income assets

Certain growth and fixed-income assets take the form of bonds held directly by EDF. Others consist of specialised collective investment funds and French general-purpose investment funds (FIVGs) on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds located in France, established for the Company.

The listed equity funds consist of international equities (mainly in North America but also in Europe, Asia-Pacific and emerging countries). Listed bonds and listed bond funds consist of sovereign and corporate bonds.

These investments are structured and managed in line with the strategic allocation, which takes into consideration international stock market cycles, for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led the Group to define a long-term investment policy with appropriate allocation between growth assets and fixed-income assets.

Growth assets also include a small portion of funds invested in unlisted equities, and fixed-income assets also include a small portion of funds invested in unlisted debt. These funds are mainly managed by EDF Invest (see note 38.2.2).

In the course of operational asset monitoring, the Group applies long-term, specific management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

38.2.2 Yield assets

The yield assets managed by EDF Invest consist mainly of assets related to investments in infrastructures and real estate, made either directly by EDF Invest or by investment funds under delegated management arrangements.

Through unlisted investment funds, EDF Invest also manages growth assets and fixed-income assets (see note 38.2.1).

At 31 December 2021, the assets managed by EDF Invest represent a total realisable value of €8,626 million, including €7,908 million of yield assets. Yield assets particularly include:

- 50.1% of EDF's shares in CTE, amounting to €3,343 million at 31 December 2021 (€2,788 million at 31 December 2020);

- EDF's investments in Teréga, Energy Assets Group, Porterbrook, Autostrade per l'Italia, Q-Park, Thyssengas, Aéroports de la Côte d'Azur, Madrileña Red de Gas (MRG), Géosel, Nam Theun Power Company, in companies that own wind and solar power plants (in the United States, Canada, and the United Kingdom) and in companies that own real estate assets (Central Sicaf, Ecowest, Korian & Partenaires Immobilier, Issy Shift, 92 France).

Details of the portfolio at 31 December 2021 are as follows:

(in millions of euros)	31/12/2021		31/12/2020	
	Net book value	Realisable value	Net book value	Realisable value
Investment in CTE (the company that owns RTE) ⁽¹⁾	2,705	3,343	2,705	2,788
Other investment securities	24,944	29,741	24,195	27,148
Other financial investments and shareholder loans	3,839	4,330	3,136	3,421
Dedicated assets – Investments	31,488	37,414	30,036	33,357
Marketable securities	50	50	260	262
Dedicated assets – Marketable securities	50	50	260	262
Total dedicated assets before hedging	31,538	37,464	30,296	33,619
Hedging instruments and other	16	(10)	48	229
TOTAL DEDICATED ASSETS AFTER HEDGING ⁽²⁾	31,554	37,454	30,344	33,848

(1) EDF's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The realisable value of CTE presented in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets.

(2) Limiting the value of certain investments in compliance with Article 16 of Decree 2007-243 concerning calculation of the regulatory realisable value of dedicated assets has no effect at 31 December 2021 or 2020.

Net book value and fair value include unmatured accrued interest.

38.2.4 Coverage of long-term nuclear obligations

At 31 December 2021, by the regulatory calculations provisions are 109.3% covered by dedicated assets. The regulatory caps on the realisable value of certain investments set in the Environment Code were respected at 31 December 2021.

At 31 December 2020, by the regulatory calculations provisions were 103.6% covered by dedicated assets and also respected these regulatory caps on realisable value.

The long-term nuclear obligations concerned by the regulations for dedicated assets related to nuclear generation are included in EDF's financial statements at the following values:

(in millions of euros)	31/12/2021	31/12/2020
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,726	1,297
Provisions for long-term radioactive waste management	14,233	13,300
Provisions for nuclear plant decommissioning	17,730	17,489
Provisions for last cores – portion for future long-term radioactive waste management	587	590
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	34,276	32,676

38.2.5 Changes in dedicated assets in 2021

As the coverage of provisions by dedicated assets was above 100% at 31 December 2020 (103.6%), EDF had no obligation to add to the dedicated asset portfolio in 2021, and no allocation was made in 2021 (compared to allocations of €797 million in 2020 in compliance with EDF's regulatory obligation for 2020). The coverage rate of provisions at 31 December 2021 is 109.3%.

2021 was another extremely favourable year on the equity markets. The economic environment remained very dynamic despite concerns triggered by the emergence of several variants of the Covid-19 virus. Vaccination campaigns in the developed countries limited the pandemic's impact on economic activity and contributed to the equity market performance.

Equity indexes rose significantly over the year, driven by a very good performance on the US market, then the European market, while other zones were less dynamic. More unusually, the biggest rises were registered by mega-caps, which progressed in all zones except the emerging countries.

As the economy recovered, the bond markets suffered due to rising rates. German 10-year rates, for example, rose by +0.4% to -0.2% and American rates rose by +0.6% to 1.5%. However, this rise remained moderate compared to the increase in inflation. The central banks still managed to reassure the markets by stressing that this development was temporary, which meant that monetary support policies would only be withdrawn gradually.

EDF Invest continued to extend its portfolio of unlisted assets in smart meters via an additional investment in Energy Assets Group (C72) in the United Kingdom (the percentage ownership remains unchanged), in the French telecommunications sector via acquisition of a minority shareholding (as part of a consortium) in the fibre optics operator Orange Concessions (C71), in real estate in France and Germany via acquisition of minority shareholdings (92 France, C79, C82, C84) and shares in diversified unlisted investment funds.

At 31 December 2021, dedicated assets registered an overall performance of €1,834 million, comprising €764 million in financial result and €1,070 million in exceptional result. This is principally explained by dividends and interest received (€856 million), increases to provisions on bonds and investment funds due notably to unfavourable market trends (€(85) million), and gains on sales of investment securities (€1,070 million).

Note 39 Related parties

39.1 Relations with subsidiaries

(in millions of euros)	EDF's receivables ⁽¹⁾		EDF's liabilities ⁽¹⁾		Financial income (excluding dividends)
	Loans	Operating receivables	Net liabilities included in current account	Operating liabilities	
Companies					
ATMEA	143				
CTE (formerly C25)		468		321	
Framatome		157		458	
EDF Energy	123	160		62	2
EDF Renewables	2,881				26
EDF International	13,048				262
EDF Trading	2,943	3,280		3,969	9
Edison					1
Enedis	1,997	58		1,824	10
Dalkia France	1,788	71		292	36
Groupe PEI	568			108	13
Citelum	123				2
EDF Luminus	80				1
Edvance		60		51	
Current accounts ⁽²⁾				2,076	
Investment agreement for subsidiaries' liquidities			1,797		(5)
Group cash management agreement with subsidiaries ⁽³⁾			11,912		
Tax consolidation agreement				1,529	

(1) Receivables and payables of more than €50 million.

(2) Including €598 million concerning Sofilo, €532 million concerning Enedis and €474 million concerning PEI.

(3) Including €5,144 million concerning C3, €1,489 million concerning EDF Trading, €879 million concerning EDF Energy and €850 million concerning Edison.

39.2 Relations with the French state and state-owned entities

39.2.1 Relations with the French state

The French State holds 83.88% of the capital of EDF at 31 December 2021, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, EDF is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (Cour des Comptes) or Parliament, and verifications by the French General Finance Inspectorate (Inspection générale des finances).

The public service contract between the French State and EDF was signed on 24 October 2005. This contract establishes the framework for public service missions assigned to EDF by the lawmaker for an unlimited period. The Law of 9 August 2004 does not stipulate the duration of the contract.

39.2.2 Relations with Engie

Concerning the common LPG distribution and supply service in the cities of Ajaccio and Bastia in Corsica, ENGIE informed EDF in October 2020 that it was considering terminating its LPG activities in Corsica.

Article 96 of France's Finance Law for 2022 allows the State to bear part of the costs associated with conversion of the LPG networks to electricity or renewable energies, for a maximum period of twenty years to be set by official order.

This measure currently has no impact for EDF. Ultimately, the prospect of ending LPG distribution operations and converting uses to electricity will need investments to reinforce the electricity distribution networks.

39.2.3 Relations with public sector entities

EDF's relations with public sector entities mainly concern the two entities belonging to the former AREVA group (Orano and AREVA SA).

Transactions with Orano concern:

- the front-end of the nuclear fuel cycle (uranium supplies, conversion and enrichment services);
- the back-end of the nuclear fuel cycle (transportation, storage, processing and recycling services for spent fuel).

Front-end of the cycle:

Several important agreements have been negotiated between EDF and Orano:

- for supplies of natural uranium: Orano Mining contracts;
- for fluorination and enrichment of natural uranium into uranium 235: an Orano Chimie-Enrichissement contract (formerly the Orano cycle contract).

Back-end of the cycle:

Relations between EDF and Orano Recyclage (formerly Orano Cycle) concerning transportation, processing and recycling of spent fuels are described in note 28.

Note 40 Management compensation

The Company's key management and governance personnel are the Chairman and CEO and the directors. In application of the law, directors representing the employees receive no remuneration for their services.

The total gross compensation (salaries and all types of benefits, excluding employer contributions) paid by EDF to the Company's key management and governance personnel was as follows in 2020 and 2021.

(in euros)	2021	2020
Chairman and CEO ⁽¹⁾	453,660	453,660
Directors ⁽²⁾	436,934 ⁽³⁾	439,946 ⁽⁴⁾

(1) At its meeting of 17 February 2021 the Board of Directors decided to keep the gross fixed annual compensation of the Chairman and Chief Executive Officer at €450,000 for 2021, the same as in 2020. The Chairman and Chief Executive Officer also receives benefits in kind in the form of a company car.

(2) The General Shareholders' Meeting of 6 May 2021 approved the Board of Directors' proposal to set the annual budget for directors' compensation at €440,000 for 2021.

(3) This amount includes directors' fees paid in 2021 to directors whose terms of office ended during 2021, amounting to a total €35,505.

(4) This amount includes directors' fees paid in 2020 to directors whose terms of office ended during 2019, amounting to a total €50,142.

Note 41 Subsequent events

Exceptional regulatory measures and outlook for nuclear power generation in France

Exceptional regulatory measures

In view of the high increases in electricity market prices, France introduced a "tariff cap" for 2022 limiting the raise in regulated sales tariffs for residential customers to a maximum 4% (including taxes) at 1 February 2022 compared to the tariffs in force at 1 August 2021. This tariff cap is founded on two articles of the Finance Law for 2022 (law 2021-1900 of 30 December 2021):

- under Article 29, a reduction in the TICFE tax (or CSPE) is applicable from 1 February 2022 for all customers (residential and business customers, on regulated-tariff or market-price contracts), although a legal minimum level must be maintained (€1/MWh for residential and small business customers). This reduction applies to quantities of energy delivered until 31 January 2023. The new TICFE tariffs have been set by decree;
- under Article 181, if the CRE, despite the reduction in the TICFE, proposes an increase in regulated sales tariffs for residential customers that exceeds 4% (including taxes) compared to the tariffs in force at 31 December 2021, as a dispensation from the Energy Code the French government may object to the proposal and through a joint decision by the Ministers for the Economy and Energy set the regulated sales tariffs, and tariffs for sales to the local distribution companies, at a lower level. If this happens, the law provides for a subsequent catch-up adjustment of regulated sales tariffs in 2023, to be smoothed over twelve months, to cover the loss of income for EDF in 2022. The same article also introduces a mechanism to compensate for losses borne by local electricity distribution companies on regulated-tariff offers and electricity suppliers on market-price offers.

On 13 January 2022 the French government announced further exceptional measures to limit the rise in electricity tariffs for consumers in 2022. Details of their practical implementation are still forthcoming, but one main step is attribution of an additional volume of 20TWh to the ARENH scheme for 2022, over the period 1 April to 31 December 2022, at the price of €46.2/MWh. This measure, announced in January 2022, has two effects for EDF: i) it is necessary to purchase these 20TWh of ARENH volume for delivery to other suppliers, with a very significant negative price effect given current market prices; ii) the increased ARENH portion in relation to the market-price portion in the "cost stacking" method used to calculate regulated sales tariffs for 2022 will induce a decrease in sales prices to customers on both regulated-tariff and market-price contracts.

The additional measures also concern extension of the 4% regulated tariff increase cap (including taxes) to non-residential customers who are still eligible for the regulated tariff in mainland France and non-interconnected zones.

In a press release of 13 January 2022, EDF acknowledged the measures announced by the French government to limit the rise in electricity tariffs for 2022. EDF stated that the financial consequences could not be accurately determined at that stage. Based on the information available to the Company at the press release date, the impact of these measures on EDF's 2022 EBITDA, compared to a situation in which they were not implemented, was estimated at around €8.4 billion based on market prices at 31 December 2021, and around €7.7 billion based on market prices at 12 January 2022. EDF stated that the final impact on EBITDA would depend on the market prices over the implementation period, and that it would release information as soon as possible and regularly on adjustments to this estimate. In the meantime it withdrew its 2022 Net Financial Debt/EBITDA guidance.

EDF also stated that it was going to consider appropriate measures to strengthen its balance sheet structure, and any steps that could protect its interests.

In a decision of 18 January 2022, the CRE proposed an increase of 35.4% including taxes (44.5% excluding taxes) in the "blue" tariffs for residential customers and 35.9% including taxes (44.7% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2022. This proposed increase was driven primarily by the significant rise in prices on the energy market. If it had taken account of the maximum decrease in the TICFE confirmed by decree 2022-84 of 28 January 2022, this proposal would have been for a 20% increase (including taxes) in the "blue" tariffs for residential customers and a 20.9% increase (including taxes) in the "blue" tariffs for non-residential customers. In accordance with the tariff cap, this proposal was rejected by the Ministers for the Economy and Energy, who set the increase in the "blue" tariffs for residential customers at 4% including taxes (24.3% excluding taxes) and the increase in the "blue" tariffs for non-residential customers at 4% including taxes (23.6% excluding taxes) through tariff orders of 28 January 2022, published in the *Journal officiel* of 30 January 2022 and implemented from 1 February 2022.

The CRE stated that the average price (excluding taxes) resulting from the new "blue" tariffs for residential customers in mainland France would have been €57.2/MWh under its tariff proposal, and will be €31.2/MWh in application of the tariff order of 28 January 2022. In accordance with Article 181 of the Finance Law for 2022, the difference will be covered by a catch-up adjustment in 2023, and suppliers to residential customers on market-price contracts and the local distribution companies will be entitled to compensation from 1 February 2022. The CRE also stated that it would assess the impact of the additional ARENH volumes in 2022 at a later date; this should result in a reduction to the catch-up adjustment planned for 2023, and the supplier compensation provided for in Article 181 of the Finance Law.

Outlook for nuclear power generation in France

On 13 January 2022 EDF updated its estimated nuclear output in France for 2022 from 330-360TWh to 300-330TWh, following extension of outages for 5 of EDF's French nuclear reactors. During preventive maintenance checks on reactor 1 at the Civaux nuclear power plant, scheduled as part of its ten-year inspection, some defects were detected close to the welds on the pipes of the safety injection system (SIS) circuit. Preventive checks were then carried out on the Civaux 2, Chooz 1 and Chooz 2 reactors. They revealed similar defects at the Civaux 2 and Chooz 2 reactors. Checks and expert assessments of the Chooz 1 reactor are still in progress and will continue until a full assessment is completed. Preventive maintenance checks conducted during the ten-year inspection of reactor 1 at the Penly nuclear power plant also found similar defects on the SIS circuit.

Due to performance of checks, and the examination and implementation of technical solutions, EDF extended the maintenance outages of the Civaux 1, Civaux 2, Chooz 1, Chooz 2 and Penly 1 reactors. A control program for the entire nuclear fleet is under development, incorporating experience from the initial analyses as it is gained.

As part of its control programme on the French nuclear fleet, on 7 February 2022 EDF revised its 2022 nuclear output estimate from 300-330TWh to 295-315TWh, and stated that the 2023 French nuclear output estimate, currently 340-370TWh, would be updated as soon as possible.

On 11 February 2022, EDF updated its 2023 French nuclear output estimate from 340-370TWh to 300-330TWh. This estimate takes into account:

- a heavy industrial programme with 44 reactor outages for maintenance and inspection, including 6 ten-yearly inspections, plus 2 scheduled outages starting in 2022 that will continue into 2023;
- the continuation of the control and repair programme on the pipes potentially affected by the stress corrosion phenomenon, which is still ongoing.

The regulatory measures described above, and the new estimates of nuclear power output in France, will have significant effects on EDF's financial statements from 2022, but have no impact on the financial statements at 31 December 2021.

Exclusive agreement to acquire part of GE Steam Power's nuclear activities

EDF and GE announced on 10 February 2022 that they had signed an exclusive agreement for EDF to acquire part of GE Steam Power's nuclear power activities. The proposed transaction would bring together GE's nuclear steam turbine technology and services expertise with EDF strengthening its commitment to the nuclear power sector, creating an industry-leading global steam turbine equipment

and services provider within the EDF group. Today, GE Steam Power's nuclear steam turbines are installed in half of the world's nuclear power plants, including all of EDF's nuclear plants in France.

The proposed transaction includes GE Steam Power's conventional island equipment for new nuclear power plants—including the world's most powerful steam turbine in operation, the Arabelle turbine - as well as maintenance and upgrades for existing nuclear power plants. The transaction would also include steam turbine technology to equip EPR (European Pressurized Reactors) and EPR 2 reactor and small modular reactors (SMR).

GE would retain a services-focused Steam Power business and continue to provide best-in-class services for more than 100GW of nuclear turbine islands in the Americas region, and it also retains GE Hitachi Nuclear Energy, a leading lifecycle provider for reactor island which will deploy Canada's first commercial, grid-scale SMR. GE remains committed to the nuclear sector and continues to invest in next-generation technology, which plays an important role in today's energy transition.

The nuclear activities and teams in the scope of the proposed transaction are based in about fifteen countries, with nearly 70% of the workforce in France, including at GE Steam Power manufacturing sites like Belfort and La Courneuve.

Financial details of the proposed transaction were not disclosed. The proposed transaction is subject to consultation with employee representatives and other customary closing conditions, including regulatory reviews. The transaction is expected to be finalised in the first half of 2023.

Launch of an action plan

As announced on 13 January 2022, EDF presented an action plan at the Board of Directors' meeting on 17 February 2022. This plan is designed to reinforce EDF's balance sheet structure in the context of the events of early 2022. It aims to continue the Group's strategy, founded on a balanced mix of nuclear and renewable energies, which develops energy efficiency services and brings customers even more innovations.

To finance this strategy, EDF plans to:

- submit a proposal to the Board of Directors as soon as possible, subject to market conditions, for a capital increase maintaining preferential subscription rights. This would lead to the issuance of some 510 million new shares with total value of approximately €2.5 billion including the issue premium;
 - propose a scrip option (payment in shares) for the 2022 and 2023 dividends.
- The French State, EDF's largest shareholder, has informed the Board of its position on these two points, which will be covered in a separate communication;
- complete disposals of around €3 billion in total in the years 2022-2023-2024.

6.4 Statutory auditors' report on the financial statements

This is a translation into English of the statutory auditors' report on the financial statements of the Company issued in French and it is provided solely for the convenience of English-speaking users.

This statutory auditors' report includes information required by European regulation and French law, such as information about the appointment of the statutory auditors or verification of the management report and other documents provided to shareholders.

This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

For the year ended December 31, 2021

To the General Meeting of Électricité de France,

Opinion

In compliance with the engagement entrusted to us by your General Meeting, we have audited the accompanying financial statements of Électricité de France S.A. (« EDF » or the « Company ») for the year ended December 31, 2021.

In our opinion, the financial statements give a true and fair view of the assets and liabilities and of the financial position of the Company as at December 31, 2021 and of the results of its operations for the year then ended in accordance with French accounting principles.

The audit opinion expressed above is consistent with our report to the Audit Committee.

Basis for Opinion

Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described in the *Statutory Auditors' Responsibilities for the Audit of the Financial Statements* section of our report.

Independence

We conducted our audit engagement in compliance with independence requirements of the French Commercial Code (*Code de Commerce*) and the French Code of Ethics (*Code de Déontologie*) for statutory auditors for the period from January 1, 2021 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in Article 5(1) of Regulation (EU) No 537/2014.

Emphasis of matter

Without qualifying the opinion expressed above, we draw your attention to the notes 1.1, 24 and 30 to the financial statements which describe the change in accounting method relating to the application of the update by the College of the French National Accounting Board (ANC) on November 5, 2021 of Recommendation no. 2013-02 of November 7, 2013, relating to the rules for the measurement and recognition of pension and similar benefit obligations and which introduced a choice of methods for allocating benefit entitlements for defined benefit plans.

Justification of Assessments – Key Audit Matters

Due to the global crisis related to the Covid-19 pandemic, the financial statements of this period have been prepared and audited under specific conditions. Indeed, this crisis and the exceptional measures taken in the context of the state of sanitary emergency have had numerous consequences for companies, particularly on their operations and their financing, and have led to greater uncertainties on their future prospects. Those measures, such as travel restrictions and remote working, have also had an impact on the companies' internal organization and the performance of the audits.

It is in this complex and evolving context that, in accordance with the requirements of Articles L.823-9 and R.823-7 of the French Commercial Code (*Code de Commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the financial statements.



Valuation of provisions related to nuclear generation in France – back-end of the nuclear cycle, plant decommissioning and last cores – and dedicated assets

Notes 1.2.2, 1.7.2, 1.15.1, 18, 28 and 38 to the financial statements

Key Audit Matter

As at December 31, 2021, the provisions recorded to cover obligations relating to nuclear power plants for which EDF is the operator in France total €46,442 million, including €26,052 million with respect to the back-end of the nuclear cycle (management of spent fuel and radioactive waste) and €20,390 million with respect to the decommissioning of nuclear power plants and last cores.

The valuation of these provisions depends on the regulatory context is described in Notes 1.15.1 and 28 to the financial statements. It requires defining technical and financial assumptions and using complex calculation models.

They are updated and the assumptions taken into consideration in the models are reviewed at least once a year. As of 31 December 2021, the methodologies used to determine the discount rate changed in 2020, remain unchanged in 2021. These assumptions reflect management's best estimate at the reporting date of the impacts of the applicable regulation, the implementation of decommissioning and storage processes or changes in the main financial parameters. More specifically, they reflect the impacts of the extension of the amortization period for the 1,300MWe nuclear fleet and of studies on preparing the dismantling plan of Fessenheim nuclear plants over the other nuclear plants in operation and, the updated scenario regarding interim spent fuel storage.

Furthermore, the Company is required to allocate so-called "dedicated" assets to secure financing of certain categories of nuclear provisions in France. The realizable value of these assets should allow the Company's commitments relating to the decommissioning of nuclear power plants and long-term storage of radioactive waste in France to be covered (Note 38). The realizable value of these dedicated assets, for an amount of €37,454 million (or a net carrying amount of €31,554 million) as of December 31, 2021, was determined based on the fair value of diversified equity and bonds investments, and the equity value of a non-listed assets portfolio managed by the division EDF Invest. These dedicated assets are classified as growth assets, fixed-income assets and yield assets and ought to be compliant with the cart of responsible investor implemented in 2021.

We considered the valuation of provisions related to nuclear generation and dedicated assets to be a key audit matter due to:

- the sensitivity of the assumptions on which the valuation of these provisions is based, notably in terms of cost, inflation and long-term discount rates, as well as the depreciation periods of nuclear power plants in operation, and forecast cash outflows; the modification of these parameters can lead to a material revision in the provisioned amounts;
- the negative impacts on the financial position of the Company (cash earmarked to increase the amount of dedicated assets) in the event of an increase in nuclear provisions in France, a change in the realizable values of dedicated assets or changes in the coverage rate of nuclear provisions for dedicated assets,

it being specified that the valuation of provisions covers and includes uncertainties related to the fact that certain scenarios and technical solutions have never been implemented.

Responses

We have analyzed the measures for recognizing provisions related to nuclear generation in France and gained an understanding of the industrial scenarios for decommissioning nuclear power plants and the technical solutions adopted in terms of management of spent fuel and radioactive waste. We have assessed the compliance of the methods for determining the provisions with regard to applicable accounting, legal and regulatory measures.

We have verified the calculation models used by the Company and assessed the assumptions adopted in terms of cost, forecast cash outflows and financial parameters (discount and inflation rates).

Our work also consisted in verifying the type of costs used to determine provisions and assessing the reconciliation of forecast costs and forecast cash outflows with industrial scenarios as well as the available studies and quotes, based on the current year change in assumptions.

We have also assessed the appropriateness of:

- margins for uncertainties and risks included in the provisions, to take into account the degree of control over decommissioning techniques and the management of spent fuel and radioactive waste.
- the series and mutualization effects adopted in the quotes for decommissioning nuclear power plants in operation, for which the nominal cost represents €20,479 million to economic conditions at the end of the period, for a provision of €12,680 million in discounted value (Note 28.5.3).

Concerning the inflation and discount rates and their calculation methods adopted by management described in note 28.5, we have verified their compliance with applicable accounting standards and regulatory measures, since 2020. We have reconciled the data used for this purpose with available market data or internal expertise-based documentation.

Concerning the securing of financing for certain of these provisions through dedicated assets, we have reconciled the realizable value of the dedicated assets in the portfolio at the reporting date with the available certificate of depository statements, and available external data and valuations. We have also assessed the accounting treatment and their valuation, in particular the compliance with the accounting standard of the impairment model described in the accounting principles and methods of the Note 1.7.2.

Finally, we have verified the appropriateness of the disclosures given in the Notes for the provisions related to nuclear generation in France and the dedicated assets, notably regarding the sensitivity of the valuation of provisions to changes in macro-economic assumptions (Note 28.5.3).

Specific Verifications

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations.

Information given in the management report and in the other documents with respect to the financial position and the financial statements provided to the Shareholders

We have no matters to report as to the fair presentation and the consistency with the financial statements of the information given in the management report of the Board of Directors, and in the other documents with respect to the financial position and the financial statements provided to Shareholders.

We attest the fair presentation and the consistency with the financial statements of the information relating to payment deadlines mentioned in Article D.441-6 of the French Commercial Code (*Code de commerce*).

Information relating to corporate governance

We attest that the section of the management report devoted to corporate governance sets out the information required by Articles L.225-37-4, L.22-10-10 and L.22-10-9 of the French Commercial Code.

Concerning the information given in accordance with the requirements of Article L.22-10-9 of the French Commercial Code (*Code de commerce*) relating to remunerations and benefits received by or awarded to the directors and any other commitments made in their favour, we have verified its consistency with the financial statements, or with the underlying information used to prepare these financial statements and, where applicable, with the information obtained by your company from controlling and controlled companies included in the scope of consolidation. Based on these procedures, we attest the accuracy and fair presentation of this information.

With respect to the information relating to items that your company considered likely to have an impact in the event of a public takeover bid or exchange offer, provided pursuant to Article L.22-10-11 of the French Commercial Code, we have agreed this information to the source documents communicated to us. Based on these procedures, we have no observations to make on this information.

Other information

In accordance with French law, we have verified that the required information concerning the identity of the shareholders and holders of the voting rights has been properly disclosed in the management report.

Report on Other Legal and Regulatory Requirements

Format of presentation of the financial statements intended to be included in the annual financial report

We have also verified, in accordance with the professional standard applicable in France relating to the procedures performed by the statutory auditor relating to the annual and consolidated financial statements presented in the European single electronic format, that the presentation of the financial statements intended to be included in the annual financial report mentioned in Article L.451-1-2, I of the French Monetary and Financial Code (code monétaire et financier), prepared under the responsibility of the Chief Executive Officer, complies with the single electronic format defined in the European Delegated Regulation N° 2019/815 of 17 December 2018.

Based on the work we have performed, we conclude that the presentation of the financial statements intended to be included in the annual financial report complies, in all material respects, with the European single electronic format.

We have no responsibility to verify that the financial statements that will ultimately be included by your company in the annual financial report filed with the AMF are in agreement with those on which we have performed our work.

Appointment of the Statutory Auditors

We were appointed as statutory auditors of Electricité de France S.A. by the General meeting of June 6, 2005 for KPMG S.A. and the by decision of the Board of Directors of April 25, 2002 for Deloitte & Associés.

As at December 31, 2021, KPMG S.A. was in the 17th year of total uninterrupted engagement and Deloitte & Associés was in the 20th year of total uninterrupted engagement, which for both 17 years since securities of the Company were admitted to trading on a regulated market.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with French accounting principles and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The financial statements were approved by the Board of Directors.

Statutory Auditors' Responsibilities for the Audit of the Financial Statements

Objectives and audit approach

Our role is to issue a report on the financial statements. Our objective is to obtain reasonable assurance about whether the financial statements as a whole are free

from material misstatement. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As specified in Article L. 823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the statutory auditor exercises professional judgment throughout the audit and furthermore:

- Identifies and assesses the risks of material misstatement of the financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control.
- Evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the financial statements.
- Assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the statutory auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein.
- Evaluates the overall presentation of the financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation.

Report to the Audit Committee

We submit to the Audit Committee a report which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control regarding the accounting and financial reporting procedures that we have identified.

Our report to the Audit Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the financial statements of the current period and which are therefore the key audit matters, that we are required to describe in this report.

We also provide the Audit Committee with the declaration provided for in Article 6 of Regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by Articles L.822-10 to L.822-14 of the French Commercial Code (*code de commerce*) and in the French Code of Ethics (*code de déontologie*) for statutory auditors. Where appropriate, we discuss with the Audit Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Paris La Défense, February 17, 2022

The Statutory Auditors

French original signed by

KPMG S.A.

Marie Guillemot

Michel Piette

Deloitte & Associés

Damien Leurent

Christophe Patrier



6.5 Dividend policy

6.5.1 Dividends and interim dividends paid in the last three fiscal years

The amount of dividends and interim dividends paid in the last three fiscal years was as follows:

Fiscal year	Number of shares	Dividend per share (in euros)	Total dividend paid ⁽¹⁾ (in euros)	Dividend payment date
2018	3,010,267,676	0.31 ⁽²⁾	933,556,364.41 ⁽³⁾	18 June, 2019
2019	3,050,969,626	0.15 ⁽⁴⁾	456,888,323.70 ⁽⁴⁾	17 December 2019
2020	3,099,923,579	0.21 ⁽⁵⁾	652,259,998.76 ⁽⁶⁾	7 June 2021

(1) After deduction of treasury shares.

(2) I.e. €0.341 in 2018 for shares benefiting from the increased dividend.

(3) Including €451,000,397.55 paid on 10 December 2018 as an interim dividend on the 2018 dividend paid entirely in cash. The balance of the 2018 dividend, in the amount of 482,555,966.86 paid on 18 June 2019, is composed of €452,021,956.95 paid in new shares and €30,534,009.91 paid in cash.

(4) The interim dividend for 2019 of €456,888,323.70 paid on 17 December 2019, is composed of €429,635,913.60 paid in new shares and €27,252,346.20 paid in cash and €63.90 of balancing cash.

(5) I.e. an amount of €0.231 in 2020 for the shares benefiting from the increased dividend.

(6) The balance of the 2020 dividend of 652,259,998.76 paid on 7 June 2021 is composed of €616,146,887.12 paid in new shares and €36,113,111.64 paid in cash.

At its meeting of 17 February 2022, the Board of Directors decided to propose to the General Meeting of Shareholders that will be called to approve the financial statements for the year ended 31 December 2021 and will be held on 12 May 2022, the payment of a dividend of €0.58 per share (excluding the increased dividend) for the 2021 fiscal year i.e. a balance of EUR 0.28 taking into account the interim dividend for 2021 of EUR 0.30 paid on 2 December 2021. The balance of the dividend payable for the 2021 fiscal year comes to €0.338 per share for shares benefiting from the increased dividend.

Shareholders will be offered the option of having the remaining dividend paid out in new Company shares. This option will be available between 20 May and 7 June

2022 inclusive. For shareholders who have not exercised their option by 13 June 2022, at the latest, all remaining dividend payments will be made in cash. The French State has undertaken to have its dividend paid out in the form of new shares.

New common shares issued to pay for the share capital increase will only entitle their holders to the payment of the balance of the 2021 dividend.

The dividend payment date, subject to the approval of the General Meeting, will be 7 June 2022, with an ex-dividend date of 18 May 2022.

6.5.2 Dividend policy, increased dividend

The dividend policy formulated by the Board of Directors takes the Group's investment needs, the economic context and any other relevant factor into account.

In accordance with the amendment to the articles of association passed by the Shareholders' Meeting of 24 May 2011, the first increased dividend was paid in 2014 for the previous year. Shareholders holding their shares in registered form for at least two years are entitled to an increased dividend. The number of shares

eligible for the 10% increased dividend may not exceed 0.5% of the share capital for a single shareholder.

On 21 November 2014, the Shareholders' Meeting amended the articles of association to the effect of authorizing it to approve the payment of any dividend, interim dividend, reserves or premium that is distributed or any reduction in capital through delivery of the Company's assets, including financial securities.

6.5.3 Unclaimed dividends

Dividends not claimed within five years of their payment date lapse in favour of the French State.

6.6 Other items

6.6.1 Table of results for the last five fiscal years

	2021	2020	2019	2018	2017
Capital at year ended					
Share capital (<i>in millions of euros</i>)	1,619	1,550	1,552	1,505	1,464
Capital contributions (<i>in millions of euros</i>)					
Number of common shares in existence	3,238,676,748	3,099,923,579	3,103,621,086	3,010,267,676	2,927,438,804
Number of priority dividend shares (with no voting rights) in existence					
Maximum number of future shares to be created by conversion of bonds					
by exercise of subscription rights					
Operating results for the year (<i>in millions of euros</i>)					
Sales excluding taxes	53,001	44,315	46,155	44,874	42,371
Income before tax, employee profit-sharing, depreciation, amortization and provisions	9,177	8,051	7,639	7,925	5,091
Income tax	1,410	(406) ⁽²⁾	605	(756) ⁽²⁾	(687) ⁽²⁾
Employee profit-sharing for the year					
Income after tax, employee profit-sharing, depreciation, amortisation and provisions	1,457	222	1,593	1,591	1,924
Dividends				934 ⁽¹⁾	1,341 ⁽¹⁾
Interim dividends	947	652	457	451	433
Earnings per share (<i>in euros/share</i>)					
Income after tax and employee profit-sharing but before depreciation, amortisation and provisions	2.40	2.73	2.27	2.88	1.97
Income after tax, employee profit-sharing, depreciation, amortisation and provisions	0.45	0.07	0.51	0.53	0.66
Dividend per share		0.21 ⁽⁵⁾		0.31 ^{(1) (4)}	0.46 ^{(1) (3)}
Interim dividend per share	0.30	0	0.15	0.15	0.15
Employees					
Average number of employees over the year	62,035	62,462	63,530	64,927	66,577
Total payroll expense for the year (<i>in millions of euros</i>)	3,720	3,694	3,654	3,711	3,831
Amounts paid for employee fringe benefits for the year (social security, Company benefit schemes, etc.) (<i>in millions of euros</i>)	2,687	2,745	2,799	2,854	2,923

(1) Including interim payment.

(2) Amount corresponding to a tax product.

(3) I.e. €0.506 for shares benefiting from the bonus dividend.

(4) I.e. €0.341 for shares benefiting from the bonus dividend.

(5) I.e. €0.231 for shares benefiting from the bonus dividend.

6.6.2 Significant change in the financial or trading position

Significant events occurring between the end of the 2021 fiscal year and the date of the filing of this Universal Registration Document are mentioned in note 23 to the consolidated financial statements for the financial year ending 31 December 2021 for events which occurred before 17 February 2022, when the Board of Directors approved the financial statements, and for events which occurred after 17 February 2022, in section 5.2 "Subsequent events" of this Universal Registration Document.

6.6.3 Information on invoice settlement times (account payable and receivable) (as required by Article L. 441-6-1 of the French Commercial Code)

Within the framework of the LME Act, as amended by Act no. 2015-990 promoting growth, activity and equal economic opportunities, EDF discloses the amounts (including VAT) of debts and receivables due at the end of the fiscal year. These amounts are broken down by tranche of overdue payments and posted respectively to the amount including VAT of purchases and sales for the fiscal year.

(in millions of euros)	Article D. 441 I.- 1°: overdue invoices which have been received but not paid at the closing date of the fiscal year						Article D. 441 I.- 2°: overdue invoices which have been issued but not paid at the closing date of the fiscal year					
	0 day	1-30 days	31-60 days	61-90 days	91 days and more	Total (1 day and more)	0 day	1-30 days	31-60 days	61-90 days	91 days and more	Total (1 day and more)
(A) Period overdue												
Number of invoices	106,852					4,522	3,774,482					7,447,907
Total amount of invoices (including VAT)	3,218	23	4	1	1	29	1,632	125	73	48	654	900
% of the total amount of purchases of the year	5.9	0.0	0.0	0.0	0.0	0.0						
% of total amount of sales of the year (including VAT)							2.5	0.2	0.1	0.1	1	1.4
(B) Invoices excluded from (A) relating to payables and receivables in dispute or unrecognised												
Number of invoices excluded						0						0
Number of invoices excluded						0						0
(C) Reference payment terms applied (contractual or statutory – Article L. 441-6 or Article L. 43-1 of the French Commercial Code)												
Payment terms used for calculating periods overdue	Legal and contractual deadlines						Legal deadlines					

6.6.4 Information on existing branches – as required by Article L. 231-1 of the French Commercial Code

At 31 December 2021, the Group had 215 secondary establishments registered with the French Trade and Companies Registers stated in the Company's "K-bis" document, and operated on French territory through several thousand different offices which do not fulfil the independent management criterion to qualify as a branch.

EDF's branches ⁽¹⁾ outside mainland France are listed below:

- Saint-Barthélemy;
- Saint-Pierre-et-Miquelon;
- Saint-Martin;
- Saint-Denis de la Réunion;
- Cayenne;
- Pointe-à-Pitre;
- United Arab Emirates: Abu Dhabi and Dubai;
- Bahrain;
- Benin;
- Cambodia;
- China: Taishan;
- South Africa;
- Cape Verde;
- Qatar;
- New Caledonia;
- Togo.

(1) In fiscal terms, this is a list of permanent establishments located outside France.

6.7 Information relating to the allocation of funds raised through Green Bonds issued by EDF

Since 2013 the Group has conducted six Green Bond issues for a total of around €8.75 billion in order to support its development in renewable energies.

After two bond issues chiefly intended to finance the building of new wind and solar power projects by its subsidiary EDF Renewables (€1.4 billion in November 2013 and \$1.25 billion in October 2015), the Group expanded its Green Bond Framework to finance investments in the renovation and modernisation of its hydropower assets in mainland France. The new Framework was first applied to a €1.75 billion issue in October 2016 and then to a JPY26 billion issue in two tranches in January 2017. The Group further extended the scope of its Green Bond Framework in early 2020 by opening it up to international hydropower assets, energy efficiency projects and biodiversity conservation projects. In this context, the Group issued Green Bonds for an amount of €2.4 billion in September 2020, and new Green Bonds for an amount of €1.85 billion in November 2021 ⁽¹⁾.

The commitments made by EDF in the context of these two bond issues follow the four Green Bond Principles ⁽²⁾ guiding (i) the use of proceeds, (ii) existing processes for evaluating and selecting Eligible Projects, (iii) the management of proceeds, and (iv) reporting procedures. A detailed description of these investments can be found in the EDF Green Bond Framework of January 2020 available on the Sustainable Finance page of the Company's website.

This section provides a summary of these commitments and how EDF has fulfilled them as at the end of 2021.

Use of proceeds

EDF has committed itself to allocate the proceeds from its Green Bonds programme to finance new investments in renewable energy projects. Projects eligible for Green Bond financing as per the Green Bond Framework (the "Eligible Projects") are:

- the construction or acquisition of a portfolio of renewable energy power generation projects including wind, solar, hydro, storage, biomass and geothermal projects;
- investments in existing hydroelectric facilities, including renovation and heavy maintenance; modernisation and automation; and development of existing facilities (including power increases);
- energy efficiency projects, including projects to reduce energy consumption, modernise lighting, heating and cooling network projects and projects involving the creation of charging stations for electric vehicles;
- biodiversity preservation projects, such as actions to mitigate the impact of EDF's activities on biodiversity, site restoration or re-naturalisation and research and development.

The Green Bond Framework provides that the funds may finance projects which would not have benefited from financing through a Green Bond within 3 years before the issue of the Green Bond (look-back clause). Similarly, the funds can be used to acquire a portfolio of renewable energy projects.

Assessment and selection of financed eligible projects

Each Eligible Project to be funded is assessed against the environmental and social eligibility criteria ⁽³⁾ ("E&S criteria") specified in Appendix 1 of the Green Bond Framework. This assessment is based on five elements, including (1) compliance with ethical, transparent and sustainable human resources criteria; (2) monitoring of the project's environmental impact; (3) promotion of occupational health and safety; (4) responsible supplier relations; and (5) a commitment to organise a consultation process for each new project.

Only projects meeting the E&S criteria qualify for Green Bond financing.

Compliance with these criteria is certified by Deloitte (auditor) in accordance with the requirements of the Green Bond Framework. On this basis, the Finance Departments of the Group entities in question designate the Eligible Projects that are financed.

Management of proceeds

Proceeds raised are managed according to a strict ring-fencing principle in order to ensure that their use is exclusively and effectively reserved for financing Eligible Projects.

Once received by EDF's Finance and Investment Department, proceeds from each bond issue are invested and tracked in a dedicated sub-portfolio of treasury assets until allocated to Eligible Projects. Proceeds are invested in priority in treasury assets identified as Socially Responsible Investments (SRI).

The Finance Divisions of the corresponding entities notify EDF's Treasury Division, on an ongoing basis or at regular intervals, of the proceeds needed to cover investments related to the selected projects. Based on this information the Treasury Division adjusts the amounts available in the dedicated treasury asset sub-portfolios.

Reporting

Effective use of proceeds

All the proceeds raised in November 2013 under the first Green Bond issued by EDF for €1.4 billion were allocated by June 2015. All the proceeds raised in October 2015 under the second Green Bond issued for US\$1.25 billion were allocated by the end of 2017. The funds raised as part of the third Green Bond issued in October 2016 (€1.75 billion) were allocated at the end of 2019. All the proceeds raised in January 2017 under the fourth Green Bond issued for ¥26 billion were allocated by mid-2020. The funds raised as part of the fifth Green Bond issued in September 2020 (€2.4 billion) were allocated at the end of 2021.

As at 31 December 2021, the funds raised in November 2021 in the amount of €1.75 billion under the sixth Green Bond issued by EDF, increased by €100 million in the context of a tap-up in December 2021, which generated net proceeds of €1.8 billion, have been invested in a dedicated cash portfolio, as described above, pending its allocation to Eligible Projects.

(1) EDF issued a €1.75 billion Green Bond on 29 November 2021, which was tapped up by €100 million on 6 December 2021.

(2) The Green Bond Principles, updated in June 2018, are voluntary guidelines for issuance of Green Bonds. They recommend transparency and disclosure and promote integrity to support development of the Green Bond market. For more information, see <http://icmagroup.com/News/news-in-brief/green-and-social-bond-principles-2021-edition-issued/>.

(3) The E&S criteria for each project type are presented in the appendix to the EDF Green Bond Framework of September 2016 and January 2020.

Allocation of proceeds at 31 December 2021:	Nominal value at issuance	Funds allocated at 31/12/2021	Funds allocated to Eligible Projects	Number of Green Bond funded projects	Share of investment financed via Green Bonds proceeds
Green Bond no. 1 November 2013	€1.4 billion	€1.4 billion	Of which renewable capacities: €1.4 billion	13 ⁽¹⁾	59%
Green Bond no. 2 October 2015	\$1.25 billion	\$1.25 billion	Of which renewable capacities: \$1.25 billion	7 ^{(1) (2)}	58%
Green Bond no. 3 October 2016	€1.75 billion	€1.75 billion	Of which renewable capacities: €1,248 million	10 ^{(2) (3)}	54%
			Of which hydroelectric projects: €502 million	600 operations	100%
Green Bond no. 4 January 2017	¥26,000 million	¥26,000 million	Of which renewable capacities: ¥14,021 million	7 ⁽³⁾	15%
			Of which hydroelectric projects: ¥11,979 million	207 operations	87% ⁽⁴⁾
Green Bond no. 5 September 2020	€2.4 billion	€2.6 billion ⁽⁶⁾	Of which renewable capacities: €2,421 million (including €1,461 million in look back)	32 projects ⁽³⁾ + 3 portfolio redemptions	78%
			Of which hydroelectric projects: €110 million	153 operations ⁽⁵⁾	100%
			Including biodiversity projects developed by EDF Hydro: €28 million (including €16 million in look back)	39 projects	100%
Green Bond no. 6 – November 2021	€1.85 billion	-	-	-	-

(1) Including the Roosevelt Project, financed by Green Bonds 1 and 2.

(2) Including the Red Pine Project, financed by Green Bonds 2 and 3.

(3) Including the Milligan and Las Majadas Projects, financed by Green Bonds 3, 4 and 5 and the Big Beau Solar Project financed in part by the sustainable securities loan transaction. A REPO green evergreen contract was signed on 1 October 2021 with BNP for €50,000,000. This green contract was set up to finance the portion of EDF EN FUNDING's "Big Beau" Project that is surplus to the proceeds of Issue 5. It will be refinanced by Green Bond 6.

(4) Share of total investments financed by EDF, including half of the investment in the Romanche-Gavet Project.

(5) Including 31 transactions already partly financed by a previous Green Bond.

(6) The issue premium of Green Bond no. 5 enabled EDF to receive a total amount of €2,559 million.

At 31 December 2021, the following Eligible Projects had been chosen by EDF Renewables for financing under the Green Bonds issued in November 2013 (GB1), October 2015 (GB2) October 2016 (GB3), January 2017 (GB4) and September 2020 (GB5):

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
CID Solar	PV Solar, 27MW	US (California)	In service	GB1
Cottonwood	PV Solar, 33MW	US (California)	In service	GB1
Catalan wind farm	Onshore wind, 96MW	France (Pyrénées-Orientales)	In service	GB1
Heartland	Biogas, 20MW	US (Colorado)	In service	GB1
Hereford	Onshore wind, 200MW	US (Texas)	In service	GB1
La Mitis	Onshore wind, 25MW	Canada (Quebec)	In service	GB1
Le Granit	Onshore wind, 25MW	Canada (Quebec)	In service	GB1
Longhorn North	Onshore wind, 200MW	US (Texas)	In service	GB1
Pilot Hill	Onshore wind, 175MW	US (Illinois)	In service	GB1
Rivière du Moulin	Onshore wind, 350MW	Canada (Quebec)	In service	GB1
Spinning Spur 2	Onshore wind, 161MW	US (Texas)	In service	GB1
Spinning Spur 3	Onshore wind, 194MW	US (Texas)	In service	GB1
Roosevelt	Onshore wind, 250MW	US (New Mexico)	In service	GB1 and GB2
Great Western	Onshore wind, 225MW	US (Oklahoma)	In service	GB2
Kelly Creek	Onshore wind, 184MW	US (Illinois)	In service	GB2
Salt Fork	Onshore wind, 174MW	US (Texas)	In service	GB2
Slate Creek	Onshore wind, 150MW	US (Texas)	In service	GB2
Tyler Bluff	Onshore wind, 126MW	US (Texas)	In service	GB2
Red Pine	Onshore wind, 200MW	US (Minnesota)	In service	GB2 and GB3
Bluemex Power 1	PV Solar, 120MW	Mexico (Sonora)	In service	GB3
Copenhagen Wind Farm	Onshore wind, 80MW	US (New York)	In service	GB3
Nicolas Riou	Onshore wind, 112MW	Canada (Quebec)	In service	GB3
Rock Falls	Onshore wind, 154MW	US (Oklahoma)	In service	GB3
Stoneray Power Partners	Onshore wind, 100MW	US (Minnesota)	In service	GB3
Valentine Solar	PV Solar, 135MW	US (California)	In service	GB3
Glaciers Edge	Onshore wind, 203MW	US (Iowa)	In service	GB3
Milligan	Onshore wind, 300MW	US (Nebraska)	In service	GB3, GB4 and GB5
Las Majadas	Onshore wind, 273MW	US (Texas)	In service	GB3, GB4 and GB5
Maverick 1	PV Solar, 180MW	US (California)	In service	GB5
Maverick 4	PV Solar, 132MW	US (California)	In service	GB5
Desert Harvest	PV Solar, 114MW	US (California)	In service	GB5
Desert Harvest 2	PV Solar, 111MW	US (California)	In service	GB5
Coyote	Onshore wind, 242MW	US (Texas)	In service	GB5
Champagne Picardie	Onshore wind, 73MW	France	In service	GB5 (look back)
Les Taillades	Onshore wind, 27MW	France	In service	GB5 (look back)

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
Pays d'Anglure	Onshore wind, 22MW	France	In service	GB5 (look back)
Montagne Ardéchoise	Onshore wind, 16MW	France	In service	GB5 (look back)
Blyth	Offshore wind, 42MW	United Kingdom	In service	GB5 (look back)
Mashabai Sadeh	PV Solar, 60MW	Israel	In service	GB5 (look back)
Romney	Onshore wind, 60MW	Canada (Ontario)	In service	GB5 (look back)
Courant-Nachamps	Onshore wind, 21MW	France	In service	GB5 (look back)
Demange	Onshore wind, 20MW	France	In service	GB5 (look back)
Faydunes	Onshore wind, 14MW	France	In service	GB5 (look back)
Joncels Futuren	Onshore wind, 6MW	France	In service	GB5 (look back)
Coteaux	Onshore wind, 38MW	France	In service	GB5 (look back)
Mazurier	Onshore wind, 13MW	France	In service	GB5 (look back)
Mottenberg	Onshore wind, 15MW	France	In service	GB5 (look back)
Espiers	Onshore wind, 18MW	France	In service	GB5 (look back)
Clanlieu	Onshore wind, 13MW	France	In service	GB5 (look back)
Luxel	Solar project portfolio	France	In service	GB5 (look back)
NnG	Offshore wind, 450MW	United Kingdom	In service	GB5 (look back)
Atlantic Offshore	Offshore wind, up to 2.3GW	US (New Jersey)	In service	GB5 (look back)
Gorzycza	Onshore wind, 24MW	Poland	In service	GB5
Parnowo	Onshore wind, 12.5MW	Poland	In service	GB5
Ustka	Onshore wind, 28.6MW	Poland	In service	GB5
Roussac	Onshore wind, 16.5MW	France	In service	GB5
Big Beau	Solar power, 166MW	United States	In service	GB5

The Eligible Projects selected by Luminus for financing as at 31 December 2021 as part of the January 2017 Green Bond issue (GB4) and September 2020 (GB5) issue can be broken down as follows:

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
Geel-West	Onshore wind, 11MW	Belgium	In service	GB4
Villers 4	Onshore wind, 45MW	Belgium	In service	GB4
Turnhout	Onshore wind, 12MW	Belgium	In service	GB4
Monsin	Hydropower, 18MW	Belgium	In service	GB4
Tinlot	Onshore wind, 10MW	Belgium	In service	GB5
Lommel	Onshore wind, 17MW	Belgium	In service	GB5

The Eligible Projects selected by EDF ENR for financing as at 31 December 2021 as art of the Green Bond issue in September 2020 (GB5) can be broken down as follows:

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
ITER	PV shade, 2MW	France	In service	GB5
Bugey RTE	PV shade, 4MW	France	In service	GB5

The Eligible Projects selected by EDF Hydro (excluding biodiversity projects which are detailed below) for financing as at 31 December 2021 as part of the Green Bond issue in October 2016, January 2017 and September 2020 can be broken down as follows:

Projects	Number of operations by type	Capacity in question (GW)	Amounts (in million of euros)
Renovation and heavy maintenance	586	9.6	342
Modernisation and automation	309	15.9	80
Development of existing structures	33	1.2	277
TOTAL (EXCL. DUPLICATION)	928	17.1	699

Impact of financed Eligible Projects

The table below shows three main impacts associated with the renewable energy projects that received Green Bond financing:

- the electricity generation capacity built under each project;
- the additional electricity generation expected from each project;

- the estimated CO₂ emissions avoided as a result of injecting this additional electricity generation into the electricity grid.

These impacts are presented in aggregate: gross data correspond to the aggregate impact of every project that received financing from the Green Bond in question; while the net values correspond to the sum total of the impact of each Eligible Project weighted by the share of project investment amount financed by the Green Bond in question.

		Total capacity of projects financed at 31 December 2021 (in MW)		Expected output (in TWh/year)		Estimated CO ₂ emissions avoided (in Mt/year)	
		Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾
Green Bond no. 1							
November 2013		1,529	976	6.0	4.1	2.21	1.55
Green Bond no. 2							
October 2015		1,107	815	4.6	3.3	2.53	1.83
Green Bond no. 3							
October 2016	EDF Renewables	1,450	962	5.3	3.5	2.42	1.61
	EDF Hydro	903	903	0.2 ⁽³⁾	0.2 ⁽³⁾	0.01 ⁽³⁾	0.01 ⁽³⁾
Green Bond no. 4							
January 2017	EDF Renewables + Luminus	137	86	0.4	0.26	0.17	0.12
	EDF Hydro + Luminus	142	133	0.1	0.05	0.01	0.01
Green Bond no. 5 –							
September 2020	EDF Renewables + EDF ENR + Luminus	1,762	1,412	4.7 ⁽⁴⁾	3.6 ⁽⁴⁾	1.86 ⁽⁴⁾	1.35 ⁽⁴⁾
	EDF Hydro	123	123	0.03	0.03	0.001	0.001
TOTAL		7,135	5,410	21.33	15.04	9.21	6.48

(1) Sum of the gross impacts of each project that received Green Bond financing.

(2) Sum of the impacts of each project weighted by the project investment amount financed by the Green Bond in question.

(3) Only related to the expected additional generation resulting from development investments, including half of the expected additional generation of the Romanche-Gavet project.

(4) Not including acquisitions.

The above impacts are established using the methodological principles below:

- generation capacity of financed projects: installed capacity at the end of the construction of each Eligible Project as defined in the project's investment memorandum and updated as appropriate during the construction phase or at project commissioning;
- expected output: generation forecast (the "P50") taken into account when the investment decision of each Eligible Project is made;
- avoided CO₂ emissions: the average emission factor per kWh of the electric system is estimated on the basis of the energy mix of the electric system and LCA emission factors of each generation technology. The emission factor of the

project corresponds to the LCA emission factor of the project's production chain. The energy mixes are those published by the United States Environmental Protection Agency (EPA, eGRID 2018) for large power networks in the United States, Statistics Canada (2019) for the networks and provinces of Canada, and the International Energy Agency (IEA 2019) for other countries. LCA emission factors of each technology correspond to the median values established by the Intergovernmental Panel on Climate Change (IPCC) and published in its fifth assessment report (2014). The detailed methodology is available on request at the EDF group head office. It is important to note that (i) there is no single standard defining a methodology for calculating avoided CO₂ emissions and (ii) the expected output and, therefore, avoided CO₂ emissions are estimated forecast data and not actual data.

Biodiversity

The table below presents the main monitoring indicators associated with biodiversity projects that have received financing through Green Bond financing. All of these projects were supported by EDF Hydro.

Year(s)	Amount financed (in millions of euros)	Category of the Green Bond framework	Project type	Number of projects considered ⁽¹⁾	Indicator	Indicator value
2020	12	a. Projects and/or facilities that integrate the principles of the "avoid-reduce-compensate" approach (mitigation hierarchy) related to the mitigation of the impact of the Group's activities on biodiversity.	Bringing reserved flows into compliance ⁽²⁾	4	Number of protected wildlife species benefiting from the project	6
			Ecological continuity (sediments, fish, semi-aquatic mammals) ⁽²⁾	17		17
			Biodiversity partnerships	7	Number of species targeted by partnerships	20
		b. Restoration and/or "re-naturalising" of sites	Decommissioning of facilities	1	Number of protected wildlife species benefiting from the project	3
2017 – 2019 (financed by the Look Back)	16	a. Projects and/or facilities that integrate the principles of the "avoid-reduce-compensate" approach (mitigation hierarchy) related to the mitigation of the impact of the Group's activities on biodiversity.	Bringing reserved flows into compliance ⁽²⁾	7	Number of protected wildlife species benefiting from the project	6
			Ecological continuity (sediments, fish, semi-aquatic mammals) ⁽²⁾	22		16
		b. Restoration and/or "re-naturalising" of sites	Renaturation/ restoration including Ecosystem Services	1	Area concerned (ha)	190
			Decommissioning of facilities	1	Number of protected wildlife species benefiting from the project	3

(1) Look Back and in 2020.

(2) A project at the Esterre dam has elements of compliance with reserved flows and ecological continuity; it is therefore counted for the calculation of the indicators for these two types of projects.

The impacts presented above are established on the basis of the following methodological principles:

- the **"number of protected wildlife species benefiting from the project"** indicator is established on the basis of the lists of target species of the works attached to their execution files or the watercourse classification decrees, and the analysis of EDF naturalist experts. As these operations mainly concern aquatic environments, only aquatic and semi-aquatic species are counted, although these projects generally benefit a wider range of animal and plant species. If a species benefits several projects, it is counted only once;
- the **"number of species targeted by partnerships"** indicator refers to species named in partnership agreements or activity reports (families of species are therefore not counted). Biodiversity partnerships cover a wide range of activities, from raising awareness to land management or carrying out naturalist inventories or ecological status diagnoses;
- the **"area concerned"** indicator is measured in hectares (ha). It corresponds to the surface area of projects involving the re-naturalisation or restoration of environments.

Attestation from one of the statutory auditors of EDF SA on the information related to the allocation, as of 31 December 2021, of funds raised for the Green Bonds issued by EDF on 25 November 2013, 8 October 2015, 11 October 2016, 26 January 2017, 8 September 2020 and 29 November 2021 and the green repo of 29 September 2021

To the Chairman and Chief Executive Officer,

In our capacity as statutory auditor of Electricité de France S.A. (the “**Company**”) and in accordance with your request, we have prepared this attestation on the information related to the allocation, as of 31 December 2021, of funds raised for (i) the Green Bonds (the “**GB Offerings**”) issued by EDF on 25 November 2013 amounting to €1.4 billion (the “**GB 1 Offering**”), 8 October 2015 amounting to US\$ 1.25 billion (the “**GB 2 Offering**”), 11 October 2016 amounting to €1.75 billion (the “**GB 3 Offering**”), 26 January 2017 amounting to ¥26 billion (the “**GB 4 Offering**”), 8 September 2020 amounting to €2.4 billion (the “**GB 5 Offering**”) and 29 November 2021 amounting to €1.75 billion (the “**GB 6 Offering**”) and (ii) the green repo signed on 29 September 2021 amounting to €50 million (the “**Green Repo Offering**”, and with the GB Offerings, the “**Offerings**”), contained in the attached document “*Information relating to the allocation of funds raised through Green Bonds issued by EDF in November 2013, October 2015, October 2016, January 2017, September 2020 and September 2021 and the green repo of 29 September 2021*”, and prepared pursuant to the terms and conditions of the final terms of the Green Bond Offerings dated 25 November 2013, 8 October 2015, 11 October 2016, 26 January 2017, 8 September 2020 and 29 November 2021 (the “**GB Final Terms**”) and pursuant to the terms and conditions of the green repo signed on 29 September 2021 and governed by the FBF framework agreement on repos signed with BNP Paribas on 25 March 2020, as subsequently amended (the “**Green Repo Final Terms**”, and with the GB Final Terms, the “**Final Terms**”).

This document, prepared for the purposes of the information of the Green Bond debt securities holders and the financial institution party to the Green Repo Final Terms, was drafted under your responsibility. It presents an allocation of the funds raised from the Offerings to eligible projects (the “**Eligible Projects**”) for the period beginning as of the receipt of the funds raised from the Offerings to 31 December 2021 (the “**Allocation of Proceeds**”):

- For an amount of €1.4 billion in relation to the GB 1 Offering, from 27 November 2013 to 31 December 2015, noting that the allocation of proceeds was completed in full in June 2015;
- For an amount of US\$1.25 billion in relation to the GB 2 Offering, from 13 October 2015 to 31 December 2017, noting that the allocation of proceeds was completed in full by the end of 2017;
- For an amount of €1.75 billion in relation to the GB 3 Offering, from 11 October 2016 to 31 December 2019, noting that the allocation of proceeds was completed in full by the end of 2019;
- For an amount of ¥26.0 billion in relation to the GB 4 Offering, from 26 January 2017 to 31 December 2020, noting that the allocation of proceeds was completed in full in June 2020;
- For an amount of €2.4 billion in relation to the GB 5 Offering, from 1 January 2017 to 31 December 2020 (including the look-back period), noting that the allocation of proceeds was completed in full by the end of 2021;
- For an amount of €1.75 billion in relation to the GB 6 Offering, from 29 November 2021 to 31 December 2021, noting that €0 million were allocated as at 31 December 2021;
- For an amount of €50 million in relation to the Green Repo Offering, from 29 September 2021 to 31 December 2021, noting that €50 million were allocated in full as at 31 December 2021.

This information was prepared under your responsibility from the accounting records used for the preparation of the consolidated financial statements for the year ended 31 December 2021.

Our role is to report on:

- the compliance with the four components of the Green Bond Principles defined by the International Capital Market Association⁽¹⁾ being (i) the use of proceeds (ii) existing processes for evaluation and selection of the Eligible Projects (iii) the management of proceeds and (iv) the reporting;
- the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria defined in the Final Terms, as well as in the EDF Green Bond Framework updated in January 2020 (the “**EDF Green Bond Framework**”);
- the tracking of the funds raised from the Offerings, in a dedicated portfolio of financial assets, to the allocation of such funds to Eligible Projects and on the reconciliation of the amount of funds allocated to Eligible Projects as at 31 December 2021 as part of the Offerings, with the accounting records and data underlying the accounting records;
- the compliance, in all material respects, of the methods used by the Company to estimate the CO₂ emissions avoided by the Eligible Projects financed as at 31 December 2021 with the methodology described in the section “Impact of Eligible Projects” of the attached document.

However, we have no responsibility:

- for challenging the eligibility criteria defined in the appendix to the Final Terms and, in particular, we give no interpretation on the terms of the Final Terms;
- for forming an opinion on the use of the allocated funds to Eligible Projects after such funds have been allocated;
- for concluding on whether the methodology used by the Company to estimate the avoided CO₂ emissions is appropriate.

In the context of our role as statutory auditor, we have audited, jointly with the other statutory auditor, the consolidated financial statements of the Company for the year ended 31 December 2021. Our audit was conducted in accordance with professional standards applicable in France, and was planned and performed for the purpose of forming an opinion on the consolidated financial statements taken as a whole and not on any individual component of the accounts used to determine the information presented in the attached document. Accordingly, the audit tests and samples were not carried out with this objective and we do not express any opinion on any components of the accounts taken individually. These consolidated financial statements, which have not yet been approved by the Shareholders’ Meeting, have been audited and our report thereon is dated 17 February 2022.

Furthermore, we have not performed any procedures to identify events that may have occurred after the date of our report on the consolidated financial statements of the Company which was issued on 17 February 2022.

Our engagement, which constitutes neither an audit nor a review, was performed in accordance with the professional guidance issued by the French Institute of Statutory Auditors (*Compagnie nationale des Commissaires aux comptes*). For the purpose of this attestation, our work consisted, using sampling techniques or other methods of selection, in:

For the information related to the Allocation of Proceeds and the compliance with the four components of the Green Bond Principles

- verifying the appropriate consideration of the four components of the Green Bond Principles of the International Capital Market Association being (i) the use of proceeds (ii) the existing processes for evaluation and selection of the Eligible Projects (iii) the management of proceeds and (iv) the reporting;
- understanding the procedures implemented by the Company for producing the information contained in the attached document;

(1) Green Bond Principles Voluntary Process - Guidelines for Issuing Green Bonds - June 2021

- verifying the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria, as defined in the appendix to the Final Terms and in the EDF Green Bond Framework;
- verifying the appropriate segregation of the funds raised from the Offerings and their exclusive allocation to Eligible Projects;
- verifying the global allocation of the capital expenditures incurred in relation to the Eligible Projects financed by each of the Offerings;
- performing the necessary reconciliations between this information and the accounting records from which it is derived and verifying that the information agrees with the data used to prepare the consolidated financial statements for the year ended 31 December 2021.

For the estimation of the avoided CO₂ emissions

- understanding and considering the methodology used to estimate the avoided CO₂ emissions;
- verifying the compliance, in all material respects, of the methods used to estimate the CO₂ emissions avoided by the Eligible Projects financed during the period with the methodology described in the section "Impact of Eligible Projects" of the attached document;
- verifying the consistency of the information related to the estimation of the electricity output as well as the choice of emission factors used (based on the calculation of the emission factors of the applicable electrical grids where the projects are located and the choice of emission factors by energy production technology), it being specified that there is no single framework defining a methodology for the calculation of avoided CO₂ emissions.

On the basis of our work, we have no matters to report on:

- the compliance with the four components of the Green Bond Principles of the International Capital Market Association;
- the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria, as defined in the Final Terms and in the EDF Green Bond Framework;
- the tracking of the funds raised from the Offerings, in a dedicated portfolio of financial assets, to the allocation of such proceeds to Eligible Projects and the consistency of the amount of allocated funds to Eligible Projects as at 31 December 2021 in the context of the Offerings, with the accounting records and data underlying the accounting records;
- the compliance, in all material respects, of the methods used by the Company to estimate the CO₂ emissions avoided by the Eligible Projects financed as at 31 December 2021 with the methodology described in the section "Impact of Eligible Projects" of the attached document.

This attestation has been prepared solely for your attention within the context described above and may not be used, distributed or referred to for any other purpose.

Paris La Défense, 16 March 2022

One of the statutory auditors

Deloitte & Associés

Christophe Patrier *Partner*

6.8 Information relating to the allocation of funds raised in the framework of Social Bonds issued by EDF

In May 2021, the Group issued Hybrid Social Bonds for €1.25 billion to support its responsible development.

The funds raised through the hybrid social bonds are dedicated to financing capital expenditure incurred by EDF group by placing orders with SMEs that contribute to the development or maintenance of EDF group's generation or distribution assets in the European Union and the United Kingdom (the "Eligible Projects"). More information can be found in the EDF Social Bond Framework ⁽¹⁾. In compliance with the Social Bond Principles of the ICMA (International Capital Markets Association) ⁽²⁾, this Hybrid Social Bond issue is consistent with the Group's CSR (Corporate Social Responsibility) commitments and strategy in terms of responsible territorial development and the development of industrial sectors.

The commitments made by EDF in the context of these two bond issues follow the four Social Bond Principles guiding (i) the use of proceeds, (ii) existing processes for evaluating and selecting Eligible Projects, (iii) the management of proceeds, and (iv) reporting procedures. A detailed description of these investments can be found in the EDF Social Bond Framework of May 2021 available on the Sustainable Finance page of the Company's website.

This section provides a summary of these commitments and how EDF has fulfilled them as at the end of 2021.

Use of proceeds

In the context of its social bond issues, EDF has undertaken to allocate the funds raised to finance investment expenditure incurred with SMEs that contribute to the development or maintenance of the EDF group's generation and/or distribution assets in Europe (defined as the European Union and the UK).

The social objective of this investment expenditure is to support SMEs located in employment areas with high unemployment ⁽³⁾, which are a key element of EDF's industrial fabric and which create employment opportunities in the territories where EDF operates.

EDF group has undertaken to comply with the Social Bonds Principles to "seek positive social outcomes, particularly but not exclusively for one or more target populations." In this respect, EDF has allocated the funds from its May 2021 social bond issue solely to investments contracted with SMEs located in areas of high unemployment ⁽⁴⁾, i.e. in employment areas where the unemployment rate:

- is higher than the national average unemployment rate; or
- is falling less rapidly (or rising more rapidly) than the national average unemployment rate over the past five years.

The target population is employees and subcontractors of SMEs

EDF undertakes not to carry out any double counting. Therefore, EDF will not finance eligible projects that have already been financed by one of its Green Bonds.

The Social Bond Framework allows funds to finance eligible projects that have not yet received financing through a social bond, within a period of 2 years prior to the issue of the social bond (look-back clause).

Assessment and selection of financed eligible projects

Eligible Projects are subject to a specific evaluation and selection process:

- under the coordination of the EDF group Finance Department, each EDF Division is responsible for identifying Eligible Project proposals that meet the criteria for the use of funds;
- each EDF Division has undertaken to comply with EDF group policies and procedures, including those relating to ethical purchasing and contracting with SMEs;
- each relevant Division will document the process of evaluating projects within its scope.

Only projects that meet these criteria are eligible for financing from the social hybrid bond issue.

Within this process, eligible expenditure is identified in three different stages:

- **receipt and validation of data:**
 - › identification of the data on CAPEX purchases made from SMEs by the EDF group in 2019 and 2020 and the first quarter of 2021 on a scope of generation and marketing ⁽⁵⁾ activities and regulated activities ⁽⁶⁾,
 - › comparison of the data received with the data collected to carry out the EDF group's employment footprint (2019/2020 and 1st quarter of 2021 purchase data and type of suppliers) in order to validate the amounts received. Each purchase amount corresponds to the SIRET number of the place of business that received this payment,
 - › validation of the data received with the respective departments of EDF and Enedis;
- **data processing:**
 - › data reprocessing,
 - › extraction of official information on places of business from the two Sirene® databases (source 5.4): status of places of business (SME/intermediate-sized enterprises/large enterprises) as well as internal classification number (NIC), postal code and business subsector ID number (NAF) data,
 - › verification of the SME status of suppliers using Insee data obtained via the Sirene® database,
 - › exclusion of SMEs owned by a larger company (i.e. intermediate-sized or large enterprises);
- **employment area associations and business sectors:**
 - › location of each purchase in one of the 306 employment areas in France, as defined by INSEE ⁽⁷⁾,
 - › correspondence of business sector codifications.

Management of proceeds

Proceeds raised are managed according to a strict ring-fencing principle in order to ensure that their use is exclusively and effectively reserved for financing Eligible Projects.

The proceeds from each bond issue are invested and tracked in a dedicated sub-portfolio of treasury assets until allocated to Eligible Projects. Proceeds are invested in priority in treasury assets identified as Socially Responsible Investments (SRI). The

(1) <https://www.edf.fr/sites/default/files/contrib/groupe-edf/espaces-dedies/espace-finance-en/investors-analysts/bonds/social-bonds/edf-social-bond-framework-may-19-2021.pdf>

(2) The Social Bond Principles are voluntary guidelines for the issuance of "Social Bonds" that recommend transparency and disclosure in order to support the development of the Social Bond market with integrity. For more information: <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/social-bond-principles-sbp/>

(3) SMEs located in employment areas where the unemployment rate is higher than the national average unemployment rate OR is decreasing less rapidly (or increasing more rapidly) than the national average unemployment rate over the last five years.

(4) More details are available on the EDF group website dedicated to sustainable finance: <https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/bonds/green-bonds>. A detailed Note relating to this methodology is available on demand.

(5) Limited to the Nuclear and Thermal Generation Department (DPNT) and the New Nuclear Engineering and Projects Department (DIPNN).

(6) Limited to Enedis and Island Energy Systems (SEI).

(7) According to INSEE, an employment area is "a geographical area within which most of the working population resides and works" (<https://www.insee.fr/en/metadonnees/definition/c1361>).

amounts available in the dedicated sub-portfolios of treasury assets are adjusted according to the actual use of the funds.

Compliance with these criteria is certified by KPMG (auditor) in accordance with the requirements of the Social Bond Framework. On this basis, the Finance Departments of the Group entities in question designate the Eligible Projects that are financed.

Reporting

Effective management of funds

The funds raised in May 2021 have been invested in a dedicated portfolio of cash assets, pending the identification of Eligible Projects.

Effective allocation of proceeds

As at 31 December 2021, all of the funds raised in May 2021 in the amount of €1.25 billion in the context of EDF's social hybrid bond issue have been allocated to Eligible Projects.

Impact of financed Eligible Projects

EDF is able to estimate the impact (number of jobs) on the target population by using the following calculation: ^{(1) (2)}

- number of jobs per business sector/Amount of total production for each business sector (in EUR) = **Ratio** (per business sector);
- ratio x CAPEX purchase amount = **Number of employees needed by SMEs to fulfil their contract with EDF.**

The table below sets out three main impacts associated with the Eligible Projects that received financing from the hybrid social bond issue:

- the amounts invested in Eligible Projects by EDF;
- the number of SMEs concerned by these Eligible Projects;
- the number of jobs in these SMEs needed to carry out their contract with EDF group. This number is calculated from the ratio: number of jobs/amount of production for the business sector.

Year	Investments (in millions of euros)	Number of SMEs	Number of jobs
2019	550✓	1,324	3,330
2020	589✓	1,411	3,531
1 quarter 2021	111✓	690	664

INVESTMENTS MADE BY EDF GROUP (in millions of euros)

Business line	2019	2020	2021
France – Sales and marketing ⁽¹⁾	129✓	167✓	24✓
France – Regulated activities ⁽²⁾	422✓	422✓	86✓

(1) Nuclear & Thermal Fleet Department (DPNT) and New Nuclear Projects & Engineering Department (DIPNN) only.

(2) Enedis and EDF SEI's power grids only.

(1) Based on the input-output economic model and a methodology developed by Goodwill Management for the study of EDF SA's employment footprint (see section 3.4.2.1.3 "Examples of its contribution to territorial development through employment" in EDF's 2020 URD).

(2) More details can be found on the EDF group website dedicated to sustainable finance <https://www.edf.fr/groupe-edf/espaces-dedies/investisseurs-actionnaires/espace-obligataire/finance-durable>

Statement by one of the statutory auditors of EDF S.A. on the information relating to the allocation of the proceeds to eligible capital expenditures as at December 31, 2019, December 31, 2020 and March 31, 2021, of the funds raised in connection with the social hybrid bond launched by EDF on May 26, 2021

This is a free translation into English of the statutory auditors' attestation on the information related to the allocation of the proceeds to eligible capital expenditures as at December 31, 2019, December 31, 2020 and March 31, 2021, in the context of the social bonds issued by EDF on May 26, 2021 issued in French and is provided solely for the convenience of English-speaking users.

This attestation should be read in conjunction with, and is construed in accordance with, French law and professional standards applicable in France.

To the Chief Executive Officer,

In our capacity as statutory auditor of EDF S.A. (the "**Entity**") and in accordance with your request, we have prepared this attestation report on the information relating to the allocation of proceeds to eligible capital expenditures as at December 31, 2019, December 31, 2020 and March 31, 2021 of the funds raised in connection with the social hybrid bond launched by the Entity on May 26, 2021 in the amount of EUR 1.25bn (hereinafter the "**Social Bonds**"), presented in the document (hereinafter the "**Allocation and Impact Reporting**") attached to this certificate and presented in the universal registration document under the heading "Information relating to the allocation of funds raised in the context of the social bonds ("**Social Bonds**") issued by EDF".

This Allocation and Impact Reporting, including information related to the entity's Social Bond, established in accordance with the terms and conditions of the Social Bond issuance contract, and in particular the EDF Social Bond Framework (hereinafter the "**Framework**"), is intended for the information of holders of Social Bonds. This Framework is available on the EDF S.A. website ⁽¹⁾.

This Allocation and Impact Reporting shows the amounts of proceeds allocated to capital expenditures contracted with SME (the "**Capital Expenditures**") as defined in the Framework, as at December 31, 2019, December 31, 2020 and March 31, 2021. The total amount is EUR 1.25bn.

This Allocation and Impact Reporting was prepared under your responsibility, based on the accounting records used for the preparation of the consolidated financial statements for the years ended December 31, 2019, 2020 and 2021. The methods and criteria for eligibility used to prepare the Capital Expenditures are detailed in the Framework.

It is our responsibility to report on:

- the compliance of the allocation and impact Reporting with the Social Bond Principles of ICMA
- the compliance of the methods implemented by the entity to evaluate the social impacts of the eligible capital expenditures with the methodology detailed by EDF in the Allocation and Impact Reporting the compliance of the Capital Expenditures as at December 31, 2019, December 31, 2020 and March 31, 2021 with the criteria for eligibility as defined in the Framework and with the unemployment rate criterion; the related amounts are marked "√" in the Allocation and Impact Reporting attached to this statement;
- the consistency of the capital expenditure amount with the accounting records and the internal data relating to the accounting records for the year ended 2019, 2020 and 2021
- the consistency of the management of proceeds until their allocation described in the Allocation and Impact Reporting with the accounting records and the internal data relating to the accounting records as at December 31, 2021

However, we have no responsibility to report on

- the criteria for eligibility as defined in the Framework, validated by S&P Global Ratings in a Second Party Opinion before the issuance of the social bonds, and in particular, to provide an interpretation of the Framework's terms
- the use of proceeds allocated to eligible capital expenditures after allocation
- the indicators of impacts mentioned in the Allocation and Impact Reporting

Our engagement, which constitutes neither an audit nor a review, was performed in accordance with the professional doctrine of the French national auditing body (Compagnie nationale des commissaires aux comptes). For the purpose of this attestation, our work consisted, in:

- Identifying the persons within EDF S.A. and Enedis S.A. who are in charge of the collection processes and, where necessary, are responsible for the internal control and risk management procedures in place;
- Assessing the appropriateness of the capital expenditure reporting process in terms of its relevance, completeness, reliability, neutrality, and understandability in relation to the principles of the Social Bonds Framework;
- Inquiring about the existence of internal control and risk management procedures implemented by EDF S.A. and Enedis S.A.;
- Testing, through sampling, the processes for collecting, compiling, processing, and controlling information, including information related to the allocation of funds set forth in the Framework. This included:
 - Verifying the arithmetic accuracy of the compilations and treatments applied to the collected capital expenditures to determine the Capital Expenditures;
 - Verifying the eligibility of the investment expenditure with regard to the eligibility criteria defined in the Framework ⁽²⁾, on the basis of internal information (name of the supplier, SIRET number, nature of the services and goods received, etc.) obtained from EDF S.A. and Enedis S.A. and external information from the SIRENE database (Système national d'identification et du répertoire des entreprises et de leurs établissements), in particular for a representative sample of the capital expenditure considered eligible, as at the allocation reporting date;
 - Verifying the correct application of the unemployment rate criterion ⁽³⁾ to Capital Expenditures;
 - Verifying the consistency of the cumulative amount of capital expenditures collected from EDF S.A. and Enedis S.A. at December 31, 2019, December 31, 2020 and March 31, 2021 with the accounting and internal data used to prepare EDF S.A.'s consolidated financial statements for the years ended December 31, 2019, 2020 and 2021;
 - Verifying that the Capital Expenditures selected using the unemployment rate criterion are consistent with the amount of funds allocated in the Allocation and Impact reporting;
 - Verifying the compliance of the Allocation and Impact Reporting of the Social Bond issue with the ICMA Social Bond Principles;
 - Verifying the consistency of the management of proceeds until their allocation described in the Allocation and Impact Reporting with EDF accounting records and the internal data relating to EDF accounting records as at December 31, 2021
 - Verifying the conformity of the methods used by EDF to estimate the social impacts of eligible capital expenditures with the methodology described by EDF in the Allocation and Impact Reporting.

⁽¹⁾ <https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/bonds/green-bonds>

⁽²⁾ « Eligible Projects » include any capital expenditure contracted with SME which contribute to the development or maintenance of EDF Group's power generation and/or distribution assets in Europe (defined as the European Union and the United Kingdom)

⁽³⁾ In employment zones where the unemployment rate is higher than the average national unemployment rate or decreases less rapidly (or increases more rapidly) than the average national unemployment rate over the last five years. This information comes from an external analysis performed at EDF request

On the basis of our work, as described above, we have no matters to report on:

- the compliance, in all material respects, of the Capital Expenditures with the criteria for eligibility as defined in the Framework and with the unemployment rate criterion
- the consistency of the capital expenditure amount, respectively as at December 31, 2019, December 31, 2020 and March 31, 2021, with the accounting records and the internal data relating to the accounting records used for the preparation of EDF consolidated financial statements for the year ended 2019, 2020 and 2021
- the compliance of the Allocation and Impact Reporting with the Social Bond Principles of ICMA
- the consistency of the management of proceeds until their allocation described in the Allocation and Impact Reporting with EDF accounting records and the internal data relating to EDF accounting records as at December 31, 2021
- the compliance of the methods implemented by the entity to evaluate the social impacts of the eligible capital expenditures with the methodology detailed by EDF in the Allocation and Impact Reporting

In our capacity as statutory auditor of EDF, our responsibility towards the entity and the Shareholders is defined by French law and we do not accept any extension of our responsibility beyond that set out in French law. We do not owe or accept any duty of care to any third party, including the holders of the Social Bonds, since we are not a party to the Social Bonds issuance contract (incorporating by reference the Framework). In no event shall KPMG S.A. be liable for any loss, damage, cost or expense arising in any way from the execution of these contracts.

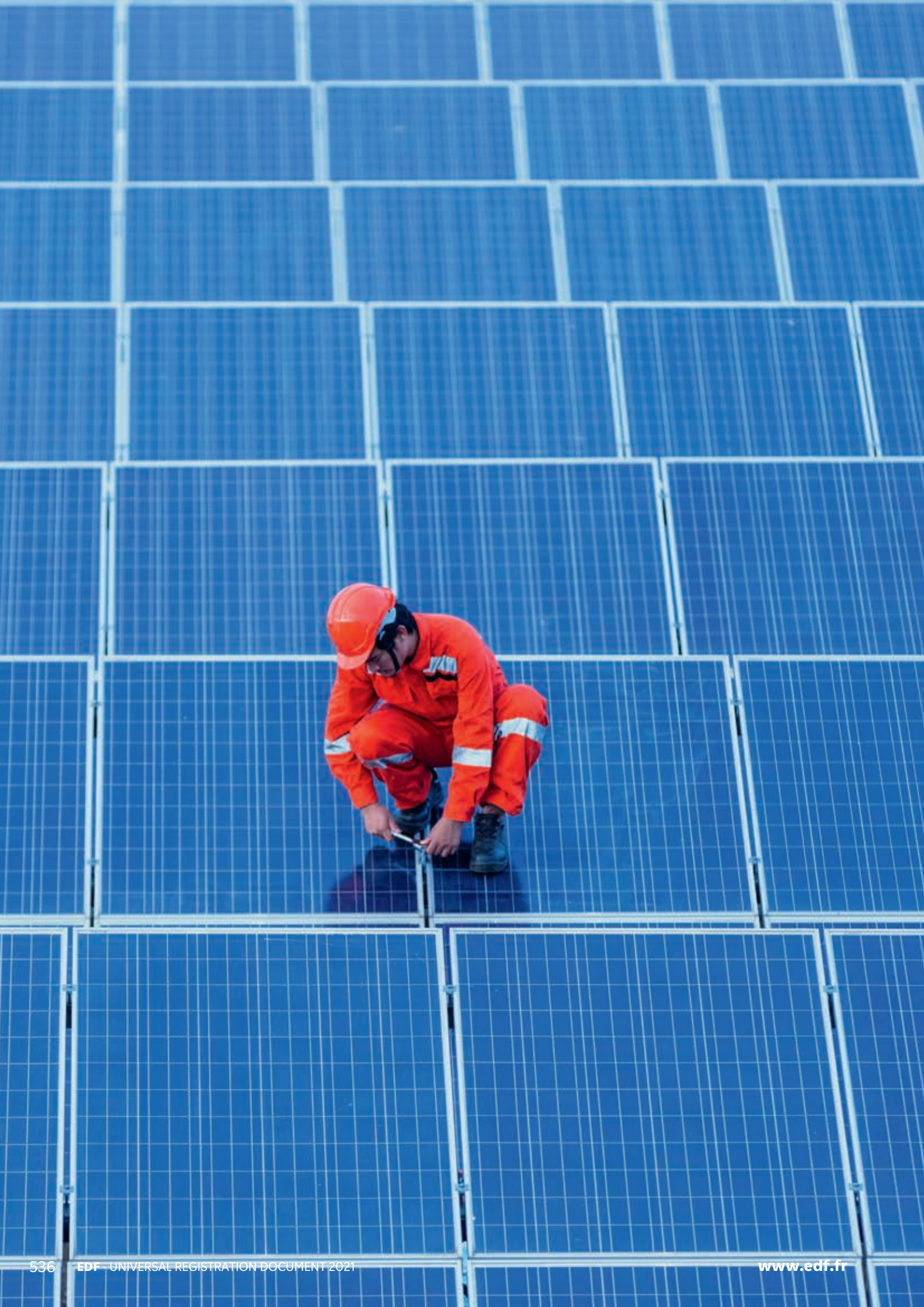
This attestation report is governed by French law. The French courts shall have exclusive jurisdiction in relation to any claim, difference or dispute which may arise out of or in connection with our engagement letter or this attestation report. Each party irrevocably waives any right it may have to object to an action being brought in any of those Courts, to claim that the action has been brought in an illegitimate court or to claim that those Courts do not have jurisdiction.

Paris La Défense, 1 March 2022

KPMG S.A.

Fanny Houlliot
Partner
Sustainability Services

Quentin Hénaux
Partner





7

GENERAL INFORMATION ABOUT THE COMPANY AND ITS CAPITAL

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7.1 General information about the Company

7.1.1 Company name, address and telephone number of the registered office

The name of the Company is: "Électricité de France". The Company may also be legally designated by the acronym "EDF".

The Company's registered office is at 22-30 Avenue de Wagram in the 8th arrondissement of Paris.

The telephone number is + 33(0) 1 40 42 22 22.

7.1.2 Trade and Companies Registry, APE code

The Company is registered with the Paris Trade and Companies Registry under number 552 081 317. Its APE code is 401E.

7.1.3 Date of incorporation and term of the Company

EDF was incorporated pursuant to Act no. 46-628 of 8 April 1946 as a French public industrial and commercial establishment (EPIC). It was converted into a French *société anonyme* (public limited company) by the Act of 9 August 2004 and the Decree of 17 November 2004.

The Company was incorporated for a term of 99 years as from 19 November 2004, unless the Company is dissolved before such date or unless its term is extended.

7.1.4 Legal form and applicable legislation

Since 20 November 2004, EDF has been a French *société anonyme* with a Board of Directors. It is governed by the laws and regulations applicable to commercial companies, in particular the French Commercial Code, except in the event of specific exceptions stipulated in the French Energy Code or Order no. 2014-948 of 20 August 2014 on the governance and capital transactions of companies with State holdings and by its articles of association.

7.1.5 Disputes

This section describes the main legal proceedings except the one covered in note 17.3 to the consolidated financial statements (section 6.1) and any material developments in those proceedings that have occurred between the approval of the financial statements and the filing date of this document.

To the knowledge of the Company, there are no administrative, legal or arbitration proceedings (including any pending or threatened proceedings of which the Company is aware) likely to have or having had in the past 12 months a material impact on the financial situation or the profitability of the Company and/or the Group with the exception of those described below and those described in the notes to the 2021 consolidated financial statements.

AMF investigation

As part of an AMF investigation into financial information provided to the markets since July 2013, the AMF notified EDF of two grievances on 5 April 2019, which

EDF challenged. On 28 July 2020, the AMF *Commission des sanctions* (Enforcement Committee) imposed financial penalties of €5 million on EDF for a failure consisting in the dissemination of false or misleading information in connection with the construction of the Hinkley Point C nuclear power plant in a press release dated 21 October 2013 entitled "Agreement on the Commercial Terms of Contracts for the Hinkley Point C Nuclear Power Plant Project".

In contrast, the Enforcement Committee ruled out any breach of the obligation to disclose as soon as possible inside information relating to EDF's decision to pursue the Hinkley Point C project as part of the full consolidation in the Group's financial statements, which was disclosed to the market on 21 September 2015, thereby exonerating both EDF and its current Chairman and Chief Executive Officer in this respect.

On 5 October 2020, EDF appealed against this decision to the Paris Court of Appeal in respect of the sole complaint against it. Following EDF's appeal, the AMF Chairman also filed a cross-appeal against the Enforcement Committee's decision on 3 December 2020, requesting that the amount of the fine imposed on EDF be raised to €8 million. However, the AMF Chairman's cross-appeal does not challenge the Enforcement Committee's decision to dismiss the second complaint. Consequently, the decision of the Enforcement Commission regarding this issue is now final. The decision of the Paris Court of Appeal is expected on 12 May 2022.

CRE/REMIT investigation

On 1 December 2016, the CRE (French Energy regulation Commission) launched an investigation into whether EDF and its subsidiaries EDF Trading Limited and EDF Markets Limited were guilty of engaging, since 1 April 2016, in practices that could constitute breaches of the provisions of regulation (EU) no. 1227/2011 of 25 October 2011 on wholesale energy market integrity and transparency (REMIT). The CRE informed EDF by letter dated 5 July 2018 that it had referred the matter to the Settlement of Disputes and Sanctions Committee (CoRDis). On 17 December 2021, EDF and EDF Trading Limited received a notification of CoRDis's grievances.

The Dutch Authority for Consumers and Markets (ACM) has opened an investigation into the availability of the Sloe power plant (gas-fired combined cycle power plant based in the Netherlands). On 19 November 2020, EDF and EDF Trading Limited received a notification of ACM's grievances. There is no indication as to the outcome of the proceedings.

Appeals by NGOs and associations against administrative authorisations related to the generation plants

A certain number of authorisations and permits related to the Group's generation plants (ASN (Nuclear Safety Authority), decisions by the Prefecture, decrees, orders, etc.) have been challenged before the courts, mainly by environmental associations.

ADLC investigations

1. Decision of 22 February 2022 of the ADLC condemning EDF

On February 22, 2022, the French Competition Authority ("ADLC") sanctioned the EDF Group in the amount of €300 million for dominant position abuse practices that would have enabled it to maintain its market shares in the electricity supply sector and to strengthen its position in the associated gas and energy services supply markets. In this decision, which follows a complaint filed in 2017 by Engie (see note 17.3 to the consolidated financial statements for the year ended 31 December 2021), the ADLC criticises EDF for having used data from the files of its TRV eligible customers, as well as the commercial infrastructure dedicated to the management of TRV contracts, in order to develop the commercialisation of market offers for gas and energy services.

EDF, which benefited from the settlement procedure in this case, made two commitments: firstly, to make its Blue TRV customer file available to alternative electricity suppliers who requested it, and secondly, to separate the telephone subscription process for Blue TRV customers and prospects from that of customers and prospects with market offers.

2. Appeal to the Paris Court of Appeal against the ADLC's decision of January 18, 2022

As indicated in Note 17.3 to the consolidated financial statements for the year ended December 31, 2021 (see Section 6.1), the ADLC, in a decision dated January 18, 2022, rejected the complaint and the request for protective measures filed against it by ANODE (National Association of Energy Retailers). This complaint related to EDF's refusal to maintain access to the database of non-residential customers affected by the end of the Blue TRVE and having automatically switched, on 31 December 2020, to a tariff exit contract. However, the ADLC considered that the facts put forward by ANODE were not supported by sufficient evidence to substantiate the existence of the practices complained of. ANODE finally appealed the Authority's decision on 1 March 2022.

7.1.6 EDF, a public undertaking with a public service mission

7.1.6.1 EDF as a public undertaking

As an undertaking in which the French State holds a majority share (see section 7.2.9 "By law or statutory provisions that delay acquisition of control over the Company"), EDF is subject to the provisions of Order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding and its application Decree no. 2014-949 of the same date.

In accordance with the legislation that applies to all undertakings of which the State is a majority shareholder, EDF may have to undergo certain State audit procedures, in particular through an economic and financial evaluation assignment, pursuant to Decree no. 55-733 of 26 May 1955 on State economic and financial evaluation and Decree no. 53-707 of 9 August 1953 on State evaluation of national public undertakings and certain organisations, the purpose of which has an economic or social component.

EDF also has to undergo the audit procedures performed by the French General Accounting Office (*Cour des Comptes*) and Parliament. Thus, in addition to the control performed by the Statutory Auditors, the Company's accounts and management and, where applicable, those of its directly-held majority subsidiaries, fall under the control of the French General Accounting Office, in accordance with Articles L. 111-4, L. 133-1 and L. 133-2 of the French Code of Financial Jurisdictions.

Lastly, the disposal of EDF shares by the State, or the dilution of the State's stake in EDF's capital, is subject to a specific procedure under Order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding.

As a buyer, EDF is governed by the French Public Procurement Code.

7.1.6.2 Public service in France

Statutory definition of public service in France

Articles L. 121-1 *et seq.* of the French Energy Code outline the framework for the public electricity sector.

Public service missions

Articles L. 121-1 *et seq.* of the French Energy Code state that the public electricity service must develop a balanced supply of electricity, develop and operate public electricity networks and supply electricity at regulated sales tariffs.

Balanced development of electricity supply mission

The purpose of developing a balanced supply of electricity, which is defined in Article L. 121-3 of the French Energy Code, is to achieve the objectives defined in the multi-year energy programme (PPE). The PPE was defined by decree, and sets out priority courses of action for the public authorities for the management of all forms of energy in continental metropolitan France. It must be compatible with the greenhouse gas emission reduction targets set in the carbon budget and the low carbon strategy, which are defined by Decree no. 2020-457 of 21 April 2020.

It defines the quantitative objectives for the plan and the maximum indicative budget for the public funds that will be allocated by the State and its public institutions in order to attain them. It may be broken down by objective and by industry sector.

Decree No. 2020-456 of 21 April 2020 set the multi-year energy programme for 2019-2023 period and 2024-2028 period.

Pursuant to the law, EDF prepared a Corporate Strategy Plan (PSE) presenting the actions that the Company commits to implementing in order to meet the security of supply and electricity generation diversification objectives defined in the first period of the PPE. On 14 October 2020, the PSE was submitted for approval by the Minister for Energy.

The "Climate and Energy" Act of 8 November 2019 also specifies the procedure concerning the Strategic Business Plan (PSE), which will have to cover both periods of the Multiyear Energy Programme (PPE), be made public (with the exception of information relating to business secrecy), and present the accompanying measures put in place for employees as a result of the closure of nuclear or thermal power stations. In the event that the Strategic Business Plan (PSE) is incompatible with the Multi-year Energy Programme (PPE), the act provides for a formal notice followed, if necessary, by sanctions.

The mission relating to the balanced development of electricity supply also involves guaranteeing supply in areas that are not interconnected to continental metropolitan France (Corsica, and the overseas departments and territories, as well as some islands in Brittany). Corsica, Guadeloupe, French Guiana, Martinique, Mayotte, La Réunion, and Saint-Pierre-et-Miquelon will each have their own specific PPE. Other areas that are not interconnected with the continental metropolitan network, except for Saint Martin and Saint Barthélemy, will be subject to a section appended to the PPE for continental metropolitan France.

As a power producer, EDF, along with the other producers, contributes to the performance of this mission.

Mission to develop and operate public transmission and distribution networks

The mission to develop and operate the public electricity transmission and distribution networks, which is defined in Article L. 121-4 of the French Energy Code, involves ensuring:

- a rational electricity distribution service in France through the public transmission and distribution networks, in a way that is environmentally friendly, the interconnection with neighbouring countries;
- connection and access to the public transmission and distribution networks, under non-discriminatory conditions.

Public network operators are designated by law to carry out this duty: RTE for transport, Enedis and Local Distribution Companies (*Entreprises Locales de Distribution*, or LDCs) for distribution, EDF in zones that are not interconnected to the continental metropolitan network.

Mission to supply electricity

The public service mission to supply electricity, which is defined in Article L. 121-5 of the French Energy Code, involves ensuring the supply of electricity throughout France to customers who benefit from regulated electricity sales tariffs.

By law, this mission has been entrusted to EDF and to the LDCs.

The conditions under which customers can benefit from regulated electricity sales tariffs are defined in Articles L. 337-7 *et seq.* of the French Energy Code.

The mission to supply electricity also includes participate in calls for bids relating to the supply of emergency power to customers connected to public networks, if their supplier is unable to supply power or has had its licence withdrawn or suspended. As a transitional measure, until the aforementioned calls for bids have been implemented, in November 2021 the French government designated emergency power suppliers on a transitional basis (EDF in the areas served by RTE and Enedis, the LDCs in the areas they serve, with the option of transferring this responsibility to EDF for non-residential customers).

Social cohesion

Article L. 121-5 of the French Energy Code provides that the supply of electricity at regulated tariffs must contribute to social cohesion, in particular through the national equalisation of regulated electricity sale tariffs.



Article L. 115-3 of the French Social Action and Families Code prohibits electricity suppliers from cutting off electricity supplies to the primary residences of individuals or families during the winter period (from November 1 to March 31) due to unpaid bills, including through contract termination. Electricity suppliers may, nevertheless, in certain cases, reduce the power supplied, except with regard to customers who benefit from "energy vouchers". These vouchers are a special means of payment that allow households that are experiencing financial difficulties to cover part of their energy consumption expenses (electricity, gas, fuel oil, etc.) or their expenditure on improving the energy efficiency of their home.

In its capacity as an electricity supplier, EDF is required to maintain electricity supplies under the conditions laid down by said Article and by Decree no. 2008-780 of 13 Aug. 2008 on the procedure applicable in the event of unpaid electricity, gas, heating and water bills, implemented in its amended form pursuant to Decree no. 2014-274 of 27 February 2014 and Decree no. 2016555 of 6 May 2016.

Public Service Contract

On 24 October 2005, a Public Service Contract was entered into by the State and EDF pursuant to Article L. 121-46 of the French Energy Code. This contract, which details the commitments made by EDF and the State and specifies the rules governing the financial remuneration for service commitments, will remain in force until a new contract is signed, as provided for in the contract itself.

EDF's commitments

EDF's public service commitments include:

- the supply of electricity to customers who choose to remain at regulated tariffs;
- power generation: this area includes the implementation of the energy policy and maintaining a secure and environmentally friendly electricity production;
- the obligation to purchase or enter into remuneration supplement contracts concerning electricity generated by installations falling within the scope of the schemes;
- contributing to the safety of the electricity network. In this regard, EDF undertakes to enter into several contracts with RTE, in particular concerning the optimisation of work on production facilities and the availability of the resources required to maintain network balance.

Commitments by network managers

Through the Public Service Contract, Enedis and RTE in their capacity as network managers made commitments concerning the management of the public networks for the transmission and distribution of electricity and the safety of the electricity system. These commitments are financed by the Tariff for Using the Public Electricity transmission and distribution Networks (TURPE).

These commitments concern, above all, network safety, supply quality, third party safety and the preservation of the environment – four areas where customers' and local authorities' expectations are especially high.

7.2 Incorporation documents and articles of association

In this Universal Registration Document, a reference to the articles of association means the Company's articles of association as approved by French Decree no. 2004-1224 of 17 November 2004 adopted under French Act no. 2004-803 of 9 August 2004 relating to the public electricity and gas service and electricity and gas companies (the "9 August 2004 law"), which have subsequently been amended on various occasions.

7.2.1 Corporate purpose

EDF's purpose, both in France and abroad and in compliance with the laws set out in the first Article of its articles of association, is:

- to ensure the production, transmission, distribution, supply and trading of electrical energy, and the import and export of said energy;
- to carry out the public service missions assigned to EDF by the laws and regulations, in particular by the French Energy Code, and Article L. 2224-31 of the French Local Authorities Code (*Code général des collectivités territoriales*), as well as by concession agreements, and in particular the mission to develop and operate public electricity grids and to supply energy at regulated rates, and to supply back-up power to electricity producers and customers with the aim of compensating for unforeseen supply failures, and to supply electricity to eligible customers who cannot find a supplier, while contributing to the balanced development of electricity supply by reaching the goals defined by the multi-year generation investments programme defined by the Minister for Energy;
- more generally, to engage in any industrial, commercial or service activity, including research and engineering activities, in the field of energy, for all categories of customer;
- to enhance the value of all the personal and real property assets it holds or uses;
- to create, acquire, rent or lease under a business lease, all personal property, real property, businesses and clientele, to lease, install and operate all establishments, businesses and clientele, plants and workshops relating to any one of the aforementioned purposes;
- to obtain, acquire, operate or sell all processes and patents concerning the activities that are related to any of the aforementioned purposes;
- to take part, directly or indirectly, in all transactions that may be connected to any of the aforementioned purposes, by creating new companies or undertakings, by contributing, subscribing for or purchasing equity or

ownership interests, stakes, or through mergers, partnerships or in any other way whatsoever; and

- more generally, to engage in all industrial, commercial, financial transactions, whether in personal or real property, that are directly or indirectly connected, in whole or in part, to any of the aforementioned purposes, to any similar or related purposes or even to any purposes that may favour or develop the Company's business.

EDF's *raison d'être* would be to: "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development".

7.2.2 Fiscal year

Each fiscal year lasts for 12 months, starting on 1 January and ending on 31 December of each year.

7.2.3 Statutory distribution of profits

The distributable profit consists of the net profit for the fiscal year, less prior losses carried forward and the various deductions provided for by the law or the articles of association, plus any retained earnings carried forward.

The Shareholders' Meeting may decide to distribute amounts deducted from the reserves that are freely available to it, but must expressly state the reserve items from which the deductions are made.

After approving the financial statements and confirming the existence of distributable amounts (which include the distributable profit and any amounts deducted from the reserves mentioned above), the Shareholders' Meeting can decide to distribute all or part of such amounts to the shareholders in the form of a dividend, allocate them to reserve items or carry them forward. The Board of Directors may also distribute interim dividends prior to the approval of the financial statements for the fiscal year, under the conditions laid down by law.

The Shareholders' Meeting has the option of granting the shareholders a choice, for all or part of the dividend or interim dividend paid out, between payment in cash and payment in shares. Moreover, the Shareholders' Meeting may decide to pay any dividend, interim dividend, reserve or premium that is distributed or any reduction in capital, through remittance of the Company's assets, including financial securities.

Any shareholder who can prove, at the close of a fiscal year, that he has held registered shares for at least two years and still holds such shares on the date of payment of the dividend declared for the said fiscal year, will be entitled to an increased dividend for the said registered shares, equal to 10% of the dividend paid for the other shares, including in cases where the dividend is paid in shares. The number of shares eligible for the 10% increased dividend may not exceed 0.5% of the share capital at the close of the previous fiscal year, for any one shareholder. The first increased dividend was paid in 2014 for the 2013 fiscal year (see section 6.5.2 "Distribution policy, increased dividend").

The terms governing the payment of distributions decided by the Shareholders' Meeting, and the ex-dividend date of the distributed shares are fixed by the Shareholders' Meeting or, failing this, by the Board of Directors, in accordance with the applicable statutory provisions. If the amount of the non-cash distributions to which a shareholder is entitled does not correspond to a whole number of shares, the said number will be rounded down to the next whole number and a balancing cash payment made to the shareholder or, if requested by the Shareholders' Meeting, rounded up to the next whole number, with the difference being paid in cash by the relevant shareholder.

7.2.4 Rights attached to shares

Each share entitles its holder to a portion of the Company's profit and corporate assets that is proportional to the percentage of the capital that the share represents. Moreover, each share confers a voting right and the right to be represented at Shareholders' Meetings in accordance with legislative, regulatory and bylaw restrictions.

On the filing date of this Universal Registration Document, EDF has only issued a single class of shares.

Ownership of a share automatically entails acceptance of the articles of association and decisions adopted by Shareholders' Meetings.

Pursuant to Article L. 22-10-46 of the French Commercial Code, pursuant to Order no. 2020-1142 of 16 September 2020, formerly Article L. 225-123 of the French Commercial Code, as amended by Act no. 2014-384 of 29 March 2014, all fully paid-up shares that have been registered for at least two years in the name of the same shareholder will automatically entitle their holder to voting rights that are double that of the other shares. These provisions took effect on 3 April 2016. EDF's Board of Directors had decided not to submit an amendment to the articles of association to the Shareholders' Meeting, preventing the application of the double voting right set out in Article L. 225-123 of the French Commercial Code.

Shareholders are only liable for losses within the limit of their contributions.

Whenever it is necessary to hold more than one share in order to exercise any right whatsoever, in the event of an exchange, reverse stock split or allocation of shares, or due to a capital increase or reduction, a merger or any other corporate transaction, owners of single shares or numbers of shares below that required may only exercise such right if they take personal responsibility for consolidating or, if necessary, purchasing or selling the requisite number of shares.

Shareholders can choose to hold shares in registered or bearer form, subject to compliance with the laws and regulations.

Shares may be registered with an intermediary under the conditions provided for in Articles L. 228-1 *et seq.* of the French Commercial Code. Intermediaries must declare their status as intermediaries who hold shares for a third party, under the conditions provided for by the laws and regulations. These provisions are also applicable to the other securities issued by the Company.

Under the conditions provided for by the laws and regulations in force, the Company is entitled to request from the central custodian of financial instruments, at any time and provided that it pays the required consideration, as applicable, the name or corporate name, the nationality, the year of birth or the year of incorporation, and the address of the holders of bearer shares that grant an immediate or deferred right to vote at its own Shareholders' Meetings, as well as the quantity of securities held by each of these shareholders and, where applicable, any restrictions to which the securities may be subject. The Company, in view of the list provided by the aforementioned body, has the right to ask the persons appearing on this list and whom the Company considers could be registered on behalf of third parties for the above information concerning the owners of the shares.

For registered shares that grant immediate or deferred access to the capital, intermediaries that are registered under the conditions provided for in Article L. 228-1 of the French Commercial Code mentioned above, are required, within ten business days as from receipt of the request made by the Company or its

agent, which may be made at any time, to disclose the identity of the owners of said securities.

7.2.5 Assignment and transfer of shares

Shares can be traded without restriction, subject to compliance with the provisions of the laws and regulations. They are registered in an account and are passed on by transfer from one account to another.

7.2.6 Changes to the articles of association, the capital and voting rights

All changes to the articles of association, to the capital or to the voting rights attached to the securities that make up the capital are subject to the requirements of law, as the articles of association contain no specific provisions regarding such matters.

7.2.7 Members and functioning of the Board of Directors

The Board of Directors adopted internal rules of procedure, which are regularly updated, defining the operating procedures of the Board of Directors in addition to applicable legal and regulatory requirements and the provisions of the Company's articles of association.

These procedures are described in section 4.2 "Members and functioning of the Board of Directors".

The Group's internal rules of procedure are accessible on the Group's website (www.edf.fr).

7.2.8 Shareholder's Meetings

7.2.8.1 Convening notices to meetings

Shareholders' Meetings are convened by the Board of Directors or, in the last resort, by the Statutory Auditors or by any person empowered to do so. Meetings are held at the registered office or at any other place stated in the convening notice.

7.2.8.2 Participation in meetings and exercise of voting rights

Shareholders' Meetings may be held by video conference or any telecommunication means that allow shareholders to be identified. The conditions governing the type and use of such means are specified in Articles R. 225-97 to R. 225-99 of the French Commercial Code. In such cases, shareholders who participate in the meeting by such means are deemed to be present for the calculation of the quorum and majority, under the conditions specified by law.

All shareholders can attend Shareholders' Meetings, regardless of the number of shares they own.

Shareholders may choose between one of the following three methods of participation: attending the Shareholders' Meeting in person by requesting an admission card, giving a proxy (power of attorney) to the Chairman of the Shareholders' Meeting or to any individual or legal entity of their choice (Articles L. 225-106 and L. 22-10-39 of the French Commercial Code) or casting their vote remotely (forms which fail to provide a choice as regards a voice are considered as negative votes, votes expressing an abstention will be taken into account for the calculation of the quorum but will not be taken into account for the calculation of the majority).

In accordance with Article R. 22-10-18 of the French Commercial Code, proof of the right to participate in a Shareholders' Meeting is obtained by the registration of the securities in an account in the name of the shareholder or of the intermediary that is registered on the shareholder's behalf (pursuant to paragraph 7 of



Article L. 228-1 of the French Commercial Code), on the second day prior to the meeting, i.e. at midnight, Paris time, either in the registered share accounts held by the Company (or its authorised representative), or in the bearer share accounts held by the accredited intermediary.

In accordance with Article R. 225-85 of the French Commercial Code, the registration of the securities in the bearer share accounts held by financial intermediaries is evidenced by a shareholding certificate issued by these intermediaries, where applicable by electronic means under the conditions provided for in Article R. 225-61 of the French Commercial Code, as an appendix to the postal voting form, the voting proxy or admission card request made on behalf of a shareholder or on behalf of a shareholder who is represented by the registered intermediary.

All shareholders may grant a proxy to any individual or legal entity of their choice in order to be represented at a Shareholders' Meeting. Proxies, as well as any proxy revocations, must be evidenced in writing and notified to the Company. Proxies may be revoked in the same forms as those required for the designation of the proxy holder, including by electronic means if need be. The owners of shares that are properly registered in the name of an intermediary under the conditions provided for in Article L. 228-1 of the French Commercial Code may be represented by a registered intermediary under the conditions provided for in said article.

EDF gives its shareholders the possibility of voting online, prior to the Shareholders' Meeting.

Certain shares may carry double voting rights in accordance with the conditions laid down in Article L. 22-10-46 of the French Commercial Code (see section 7.2.4 "Rights attached to shares").

In 2020 and 2021, in the context of the Covid-19 health crisis and in accordance with the legal stipulations in force, the General Assemblies were held behind closed doors, without the shareholders and other persons entitled to participate being physically present. Details of how to participate in the General Meetings were set out in the notices of meeting made available on the company's website. The General Assemblies were broadcast live on the Company's website and the videos are available on a deferred basis within the timeframe provided for by the regulations. Shareholders were invited to ask their questions on the day of the meeting in written form on the connection platform.

7.2.8.3 Requests for the inclusion of items or draft resolutions on the agenda and written questions to the Board of Directors

Requests for the inclusion of items or draft resolutions on the Shareholders' Meeting agenda made by shareholders who meet the conditions provided for in Article R. 225-71 of the French Commercial Code must be received by the Company no later than twenty-five day prior to the date of the Shareholders' Meeting, but may not be sent more than 20 calendar days after the publication of the prior meeting notice, in accordance with Article R. 225-73 and Article R. 22-10-22 of the French Commercial Code.

Requests for the inclusion of items on the agenda must be substantiated. The wording of the draft resolutions must accompany requests for the inclusion of such resolutions, and a brief explanation of the reasons may also be given.

On the date of the request, the authors must provide proof of owning or representing the percentage of the capital required by Article R. 225-71 of the French Commercial Code. Requests must be accompanied by proof of entry in an account. Agenda items or draft resolutions that are proposed for inclusion are only reviewed if the authors of the request submit a new certificate proving the registration of the securities in the same accounts on the second day prior to the meeting.

Each shareholder also has the option of sending the Board of Directors written questions of his or her choice. In accordance with Article L. 225-108 of the French Commercial Code, the Board of Directors will answer, or delegates the Chairman and Chief Executive Officer the power to answer, the questions during the meeting, or the answer is deemed to have been given provided that it is published on the Company's website.

Written questions must be sent to the Company by registered letter with return receipt or by electronic telecommunication at the latest on the fourth business day prior to the date of the Shareholders' Meeting. In accordance with Article R. 225-84 of the French Commercial Code, these questions must be accompanied by a shareholding certificate, in order to be taken into account.

7.2.8.4 Temporary disposals during meeting periods

In accordance with the provisions of Article L. 22-10-48 of the French Commercial Code, any person, alone or together with other persons, by way of one or more temporary disposals or any transaction that grants the right to or requires the resale or return of said shares to the assignor, who holds a number of shares that represents more than 0.5% of the voting rights in a listed company, must notify the Company and the French Market Authority no later than midnight, Paris time, on the second business day prior to the Shareholders' Meeting, and when the contract that arranges this transaction remains in force on this date, of the total number of shares held on a temporary basis. In addition to the number of shares acquired, this notification must contain the identity of the assignor, the date and the expiration of the contract that organises the transaction and, as applicable, the voting agreement.

If no information is provided to the Company and the French Market Authority, the shares thus acquired are automatically stripped of voting rights for the Shareholders' Meeting concerned and for all Shareholder's Meetings that are held until such shares are resold or returned.

Moreover, the Company representative, a shareholder or the French Market Authority may petition the Commercial Court to order the complete or partial suspension, for a maximum of five years, of the voting rights of any shareholder who fails to provide such information, regardless of whether or not the voting borrowing shareholder has exercised his or her voting rights.

7.2.9 By law or statutory provisions that prevent a change in its current control

Pursuant to Article L. 111-67 of the French Energy Code and the EDF articles of association, changes in share capital cannot result in the French State's shareholding falling below the statutory 70% threshold.

Certain shares may carry double voting rights in accordance with the conditions laid down in Act no. 22-10-46 of the French Commercial Code (see section 7.2.4 "Rights attached to shares").

With the exception of the foregoing, no other provision specifically aims to prevent or delay the takeover of the Company by a third party

7.2.10 Threshold crossings

Pursuant to the provisions of the French Commercial Code, any individual or legal entity, acting alone or together with other persons or entities, that acquires a number of shares that represents more than 5%, 10%, 15%, 20%, 25%, 30%, 33.3%, 50%, 66.6%, 90% or 95% of the capital or voting rights must inform the Company, no later than prior to the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded, of the total number of shares or voting rights owned (Article R. 233-1 of the French Commercial Code). Moreover, such individuals or legal entities must also inform the AMF of these acquisitions no later than prior to the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded (Article 223-14 of the AMF General regulations). The AMF publishes threshold crossings that are notified to it.

Since 2012, cash payoff or physically-settled derivatives having a similar economic effect to detention of underlying shares, are taken into account for this calculation of threshold crossing (Article L. 233-9(I) 4o bis of the French Commercial Code). Pursuant to AMF General regulations, holders of these financial instruments must take into account the number of shares that carry this type of agreement and financial instruments for the calculation of their participation in the framework of their reporting obligation, and must precise, when they declare threshold crossing, their intention as to the outcome of this type of agreements and financial instruments.

Within the same timeframes and under the same conditions, this information must also be disclosed when the capital or voting rights fall below the thresholds stated above.

Absent a proper declaration, the shares that exceed the fraction which should have been declared in accordance with the provisions of law mentioned above will be stripped of voting rights for all Shareholders' Meetings that are held during a two-

year period following the date on which the effective disclosure is made.

Moreover, the Company's articles of association provide that any individual or legal entity, acting alone or jointly, who acquires or ceases to hold, directly or indirectly, a number of shares that corresponds to 0.5% of the Company's capital or voting rights, or a multiple of said fraction, is required to inform the Company, by registered letter with return receipt requested, at the latest before the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded, of the total number of shares, voting rights or equity interests held. The Company's articles of association state that the rules for the calculation and assimilation of shareholdings applicable to the statutory thresholds, as well as

the obligations to provide information on financial instruments that are not assimilated to shares, apply to the disclosure requirements set out in the articles of association for bylaw thresholds.

Failure to comply with the above provisions is punishable by the loss of voting rights for the shares that exceed the fraction that should have been declared, for all Shareholders' Meetings that are held until the expiration of a two-year period following the date of the effective threshold disclosure provided for above, if the application of this penalty is requested by one or more shareholders who hold at least 1% of the Company's capital. Such requests are recorded in the minutes of Shareholders' Meetings.

7.3 Information regarding capital and share ownership

7.3.1 Amount and changes in share capital

On the filing date of this Universal Registration Document, the details of the Company's share capital are as follows:

Number of shares issued	3,238,676,748
Par value	€0.50 per share
Type of shares issued	common shares
Share capital amount	€1,619,338,374

The share capital issued by the Company has been paid up in full. The Company has not issued or authorised any preference shares.

Pursuant to the law of 9 August 2004, EDF was converted into a *société anonyme* (public limited company) on 20 November 2004 and its capital set at €8,129,000,000, divided into 1,625,800,000 shares with a par value of €5.

The EDF Shareholders' Meeting of 31 August 2005 granted full powers to the EDF Board of Directors with a view to reducing the capital by a maximum amount of €7,316,100,000, *via* a reduction in the par value of shares from €5 to a minimum of €0.5. During its meeting of 27 October 2005, the Board of Directors decided to reduce the share capital by €7,316,100,000, *via* a €4.50 reduction in the par value of shares, which therefore decreased from €5 to €0.50. The share capital was thus reduced to €812,900,000.

During its 18 November 2005 meeting, the Board of Directors used the authority granted to it by the Combined Shareholders' Meeting of 10 October 2005, and approved the increases in the Company's share capital in connection with the Open Price Offering and the Guaranteed Global Placement that were performed when the Group was first listed on the stock market. As a result, the Board of Directors increased the share capital to €906,834,514.

On 20 December 2005, Calyon (now Crédit Agricole-CIB) paid EDF the price that corresponded to the exercise of 8,502,062 warrants that the EDF Board issued to Calyon by decision taken on 18 November 2005. Consequently, the share capital was increased to €911,085,545 divided into 1,822,171,060 common shares.

The payment of dividends in shares on 17 December 2009 resulted in an increase in the share capital of €13,347,786 following the issue of 26,695,572 shares. On 21 January 2010, the share capital was thus increased to €924,433,331 divided into 1,848,866,662 common shares.

On 24 June 2011, the capital was increased to €930,406,055 divided into 1,860,812,110 common shares, *via* the issue of new shares as consideration for the EDF Énergies Nouvelles shares contributed to EDF in exchange for the EDF shares tendered as part of the alternative simplified public purchase or exchange offer involving EDF Énergies Nouvelles shares, which was initiated by EDF (see section 1.4.1.5.3 "EDF Renewables"). Then, on 28 September 2011, the capital was reduced to €924,433,331 divided into 1,848,866,662 common shares, *via* the cancellation of the shares purchased as part of the share buyback programme with a view to cancellation, in order to offset the dilution caused by the aforementioned offer.

On 29 July 2013, the capital was increased to €930,004,234, divided into 1,860,008,468 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 30 May 2013 to offer each shareholder in the Company the possibility to opt for the payment in new shares of a fraction of the remaining dividend to be distributed for the fiscal year ending 31 December 2012.

The payment of interim dividends in shares on 18 December 2015 resulted in an increase in the capital of €30,065,279.50 following the issue of 60,130,559 shares. The share capital was thus increased from €930,004,234 to €960,069,513.50 divided into 1,920,139,027 common shares.

On 31 October 2016, the capital was increased to €1,054,568,341.50 divided into 2,109,136,683 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 12 May 2016 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2016.

The payment of interim dividends in shares on 31 October 2016 resulted in an increase in the capital of €47,942,646 following the issue of 95,885,292 shares. The capital was thus increased from €1,006,625,695.50 to €1,054,568,341.50, divided into 2,109,136,683 common shares.

At its meeting of 3 March 2017, the Board of Directors, making use of the delegation of authority given by the Combined Shareholders' Meeting of 26 July 2016 in its second resolution, decided to increase the capital with maintenance of the shareholders' preferential subscription right. The capital was increased to €1,370,938,843.50, divided into 2,741,877,687 common shares. The final gross capital increase, including the issue premium, stood at €4,017,905,375.40 and resulted in the issue of 632,741,004 new shares. It was launched on 6 March 2017 and was completed on 30 March 2017.

On 12 July 2017, the capital was increased to €1,443,677,137, divided into 2,887,354,274 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 18 May 2017 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2016.

The payment of interim dividends in shares on 14 December 2017 resulted in an increase in the capital of €398,440,228.20 following the issue of 40,084,530 shares. The capital was thus increased from €1,443,677,137 to €1,463,719,402, divided into 2,927,438,804 common shares.



On 29 June 2018, the capital was increased to €1,505,133,838, divided into 3,010,267,676 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 15 May 2018 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2017.

At the Board meeting held on 19 November 2019, the directors decided to distribute an interim dividend of €0.15 per share for the 2019 fiscal year and resolved, in accordance with the terms of the fourth resolution adopted at the Combined Shareholders' Meeting held on 16 May 2019, that it could be paid in new shares issued by the Company.

The payment of interim dividends in shares on 17 December 2019 resulted in an increase in the capital of €429,635,913.60 following the issue of 52,651,460 shares. The capital was thus increased from €1,525,484,813.00 to €1,551,810,543, divided into 3,103,621,086 common shares.

At its meeting on 29 July 2020, the Board of Directors decided to cancel 3,697,507 EDF treasury shares on 30 September 2020 that had previously been allocated to a capital reduction target through the cancellation of shares on 19 December 2019.

On that date, the share capital was reduced to €1,549,961,789.50 in par value, divided into 3,099,923,579 shares with a par value of €0.50 each.

On 30 June 2021, the capital was increased to €1,578,916,053.50, divided into 3,157,832,107 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 6 May 2021 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2020.

At the Board meeting held on 4 November 2021, the Board of Directors decided to distribute an interim dividend of €0.30 per share for the 2021 fiscal year and resolved, in accordance with the terms of the fourth resolution adopted at the Combined Shareholders' Meeting held on 6 May 2021, that it could be paid in new shares issued by the Company.

The payment of interim dividends in shares on 2 December 2021 resulted in an increase in the capital of €898,992,407.92 following the issue of 80,844,641 shares. The capital was thus increased from €1,578,916,053.50 to €1,619,338,374, divided into 3,238,676,748 common shares.

7.3.2 Treasury shares and share buyback programme

A share buyback programme initially authorised by the Shareholders' Meeting held 9 June 2006 has been used by the Board of Directors within a limit of 10% of the Company's share capital and for an initial period of 18 months. This programme was continued for 18 months by the following Shareholders' Meetings held since 2006, including by the Shareholders' Meeting held on 6 May 2021 which approved it.

7.3.2.1 Share buyback programme in force as of the filing date of the Universal Registration Document (programme authorised by the Shareholders' Meeting of 6 May 2021)

After consulting the Board of Directors' report, and in accordance with the provisions of Articles 22-10-62 *et seq.* of the French Commercial Code, Articles L. 241-1 *et seq.* of the General regulations of the AMF, EU regulation no. 596/2014 of 16 April 2014 on market abuse, the sixteenth resolution adopted by the Shareholders' Meeting held on 6 May 2021 authorised the Board of Directors to implement a programme to buy back Company shares, capped at a maximum of 10% of the Company's capital.

This resolution immediately terminated the unused portion of the authorisation to purchase Company shares, which was granted by the twenty-first resolution adopted by the Shareholders' Meeting held on 7 May 2020.

The main aims of the share buyback programme are as follows: to cancel shares; to allot or transfer shares to employees or former employees of the Company, on the terms and conditions provided for by law, in particular as their share of the Company's profits, or by way of bonus shares or offers reserved for employees; to deliver shares following the exercise of rights attached to securities granting access to the capital by redemption, conversion, exchange, presentation of a warrant or otherwise; to provide liquidity through a liquidity contract in accordance with accepted market practice established by the AMF; to deliver shares following the exercise of rights attached to securities granting access to the Company's capital and implement all hedging transactions for the obligations of the Company or one of its subsidiaries; to retain and subsequently deliver shares in connection with external growth transactions, contributions, mergers or demergers; more generally, to carry out any transaction that is or may become authorised under the regulations in force, or falling within the scope of market practice accepted by the AMF.

The maximum percentage of capital that may be bought back under this programme is 10% of the total number of shares making up the share capital (or 5% for shares acquired with a view to their retention and subsequent delivery in

payment or in exchange as part of an external growth transaction), it being noted that whenever shares are bought back to provide liquidity under a liquidity contract, the 10% threshold will be calculated using the number of shares purchased, as reduced by the number of shares resold during the validity period of the authorisation.

Under no circumstances may the Company hold, directly or indirectly, more than 10% of its capital.

These shares may be acquired or transferred, under the conditions and within the limits, in particular in terms of volumes and price, provided for by the laws and regulations in force on the date of the relevant transactions, by any means, such as on the market or over the counter, including *via* block trades (purchases or sales), by the use of derivative financial instruments or notes or securities that grant access to Company shares, or by implementing option strategies, under the conditions stipulated by the market authorities and at such times as determined by the Board of Directors or any person who is acting on the Board's behalf. This authorisation may be used during public takeover bids, within the limits permitted by the applicable regulations.

The Shareholders' Meeting set at €20 the maximum purchase price per share ⁽¹⁾ and at €2 billion the maximum amount of funds allocated to the implementation of the programme, and granted the Board of Directors full powers, with the right of delegation, to use this authorisation.

The authorisation was granted for a maximum of 18 months as from the Shareholders' Meeting of 6 May 2021, and will therefore end on 6 November 2022, unless the Shareholders' Meeting of 12 May 2022 adopts the new programme described in section 7.3.2.3 "Description of the new share buyback programme to be submitted for approval at the Combined Shareholders' Meeting to be held on 12 May 2022" below.

(1) The Board of Directors may, however, adjust the aforementioned purchase price if premiums, reserves or profits are capitalised, which results either in an increase in the par value of the shares or the creation and award of bonus shares, and in the event of a stock split or reverse stock split, or any other transaction involving the shareholders' equity, in order to take into account the impact of these operations on share value.

7.3.2.2 Summary of the Company's trading in its own shares during the 2021 fiscal year

Number of treasury shares held at 31 December 2021	1,174,554
Percentage of capital held through treasury shares at 31 December 2021	0.036%
Carrying value of the portfolio at 31 December 2021 ⁽¹⁾ (in euros)	13,536,006.43
Market value of the portfolio at 31 December 2021 ⁽²⁾ (in euros)	12,133,142.82
Number of shares cancelled over the past 24 months	3,697,507

(1) Valued at the purchase price.

(2) Based on the closing price at 31 December 2021, i.e. €10.33.

Liquidity contract

Following changes to the regulations governing liquidity contracts and in accordance with AMF decision no. 2018-01 of 2 July 2018 a new liquidity contract was signed with Oddo BHF and as at 28 March 2019, the liquidity account comprised €10,120,161 and 738,882 shares.

Number of shares purchased and sold during the 2021 fiscal year

During the 2021 financial year, EDF acquired 9,475,538 of its own shares and sold 9,130,984 shares under the liquidity contract. The average share purchase price was €11.5856 and the average share sale price was €11.6544.

Portfolio breakdown at 31 December 2021

As at 31 December 2021, the Company held a total of 1,174,554 treasury shares, all held under the liquidity contract (representing 0.0363% of its share capital).

On this date, EDF's subsidiaries did not hold any shares, either directly or indirectly.

Post-closing transactions

Between 1 January 2022 and 28 February 2022, the Company acquired 1,958,972 treasury shares for an average unit value of €8.6644 and sold 1,793,920 shares for an average unit value of €8.74602. These operations took place in the liquidity contract framework.

7.3.2.3 Description of the new share buyback programme to be submitted for approval at the Combined Shareholders' Meeting to be held on 12 May 2022

Pursuant to Article 241-2 *et seq.* of the AMF General regulations and Article L. 451-3 of the French Monetary and Financial Code, and in accordance with EU regulations, the following is a description of the share buyback programme that will be submitted to the Ordinary and Extraordinary Shareholders' Meeting to be held on 12 May 2022 for approval.

Objectives of the new share buyback programme

Under the share buyback programme, shares will be bought back for the following purposes:

- to reduce the capital by cancelling them;
- to allow them to be allotted to employees and former employees of the EDF group, on the terms and conditions provided for by law, in particular as part of any stock options plan, allocation of bonus shares, or any offers reserved for employees;
- to allow them to be delivered when exercising rights attached to securities granting access to the capital by redemption, conversion, exchange, presentation of a warrant or otherwise and to implement all hedging transactions for the obligations of the Company or one of its subsidiaries related to those securities; to provide liquidity under a liquidity contract;
- to allow them to be delivered following the exercise of rights attached to options granting access to the Company's capital and to implement all hedging transactions for the obligations of the Company or one of its subsidiaries related to these options;
- to allow them to be retained and subsequently delivered in connection with external growth transactions, contributions, mergers or demergers;
- more generally, to carry out any transaction that is or may become authorised under the regulations in force, or falling within the scope of market practice accepted by the AMF.

Duration of the share buyback programme

The share buyback programme may be implemented for a period of 18 months, as of the Shareholders' Meeting of 12 May 2022.

Maximum percentage of capital, maximum number and characteristics of the shares that the Company wishes to buy back and maximum purchase price

The maximum percentage of capital that may be bought back under this programme is 10% of the total number of shares making up the share capital (or 5% for shares acquired with a view to their retention and subsequent delivery in payment or in exchange as part of an external growth transaction), it being noted that whenever shares are bought back to provide liquidity under a liquidity contract, the 10% threshold will be calculated using the number of shares purchased, as reduced by the number of shares resold during the validity period of the authorisation.

Under no circumstances may the Company hold, directly or indirectly, more than 10% of its capital.

The maximum purchase price of shares under this resolution is €20 per share and the total amount of funds that may be allocated to the implementation of this share buyback programme may not exceed €2 billion.

7.3.3 Capital authorised but not issued

The following table presents a summary of the delegations of authority and authorisations to increase or reduce the share capital that were in force on the filing date of this Universal Registration Document which the Board of Directors was granted by the Combined Shareholders' Meeting of 7 May 2020, and the extent to which they have been used at 31 December 2021:

STATUS OF THE AUTHORISATIONS ADOPTED BY THE COMBINED SHAREHOLDERS' MEETING OF 7 MAY 2020

Securities concerned/type of issue	Term of the authorisation and expiration	Maximum nominal increase in capital (in millions of euros)	Use of authorisations (in millions of euros)
Delegation of authority to the Board to increase the capital with maintenance of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	365 ⁽¹⁾	none
Delegation of authority to the Board to increase the capital, by way of a public offering, with cancellation of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	290 ⁽¹⁾	none
Delegation of authority to the Board to make offers for private placements ⁽²⁾ with cancellation of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	290 ⁽¹⁾ and 20% of the share capital per year	Issue of 219,579,139 OCEANE bonds ⁽³⁾
Authorisation for the Board to increase the number of securities to be issued in the event of a capital increase, with or without preferential subscription rights Capital increase, all securities	26 months 7 July 2022	15% the amount of the initial issue ⁽¹⁾	none
Delegation of authority to the Board to increase the capital through the capitalisation of reserves, profits, premiums or otherwise	26 months 7 July 2022	1,000	
Delegation of authority to the Board to increase the capital as consideration for a public exchange bid initiated by the Company	26 months 7 July 2022	145 ⁽¹⁾	none
Delegation of authority to the Board to increase the capital to remunerate in-kind contributions ⁽⁴⁾	26 months 7 July 2022	10% the Company's capital up to a maximum of 95 ⁽¹⁾	none
Delegation of authority to the Board to increase the share capital in favour of members of savings plans with cancellation of preferential subscription rights in favour of the latter	26 months 7 July 2022	15	none
Issues reserved for the personnel			

(1) The nominal aggregate limit on the share capital increase of €365 million provided for in the twenty-second resolution submitted to the Shareholders' Meeting of 7 May 2020, applies to all capital increases the nominal amount of which will be charged in consequence on this limit, with the exception of capital increases through capitalisation of reserves, premiums, profits or otherwise and capital increases that are reserved for savings plan members.

(2) Offers governed by Article L. 411-2 II of the French Monetary and Financial Code, in that they are exclusively intended for persons who provide investment portfolio management services on behalf of third parties or qualified investors or a restricted circle of investors acting on their own behalf.

(3) At the issue date, the OCEANEs represent a maximum nominal amount of capital increase, if all the OCEANEs were converted, of approximately €109.8 million, i.e. a remaining amount of €180.2 million

(4) Article L. 22-10-53 of the French Commercial Code.

GENERAL INFORMATION ABOUT THE COMPANY AND ITS CAPITAL

Information regarding capital and share ownership

STATUS OF THE AUTHORISATIONS ADOPTED BY THE COMBINED SHAREHOLDERS' MEETING OF 6 MAY 2021

Securities concerned/type of issue	Term of the authorisation and expiration	Maximum nominal increase or reduction in capital (in millions of euros)
Delegation of authority to the Board to carry out increases of capital reserved for a category of beneficiaries, with cancellation of the shareholders' preferential subscription right	18 months 6 November 2022	10
Authorisation for the Board to reduce the capital by cancelling treasury shares	18 months 6 November 2022	10% the capital by 24-month periods

As of the date of this Universal Registration Document, no use has been made of these authorisations.

STATUS OF THE AUTHORISATIONS TO BE SUBMITTED TO THE COMBINED SHAREHOLDERS' MEETING OF 12 MAY 2022 FOR ADOPTION

Securities concerned/type of issue	Term of the authorisation and expiration	Maximum nominal increase or reduction in capital (in millions of euros)
Delegation of authority to the Board to increase the capital with maintenance of the shareholders' preferential subscription right	26 months 12 July 2024	935 ⁽¹⁾
Capital increase, all securities		
Delegation of authority to the Board to increase the capital, by way of a public offering, with cancellation of the shareholders' preferential subscription right	26 months 12 July 2024	375 ⁽¹⁾
Capital increase, all securities		
Delegation of authority to the Board to make offers for private placements ⁽²⁾ with cancellation of the shareholders' preferential subscription right	26 months 12 July 2024	375 ⁽¹⁾ and 20% of the share capital per year
Capital increase, all securities		
Authorisation for the Board to increase the number of securities to be issued in the event of a capital increase, with or without preferential subscription rights	26 months 12 July 2024	15% the amount of the initial issue ⁽¹⁾
Capital increase, all securities		
Delegation of authority to the Board to increase the capital through the capitalisation of reserves, profits, premiums or otherwise	26 months 12 July 2024	1,000
Delegation of authority to the Board to increase the capital as consideration for a public exchange bid initiated by the Company	26 months 12 July 2024	185 ⁽¹⁾
Delegation of authority to the Board to increase the capital to remunerate in-kind contributions ⁽³⁾	26 months 12 July 2024	10% the Company's capital up to a maximum of 115 ⁽¹⁾
Delegation of authority to the Board of Directors to increase the share capital in favour of members of savings plans with cancellation of preferential subscription rights in favour of the latter	26 months 12 July 2024	15
Issues reserved for the personnel		
Delegation of authority to the Board to carry out increases of capital reserved for a category of beneficiaries, with cancellation of the shareholders' preferential subscription right	18 months 12 November 2023	10
Authorisation for the Board to reduce the capital by cancelling treasury shares	18 months 12 November 2023	10% the capital by 24-month periods

(1) The nominal aggregate limit on the share capital increase of €365 million provided for in the twenty-second resolution submitted to the Shareholders' Meeting of 7 May 2020, applies to all capital increases the nominal amount of which will be charged in consequence on this limit, with the exception of capital increases through capitalisation of reserves, premiums, profits or otherwise and capital increases that are reserved for savings plan members.

(2) Offers governed by Article L. 411-2 II of the French Monetary and Financial Code, in that they are exclusively intended for persons who provide investment portfolio management services on behalf of third parties or qualified investors or a restricted circle of investors acting on their own behalf.

(3) Article L. 22-10-1953 of the French Commercial Code.

The Company intends to submit to the Board of Directors a capital increase operation restricted to employees and retired members of the EDF Group Savings Plan with cancellation of the preferential subscription right in favour of the latter, if market conditions permit, on the basis of the resolutions proposed to this Meeting.



7.3.4 Other equity securities

On 8 September 2020, EDF launched an issue of senior unsecured Green Bonds convertible into and/or exchangeable for new and/or existing shares (Green OCEANE Bonds) maturing on 14 September 2024. The bonds were offered to the public exclusively to qualified investors, within the meaning of Article 2(e) of EU regulation 2017/1129 of 14 June 2017, in France and outside France, in accordance with the procedure known as "bookbuilding", as developed by professional practice, with the exception of the United States of America, Australia and Japan (as referred to in Article L. 411-2, 1° of the French Monetary and Financial Code), for a maximum par value of approximately €2.4 billion and a gross annual negative return of -1.68%.

On the 14 September 2017, 219,579,139 Green OCEANE Bonds were issued under ISIN code FR0013534518 with a par value of €10.93 and an issue price of €11.70, i.e. 107% of the par value. They do not bear interest. The French State subscribed to 87,831,655 bonds in this issue, representing a nominal amount of approximately €960 million, i.e. approximately 40% of the issue.

The Company has decided that in the event that the holders of Green Bonds exercise the option to convert and/or exchange the Green Bonds into ordinary shares of the Company, the Green Bonds will be converted and the Company will issue new ordinary shares. The conversion ratio was on the issue date 1 OCEANE bond for 1 common share. It can be subject to adjustment in accordance with the terms of the issue agreement (see below).

An amount equal to the net proceeds of the issue will be allocated, directly or indirectly, for the financing and/or refinancing, in whole or in part, of new or

existing Eligible Projects, as defined in EDF's Green Bond Framework. Existing eligible projects that may be refinanced through this issue with a maximum three-year retrospective period preceding the year of the Bond Issue represent approximately €1.5 billion, pursuant to EDF's Green Bond Framework.

This issue may also contribute to the strengthening of the Company's shareholders' equity, in the event that the holders of the OCEANE Green Bonds exercise their conversion option, resulting in the issue of new shares of the Company.

Assuming an issue with a par value of €2,399,999,989.27 represented by 219,579,139 bonds with a par value of €10.93 each, based on the initial conversion ratio, the potential dilution would be approximately 7.1% of the Company's share capital if the right to the allocation of shares were exercised for all Bonds and the Company decided to issue only new shares in the event that the right to the allocation of shares is exercised (see section 6.8 of the 2020 URD presenting the report of the Board of Directors and the Statutory Auditors on the bond issue).

In 2021, as a result of the distribution of a dividend of 0.21 euro per share and in accordance with the provisions of the issue agreement, the conversion/exchange ratio has been increased to 1.018 EDF shares per OCEANE. Subsequently, following the distribution of an interim dividend of €0.30 per share, the conversion/exchange ratio was increased to 1.042 EDF shares per OCEANE, with effect from 2 December 2021.

7.3.5 Non-equity securities

On 18 April 1996, EDF set up a programme to issue debt securities in the form of Euro Medium Term Notes (the "EMTN" programme). Since this date, this programme has been regularly renewed.

On 6 October 2016, EDF successfully raised \$2.655 billion from 2 senior bonds subscribed for by twenty or so investors on the Taiwanese market ("Formosa bonds"):

- \$491 million, with a fixed coupon of 4.65%, 30-year bond;
- \$2.164 billion, with a fixed coupon of 4.99%, 40-year bond.

On 6 October 2016, EDF also successfully launched a senior multi-currency bond issue of approximately €3 billion in four tranches:

- €1.75 billion, with a fixed coupon of 1%, 10-year Green Bond;
- €750 million, with a fixed coupon of 1.875%, 20-year bond;
- CHF400 million, with a fixed coupon of 0.3%, 8-year bond;
- CHF150 million, with a fixed coupon of 0.65%, 12-year bond.

This third Green Bond issue, in an amount of €1.75 billion, is the largest tranche of Green Bonds issued to date and means that EDF has already issued the equivalent of more than €4 billion in Green Bonds over a three-year period to support its expansion in the renewable energies field.

On 20 January 2017, EDF successfully raised 137 billion yen, corresponding to approximately €1.1 billion, through 4 senior bonds issued on the Japanese market ("Samurai bonds"):

- JPY107.9 billion, with a fixed coupon of 1.088%, 10-year bond;
- JPY19.6 billion, with a fixed coupon of 1.278%, 12-year Green Bond;
- JPY6.4 billion, with a fixed coupon of 1.569%, 15-year Green Bond;
- JPY3.1 billion, with a fixed coupon of 1.870%, 20-year bond, which is the longest bond maturity ever issued on the Samurai market.

With the issue of two green tranches, in a total amount of JPY26 billion to be used to finance its renewable investments, EDF opens the Samurai Green market and thus continues to actively participate in the development of Green Bonds as tools to finance the energy transition.

On 19 September 2018, EDF successfully raised US\$3.75 billion on 3 tranches of senior bonds:

- \$1.8 billion, with a fixed coupon of 4.500%, 10-year bond;
- \$650 million, with a fixed coupon of 4.875%, 20-year bond;
- \$1.3 billion, with a fixed coupon of 5.000%, 30-year bond.

In addition, on 25 September 2018, EDF successfully launched a €1 billion senior bond issue with a 12-year maturity and a fixed coupon of 2%.

On 25 September 2018, EDF launched a €1.25 billion super-subordinated bond issue with a 4% coupon and a redemption option exercisable at EDF's discretion, initially between 4 July 2024 (inclusive) and 4 October 2024 (inclusive). It also launched a contractual cash buyback offer for four existing hybrid bond issues for €1.25 billion. The total amount of EDF hybrid shares remains unchanged following these issue/redemption operations.

On 26 November 2019, EDF launched a €500 million euro-denominated hybrid bond issue with a 3.00% coupon and a redemption option including a first option for early redemption at the Company's call in December 2027. The Company also launched contractual buyback offers for the following securities:

- perpetual super-subordinated bonds of €1,000 million with a first early redemption date at the Company's call falling on 22 January 2022, with a current outstanding amount of €661.8 million, admitted for trading on Euronext Paris;
- perpetual super-subordinated bonds of US\$3,000 million with a first early redemption date at the Company's call falling on 29 January 2023, with a current outstanding amount of US\$3,000 million admitted for trading on the regulated market of the Luxembourg Stock Exchange.

GENERAL INFORMATION ABOUT THE COMPANY AND ITS CAPITAL

Information regarding capital and share ownership

On 28 November 2019, EDF raised US\$2 billion with a 50-year maturity and a fixed coupon of 4.50% under its EMTN program

As part of the same programme, on 2 December 2019, EDF raised €1.25 billion with a 30-year maturity and a fixed coupon of 2.00%. On 12 December 2019, EDF announced the final result of its buyback offer for euro-denominated hybrid bonds and the results of early participation in its buyback offer for US dollar-denominated hybrid bonds.

On 30 December 2019, EDF announced the final result of its buyback offer for US dollar-denominated hybrid bonds. The Company also exercised its option to buy back on 29 January 2020 all of the perpetual subordinated bonds totalling €1.250 billion, with a current outstanding amount of €338.2 million.

On 8 September 2020, EDF launched two new euro-denominated hybrid bond issues for a total par value of €2.1 billion, consisting of:

- an issue of hybrid perpetual bonds for an amount of €850 million with an initial coupon of 2.875% and a first option for early redemption at the Company's option on 15 December 2026 (the "Hybrid Bonds not redeemable before 6.5 years");
- €1.250 billion open-ended hybrid bond issue with an initial coupon of 3.375% and a first option for early redemption at the Company's option on 15 June 2030 (the "Hybrid Bonds not redeemable before 10 years", together with the Hybrid Bonds not redeemable before 6.5 years, the "Hybrid Bonds").

On 26 May 2021, EDF launched an issue of hybrid perpetual corporate bonds denominated in euros for a total nominal amount of €1.25 billion with an initial coupon of 2.625% and a first early redemption option at EDF's option on 1 June 2028.

On 23 November 2021, EDF launched a senior green bond issue maturing on 29 November 2033 denominated in euros, for a nominal amount of €1.75 billion and with a fixed coupon of 1%.

At 31 December 2021, the amount of bonds in the balance sheet was EUR 49,242 million (Note 18.3.2.1 "Changes in loans and other financial liabilities" in the consolidated financial statements at 31 December 2021), with Note 18.3.2.2 also providing details of the Group's main borrowings, including those relating to EMTNs and other bonds. At 31 December 2021, the amount of perpetual

subordinated bonds recognised in equity was EUR 12,264 million (Note 14.4.1 "Outstanding perpetual subordinated bonds at 31 December 2021" of the consolidated financial statements at 31 December 2021).

7.3.6 Information on the capital of every group member that is the subject of a conditional or unconditional agreement

Disposal commitments involving securities in subsidiaries are described in note 3.2 to the consolidated financial statements for the fiscal year ended 31 December 2021 and concerning the E&P activities, in particular earn-outs. In addition, note 23 "Events after the balance sheet date" recalls that on February 10, 2022, EDF and GE announced the signature of an exclusivity agreement concerning the proposed acquisition by EDF of GE Steam Power's nuclear activities relating to the conventional island. The completion of this transaction is, among other things, subject to various regulatory approvals.

With the exception of these commitments to acquire and dispose of securities and any other commitments that are described in chapter 1 ("The Group, its strategy and activities") of this Universal Registration Document and mainly the above mentioned acquisition of GE GEAST which is listed in 1.4.1.1.2.3 B, EDF has not made any promises to purchase or sell that would make it possible to acquire or dispose of, as applicable, all or part of the capital of the Company or of any of its subsidiaries, as defined in Article L. 233-1 of the French Commercial Code.

7.3.7 Pledge of the Company's shares

To the Company's knowledge, none of the Company's common shares that make up its share capital have been pledged.

7.3.8 Ownership of the Company's capital and voting rights

For the past three fiscal years, EDF's share capital has been owned as follows as at 31 December of each year:

	At 31/12/2021		At 31/12/2020		At 31/12/2019	
	Number of shares	% of capital	Number of shares	% of capital	Number of shares	% of capital
State ⁽¹⁾	2,716,550,741	83.88	2,593,960,583	83.68	2,593,960,583	83.58
Institutional and private investors	478,277,574	14.77	463,040,491	14.94	463,147,431	14.92
Employee shareholdings	42,673,879 ⁽²⁾	1.32	42,092,505 ⁽³⁾	1.36	41,630,134 ⁽⁴⁾	1.34
Treasury shares	1,174,554	0.03	830,000	0.02	4,882,938	0.16
TOTAL	3,238,676,748	100	3,099,923,579	100	3,103,621,086	100.00

(1) The French State's shareholding in EDF includes the EDF shares held by EPIC BPI France.

(2) This number includes 38,775,926 shares (representing 1.20% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" and "EDF ORS" FCPE of the EDF group's savings plan). This number also includes almost 3.89 million shares, representing 0.12% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

(3) This number includes 38,075,245 shares (representing 1.23% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" and "EDF ORS" FCPE of the EDF group's savings plan). This number also includes almost 4.017 million shares, representing 0.13% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

(4) This number includes 37,527,237 shares (representing 1.21% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" and "EDF ORS" FCPE of the EDF group's savings plan). This number also includes almost 4.1 million shares, representing 0.13% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

Following a French state allotment of 389,349,361 EDF shares to EPIC Bpifrance, on 29 January 2018, BPI France and the French State combined crossed the statutory thresholds of 5%, 10%, 15%, 20%, 30%, one third, 50% and two-thirds

of the Company's capital and voting rights. The French state and EPIC Bpifrance act together and have to consult each other before every Shareholders' Meeting of EDF. Bpifrance undertook to not transfer, pledge or otherwise dispose of the EDF shares.

In October 2020, the French State reduced its allocation to EPIC Bpifrance by 61,000,000 EDF shares. EPIC Bpifrance also received 6,480,579 shares in respect of the 2020 Dividend paid in June 2021 and 9,033,181 shares in respect of the 2021 Interim Dividend paid in December 2021.

The Company conducted a study on identifiable bearer of shares as at 31 December 2021, which allowed it to examine the ownership of its capital and the geographical location of its shareholders on this date. The table set out below summarises this information as at 31 December 2021 and 31 December 2020:

	At 31/12/2021		At 31/12/2020	
	Number of shares held	% of capital	Number of shares held	% of capital
State *	2,716,550,741	83.88	2,593,960,583	83.68
Institutional investors in Europe (other than France)	140,784,361	4.35	143,898,238	4.64
Institutional investors in the rest of the world	187,323,465	5.78	176,371,418	5.69
Institutional investors in France	88,375,678	2.73	81,640,550	2.64
Private shareholders	61,794,070	1.91	61,130,285	1.97
Employee shareholdings	42,673,879	1.32	42,092,505	1.36
Treasury shares	1,174,554	0.03	830,000	0.02
TOTAL	3,238,676,748	100.00	3,099,923,579	100.00

* The French State's stake in EDF's share capital includes the EDF shares held by EPIC Bpifrance.

The French State opted for a payment in shares of the balance of the 2018 dividend as well as the dividend for the years 2019 and 2020. It has renewed its commitment for the 2021 dividend and for the 2022 and 2023 ⁽¹⁾ fiscal years.

The theoretical and exercisable voting rights at the General Meeting of the various categories of shareholders as at 31 December 2021 are as follows:

					Voting rights exercisable at Shareholders' Meeting	% of voting rights exercisable at Shareholders' Meeting
31/12/2021	Equities	% of capital	Theoretical voting rights	% of theoretical voting rights		
State *	2,716,550,741	83.88	4,921,161,963	89.18	4,921,161,963	89.20
Employee shareholdings	42,673,879	1.32	77,207,429	1.40	77,207,429	1.40
Individual and institutional shareholders	478,277,574	14.77	518,524,284	9.39	518,524,284	9.40
Treasury shares	1,174,554	0.03	1,174,554	0.03	-	-
TOTAL	3,238,676,748	100	5,518,068,230	100	5,302,974,698	100

* The French State's stake in EDF's share capital includes the EDF shares held by EPIC Bpifrance.

7.3.9 Agreements whose implementation could lead to a change of control

To EDF's knowledge, there are no agreements whose implementation could subsequently lead to a change in the Company's control.

Moreover, pursuant to Article L. 111-67 of the French Energy Code, the State may not hold less than 70% of EDF's capital.

7.3.10 Shareholder dialogue

Institutional and individual shareholders (excluding employee shareholders) represent approximately 15% of EDF's share capital. Since the opening of the capital in November 2005, there has been ongoing dialogue with these stakeholders.

The EDF group's financial communication consists in establishing a regular dialogue with the financial markets in compliance with regulations. The objective is for the market to possess the information needed to enhance the Company's value over time, by explaining its strategy, its development model and its environment.

In this context, the Group pursues an active policy of information and dialogue, making available to the public, individual shareholders, institutional investors and, more generally, the financial community in France and abroad, a wide range of documents and information media enabling a better understanding of the Group, its strategy, results and outlook.

Relations with institutional investors and financial analysts

The purpose of this dialogue with the financial markets is to maintain a consistent and faithful image of the EDF group among analysts and investors, in particular so

(1) French State Participation Agency (APE) Press Release of 18 February 2022.

that the latter can assess the Group's operating and financial performance as well as its development prospects.

In 2021, as in previous years, the publication of the Group's financial results on a quarterly basis was the subject of presentations by senior management in conference calls during which it also answered questions from investors and financial analysts.

In addition, throughout the year, senior management and the Financial Communications Department participated in meetings with the financial community (financial analysts and institutional investors) in the form of conference calls and roadshows. The Financial Communications Department also maintains ongoing exchanges with analysts to discuss their models and Group news.

Relations with individual shareholders

To maintain good interactions with its individual shareholders at all times, EDF uses varied and innovative communication channels. In addition to a dedicated space for investors and shareholders on the Company's website edf.fr, a Shareholders' Club offering its members numerous meetings, mainly in digital form since the outset of the health crisis, and a Facebook page, EDF also offers short educational videos in

French and English, accessible to the deaf and hearing impaired, on financial and strategic subjects. The Shareholders' Meeting can be followed live remotely, then replayed on edf.fr, and is the subject of a report distributed via a special edition of the shareholders' newsletter. Shareholders may also contact the Company through

a dedicated toll-free number or mail address. The diversity of its individual shareholder base is reflected in the composition of its Shareholders' Advisory Committee.

7.4 Market for the Company's shares

The Company's shares have been listed for trading by Euronext Paris (Compartment A) since 21 November 2005, under ISIN code FR 0010242511, Reuters code (EDF. PA) and Bloomberg code (EDF: FP).

The following graph shows the changes in the Company's share price between 21 November 2005 and 31 December 2021 (base index 100 as at 21 November 2005):



The following table shows the share price and volume of EDF shares traded between 1 January 2021 and 31 January 2022 on the Euronext Paris stock market:

	Transactions		Closing price (in euros)	
	(in number of shares)	(in euros *)	Highest	Lowest
2022				
January 2022	150,652,129	1,343,808,338	10.66	8.14
2021				
December 2021	95,071,567	1,036,980,435	12.95	9.85
November 2021	61,381,874	775,129,238	13.06	12.17
October 2021	66,914,702	831,645,263	13.17	11.54
September 2021	57,273,643	622,007,036	11.37	10.45
August 2021	38,725,087	429,293,207	11.51	10.49
July 2021	63,130,825	693,670,796	12.11	10.27
June 2021	52,969,316	619,255,705	12.06	11.22
May 2021	60,151,151	699,525,454	12.16	11.41
April 2021	67,039,834	803,291,237	12.41	11.23
March 2021	72,191,498	774,157,277	11.44	9.74
February 2021	50,693,615	526,441,610	10.76	9.91
January 2021	73,299,933	856,149,046	13.51	10.28

* Transactions in euros correspond to the monthly sum of the proceeds of the daily number of shares traded by the closing price on the same day (Source: Euronext).

2021

In 2021, EDF's share price decreased by -19.89%, the Euro Stoxx Utility sector index (SX6P) increased by +5.41% while the CAC 40 index increased by +28.85%.

On 31 December 2021, the closing price of the EDF share was €10.33 (€12.89 at 31 December 2020). Its highest closing price in 2021 was €13.51 on 8 January 2021, and its lowest closing price was €9.75 on 5 March 2021.

On 31 December 2021, EDF's market capitalisation totalled €33.46 billion (compared to €39.97 billion at 31 December 2020).

2022

From the beginning of 2022 to 31 January 2022 inclusive, EDF's share price fell by -17.95%, the CAC 40 index decreased by -1.58% and the Euro Stoxx Utility sector index (SX6P) decreased by -2.55%.

On 31 January 2022, the closing price of the EDF share was €8.49. Its lowest closing price in 2022, up to 31 January 2022 inclusive, was €8.14 on 24 January 2022, and its highest closing price was €10.66 on 4 January 2022.

On 31 January 2022, EDF's market capitalisation totalled €27.52 billion.

7.5 Related-party transactions

7.5.1 Related-party transactions

The information regarding the details of the transactions concluded by the Company with related parties, as defined by the IFRS, in respect of the 2021 fiscal year, are contained in note 22 to the consolidated financial statements for the fiscal year ended 31 December 2021.

They describe:

- relations with the French state;
- relations with Engie;
- relations with Orano and public sector companies;
- the main intra-group relations.

The information on the regulated agreements referred to in Article L. 225-38 of the French Commercial Code is stated in the Statutory Auditors' special report, which is reproduced below in section 7.5.2 ("Statutory Auditors' special report on regulated agreements and commitments") of this Universal Registration Document.

7.5.2 Statutory Auditors' special report on regulated agreements

Shareholders' meeting held to approve the financial statements for the year ended December 31, 2021

This is a free translation into English of the Statutory Auditors' special report on regulated agreements that is issued in the French language and is provided solely for the convenience of English speaking readers. This report on regulated agreements should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France. It should be understood that the agreements reported on are only those provided by the French Commercial Code and that the report does not apply to those related party transactions described in IAS 24 or other equivalent accounting standards.

To the Shareholders' Meeting of Electricité de France S.A.,

In our capacity as Statutory Auditors of Electricité de France S.A. ("**EDF**"), we hereby report to you on regulated agreements.

The terms of our engagement require us to communicate to you, on the basis of information provided to us, the principal terms and conditions of those agreements brought to our attention or which we may have discovered during the course of our audit, as well as the reasons justifying that such agreements are in the Company's interest, without expressing an opinion on their usefulness and appropriateness or identifying such other agreements, if any. It is your responsibility, pursuant to Article R. 225-31 of the French Commercial Code (*Code de commerce*), to assess the interest involved in respect of the conclusion of these agreements for the purpose of approving them.

Our role is also to provide you with the information stipulated in Article R. 225-31 of the French Commercial Code relating to the implementation during the past year of agreements previously approved by the Shareholders' Meeting, if any.

We conducted the procedures we deemed necessary in accordance with the professional guidelines of the French National Institute of Statutory Auditors (*Compagnie nationale des commissaires aux comptes*) relating to this engagement. These procedures consisted in agreeing the information provided to us with the relevant source documents.

Agreements submitted to the approval of the shareholders' meeting

Agreements authorized and concluded during the year

Pursuant to Article L. 225-40 of the French Commercial Code, we have been notified of the following agreement concluded during the year which was previously authorized by your Board of Directors.

Settlement agreement between EDF S.A. and AREVA SA and AREVA NP to resolve all disputes relating to the FRAMATOME acquisition agreement concluded in 2017 and their business relations prior to this acquisition.

Persons concerned: the French State, represented by Mr. Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF and AREVA SA.

Nature, purpose and terms & conditions: this settlement agreement forms part of the acquisitions carried out by EDF at the end of 2017 for NEW NP (now called FRAMATOME). It resolves all disputes with AREVA SA arising from:

(i) the sale agreement between EDF, AREVA SA and AREVA NP for the acquisition of 75.5% of the capital of NEW NP (now called FRAMATOME) 100%-held by AREVA NP, a subsidiary of AREVA SA, regrouping the industrial activities relating to the design and supply of nuclear reactors and equipment, fuel assemblies and services to the nuclear installed base within the EDF Group, as mentioned in the second part of this report;

(ii) the other agreements signed by EDF as part of the aforementioned sale, as mentioned in the second part of this report, namely:

- the final sale agreement signed by EDF on December 14, 2017 relating to the acquisition of 19.5% of the FRAMATOME shares by Mitsubishi Heavy Industries (MHI) from AREVA SA and AREVA NP;
- the final sale agreement signed by EDF on December 14, 2017 relating to the acquisition of 5% of the FRAMATOME shares by Assystem from AREVA SA and AREVA NP.

This settlement agreement entered into on June 29, 2021 resolves all known or unknown disputes between EDF, as acquirer, and AREVA SA under the FRAMATOME acquisition agreement concluded in 2017 and between the EDF, as client, and AREVA SA under the expired agreements, in consideration for a full and final lump sum compensation of €563 million, which was paid by AREVA SA to EDF on October 5, 2021.

Finally, a portion of the lump-sum compensation obtained by EDF totaling €33 million shall be transferred to the following companies: €23 million for FRAMATOME, and €10 million to be divided up between MHI and Assystem in proportion to their investment in the share capital.

On June 24, 2021, your Board of Directors authorized the signing of this agreement, considering that it was in EDF's interest to sign it to resolve all the disputes with AREVA SA and obtain, primarily, a final lump-sum compensation of €563 million as of 2021, regardless of the outcome of the ongoing litigation and arbitration proceedings.



Agreements already approved by the shareholders' meeting

Agreements approved during previous years that remained in force during the year

Pursuant to Article 225-30 of the French Commercial Code, we have been notified that the following agreements, previously approved by Shareholders' Meetings of previous years, have remained in force during the year.

1. Settlement agreement relating to the French State's compensation for the closure of the Fessenheim nuclear plant

Persons concerned: the French State, represented by Mr. Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF.

Nature, purpose and terms & conditions: the protocol agreement was entered into to determine the heads of damages and the terms and conditions for the calculation of compensation payable by the French State to EDF in connection with the early closure of the Fessenheim nuclear power plant. The conclusion of this settlement agreement, signed on September 27, 2019, was authorized by the Board of Directors' meetings of April 4 and September 20, 2019.

The compensation breaks down as follows:

- Initial payments corresponding to the plant's anticipated closure costs. In this respect, EDF received compensation of €370 million on December 14, 2020. This compensation is recognized in the income statement in operating subsidies at the same rate as the anticipated closure costs, that is €57 million in the year ended December 31, 2021;
- Further payments corresponding to lost profits that would have been generated by future production volumes, determined on the basis of the past production of the Fessenheim power plant, up to 2041, calculated ex post in accordance with the sales prices of nuclear production, and in particular observed market prices. This second category of compensation had no impact in the year ended December 31, 2021.

2. Sale agreement between EDF, AREVA SA and AREVA NP for the acquisition of 75.5% of NEW NP (now called FRAMATOME) capital and other agreements signed by EDF as part of the sale by AREVA SA of its entire interest in NEW NP (now called FRAMATOME)

Persons concerned: the French State, represented by Mr. Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF and AREVASA.

Nature, purpose and terms & conditions: as mentioned in the first part of this report, in connection with the acquisitions carried out by EDF for NEW NP, EDF entered into the following agreements:

(i) a sale agreement between EDF, AREVA SA and AREVA NP for the acquisition of 75.5% of NEW NP (now called FRAMATOME) 100%-held by AREVA NP, a subsidiary of AREVA SA. The final acquisition agreement covering 75.5% of the capital of FRAMATOME was authorized by your Board of Directors on December 14, 2017 and signed on December 22, 2017. The acquisition was carried out on December 31, 2017 for €1,868 million, excluding acquisition costs.

(ii) the other agreements signed by EDF as part of the aforementioned sale, previously authorized by your Board of Directors on June 23, 2017 and December 14, 2017, i.e.:

- the final sale agreement signed by EDF on December 14, 2017 for the acquisition of 19.5% of the FRAMATOME shares by MHI from AREVA SA and AREVA NP, under financial conditions similar to those of EDF;
- the final sale agreement signed by EDF on December 14, 2017 for the acquisition of 5% of the FRAMATOME shares by Assystem from AREVA SA and AREVA NP, under financial conditions similar to those of EDF.

On November 29, 2021, EDF obtained €14.5 million under the provisions of the sale agreement described in (i) above. Furthermore, pursuant to the agreements described in (ii) above, EDF transferred a portion of this amount, i.e. €2.8 million to MHI and €0.7 million to ASSYSTEM, according to their respective percentage investments in the share capital of FRAMATOME.

Agreements authorized during previous years but not approved by the shareholders' meeting

In accordance with the terms of Article R.225-30 of the French Commercial Code, we have been notified of the following agreements, which were described in our special report on regulated agreements and commitments for fiscal years 2016 to 2020, and which were not approved by the Combined Shareholders' Meeting of May 18, 2017 held to approve the financial statements for the year ended December 31, 2016, which remained in force during the year.

1. Shareholders' agreement between EDF on the one hand, and Caisse des Dépôts et Consignation and CNP Assurances on the other hand, regarding Coentreprise de Transport d'Electricité - CTE, parent company of RTE

Persons concerned: the French State, represented by Mr. Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF SA, and having a representative on the Board of Directors of CNP Assurances.

Nature, purpose, and terms & conditions: this agreement, signed on December 14, 2016 and implemented on March 31, 2017 between EDF, Caisse des Dépôts et Consignation and CNP Assurances, enabled Caisse des Dépôts et Consignation and CNP Assurances to acquire an indirect interest of 49.9% in the capital of RTE, via CTE, and the set-up of the terms and conditions of a long-term partnership to encourage the development of RTE, notably by the conclusion of a shareholders' agreement.

This shareholders' agreement remained in force in fiscal 2021.

2. Agreement entered into between the French State, EDF, the Caisse des Dépôts, CNP Assurances and CTE relating to the governance of CTE and RTE

Persons concerned: the French State, represented by Mr. Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF, a party to the agreement and having a representative on the Board of Directors of CNP Assurances.

Nature, purpose and terms & conditions: the purpose of this agreement, entered into between EDF, Caisse des Dépôts and CNP Assurances, CTE and the French State, is to set forth the commitment of the French State to limit its representatives to two on the Supervisory Board of RTE.

Paris La Défense, March 15, 2022,

The Statutory Auditors

KPMG S.A.

Deloitte & Associés

Marie Guillemot

Michel Piette

Damien Leurent

Christophe Patrier

7.5.3 Routine agreements procedure

On 13 February 2020, the Board of Directors approved an internal procedure, meeting the requirements of the AMF recommendation, that is primarily designed to implement the procedure required under Article L. 22-10-12 of the French Commercial Code, to regularly assess unregulated agreements (*i.e.* agreements relating to routine transactions concluded under normal conditions).

Given the high number of routine agreements concluded under normal conditions that EDF may enter into, the procedure involves:

- drawing up a list of routine agreements "by type", that do not require an assessment; this category includes agreements entered into in the normal course of EDF's business and a list of intra-group agreements;

- defining which routine agreements concluded under normal conditions require an annual assessment by the Board; this category includes agreements deemed sufficiently material for at least one of the parties to the contract; it specifically includes agreements that have been approved by the Group Executive Committee's Commitments Committee (CECEG) and agreements entered into with the French state or a public company.

The Board of Directors assesses them once a year at the Board meeting called to approve the annual financial statements, when reviewing the regulated agreements concluded over the fiscal year or agreements concluded and authorised during previous fiscal years that have been performed over the past fiscal year.

7.6 Material contracts

The information on the regulated agreements referred to in Article L. 225-38 of the French Commercial Code is contained in the Statutory Auditors' special report, which is reproduced in section 7.5.2 "Statutory Auditors' special report on regulated agreements" of this Universal Registration Document, section 7.5.2 of the 2020 Reference Document and section 7.5.2 of the 2019 Reference Document.

Except for the contracts which may be described in chapters 1 and 5 of this Universal Registration Document or in the notes to the consolidated statements for

the fiscal year ended 31 December 2021, in chapters 1 and 5 of the 2019 and 2020 Reference Document or in the notes to the consolidated statements for the fiscal years ended 31 December 2019 and 2020, including the contracts described hereunder, EDF entered into no material contracts other than those concluded in the normal course of business over the last two years preceding the filing of this Universal Registration Document, the 2019 Reference Document and the 2020 Reference Document.

7.6.1 Material contracts entered into in 2021

Material contracts entered into in 2021, other than those conducted in the normal course of business, by the Group, are the followings:

- settlement agreement between EDF and Areva to resolve all disputes between EDF and between EDF and Areva relating to the Framatome acquisition agreement contract entered into in 2017 and their commercial relationship prior to the acquisition (29 June 2021)

7.6.2 Material contracts entered into in 2020

Material contracts entered into in 2020, other than those conducted in the normal course of business, by the Group, are the followings:

- purchase agreement for Pod Point, a company specialized in electric charging station in the UK, by EDF Energy (13 February 2020);

- sale agreement for Edison's E&P Division entered into with Energean Oil and Gas (excluding Algeria and Norway) (17 December 2020).

7.6.3 Material contracts entered into in 2019

Material contracts entered into in 2019, other than those conducted in the normal course of business, by the Group, are the followings:

- in Switzerland, EDF sold its 25.04% stake in the Swiss energy company Alpiq (May 2019);
- in France, signature of a remuneration agreement by the French state for the early closure of the Fessenheim power plant (September 2019);

- in Italy, Edison signed a binding memorandum to sell its gas exploration and production assets to Energean Oil and Gas (July 2019).





8 ADDITIONAL INFORMATION

8.1	PERSON RESPONSIBLE FOR THE UNIVERSAL REGISTRATION DOCUMENT AND THE CERTIFICATION	560	8.3	PUBLICLY AVAILABLE DOCUMENTS AND FINANCIAL REPORTING CALENDAR	560
8.1.1	Person responsible for the Universal Registration Document	560	8.4	CONCORDANCE TABLES	561
8.1.2	Certification from the person responsible for the 2021 Universal Registration Document containing the annual financial report	560	8.4.1	Concordance table with Appendix I of (EC) regulation no. 2019/980	561
8.2	AUDITORS - STATUTORY AUDITORS	560	8.4.2	Concordance table with the management report	563
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8.1 Person responsible for the Universal Registration Document and the Certification

8.1.1 Person responsible for the Universal Registration Document

Jean-Bernard Lévy, Chairman and Chief Executive Officer of EDF.

8.1.2 Certification from the person responsible for the 2021 Universal Registration Document containing the annual financial report

I certify that, to the best of my knowledge, the information contained in this Universal Registration Document accurately reflects the facts and contains no omission likely to affect its meaning.

I certify that, to the best of my knowledge, the financial statements are prepared in accordance with accounting standards and that they give a true and fair view of the assets and liabilities, financial position and the income of the Company and of all the companies included in the consolidation, and that the management report included in this document presents a true and fair view of the business trends, income and financial position of the Company and of all the companies included in the consolidation and a description of the main risks and uncertainties they face.

Jean-Bernard Lévy,

Chairman and Chief Executive Officer of EDF

8.2 Auditors – Statutory Auditors

Deloitte & Associés

6, Place de la Pyramide, 92908 Paris – La Défense Cedex, represented by Mr Damien Leurent and Mr Christophe Patrier.

The Statutory Auditors were initially appointed by decision of the Shareholders' Meeting of 6 June 2005 for a period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2010.

Their terms of office were renewed by a decision of the Combined Shareholders' Meeting of 24 May 2011 until the Shareholders' Meeting ruling on the financial statements for the fiscal year ended 31 December 2016 then again by the Combined Shareholders' Meeting of 18 May 2017 for a further period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2022.

The aforementioned Statutory Auditors consequently certified the financial statements reproduced in this Universal Registration Document.

KPMG SA

Tour EQHO, 2, avenue Gambetta, CS 60055, 92066 Paris – La Défense Cedex, represented by Mrs Marie Guillemot and Mr Michel Piette.

8.3 Publicly available documents and financial reporting calendar

The Company's press releases, annual reports, including historical financial information relating to the Company and any related updates filed with the AMF, are available on the Company's website: www.edf.fr and a copy may also be obtained at the Company's registered office at 22-30, avenue de Wagram, 75382 Paris Cedex 08 (France).

EDF's LEI number is 549300X3UK4GG3FNM006.

The Company has imposed a 15-day embargo period prior to the announcement of the annual and half-year results and before the quarterly results ("quiet period") during which no new information regarding the business development and EDF's results shall be disclosed to financial analysts and investors so as to avoid the release of incomplete financial information enabling the recipients to anticipate EDF's results prior to their official publication.

In application of Article 19 of regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017, the following information is incorporated by reference in this Universal Registration Document:

- the main headings provided for in Appendices 1 and 2 of the delegated regulation (EU) 2019/980 of 14 March 2019;
- the information making up the annual financial report provided for in Articles L. 451-1-2 of the French Monetary and Financial Code and 222-3 of the general regulations of the AMF (French Financial Markets Authority);
- the information making up the management report of the Board of Directors provided for by the French Commercial Code, including the statement of non-financial performance (DPEF) and the annual report on corporate governance;
- the 2020 Universal Registration Document (URD 2020) of the EDF group filed with the AMF on 15 March 2021 under number D-21-0121 and the 2019 Universal Registration Document (URD 2019) of the EDF group filed with the AMF on 13 March 2020 under number D-20-0128, which can be consulted on the <https://www.edf.fr> website;

All of the regulated information published by the Company, pursuant to Article 221-1 *et seq.* of the AMF's general regulation, is available at the following address: www.edf.fr

Finally, the documents and information referred to in Article R. 225-73-1 of the French Commercial Code, are available on the Company's website in the section dedicated to Shareholders' Meetings.

- the EDF group's consolidated financial statements (under international accounting standards) for the year ended 31 December 2020 and the Statutory Auditors' report on those financial statements, which are to be found in chapter 6, sections 6.1 (pages 296 to 418) and 6.2 (pages 419 and 422) of the 2020 Universal Registration Document;
- the EDF group's consolidated financial statements (under international accounting standards) for the year ended 31 December 2019 and the Statutory Auditors' report on those financial statements, which are to be found in chapter 6, sections 6.1 (pages 278 to 393) and 6.2 (pages 394 and 398) of the 2019 Universal Registration Document;
- the review of the EDF group's financial position and results for the year ended 31 December 2020, as presented in chapter 5 (pages 266 to 293) of the 2020 Universal Registration Document;
- the review of the EDF group's financial position and results for the year ended 31 December 2019, as presented in chapter 5 (pages 244 to 275) of the 2019 Universal Registration Document.

8.4 Concordance tables

8.4.1 Concordance table with Appendix I of (EC) regulation no. 2019/980

The correlation table below identifies the information required by Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019 in accordance with the URD scheme:

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019	Sections of the 2021 URD document
1. Persons responsible, information from third parties, expert report and approval by the competent authority	
1.1. Name and address of the persons responsible	8.1
1.2. Certification by the persons responsible	8.1
1.3. Name, address, qualifications and potential interests of persons acting as experts	n/a
1.4. Certification of third party information	n/a
1.5 Declaration without prior approval of the competent authority	page 1
2. Statutory Auditors	
2.1. Name and address of the Statutory Auditors	Section 8.2
2.2. Changes where applicable	n/a
3. Risk factors	Section 2.2
4. Information about the issuer	
4.1. Legal and commercial name of the issuer	Section 7.1.1
4.2. Location, registration number and LEI of the issuer	Sections 7.1.2 and 8.3
4.3. Date of incorporation and length of life of the issuer	Section 7.1.3
4.4. Registered office and legal form of the issuer, legislation governing the activities, country of origin, address and telephone number of the registered office, website with a disclaimer	Section 7.1.1 and 7.1.4
5. Business overview	
5.1. Main activities	
5.1.1. Nature of the operations	Section 1.4
5.1.2. Important new products and services	n/a
5.2. Major markets	Section 1.4
5.3. Key events	Section 5.1.2 and 5.1.3
5.4. Strategy and objectives	Sections 1.3 and 5.4
5.5. Dependency of the issuer on patents, licenses, contracts and manufacturing processes	Section 1.5 and 2.1
5.6. Competitive position declaration	Section 1.4.2.1
5.7. Investments	
5.7.1. Major investments made	Key figures and section 5.1.5.1.1.3
5.7.2. Principal ongoing or future investments of the issuer for which the latter's management bodies have already made firm commitments and adopted financing methods	Sections 1.3.1 and 5.1.3.5
5.7.3 Joint ventures and commitments in which the issuer holds a significant share of the capital	Section 4.5.1 and Section 6.1 – Appendix to the consolidated financial statements – Note 12
5.7.4. Environmental issues	Chapter 3
6. Organisational structure	
6.1. Brief description of the Group	Section 1.2.1 and 1.2.2
6.2. List of significant subsidiaries	Section 1.2.1
7. Operating and financial review	
7.1. Financial position	
7.1.1. Changes in results and financial position including key performance indicators of a financial and, where applicable, non-financial nature	Chapters 5 and 6 Chapter 3 and section 8.4.4
7.1.2. Forecasts for future development and research and development activities	Section 1.5
7.2. Operating results	Section 6.1
7.2.1. Important factors, unusual or infrequent events or new developments	Sections 1.2.3, 5.1.2 and 5.1.3
7.2.2. Explanation of material changes in net sales or revenue	Section 5.1.4
8. Cash and capital resources	
8.1. Capital Information	Sections 7.2 and 7.3
8.2. Cash flows	Section 6.1 – Appendix to the consolidated financial statements – Note 10.4, 10.7 and 13.1
8.3. Financing needs and structure	Section 6.1- Appendix to the consolidated financial statements – Note 18.3

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019	Sections of the 2021 URD document
8.4. Restrictions on the use of capital resources	n/a
8.5. Expected sources of financing	n/a
9. Regulatory environment	
9.1. Description of the regulatory environment and any measures or factors of an administrative, economic, budgetary, monetary, or political nature	Sections 1.4 and 1.3
10. Trend information	
10.1. Description of major trends and any significant changes in the Group's financial performance since the end of the last fiscal year	Sections 5.2, 5.4 and 6.6.2
10.2. Events that are reasonably likely to have a material effect on prospects	Section 5.4
11. Profit forecasts or estimates	
11.1. Published profit forecasts or estimates	n/a
11.2. Declaration outlining key forecasting assumptions	Sections 5.1.2 and 5.1.3
11.3. Declaration regarding comparability with historical financial information and compliance of accounting methods	Section 6.1 – Appendix to the consolidated financial statements – Note 1.4
12. Administrative, management, and supervisory bodies and Executive Management	
12.1. Information regarding members	
Name, professional address and functions	Sections 4.2.1 and 4.3.1
Nature of any family relationship	Section 4.4
Expertise and experience	Sections 4.2.1 and 4.3.1
Absence of conviction	Section 4.4.2
12.2. Conflict of interest	Section 4.4.1
13. Remuneration and benefits	
13.1. Remuneration paid and benefits in kind	Sections 4.6.1 and 4.6.2
13.2. Amounts set aside or accrued to provide pension, retirement	Section 4.6.1.1.3
14. Functioning of administrative and management bodies	
14.1. Date of expiration of the current terms of office	Section 4.2.2.1
14.2. Service contracts entered into by members of the administrative or management bodies and the issuer	Section 4.4.3
14.3. Information about audit and remuneration Committees	Section 4.2.3
14.4. Statement of compliance with the corporate governance regime in force	Section 4.1
14.5. Potential significant impacts on corporate governance	Section 4.2.2
15. Employees	
15.1. Number of employees	Section 3.4.2.1.1
15.2. Shareholdings and stock options	n/a
15.3. Agreement providing for employee shareholding	n/a
16. Major shareholders	
16.1. Shareholders holding more than 5% of the capital on the date of the registration document	Section 7.3.8
16.2. Breakdown of voting rights	Section 7.2.4
16.3. Direct or indirect control	Section 7.3
16.4. Agreement whose implementation could lead to a change of control	Section 7.3.9
17. Transactions with related parties	Section 7.5
18. Financial information concerning the issuer's assets and liabilities, financial position and results	
18.1. Historical financial information	
18.1.1. Audited historical financial information for the last three fiscal years and the audit report	Section 6.1
18.1.2. Change of accounting reference date	n/a
18.1.3. Accounting standards	Section 6.1
18.1.4. Change in accounting principles	n/a
18.1.5. Financial information under French accounting standards	Section 6.1
18.1.6. Consolidated financial statements	Section 6.1
18.1.7. Date of the latest financial information	n/a
18.2. Interim and other financial information	
18.2.1. Quarterly or half-yearly financial information	n/a

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019

Sections of the 2021 URD document

18.3. Audit of historical annual financial information	
18.3.1. Independent audit of historical annual financial information	Section 6.2
18.3.2. Other audited information	n/a
18.3.3. Sources and reasons for unaudited information	n/a
18.4. <i>Pro forma</i> financial information	n/a
18.5. Dividend policy	
18.5.1. Description of the dividend policy and any applicable restrictions	Section 6.5
18.5.2. Amount of dividend per share	Section 6.5.1
18.6. Administrative, judicial and arbitration proceedings	Sections 2.2.1, 7.1.5 and 6.1 – Appendix to the consolidated financial statements
18.7. Significant change in the financial position	Section 6.6.2
19. Additional information	
19.1. Share capital	
19.1.1. Amount of subscribed capital, number of shares issued and fully paid up and par value per share, number of shares authorised	Sections 7.3.1, 7.3.3 and 6.1- Appendix to the consolidated financial statements – Note 14
19.1.2. Information on shares not representing the share capital	Section 7.3.5
19.1.3. Number, book value and par value of the shares held by the issuer	Sections 7.3.1 and 7.3.2
19.1.4. Information on convertible or exchangeable securities or securities with subscription warrants	n/a
19.1.5. Information on conditions governing any right of acquisition and/or obligation attached to authorised but unissued share capital or any endeavour to increase the share capital	Sections 7.2.4, 7.2.5 and 7.3.3
19.1.6. Information about the share capital owned by any member of the Group which is under option or subject to a conditional or unconditional agreement to be put under option and characteristics of such options	Section 7.3.6
19.1.7. History of the Company's share capital	Section 7.3.1
19.2. Incorporation documents and articles of association	
19.2.1. Register and company purpose	Sections 7.1.2 and 7.2.1
19.2.2. Rights, privileges and restrictions attached to each class of shares	Section 7.2.4
19.2.3. Provision delaying, deferring or preventing a change of control	Section 7.2.9
20. Material contracts	Section 7.6
21. Available documents	Section 8.3

8.4.2 Concordance table with the management report

This Universal Registration Document includes the elements of the Board of Directors' management report relating to the 2021 fiscal year as provided for in Articles L. 225-100-1 *et seq.* and Article L. 22-10-35 of the French Commercial Code. The management report is composed of the sections of the Universal Registration Document referred to in the following table:

Required topics	Reference texts	Chapter of the Universal Registration Document
1. Situation and activity of the Group		
1.1. Situation of the Company during the past fiscal year and an objective and exhaustive analysis of the development of the business, results and financial situation of the Company and the Group, in particular its debt situation, in relation to the volume and complexity of the business	Article L. 225-100-1, par. I., 1°, Article L. 232-1, II., Article L. 233-6 and Article L. 233-26 of the French Commercial Code	Chapter 5
1.2. Key indicators of financial performance	Article L. 225-100-1, I., 2° of the French Commercial Code	Key figures and Chapter 5
1.3. Key indicators of financial and non-financial performance relevant to the particular business of the Company and the Group, including information relating to environmental and employee-related matters	Article L. 225-100-1, I., 2° of the French Commercial Code	Chapter 3 and concordance table Section 8.4.4
1.4. Key events arising between the end of the fiscal year and the date the management report was written	Article L. 232-1-II and Article L. 233-26 of the French Commercial Code	Sections 5.1.2, 5.2 and 5.1.3
1.5. Identity of the main shareholders and holders of voting rights at General Meetings and changes during the fiscal year	Article L. 233-13 of the French Commercial Code	Sections 7.3 and 7.2.4
1.6. Existing branches	Article L. 232-1-II of the French Commercial Code	Section 6.6.4
1.7. Acquisition of significant equity holdings in companies having their registered office on the French territory	Article L. 233-6, par. 1 of the French Commercial Code	Section 5.1.3 and Note 3 of the Appendix to the consolidated financial statements
1.8. Disposal of cross-shareholdings	Articles L. 233-29, L. 233-30 and R. 233-19 of the French Commercial Code	NA
1.9. Foreseeable development and future prospects of the situation of the Company and the Group	Article L. 232-1-II and Article L. 233-26 of the French Commercial Code	Section 5.4

Required topics	Reference texts	Chapter of the Universal Registration Document
1.10. Research and development activities	Article L. 232-1-II and Article L. 233-26 of the French Commercial Code	Section 1.5
1.11. Table showing the Company's results over each of the last five fiscal years	Article R. 225-102 of the French Commercial Code	Section 6.6.1
1.12. Information concerning supplier and customer payment periods	Article D. 441-4 of the French Commercial Code	Section 6.6.3
1.13. Amount of intercompany loans granted and statement from the Statutory Auditor	Articles 511-6 and R. 511-2-1-3 of the French Monetary and Financial Code	n/a
2. Internal control and risk management		
2.1. Description of the main risks faced by the Company	Article L. 225-100-1, I., 3° of the French Commercial Code	Section 2.2
2.2. Information on the financial risks related to the effects of climate change and the measures that the Company is taking to reduce them by implementing a low-carbon strategy in all components of its activity	Article L. 22-10-35, 1° of the French Commercial Code	Section 2.2.3 Section 3.1
2.3. Main characteristics of the Internal control and risk management procedures implemented by the Company and the Group relating to the preparation and processing of accounting and financial information	Article L. 22-10-35, 2° of the French Commercial Code	Section 2.1
2.4. Information on the objectives and policy regarding the hedging of each main category of transactions and on the exposure to price, credit, liquidity and treasury risks, including the use of financial instruments	Article L. 225-100-1, 4° of the French Commercial Code	Section 5.1.6
2.5. Anti-corruptions provisions	"Sapin II" Act no. 2016-1691 of 9 December 2016	Section 3.3.2.2.1
2.6. Vigilance plan and reporting on its effective implementation	Article L. 225-102-4 of the French Commercial Code	Section 3.6
3. Report on Corporate governance		See concordance table section 8.4.3
4. Share ownership and capital		
4.1. Structure, changes in the Company's capital and crossing of thresholds	Article L. 233-13 of the French Commercial Code	Section 7.3
4.2. Acquisition and disposal by the Company of its own shares	Article L. 225-211 of the French Commercial Code	Section 7.3.2
4.3. Overview of employee share ownership on the last day of the fiscal year (proportion of capital represented)	Article L. 225-102 al. 1 of the French Commercial Code	Section 3.5.1.1 Section 7.3.8
4.4. References to potential adjustments for the securities giving access to the share capital in the case of share repurchases or financial operations	Article R. 228-90 and R. 228-91 of the French Commercial Code	n/a
4.5. Information on operations made on the Company's shares by managers and related persons transactions	Article L. 621-18-2 of the French Monetary and Financial Code	Section 4.5.2
4.6. Amount of dividend paid out over the past three fiscal years	Article 243 <i>bis</i> of the French General Tax Code	Section 6.5.1
5. Statement of non-financial performance		See concordance table section 8.4.4
6. Other information		
6.1. Additional tax information	Article 223 <i>quater</i> and Article 223 <i>quinquies</i> of the French General Tax Code	n/a
6.2. Injunctions or fines as a result of anti-competitive practices	Article L. 464-2 of the French Commercial Code	n/a

8.4.3 Concordance table with the elements of the EDF Board of Directors' report on corporate governance

This Universal Registration Document includes all the elements of the Company's Board of Directors' report pursuant to Article L. 225-37 of the French Commercial Code. The Board's report on corporate governance is composed of the sections of the Universal Registration Document referred to in the following table and is included in the management report in a section on Corporate governance:

Corporate Government/Corporate Officers

Section including elements contained in the report on corporate governance

	Reference texts	URD Sections
Information on the remunerations		
3.1. Policy regarding remuneration of corporate officers	Article L. 22-10-8, I., al. 2 of the French Commercial Code	Section 4.6.1
3.2. Remuneration and benefits of any kind paid during the fiscal year or granted in respect of the fiscal year to each corporate officer	Article L. 22-10-9, I., 1° of the French Commercial Code	Sections 4.6.1 and 4.6.2
3.3. Share of the fixed remuneration and variable remuneration	Article L. 22-10-9, I., 2° of the French Commercial Code	Section 4.6.1
3.4. Use of the option of claiming back variable remuneration	Article L. 22-10-9, I., 3° of the French Commercial Code	Section 4.6.1.1
3.5. Commitments of any kind entered into by the Company for the benefit of its corporate officers, corresponding to items of remuneration, indemnities or benefits due or likely to be due as a result of the assumption, termination or change of their duties or subsequent to the carrying out of such duties	Article L. 22-10-9, I., 4° of the French Commercial Code	Section 4.6.1.1
3.6. Remuneration paid or granted by a company included in the scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code	Article L. 22-10-9, I., 5° of the French Commercial Code	Section 4.6.2.3
3.7. Ratio between the level of remuneration of each corporate officer and the average and median remuneration of employees	Article L. 22-10-9, I., 6° of the French Commercial Code	Section 4.6.1
3.8. Annual changes in remuneration, in the Company's performance, in the average remuneration of the Company's employees and in the aforementioned ratios over the five most recent fiscal years	Article L. 22-10-9, I., 7° of the French Commercial Code	Section 4.6.1
3.9. Explanation of how the total remuneration complies with the adopted remuneration policy, including how it contributes to the long-term performance of the Company and how the performance criteria have been applied	Article L. 22-10-9, I., 8° of the French Commercial Code	Section 4.6.1
3.10. Manner in which the vote of the last Ordinary General Meeting provided for in paragraph II of Article L. 225-100 (until 31 December 2020) then in paragraph I of Article L. 22-10-34 (from 1 January 2021) of the French Commercial Code was taken into account	Article L. 22-10-9, I., 9° of the French Commercial Code	Section 4.6.1
3.11. Deviation from the procedure for implementing the remuneration policy and exceptions	Article L. 22-10-9, I., 10° of the French Commercial Code	n/a
3.12. Application of the provisions of the second paragraph of Article L. 225-45 of the French Commercial Code (suspension of payment of directors' remuneration in the event of failure to comply with the gender mix of the Board of Directors)	Article L. 22-10-9, I., 11° of the French Commercial Code	n/a
3.13. Attribution and conservation of stock-options by the corporate officers	Article L. 225-185 of the French Commercial Code	n/a
3.14. Attribution and conservation of free shares to corporate officers	Article L. 225-197-1 and Article L. 22-10-59 of the French Commercial Code	Section 4.6.4
Information on governance		
3.15. List of all mandates and positions held in all companies by each corporate officer during fiscal year	Article L. 225-37-4, 1° of the French Commercial Code	Sections 4.2 and 4.3
3.16. Agreements concluded between a manager or a major shareholder and a subsidiary	Article L. 225-37-4, 2° of the French Commercial Code	Section 7.5 Notes 12 and 22 of the Appendix to the consolidated financial statements
3.17. Summary table of the outstanding delegations given by the Shareholders' Meeting to perform capital increases	Article L. 225-37-4, 3° of the French Commercial Code	Section 7.3.3
3.18. Method of Executive Management	Article L. 225-37-4, 4° of the French Commercial Code	Sections 4.2.2 and 4.3.1
3.19. Membership, conditions for the preparation and organisation of the Board of Directors' work	Article L. 22-10-10, 1° of the French Commercial Code	Section 4.2
3.20. Principle of balanced representation of women and men on the Board of Directors	Article L. 22-10-10, 2° of the French Commercial Code	Section 3.3.3.1
3.21. Limits placed by the Board on the powers of the Chief Executive Officer	Article L. 22-10-10, 3° of the French Commercial Code	Sections 4.2.2 and 7.2.9
3.22. Reference to the Corporate Governance Code and implementation of the comply or explain principle	Article L. 22-10-10, 4° of the French Commercial Code	Section 4.1
3.23. Specific procedures relating to the participation of shareholders in the Shareholders' Meeting	Article L. 22-10-10, 5° of the French Commercial Code	Section 7.2.8
3.24. Evaluation procedure for current agreements – Implementation	Article L. 22-10-10, 6° of the French Commercial Code	Section 7.5.3
3.25. Information likely to have an impact in the event of a takeover bid or exchange offer	Article L. 22-10-11 of the French Commercial Code	Sections 7.2 and 7.3

8.4.4 Concordance table with the statement of non-financial performance

This Universal Registration Document includes the statement of non-financial performance for the 2021 fiscal year prepared in accordance with Articles L. 22-10-36 and R. 225-105 of the French Commercial Code.

Thus, to the extent necessary to understand the Company's position, the evolution of its business, its economic and financial results and the impact of its activity, the Statement of Non-Financial Performance (DPEF) presents information on how the Company and the Group take into account the social and environmental consequences of their activities, as well as the effects of these activities on respect for human rights and the fight against corruption and tax evasion.

The DPEF is hence made up of the sections of the Universal Registration Document identified in the table below:

	Topics	Reference texts	URD Sections
5.1.	Business model	Article L. 233-13 of the French Commercial Code	Sections 1.1 and 1.4
5.2.	Description of the main risks relating to the activity of the Company or the Group, including – if relevant and proportionate – risks due to its business relationships, products or services	Article L. 225-102-1 and R. 225-105, I. 1° of the French Commercial Code	Chapter 3 and Section 2.2
5.3.	Information on how the Company or Group takes into account the social and environmental consequences of its activity, and the effects of this activity in terms of respect for human rights and the fight against corruption (description of the policies applied and due diligence procedures implemented to prevent, identify and mitigate the main risks related to the Company's or Group's activity)	Articles L. 225-102-1, III., L. 22-10-36, R. 225-104 and R. 225-105, I. 1° of the French Commercial Code	Chapter 3
5.4.	Results of the policies applied by the Company or Group, including key performance indicators	Articles L. 225-102-1 and R. 225-105, I. 3 of the French Commercial Code	
	CSR issue topics from the materiality matrix	Key performance indicators	Chapter 3
	<i>Ambitious carbon trajectory</i>	Carbon intensity: specific CO ₂ emissions due to electrical generation	Section 3.1.1
	<i>Carbon offset solutions</i>	Deployment rate of the scoping guide on carbon offset solutions	Section 3.1.1.5
	<i>Adapting to climate change</i>	Rate of deployment of new climate change adaptation plans	Section 3.1.3
	<i>Developing electricity use and energy services</i>	CO ₂ emissions avoided through the sale of innovative products and services	Section 3.1.4
	<i>Biodiversity</i>	Achievement rate of Group commitments under the act4nature international initiative	Section 3.2.1
	<i>Responsible land management</i>	Rate of implementation of innovative solutions for multi-use of land	Section 3.2.2
	<i>Integrated and sustainable water management</i>	Water intensity: water consumed/electricity generated by the fleet	Section 3.2.3
	<i>Waste and circular economy</i>	Annual rates of conventional waste directed to recovery facilities	Section 3.2.4
	<i>Protecting the health and safety of all</i>	Global LTIR	Section 3.3.1
	<i>Ethics, compliance and human rights</i>	Proportion of executives who have completed the anti-corruption training programme	Section 3.3.2
	<i>Equal opportunity, diversity and inclusion</i>	Gender balance index: percentage of women in the Management Committees of the Group's entities	Section 3.3.3
	<i>Energy poverty and social innovation</i>	Annual advisory actions carried out with customers within the framework of the Energy Support scheme	Section 3.3.4
	<i>Dialogue and consultation with stakeholders</i>	Annual rate of projects for which a dialogue and consultation process is undertaken	Section 3.4.1
	<i>Responsible development of local areas</i>	Annual rate of procurement from SMEs	Section 3.4.2
	<i>Sustainable development of industrial sectors</i>	Rate of implementation of support actions carried out by EDF in favour of the relocation and maintenance of skills in the nuclear industry (<i>Programme France Relance</i>)	Section 3.4.3
	<i>Responsible digital development</i>	Rate of fulfilment of commitments made by EDF to the <i>Institut du Responsable digitalization</i> (INR)	Section 3.4.4
5.5.	Social information (employment, work organisation, health and safety, social relations, training, equal treatment)	Articles L. 225-102-1 and R. 225-105, II. A. 1° of the French Commercial Code	Sections 3.3.3, 3.3.5 and 3.3.1.3
5.6.	Environmental information (general environmental policy, pollution, circular economy, climate change)	Articles L. 225-102-1 and R. 225-105, II. A. 2° of the French Commercial Code	Sections 3.1.3, 3.2.1 and 3.3.1

Topics	Reference texts	URD Sections
5.7. Societal information (societal commitments in favour of sustainable development, subcontracting and suppliers, fair practices)	Articles L. 225-102-1 and R. 225-105, II. A. 3° of the French Commercial Code	Section 3.4.2
5.8. Information relating to the fight against corruption and tax evasion	Articles L. 22-10-36 and R. 225-105, II. B. 1° of the French Commercial Code	Section 3.3.2.2
5.9. Information on human rights actions	Articles L. 22-10-36 and R. 225-105, II. B. 2° of the French Commercial Code	Sections 3.9 and 3.3.2
5.10. Specific information:		
<ul style="list-style-type: none"> Technological accident risk prevention policy implemented by the Company; Ability of the Company to cover its civil liability with regard to property and persons as a result of the operation of such facilities; Resources allocated by the Company to ensure the management of compensation for victims in the event of a technological accident for which it is liable 	Article L. 225-102-2 of the French Commercial Code	Sections 2.1.2.6 and 3.5.2.5
5.11. Collective agreements concluded within the Company and their impact on the economic performance of the Company and working conditions of employees	Article L. 225-102-1, III and Article R. 225-105 of the French Commercial Code	Section 3.5.3
5.12. Attestation of the independent third party body on the information contained in the statement of non-financial performance (DPEF)	Articles L. 225-102-1, III. and R. 225-105-2 of the French Commercial Code	Section 3.8.4
Eligibility and alignment of the Group's activities with the European Taxonomy		Section 3.8.3

✓ 2021 indicator subject to reasonable assurance check by KPMG SA.

8.4.5 Concordance table with the annual financial report

This Universal Registration Document includes the annual financial report for the 2021 fiscal year. It has been prepared in application of Articles L. 451-1-2 of the French Monetary and Financial Code and Article 222-3 of the AMF general regulation. The annual financial report is composed of the sections of the Universal Registration Document referred to in the following table:

Topics	Sections of the Universal Registration Document
1. EDF annual financial statements	Section 6.3
2. EDF group consolidated financial statements	Section 6.1
3. Management report (minimum information within the meaning of Article 222-3 of the general regulations of the AMF (French Financial Markets Authority))	Section 8.4.2
4. Statement by the persons responsible for the annual financial report	Section 8.1.2
5. Statutory Auditors' report on the EDF's financial statements and the consolidated financial statements	Sections 6.2 and 6.4

Glossary

IAEA	International Atomic Energy Agency based in Vienna (Austria).
ANDRA	National agency for radioactive waste. In France, radioactive waste is managed by the National Agency for Radioactive Waste Management (ANDRA), a public industrial and commercial institution created under the French law of 30 December 1991.
ASN	Nuclear safety authority. For a detailed description of the ASN's remits, please refer to section 1.4.1.1.2.1.
Assembly/Fuel	Nuclear fuel is in the form of an assembly made up of an array of 264 fuel rods, bound together by a rigid structure made of tubes and grids. Each fuel rod consists of a water-tight zirconium tube into which uranium oxide pellets are piled, constituting the fuel. The assemblies are loaded side by side into the reactor vessel – 205 assemblies are required for a 1,500MW reactor – to make up the core of the reactor. During operation, these assemblies are crossed by bottom to top with primary water which heats on contact and carries this energy to the steam generators.
Becquerel (Bq)	International legal unit for measuring radioactivity. The Becquerel (Bq) is equal to one disintegration per second. The activity represented by this unit is so low that multiples of it are used: the MBq (megabecquerel or million Becquerels) and the GBq (gigabecquerel or billion Becquerels).
Biogas	Gas generated from the fermentation of organic animal or plant matter
Biomass	Technologies based on biomass mainly consists of burning certain types of waste, particularly from the timber and farming industries, or exploiting wood fuel forests, to produce heat or electricity.
Cogeneration	Generation technique for combined electricity and heat generation. The advantage of cogeneration is the ability to capture the heat produced by the fuel whereas in traditional electricity generation this heat is lost. This process also allows the same facility to meet the heating (hot water or steam) and electricity needs of both industrial and local authority customers. This system improves the energy efficiency of the generation process and reduces fuel use by an average of 20%.
Metering	A system allowing for the recording, at a given network connection point, of the volumes of electricity transmitted or distributed (power, frequency, active and reactive energy).
Congestion	Situation in which an interconnection linking the national transmission grids cannot absorb all of the physical flows resulting from international exchanges required by market operators due to a shortage of capacity in the interconnection and/or the national transmission grids involved.
CRE	French energy regulatory Commission. See section 1.4.2.1.1.
Combined-Cycle Gas	The most recent technology for generating electricity in a natural gas-fired plant. A combined cycle is made up of one or more combustion turbines and a steam turbine allowing for an improved yield. The syngas is routed to the combustion turbine, which generates electricity and very hot exhaust gases (effluents). The heat from the exhaust gases is recovered by a boiler, thus producing steam. Part of the steam is then recovered by the steam turbine to generate electricity.
Fuel Cycle	The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it. See section 1.4.1.1.2.3.
Waste	The nuclear generation of 1MWh of electricity (equivalent to the monthly consumption of two households) produces around 11g of total waste across all categories. Short-lived waste represents more than 90% of the total, but contains only 0.1% of the radioactivity of waste. Accordingly, based on their level of radioactivity, they are separated into two sub-categories: Low-Level waste and Very-Low-Level waste. Long-Lived Medium and High-Level waste are produced in low quantity (less than 10% of the total quantity), but they contain almost all of the radioactivity of the waste (99.9%).
Plant availability	Fraction of power available, out of theoretical maximum energy, counting only technical unavailability. The availability coefficient (Kd) is defined as the ratio between annual actual generation capacity (or amount producible annually) and maximum theoretical generation capacity, where maximum theoretical generation capacity = installed capacity × 8,760 hours. The Kd, which counts only technical non-availability, <i>i.e.</i> , scheduled shutdowns, unplanned outages and testing periods, characterises a plant's industrial performance.
Disruption	Voluntary reduction of electrical power by a customer, in exchange for compensation. It is called "diffused" when it is due to the aggregation of small consumption sites.
LDC	French Local Distribution Companies. LDCs sell and deliver electrical energy to end users located in their exclusive service area.
Renewable energies	Energies for which production does not require extinction of the initial resource. They include hydro, wind, solar, marine (the energy produced by marine waves and currents), geothermal (energy derived from the heat below the earth's magma) energies, and bio-mass (energy derived from living matter, particularly wood and organic waste). They often include energy from the incineration of household or industrial waste.
Enrichment	Process to increase the fissile content of an element. In its natural state, uranium is 0.7% uranium 235 (fissile) and 99.3% uranium 238 (non-fissile). To enable its efficient use in a pressurised water reactor, it is enriched with uranium 235 whose proportion is increased to around 4%.
Intermediate Storage	Intermediate stage in the process of managing nuclear waste. It involves placing waste packages in a facility to ensure, for a given period of time, their isolation from contact with man and the environment with the intention of retrieving them for a further stage in the waste management process. Intermediate storage facilities are designed, built and managed by the producers of such waste (EDF, AREVA NC (ex-COGEMA) and CEA) and are close to areas where waste is conditioned.
EPR	European Pressurised water Reactor. The latest generation of reactors currently under construction (known as "generation 3"), it is the result of Franco-German cooperation, and offers advanced safety, environmental and technical performance.
Fluorination (conversion)	Also called "conversion", fluorination allows for the purification of uranium compounds and their transformation into uranium hexafluoride (UF ₆), allowing their enrichment using current techniques.

Electricity demand can be broken down into four types of consumption:

- the “basic” (or “ribbon”) supply of electricity, which is generated and consumed throughout the year;
- “semi-basic” supply is the electricity generated and consumed over the winter period;
- “peak” supply corresponds to periods of the year when electricity generation or supply is in heavy demand;
- “lace” supply is a complement to “ribbon” supply.

Electricity supply	Gas that retains a portion of the solar radiation in the atmosphere and for which an increase in emissions due to human activity (man-made emissions) causes an increase in the earth’s average temperature and plays an important role in climate change. The Kyoto Protocol covers the seven following principal greenhouse gases: carbon dioxide (CO ₂), methane (CH ₄), nitrogen protoxide (N ₂ O), hydrofluorocarbons (HFC), perfluorated hydrocarbons (PFC), sulfurhexafluoride (SF ₆) and, since 2013, nitrogen trifluoride (NF ₃).
Greenhouse gases (GHG)	
Liquefied Natural Gas (LNG)	Natural gas turned into liquid form by reducing its temperature to -162°C, allowing for a reduction by 600 in its volume.
Man-sievert	Unit expressing the collective equivalent dose. A man-sievert is the collective dose from exposure of 1,000 men to 1mSv (milliesievert).
Hydrogen	The conversion of natural gas into hydrogen generates CO ₂ , hence the qualification of “grey” hydrogen. This form of hydrogen is used on a large scale, particularly in the chemical industry to produce ammonia and fertilisers. So-called “blue” hydrogen is obtained when the emitted CO ₂ is captured and then reused or stored. So-called “green” hydrogen is generated from renewable energy sources. The electricity generated by wind turbines or solar panels is transformed with water through an electrolysis process. No greenhouse gases are emitted. Hydrogen can be stored in large quantities and then converted back into electricity.
INB	Basic Nuclear Facilities
Interconnection	Electricity transmission infrastructure that allows for exchanges of energy between different countries, by connecting the transmission network of one country to that of a neighbouring country.
IRSN	Institut de radioprotection et de sûreté nucléaire. IRSN is the public expert in research and assessment of nuclear and radiological risks.
Balancing Mechanism	Created by RTE on 1 April 2003, the balancing mechanism allows it to use power reserves that can be mobilised in the event of an imbalance between supply and demand.
Microgrid	Microgrids are small power grids designed to provide a reliable supply of electricity to a small number of consumers. They combine multiple local and diffuse production facilities, consumption facilities, storage facilities and tools for supervision and demand management. They can be connected directly to a distribution network or operate disconnected from the network (islanding).
MW – MWh	The megawatt-hour (MWh) is the energy unit generated by a facility and is equal to the facilities’ power, expressed in megawatts (MW), multiplied by the duration of operations in hours. 1MW = 1,000 kilowatts = 1 million watts 1MWh = 1MW produced for 1 hour = 1 megawatt-hour 1GW = 1,000MW = 1 billion watts 1TW = 1,000GW
MWh cumac	The MWh cumac is the certificate energy unit of counting which corresponds to the cumulative energy savings aggregated on the operations’ lifetime.
Series	In the nuclear field, a series of plants means a set of nuclear plants with identical generation capacity. EDF’s PWR model is divided into three series of available electrical power: the 900-MW series (34 tranches of approximately 900MW each), the 1,300-MW series (20 tranches) and the 1,450-MW series (4 tranches).
Plutonium (Pu)	Element with the atomic number of 94 (number of protons) and no naturally occurring isotopes (elements whose atoms possess the same number of electrons and protons – thus the same chemical properties – but a different number of neutrons). Plutonium 239, a fissile isotope, is produced in nuclear reactors from uranium 238.
Producible hydropower generation	Maximum energy that hydropower facilities may produce using contributions under normal hydraulicity conditions. However, generation from hydroelectric facilities does vary, sometimes markedly, from one year to the next depending on hydraulicity (rainfall and snowfall). In dry years, the generation index may vary by 20% or more from the standard level.
Radiation protection	At a power plant, ionising radiation sources are numerous: the fuel itself, equipment activated by neutron flux (particularly that which is close to the core, such as tanks or lids) and particles from corrosion of the primary circuit of reactors and carried by the primary fluid. The level of exposure of a person is quantified by the dose equivalent in Sieverts (Sv). The total dose equivalents, called “collective dosimetry” and expressed in man-sieverts, is used as an indicator of dose received by all participating persons. The mobilisation of stakeholders has allowed a continuous improvement of performance on the protection of employees against the effects of ionising radiation.
Distribution network	Downstream of the transmission network, medium- and low-voltage distribution networks serve end-users (residential, local authorities, SMEs, SMLs, etc.).
Transmission network	Network providing for the transmission of electrical power at High and Very High Voltages from the generating sites to the distribution networks or industrial sites directly connected to it; this includes the major interconnection transmission network (400,000 volts and 225,000 volts) and the regional distribution networks (225,000 volts, 150,000 volts, 90,000 volts and 63,000 volts).
Entity Responsible for Balance	Entities with which RTE signs a contract for the financing of shortfalls between forecast and actual consumption and the production of a portfolio of users brought together by the entity responsible for balance which plays a role of insurer covering the potential losses arising from the many differences between over- and under-supply.
Reprocessing	Reactor burnt fuel reprocessing aimed at separating materials that can be recycled (uranium and plutonium) from final waste.

Every year, EDF draws up a GHG report (scopes 1, 2 and 3) covering the Group scope calculated according to the principles of the GHG Protocol Corporate Standard:

- scope 1 covers the direct emissions generated by EDF's assets: CO₂, CH₄ and N₂O emissions from power and heat generation plants, consumption of fossil fuels for heating, fuel consumption of the fleet of vehicles and machinery, fugitive emissions from hydropower plant reservoirs, fugitive emissions of SF₆ and refrigerating agents;
- scope 2 covers indirect emissions linked to losses in the electricity networks of our electricity distribution companies and those linked to the purchase of energy for our own needs: electricity consumption of tertiary buildings and data centres, consumption of heating and chilled water networks for our own use;
- scope 3, which comprises 15 categories (GHG Protocol), covers other indirect emissions generated by our suppliers (purchases of goods and services, upstream of fuels including nuclear, leased assets, downstream freight of by-products), and by our customers (upstream and combustion of gas purchased for resale to end customers, production of electricity and heat purchased for resale to end customers) or at our facilities (depreciation of emissions linked to the manufacture of fixed assets, emissions from non-consolidated investments, upstream and losses linked to the transport and distribution of electricity, upstream and losses of electricity, heat and cold consumption for own use, waste management, travels of employees, etc.).

Scopes 1, 2 and 3

Systems services	Systems services are services provided to users (consumers or electricity producers) through the joint action of the electricity transmission network operator RTE and the producers. They are intended to regulate frequency and voltage in order to maintain the balance between electric consumption and generation at all times. They are created by RTE from elementary contributions from producers, <i>i.e.</i> primary and secondary reserves provided to RTE. RTE remunerates the producers for these auxiliary services before re-invoicing these services <i>via</i> the tariff to use the network under the rules defined by the Union for the Coordination of Transmission of Electricity (UCTE).
Smart city	The smart city is a new urban development concept aiming at improving the quality of life of city dwellers by making the city more adaptive and efficient, using new technologies based on an object and service ecosystem. The scope of this new way of managing cities includes: public infrastructure (buildings, street furniture, home automation, etc.), networks (water, electricity, gas, telecoms); transport (public transport, intelligent roads and cars, carpooling, so-called soft mobility – by bike, on foot, etc.); e-services and e-administrations.
Smart charging	Smart charging is an umbrella term for all technologies aimed at optimising the charging or discharging of an electric vehicle through efficient, flexible and economical management of the vehicle's recharging power.
SMR	SMRs (Small Modular Reactors), <i>petits réacteurs modulaires</i> in French, are small-scale power plants with one or more reactors with a unit power of less than 300MWe. This small power allows for the reduction of certain systems, standardisation of design and thus a reduction in the duration of construction sites in order to improve their competitiveness.
STEP	Pumped-storage hydropower plant. Power plant with two tanks, an upper and a lower one, connected by pumps that allow the water to be pumped up once turbinised and located in the lower tank, towards the upper tank.
Storage	Storage consists in placing packages of radioactive waste in a facility, ensuring their long-term management, <i>i.e.</i> , under safe conditions allowing for long-term risk control.
Nuclear safety	Nuclear safety includes all of the technical, organisational and human measures which are intended to prevent accident risks and to limit the effects of an accident, and which are taken at every stage of the nuclear power plant lifecycle (from design to operation and finally to decommissioning).
European Green Taxonomy	Commission delegated regulation (EU) 2021/2139 of 4 June 2021 supplementing regulation (EU) 2020/852 of the European Parliament and of the Council with the technical review criteria for determining under which conditions an economic activity can be considered to contribute substantially to climate change mitigation or adaptation and whether that economic activity does not cause significant harm to any of the other environmental objectives.
Therms (th)	One therm (th) is equivalent to 1,163kWh or 4,186 million joules.
Nuclear unit	Electrical generation unit consisting of a nuclear boiler and a turbo-alternator generator. A nuclear unit essentially consists of its reactor type and the power of its turbo-alternator generator. EDF nuclear plants include two or four units, and occasionally six.
Uranium	In its natural state, uranium is a mix containing three main isotopes (elements whose atoms have the same number of electrons and protons, thus the same chemical properties, but a different number of neutrons): <ul style="list-style-type: none"> ● uranium 238, 99.3% fertile; ● uranium 235, 0.7% fissile; ● uranium 234. Uranium 235 is the only natural fissile isotope, a quality which justifies its use as an energy source.
Enriched uranium	Uranium, whose isotope 235 content, the only fissile material, has been increased from its low natural level (0.7%) to approximately 4% in order to be used as pressurised water reactor fuel.
ERU (enriched reprocessed uranium)	To be used in a reactor, reprocessed uranium (RepU), even if containing more fissile uranium than in its natural state, must be further enriched. It is therefore called enriched reprocessed uranium (ERU).
RepU (reprocessed uranium)	Reprocessed uranium ("RepU"), uranium derived from spent fuel reprocessing, differs from natural uranium as it contains slightly more uranium 235 and other uranium isotopes. It is recyclable and RepU fuel assembly refuelling is commonly used in reactors.
Vitrification	Process of immobilisation in a glass structure of concentrated solutions of high-level radioactive waste by mixing at high temperature with glass paste.
Non-interconnected zones	Zones in France which are not connected (by power lines) to metropolitan France (Corsica and overseas departments).

In this Universal Registration Document (the “Universal Registration Document”), unless otherwise stated, the terms “Company” and “EDF” refer to Électricité de France SA, and the terms “EDF group” and “Group” refer to EDF and its subsidiaries and affiliates.

In addition to the information contained in this Universal Registration Document, investors should carefully consider the risk factors described in chapter 2 “Risk factors and control framework”. These risks, or one of these risks, could negatively impact the Group’s business, position, financial results or outlook. Furthermore, other risks not yet identified or considered as material by the Group, could have the same negative impact, and investors could consequently lose all or part of their investment in the Company.

This Universal Registration Document also contains information relating to the markets in which the EDF group operates. This information has been taken from surveys carried out by external sources. Given the rapid changes affecting the energy sector in France and throughout the world, it is possible that this information could prove to be erroneous or no longer up-to-date on the filing date of this Document or thereafter. The Group’s activities may therefore evolve in a manner different to that described in this Document, and the declarations or information presented in this document may prove to be erroneous.

Forward-looking statements in this Document, specifically in section 1.3 “Group Strategy and objectives” and section 5.5 “Outlook”, are based on assumptions and estimates that could change or be impacted by risks, uncertainties (linked, in particular, to the economic, financial, competitive, regulatory and climatic environment) and other factors that may cause the future income, performance and achievements of the Group to differ significantly from the objectives expressed and suggested. These factors may include changes in the economic and commercial environment, in the regulations, and in the factors set forth in chapter 2 “Risk factors and control framework”.

Pursuant to French and European legislation, RTE and Enedis, which are regulated subsidiaries that are managed in accordance with the management independence rules defined by the French Energy Code, and are respectively responsible for the transmission and distribution of electricity within the EDF group, are not allowed to communicate certain information they gather while conducting their activities to other Group entities, including its Management. Similarly, certain data specific to generation and supply activities cannot be communicated to the entities responsible for transmission and distribution. This Universal Registration Document has been prepared by the EDF group in compliance with these rules. For the sake of brevity, further references in this Universal Registration Document made to RTE and Enedis will not always specify their independent nature as within the meaning of the French Energy Code.

A glossary of the main technical terms is provided at the end of this Universal Registration Document.

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