

Join the  
change

# Sustainability 2018





# Highlights 2018

Material recovery rate of waste received from our customers was

**59%**

We arranged

**1,350**

man-hours of safety training for Fortum division management and other personnel responsible for safety

We paid attention to equality by joining the **Work does not discriminate** campaign promoting Finnish workplace equality and the international Equal by 30 campaign promoting gender equality

We implemented hydropower environmental projects valued at EUR

**5.9** million



The preliminary planning phase for the Carbon Capture and Storage (CCS) project at Oslo's waste incineration plant got under way; when realised, the project will capture up to

**90%**

of the plant's CO<sub>2</sub> emissions

The Fortum-Rusnano investment fund has been granted the right to build almost

**2 GW**

of new wind power in Russia

The power upgrades at the Loviisa nuclear power plant in 2016–2018 enable us to produce about an additional

**180 GWh**

of CO<sub>2</sub>-free electricity



The **electric vehicle charging corridor** being built by Fortum between Helsinki and Oslo received its first high-power charging stations in Norway, Sweden and Finland





# Sustainability 2018

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## Fortum's 2018 reporting entity



CEO's Business Review



Financials



Governance



Remuneration



Tax Footprint



Sustainability



# Sustainability approach



The entire energy sector is undergoing a transformation. The faster pace of climate change is accelerating the need for structural changes in society. The need for low-carbon energy is growing because fossil fuels must be replaced in transportation, industry and heating. Clean electricity is a significant enabler in this. In fact, we believe that the 2020s will be the decade of electricity.

In addition to climate change, changes in the regulatory environment and the fast pace of technological development create new challenges and opportunities for us. Our role is to respond to the changing operating environment by reshaping the energy system, improving resource efficiency and providing smart solutions. This way we deliver excellent shareholder value, minimise our adverse impacts, and ensure sustainable and low-emissions business.

Sustainability is at the core of Fortum's strategy and our values – curiosity, responsibility, integrity and respect – form the foundation for all our activities. In our operations, we give balanced consideration to climate and resource issues, as well as our impacts on personnel and society. We see sustainable energy and circular economy solutions as today's competitive advantage and a prerequisite for business growth and success.

- ▶ [Fortum's vision, mission and strategy](#)
- ▶ [Fortum's values](#)



# Our contribution to the Sustainable Development Goals

As a producer of energy and circular economy solutions, Fortum impacts most of the Sustainable Development Goals (SDGs) and their specific targets. In line with our strategy, we are driving the change towards a cleaner world.

## Sustainable Development Goals and Fortum's activities

The Sustainable Development Goals adopted by the United Nations in 2015 define international sustainable development focus areas and goals to 2030. We want to do our part to promote the achievement of the goals in our value chain by increasing our positive impacts and decreasing our negative impacts. The Sustainable Development Goals offer business opportunities as well as the opportunity to create value for our stakeholder groups.

The graphic presents the SDGs for which we have the biggest impact to their achievement, as well as the most important ways we contribute and our related Group sustainability targets.

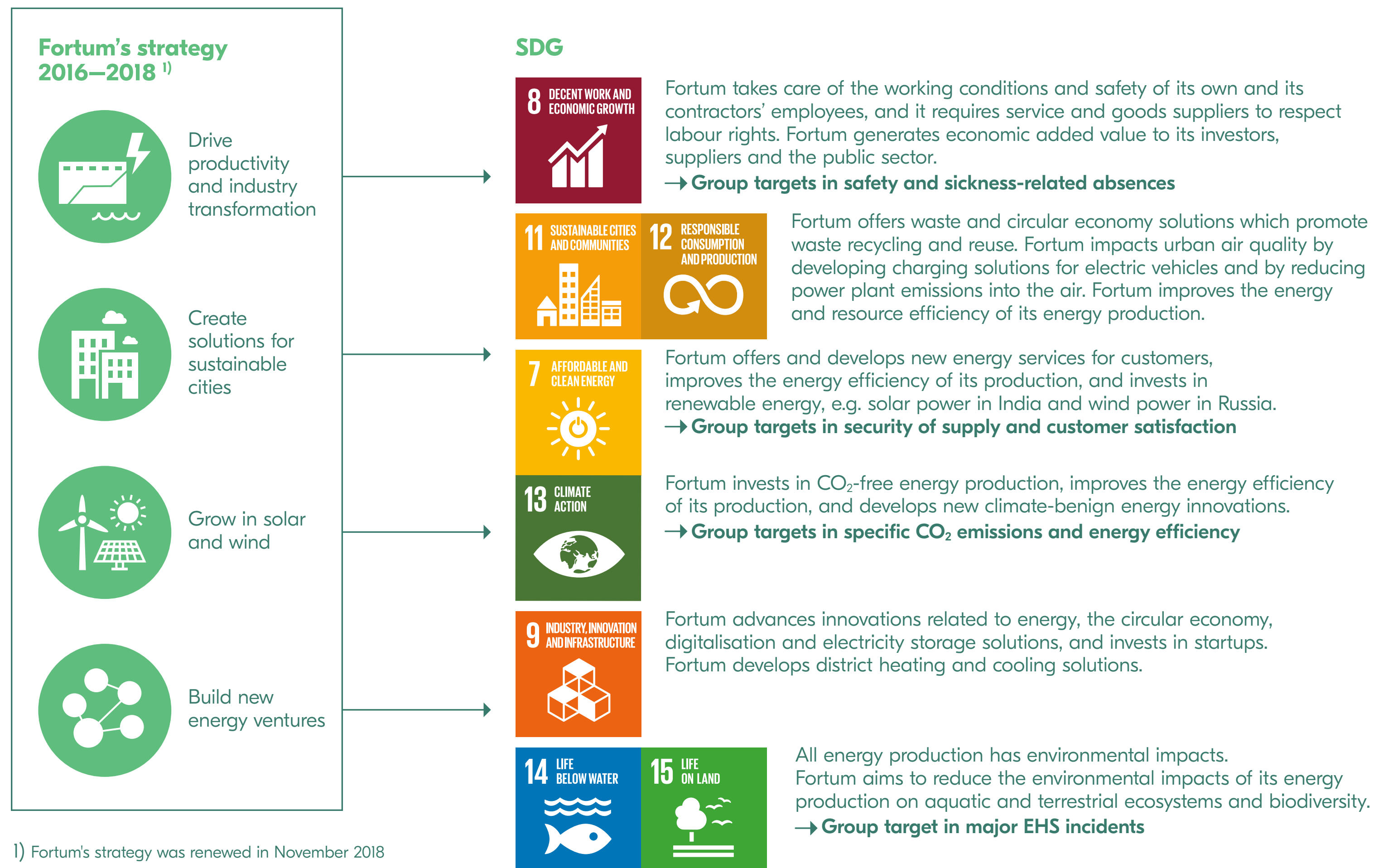
Fortum contributes to Sustainable Development Goals also by being a member in the UN Global Compact initiative. Global Compact participants are committed to aligning their operations with the ten universally accepted principles in the areas of human rights, labour, the environment and anti-corruption.

WE SUPPORT



Fortum supports the Sustainable Development Goals.

## Our contribution to the Sustainable Development Goals (SDGs)



1) Fortum's strategy was renewed in November 2018

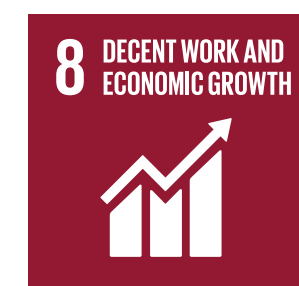
## Examples of measures we implemented in 2018 that promote the achievement of the Sustainable Development Goals

### Sustainable Development Goal (SDG)

#### Measure



- We invested in **renewable energy production**: solar, wind and hydropower
- We commissioned 123 MW of new wind power in Russia, Sweden and Norway
- The Fortum-Rusnano investment fund has been granted the right to build almost 2 GW of new wind power in Russia
- We started the first **Solar2Go pilot project** in India in collaboration with Futurice and Boond
- We invested in energy efficiency, e.g., at the Loviisa nuclear power plant in Finland and at hydropower plants in Sweden
- **Our energy-efficiency investments** in 2018 totalled 135 GWh/a
- We launched the preliminary planning phase for a **carbon capture and storage (CCS) project** with the City of Oslo in Norway
- We signed a letter of intent with the purpose of enabling the supply of renewable electricity to Unilever from Fortum's wind farm in Russia
- We started development collaboration with the City of Joensuu in Finland with the goal of a carbon-neutral Joensuu by 2025
- We started the supply of the biggest portfolio of a **roof-top solar electricity system** in the Nordic countries for S-Group in Finland



- We conducted 13 supplier audits covering work conditions and other issues
- A safety training programme, provided by an external safety service provider, was organised for the management level and key individuals leading safety and procurement work as well as for the most challenging business areas; in total 1,350 man-hours of training
- We published **Fortum Tax Principles** in December 2018
- Our subsidiaries in Great Britain published **a statement** required by the Modern Slavery Act in June 2018



- We committed to invest EUR 150 million in the new **Valo Ventures growth fund** investing in digital and scalable technology startups whose products or services have the potential to produce long-term social and environmental benefits
- We launched the Nordic countries' biggest flexible heat demand project in Espoo, Finland
- We enabled single-family homes to participate in energy demand response as part of the **Fortum Spring Virtual Battery**
- We collaborated with universities in our operating countries, and Fortum Foundation awarded over EUR 680,000 in **scholarships**
- We celebrated the **ground-breaking event** for building a bamboo-based biorefinery in India with our partners; the project is part of our Bio2X research and development programme
- We used EUR 56 million in total for research and development

### Sustainable Development Goal (SDG)

#### Measure



- We opened the first high-power charging stations as part of the Nordic charging corridor for EVs in Finland, Sweden and Norway
- **Fortum Charge & Drive and Plugsurfing** joined forces to facilitate cross-border charging of EVs
- We joined the international **EV30@30 campaign** to promote the electrification of vehicles
- We started **collaboration with Clean Motion** to accelerate the electrification of three-wheeled vehicles in India with a battery swap system
- We advanced electric aviation in Finland by participating in the Helsinki Electric Aviation Association's project
- We acquired Fincumet's metal recycling business and expanded our recycling services portfolio
- We recovered as materials about 660,000 tonnes of the waste received from our customers
- We supplied NO<sub>x</sub> emissions-reducing combustion solutions to customers in, among others, Poland, Finland and India



- We implemented **voluntary hydropower environmental projects** valued at EUR 400,000
- In collaboration with partners, we launched a three-year habitat restoration project at Lake Oulujärvi to protect endangered species
- In Sweden, we removed the Kolsjö dam, which had proven to be insignificant for hydropower production; concurrently we restored the river aquatic habitat
- The spring flood water release strategy was implemented at the River Klarälven hydropower plants to facilitate the downstream migration of salmon smolts
- We worked with partners on the planning and modelling of measures to improve the reproduction areas for the endangered Gullspång landlocked salmon
- The first season in the use of the trap and transport facility at the Montta hydropower plant on the River Oulujoki provided encouraging results with salmonoids swimming upstream into the facility
- We made preparations for the Chain of Custody certification of wood-based biomass purchases



## Towards the decade of electricity

Fortum presented its updated strategy in November 2018. The goal of our renewed strategy is to ensure the value of investments made and to propel Fortum into the 2020s. The four priorities of the strategy are:

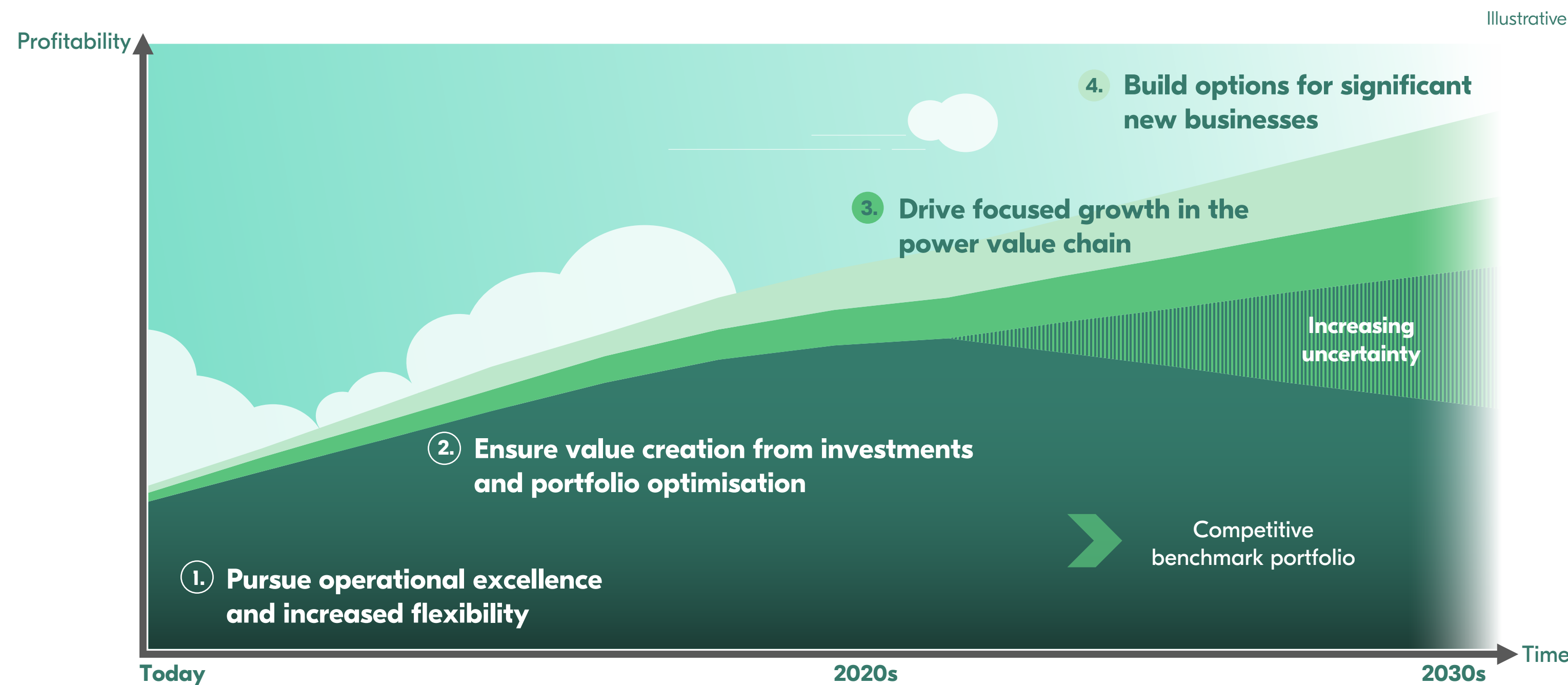
1. Pursue operational excellence and increased flexibility,
2. Ensure value creation from investments and portfolio optimisation,
3. Drive focused growth in the power value chain, and
4. Build options for significant new businesses.

The first priority of our renewed strategy is to create value from our existing businesses. At the same time, we want to ensure that our current portfolio aligns with the changing operating environment and its requirements. In this respect, flexibility – both in terms of our production forms and demand response – serves this purpose. Since 2016 we have invested nearly EUR 7 billion, and now we want to ensure the value creation of these investments.

The aim to reduce carbon dioxide emissions impacts the industry and its value chains across sectors and increases demand for clean electricity. We want to promote the electrification of society in transportation, industry and service sectors, and we will continue our growth in low-carbon electricity production. We will invest in solar and wind power, and selectively in hydropower. Also partnerships with consumers, and particularly with major electricity-intensive industry players, are important for us as we offer added value for customers in the form of new service and energy solutions. Technology, digitalisation and software applications are at the core of this offering.

We believe that the uncertainty in the energy market and in our whole operating environment will grow in the latter part of the 2020s. Forecasting the long-term development of the power price, as well as the regulatory environment, is becoming increasingly difficult. Therefore we aspire to create totally new business in sectors that are not dependent on the price of electricity. We aim to build new industrial logic by creating synergies with our existing business and expertise. We believe that the circular economy, waste recycling and recovery as well as new bio-based products offer us promising growth opportunities in the future.

▶ [CEO's Business Review 2018](#)



# Key sustainability topics

Our sustainability focus areas have been defined to support sustainable business. In our operations, we take into consideration climate and resource issues as well as our impact on personnel and society. The focus areas reflect not only the views of our personnel and stakeholders regarding our fundamental impacts, but also our values – curiosity, responsibility, integrity and respect towards each other and our stakeholder groups.

Our sustainability focus areas are based on Fortum’s and our stakeholders’ views of the significance of the impacts of our operations on the company and its ability to create value for its stakeholders and to the environment. Our understanding of stakeholder views is based on the results of the extensive stakeholder survey conducted annually as well as on information gained through other stakeholder collaboration.

Our most recent separate sustainability survey was conducted in 2015; a total of 2,133 stakeholder representatives, more than 60% of them representing personnel, participated. In that survey, decision makers, organisations, employees and the general public put special emphasis on the significance of security of supply of heat and electricity, management

of sustainability-related risks, and sustainable ways of operating. Our personnel emphasised the safety of operations. The general public considered the use of renewable energy sources as important. Our goal is to conduct our separate sustainability survey again during 2019.

## Sustainability targets affect every Fortum employee

Sustainability targets affect every Fortum employee and safety-related targets are part of Fortum’s short-term incentive (STI) scheme. In addition to the Group-level targets, divisions have their own targets.

Fortum’s Board of Directors annually decides on the sustainability targets to be included in the incentive scheme. The injury frequency for Fortum employees and for contractors was included in the incentive scheme in 2018. However, the Board can, at its discretion, take into consideration in the result also other safety-related incidents and especially the number of severe occupational accidents. The target for severe occupational accidents is zero.

In 2018, four severe occupational accidents took place in our operations. In light of these accidents, the Board decided to reduce the Group safety STI result by 20%. The reduction will directly address Fortum Executive Management members and all members of Divisional and Functional management teams. Furthermore, it was decided that Division heads will cascade the adjustment down to their respective organisations in a way they see appropriate to execute the principle of line responsibility.

The 2019 incentive scheme remains unchanged in terms of safety targets (the injury frequency rate for personnel and contractors). Likewise, as in 2018, the Board has the option to take into consideration also other safety incidents. The weight of the target in the incentive scheme is 10% (2018: 10%).





## Group sustainability targets and performance in 2018

Group target	Target for 2018	Status at the end of 2018	Status at the end of 2017
<b>Climate and resources</b>			
<b>Specific CO<sub>2</sub> emissions</b>			
Specific CO <sub>2</sub> emissions from total energy production, g CO <sub>2</sub> /kWh, 5-year average	<200	186	188
<b>Energy efficiency</b>			
Energy-efficiency improvement by 2020, baseline 2012, GWh/a	>1,900	1,637	1,502
<b>EHS incidents</b>			
Major EHS incidents <sup>1)</sup>	≤20	18	20
<b>Personnel and society</b>			
<b>Reputation and customer satisfaction</b>			
Reputation index, based on One Fortum Survey	73.0 *	72.5	72.3
Customer Satisfaction Index (CSI), based on One Fortum Survey, and Net Promoter Score (NPS) <sup>2)</sup> in Consumer Solutions division	70–74 -6	63–83 -18	64–76 -
<b>Security of supply</b>			
CHP plant energy availability, %	>95.0	96.4	96.1
<b>Occupational safety</b>			
Lost Workday Injury Frequency (LWIF) <sup>3)</sup> , own personnel and contractors	≤2.1	1.8	2.4
Number of severe occupational accidents <sup>4)</sup> , own personnel and contractors	0	4	1
Quality of investigation process of occupational accidents, major EHS incidents and near misses	Level 3.0	Level 3.0	Level 2.0 **
GAP index, implementation of EHS minimum requirements	Level 3.0	Level 2.0	-
<b>Employee wellbeing</b>			
Sickness-related absences, %	≤2.2	2.8	2.2 ***

1) Major fires, leaks, explosions, dam safety incidents, environmental non-compliances and INES events level ≥ 1

INES = International Nuclear and Radiological Event Scale

2) NPS = Net Promoter Score measuring customer loyalty

3) LWIF = Lost Workday Injury Frequency, injuries per million working hours

4) Fatality or an accident leading to permanent disability or an accident with severe and life-threatening injuries

\* The target is not comparable with the status of year 2017, because the target group is different

\*\* Scaling revised

\*\*\* Excluding DUON and Hafslund

## Successes and development needs

- In 2018, our specific CO<sub>2</sub> emissions from total energy production increased by 4%. However, we achieved our Group target in specific CO<sub>2</sub> emissions (5-year average).
- By taking proactive actions, we managed to keep major EHS incidents below the target level (20).
- We did not achieve our reputation target mainly due to more critical views by opinion leaders and non-governmental organisations. The growing concern about climate change and the questions around the Uniper transaction, among other things, contributed to the critical views. Our most significant reputation related strengths are operational expertise and reliability as an employer. Areas in most need of improvement are social responsibility and customer centricity.
- Customer satisfaction is good or very good for the majority of our business operations. The most room for improvement is with charging solutions for electric vehicles (Fortum Charge & Drive).
- We strive to be a safe workplace for our own and our contractors' employees. However, in 2018, four severe occupational accidents occurred, two of which led to contractor fatality. The occurred severe occupational accidents were a big disappointment for us.
- During 2018, we focused on establishing Fortum's safety practices in our new operations.
- The GAP index measures how well the Group's EHS minimum requirements are realised at the power plant level. In 2018, we did not achieve the set target (level 3.0) for the GAP index; we remained at level 2.0. The most significant deviations were detected in companies that Fortum had acquired in recent years and at production facilities operated by contractors.
- The percentage of sickness-related absences rose to 2.8; thus we didn't achieve the set target (2.2%). The sickness absence rate increased slightly in all countries, but particularly in Sweden, Norway and Poland.



## Our targets for 2019

Our sustainability targets are based on continuous operational improvement. However, the nature of our business and the related risks have changed during the past two years with the business acquisitions we have made and with the growth of circular economy services. This change also impacts our target setting.

In 2018, we managed to get back to the pre-business-acquisition level (1.8) for Lost Workday Injury Frequency for own employees and contractors (LWIF combined), and we reached our target ( $\leq 2.1$ ). The new target set for 2019 (LWIF combined) is  $\leq 1.7$ . The target is challenging, as it requires the City Solutions division in particular to continue the same good development as in 2018 when its Recycling and Waste Solutions business unit managed to reduce its injury frequency by half. We have zero tolerance for severe accidents.

Even though the injury frequency for our own personnel was at a historically low level (LWIF 0.2), contractor safety continues to be a challenge (LWIF 4.8). For this reason, we will adopt a proactive indicator (Contractor safety improvement index) at the Group level to measure how well we have managed to implement measures targeting improvements in contractor safety. At the division level, too, we will focus increasingly on measuring the improvement in safety based on measures taken, not just the number of injuries that have already occurred.

In 2019, we aim to reduce sickness-related absences by, e.g., ensuring similar practices in all countries for remote and alternative work, and by focusing on factors that wellbeing surveys have identified as being supportive of working capacity and wellbeing. The sickness-related absence target was raised to 2.5% to allow enough time for the effectiveness of development measures to manifest and to gain control of companies acquired through business acquisitions.

## Group-level sustainability targets in 2019

Group target	Target 2019
<b>Climate and resources</b>	
<b>Specific CO<sub>2</sub> emissions</b>	
Specific CO <sub>2</sub> emissions from total energy production, g CO <sub>2</sub> /kWh, 5-year average	<200
<b>Energy efficiency</b>	
Energy-efficiency improvement by 2020, baseline 2012, GWh/a	>1,900
<b>EHS incidents</b>	
Major EHS incidents <sup>1)</sup>	$\leq 18$ *
<b>Personnel and society</b>	
<b>Reputation and customer satisfaction</b>	
Reputation index, based on One Fortum Survey	73.0
Customer Satisfaction Index (CSI), based on One Fortum Survey	Level good (70–74)
<b>Security of supply</b>	
CHP plant energy availability, %	>95.0
<b>Occupational safety</b>	
Lost Workday Injury Frequency (LWIF) <sup>2)</sup> , own personnel and contractors	$\leq 1.7$
Number of severe occupational accidents <sup>3)</sup> , own personnel and contractors	0
Quality of investigation process of occupational accidents, major EHS incidents and near misses	Level 3.0
GAP index, implementation of EHS minimum requirements	Level 3.0
Contractor safety improvement index	Level 2.0
<b>Employee wellbeing</b>	
Sickness-related absences, %	$\leq 2.5$

1) Major fires, leaks, explosions, dam safety incidents, environmental non-compliances and INES events level  $\geq 1$

INES = International Nuclear and Radiological Event Scale

2) LWIF = Lost Workday Injury Frequency, injuries per million working hours

3) Fatality or an accident leading to permanent disability or an accident with severe and life-threatening injuries

\* The figure does not include the exceedances caused by possible changes in permit limits in Russia



# Governance and management

Sustainability management at Fortum is strategy-driven and is based on the company's values, the Code of Conduct, the Supplier Code of Conduct, the Sustainability Policy and other policies and their specifying instructions defined at the Group level.

We comply with laws and regulations. All of our operations are guided by good governance, effective risk management, adequate controls and the internal audit principles supporting them.

Fortum's goal is a high level of environmental and safety management in all business activities. Calculated in terms of sales, 99.9% (2017: 99.8%) of Fortum's electricity and heat production operations at the end of 2018 were ISO 14001 environmentally certified and 97.0% (2017: 98.4%) were either OHSAS 18001 or ISO 45001 safety-certified. The level of safety certification slightly dropped due to acquisitions and investments. The divisions and sites develop their operations with internal and external audits required by environmental, occupational safety and quality management systems.

## Responsibilities

Sustainability is an integral part of Fortum's strategy, so the highest decision-making authority in these issues is with the Board of Directors, which has joint responsibility in matters related to sustainability. For this reason, Fortum has not designated a Sustainability Committee for decision-making on economic, environmental and social issues. The Audit and Risk Committee, members of the Fortum Executive Management, and other senior executives support the Board of Directors in the decision making in these matters, when necessary.

The Fortum Executive Management decides on the sustainability approach and Group-level sustainability targets that guide annual planning. The targets are ultimately approved by Fortum's Board of Directors. Fortum Executive Management monitors the achievement

of the targets in its monthly meetings and in quarterly performance reviews. The achievement of the targets is regularly reported also to Fortum's Board of Directors.

Fortum's line management is responsible for the implementation of the Group's policies and instructions and for day-to-day sustainability management. Realisation of the safety targets is a part of Fortum's short-term incentive scheme. Fortum's Corporate Sustainability unit is responsible for coordination and development of sustainability at the Group level and for maintaining an adequate situation awareness and oversight regarding sustainability.

## Sustainability management by topic

Sustainability management in the areas of economic responsibility, environmental responsibility and social responsibility is described in more detail in [Appendix 4](#). Additionally, more detailed information about the management of different aspects and impacts is presented by topic in this Sustainability Report.

- ▶ [Corporate Governance Statement 2018](#)
- ▶ [Remuneration Statement 2018](#)
- ▶ [Code of Conduct](#)
- ▶ [Supplier Code of Conduct](#)
- ▶ [Sustainability Policy](#)





## Policies and commitments

Fortum is a participant of the UN Global Compact initiative and the UN Caring for Climate initiative. We support and respect the international initiatives and commitments, and national and international guidelines listed in the table. They guide our operations in the areas of economic, environmental and social responsibility.

Fortum's EHS minimum requirements were updated in 2018. We continued to further define the practices related to contractor management in order to improve contractor safety. We further defined, e.g., the safety assessments used in the contractor selection process as well as the qualification classifications needed for high risk work requiring special expertise. We also increased Fortum employees' and contractors' requirements for contractor work supervision. We are monitoring the implementation of the updated guidelines using the new index we deployed in 2019 to measure contractor safety.

We report on the training related to the updated instructions in the sections [► Business ethics and compliance](#), [► Sustainable supply chain](#) and [► Occupational and operational safety](#).

The company's Group-level policies are approved by Fortum's Board of Directors. The Group-level instructions are approved by either the President and CEO or Fortum Executive Management. Fortum's main internal policies and instructions guiding sustainability are listed in the table in [► Appendix 5](#).

### International and national initiatives, commitments and guidelines

	Economic responsibility	Environmental responsibility	Social responsibility		
			Social and personnel issues	Human rights	Anti-corruption and bribery
UN Universal Declaration of Human Rights			x	x	
International Covenant on Economic, Social and Cultural Rights	x		x	x	
International Covenant on Civil and Political Rights			x	x	
UN Convention on the Rights of the Child			x	x	
Core conventions of the International Labour Organisation			x	x	
UN Global Compact initiative	x	x	x	x	x
UN Caring for Climate initiative		x			
UN Guiding Principles on Business and Human Rights			x	x	
OECD Guidelines for Multinational Enterprises	x	x	x	x	x
International Chamber of Commerce's anti-bribery and anti-corruption guidelines	x				x
Bettercoal initiative's Code on responsible coal mining	x	x	x	x	x
Responsible advertising and marketing guidelines			x		
Environmental marketing guidelines			x		



## Business ethics and compliance

We believe there is a clear connection between high standards of ethical business practices and excellent financial results. As an industry leader, we obey the law, we embrace the spirit of integrity, and we uphold ethical business conduct wherever we operate.

### Code of Conduct sets the basic requirements

The Fortum Code of Conduct and Fortum Supplier Code of Conduct define how we treat others, engage in business, safeguard our corporate assets, and how we expect our suppliers and business partners to operate.

Fortum's Board of Directors is responsible for the company's mission and values and has approved the Fortum Code of Conduct. The online training on the Code of Conduct is part of the induction programme for new employees. The Supplier Code of Conduct is based on the ten principles of the UN Global Compact and has been approved by the Head of Procurement in collaboration with the purchasing steering group.

About 97% of Fortum's total purchasing volume is purchased from suppliers with a purchasing volume of EUR 50,000 or more. Geographically they target mainly suppliers in Russia, Finland, Sweden and Norway. The Supplier Code of Conduct is part of purchase agreements with a contract value of at least EUR 50,000.

In line with the Code of Conduct, Fortum has zero tolerance for corruption and fraud and does not award donations to political parties or political activities, religious organisations, authorities, municipalities or local administrations.

### Compliance risks

The compliance risks related to our business operations include the potential risk of bribery or corruption, fraud and embezzlement, non-compliance with legislation or company rules, conflicts of interest,

improper use of company assets, and working under the influence of alcohol or drugs. Compliance risk management is an integrated part of business operations. Key compliance risks, including action plans, are identified, assessed and reported annually. This applies also to the management of risks related to sustainability.

### Training

Fortum has a Compliance programme covering key areas of regulatory compliance and business ethics. It is managed with a risk-based prioritisation.

Training is a fundamental part of Fortum's Compliance programme. In 2018, training was provided to employees in the Consumer Solutions and New Business units in Norway, Sweden and Germany. The Code of Conduct online training was updated and more than 90% of Group employees worldwide completed the training.

Training on the Market Abuse Regulation and insider regulations was provided for new individuals who needed it based on their role. Targeted training on internal controls and focusing on the process-level improvement of controls was also arranged. Training on competition law issues was provided also for new individuals responsible for sales.

Training related to privacy protection (GDPR) was provided for Fortum personnel working in the EU area. More than 90% of the EU area employees participated in the training. This training wasn't provided for personnel in Russia because it has its own privacy protection legislation in effect.

### Reporting misconduct

In addition to internal reporting channels, Fortum has an external > "Raise a concern" channel. The same mechanism is used for reporting any suspected misconduct relating to the environment, labour practices or human rights violations, and it is available to all stakeholders. In Russia, Fortum has a separate compliance organisation in place and employees there are encouraged to use the channels

provided by the compliance organisation. They may, however, also use the "Raise a concern" channel should they so wish. In 2018, a project was launched to renew the misconduct reporting channel.

Suspected misconduct and measures related to ethical business practices and compliance with regulations are regularly reported to the Audit and Risk Committee.

### Suspected cases of misconduct

A total of 190 reports of suspected misconduct were made in 2018. By year-end, all cases had been reviewed. More than 80% of the investigated cases were related to non-compliance with company rules. In these cases, corrective action was taken by reviewing and developing existing processes and instructions and by providing training for employees.

Fortum has zero tolerance towards alcohol and drug use, and thousands of random breathalyser tests are conducted annually. About 30% of the investigated cases were related to alcohol abuse by either Fortum's or contractors' employees during working hours. In 26 cases, alcohol abuse during working hours resulted in either the termination of employment, or, in contractors' cases, in a ban from working at the job site. In addition, as a result of the investigations, four employment contracts were terminated either by immediate dismissal or by mutual agreement, and 16 written warnings were given. There was no cause for action to be taken in 55 of the cases investigated.

No cases of suspected corruption or bribery related to Fortum's operations were reported in 2018. Fortum also requires its goods and service suppliers as well as its business partners to comply with a zero tolerance policy towards corruption and bribery. In Poland, a Fortum employee reported an incident, based on which one fuel supplier was deemed to be guilty of attempted bribery. The supply agreement with the fuel supplier in question was terminated and the incident was reported to the prosecutor's office.

We deal with potential cases of corruption in a professional manner, in accordance with the defined compliance investigation process, in line



with applicable laws and with respect to the rights and personal integrity of all parties involved.

### Restricting competition

In 2018 there was one ongoing investigation case in Russia for which Fortum was ordered to pay a fine of RUB 1.1 million (EUR 14,904) and one Fortum employee was ordered to pay a fine of RUB 15,000 (EUR 203).

### Other significant fines

In 2018 Fortum was ordered to pay a fine of DKK 180,000 (EUR 24,152) for work-related accidents that took place in 2015 and 2016 at Fortum Waste Solutions A/S. No other significant fines were issued during the year. Fines related to environmental non-compliances are discussed in chapter ▶ **Environmental non-compliances**.

- ▶ Fortum Code of Conduct
- ▶ Fortum Supplier Code of Conduct
- ▶ Environmental grievances
- ▶ Labour practices and human rights grievances
- ▶ Incidents of discrimination





# Stakeholders

Our way of operating responsibly includes a close dialogue with our stakeholders and continuously identifying their views. Good collaboration and openness are the key ways to promote a mutual understanding with our stakeholders.

## Stakeholder collaboration

Collaboration with different stakeholder groups helps Fortum to assess and meet the expectations that stakeholder groups have towards the company. We engage in an active dialogue with the different stakeholders associated with our operations. We conduct annual stakeholder surveys. We monitor and assess the public dialogue in the countries where we operate, and we have increased the dialogue with our stakeholders also through social media channels. Feedback from customers drives the development of our products and services. Additionally, our activities in national and international organisations help to deepen our understanding of global sustainability issues and their connections to our business.

Management of stakeholder collaboration at Fortum is assigned particularly to communications, public affairs, group sustainability, the functions responsible for electricity and heat sales and energy production, as well as many of our experts. Responsibilities for managing stakeholder collaboration are primarily determined by stakeholder group or interaction themes. Key interaction areas, e.g., public affairs, and corporate communications, have annual plans that guide the activities.

Fortum has an informal Advisory Council consisting of representatives of Fortum’s key stakeholder groups as invited by the Board of Directors. The Advisory Council aims to increase the dialogue and the exchange of views between the company and its stakeholders.

## Information through surveys

In collaboration with third parties, we annually conduct surveys regarding stakeholder collaboration. The aim of these surveys is to help Fortum assess and respond to the important stakeholder groups’ expectations of the company. The surveys also measure the success of our stakeholder collaboration. Additionally, the surveys provide information about emerging sustainability trends and risks we should acknowledge. We use the survey results in business planning and development and in identifying material aspects in corporate responsibility.

The One Fortum Survey and its results in terms of customer satisfaction and reputation are presented in the section [▶ Customer responsibility and reputation](#). As part of the One Fortum Survey, we regularly survey what our stakeholders consider to be the [▶ most important areas of sustainability](#).

## Our stakeholder surveys

Survey	Target groups	Target countries	Frequency
One Fortum Survey	Customers General public Public administration Capital markets Non-governmental organisations Opinion leaders Personnel Media	Finland, Sweden, Norway, Poland, Baltic countries, Russia, India	Customer satisfaction is measured semi-annually Reputation is measured annually
Media tracking	Media	All operating countries	Daily
Brand tracking	General public and customers	Finland, Sweden, Norway, Poland, Baltic countries	Continuously in Finland, Sweden and Norway, annually in other countries
Pulse survey	Own personnel	All operating countries	Monthly



## Most important expectations stakeholders have towards Fortum, and Fortum's actions in response to them

	Stakeholder expectations	Fortum's actions		Stakeholder expectations	Fortum's actions
Lenders and share-holders	<ul style="list-style-type: none"> <li>• Long-term value creation</li> <li>• High-yield share</li> <li>• Responsible operations</li> </ul>	<ul style="list-style-type: none"> <li>• In 2018, we updated our strategy to strengthen competitiveness and ensure a benchmark portfolio for the 2020s</li> <li>• We are committed to achieving our financial targets</li> <li>• Our goal is to pay a stable, sustainable and over time increasing dividend of 50–80% of earnings per share excluding one-off items</li> <li>• Our responsibility for climate, resources, personnel and society plays a key role in our business</li> </ul>	Authorities and decision makers	<ul style="list-style-type: none"> <li>• Compliance</li> <li>• Integration of sustainability with strategy and business, risk management</li> <li>• Transparency and reliable reporting</li> <li>• Maintaining dialogue</li> <li>• Constructive, knowledgeable and open lobbying, reliable partner in policy development</li> </ul>	<ul style="list-style-type: none"> <li>• We comply with laws, regulations and permits</li> <li>• We develop our business and the management of environmental and safety risks</li> <li>• We communicate openly and we actively engage in a dialogue with authorities and decision makers about energy and climate issues: in 2018 we called for, e.g., <a href="#">▶ more ambitious long-term EU climate policy</a> and <a href="#">▶ closer Nordic collaboration</a> in energy and climate policies</li> <li>• We provide authorities with constructive suggestions on legislative proposals: in 2018, we participated actively in the preparation of the <a href="#">▶ EU plastics strategy</a> and Sweden's and Finland's corresponding national strategies</li> <li>• We communicate proactively and openly</li> </ul>
Customers	<ul style="list-style-type: none"> <li>• Competitively priced products</li> <li>• Useful additional services and advice</li> <li>• Reliability</li> <li>• Ensuring data protection</li> </ul>	<ul style="list-style-type: none"> <li>• With efficient operations and high-quality products, we ensure that we are competitive and our customers feel they get their money's worth</li> <li>• In collaboration with customers, we develop new products and services by, e.g., leveraging the opportunities brought by digitalisation</li> <li>• We deliver what we promise to our customers, and we offer constantly better customer service through different channels</li> <li>• We interviewed over 8,000 customers and 4,700 other stakeholders for our One Fortum Survey in 2018</li> </ul>	Media	<ul style="list-style-type: none"> <li>• Relevant, reliable and transparent communication</li> </ul>	<ul style="list-style-type: none"> <li>• In line with our <a href="#">▶ Disclosure Policy</a>, we communicate proactively and openly: in 2018, we had a special focus on communicating Fortum's strategy and development of our digital channels</li> <li>• We communicate about issues of topical and media interest through multiple channels and in a timely manner</li> <li>• We are easily accessible and we meet regularly with media representatives</li> <li>• We continuously improve our crisis communication preparedness</li> </ul>
Personnel	<ul style="list-style-type: none"> <li>• Equal treatment and open interaction</li> <li>• Job security and incentivising compensation</li> <li>• Opportunities for professional development</li> <li>• Occupational safety and work wellbeing</li> </ul>	<ul style="list-style-type: none"> <li>• We operate in line with Fortum's Code of Conduct and our Values, updated in 2017</li> <li>• In 2018, we arranged a Code of Conduct online course</li> <li>• In 2017, we launched our Open Leadership concept and Leadership Principles based on positive psychology. Related training has been carried out during 2018 for nearly one thousand supervisors in all Fortum's operating countries. In the same conjunction, the employees were included in the strategy update, and supervisors were offered tools to communicate the strategy (<a href="#">▶ Strategy &amp; Open Leadership project</a>).</li> <li>• Our employee compensation is based on standardised principles</li> <li>• Occupational safety and wellbeing are our important focus areas: several functions arranged <a href="#">▶ Safety training</a> and the <a href="#">▶ Energise Your Day</a> work wellbeing project expanded to several of our circular economy operating countries</li> <li>• The employee training that started in 2017 related to the change process in culture and ways of operating continued: in 2018, the training covered, among others, new ways of working, change readiness, new IT tools and personnel working capacity in change situations</li> </ul>	Energy sector organisations	<ul style="list-style-type: none"> <li>• Advocating on behalf of shared interests</li> <li>• Dialogue and expertise</li> </ul>	<ul style="list-style-type: none"> <li>• We advocate our shareholders' and the sector's shared interests and actively participate in organisational activities in our sector</li> <li>• We publish position papers and views on energy sector and policy development, and we actively communicate them in multiple media: in 2018, we published one Energy Review</li> <li>• In addition to sector organisations, Fortum has joined several joint business initiatives promoting market-driven energy and climate policy: the UN Caring for Climate initiative, the World Bank's Carbon Pricing Leadership Coalition and the Finnish Climate Leadership Coalition</li> <li>• We participate in the international <a href="#">▶ Corporate Responsibility and Sustainability Council</a>, which is part of The Conference Board of Europe</li> </ul>
Service and goods suppliers	<ul style="list-style-type: none"> <li>• Good financial position and the ability to take care of the agreed obligations</li> <li>• Fair and equal treatment of suppliers</li> <li>• Long-term business relations and collaborative development of business and products/services</li> <li>• Responsible operations</li> </ul>	<ul style="list-style-type: none"> <li>• We comply with the Fortum Code of Conduct, agreements and legislation</li> <li>• We conduct a supplier qualification process, and we actively develop our relations with existing suppliers</li> <li>• In 2018, we implemented <a href="#">▶ Contractor management procedures</a> in order to address challenges with contractor safety</li> <li>• In 2018, we updated our lawful principles related to information security and the protection of suppliers' personal data</li> </ul>	NGOs	<ul style="list-style-type: none"> <li>• Responsibility for operations and risk management</li> <li>• Promoting renewable energy production</li> <li>• Reliable and open reporting</li> </ul>	<ul style="list-style-type: none"> <li>• We develop environmental and safety risk management</li> <li>• We invest in renewable energy: in 2018, a total of EUR 180 million in hydro, wind and solar power and bioenergy</li> <li>• We collaborate with Finnish and Swedish nature conservation associations regarding our environmentally benign electricity products</li> <li>• In Sweden, we received the Bra Miljöval label for the bedding-manure mixture collected from horse stables and used as fuel at power plants</li> <li>• In 2018, we had an active dialogue with NGOs about transitioning to emissions-free production, the transition period, and the importance of policy-making in defining the regulating framework</li> <li>• We communicate actively and we report openly</li> </ul>
			Local communities	<ul style="list-style-type: none"> <li>• Operational safety</li> <li>• Developing employment, infrastructure and recreational use</li> <li>• Reducing emissions, noise and other detriments</li> </ul>	<ul style="list-style-type: none"> <li>• We invest in infrastructure and operational safety. In 2018, we arranged the annual emergency preparedness exercise at the Loviisa nuclear power plant. Additionally, we carried out operational safety assessments at power plants in the Nordic countries, Poland and Russia.</li> <li>• We collaborate with local communities in all our operating countries: <a href="#">▶ Examples of our activities in 2018</a></li> <li>• We reduce emissions and local environmental impacts</li> <li>• We communicate proactively and openly</li> </ul>



## Dialogue around Fortum's Uniper investment continued

Fortum announced towards the end of 2017 a voluntary public takeover offer for all shares in the energy company Uniper SE. The investment in Uniper finalised the redeployment of capital received from the divestment of Fortum's electricity distribution business and delivered on its strategic goal to drive productivity and industry transformation.

Fortum closed the offer in February 2018, but the public takeover was conditional on regulatory approvals in the EU and Russia. These were received in June, making Fortum the largest shareholder in Uniper with a shareholding of 47.35%. On 31 December 2018, Fortum owned 49.99% of the shares in Uniper. The authority clearances in compliance with Russian competition legislation and strategic investment law enabled Fortum to acquire up to 50% of shares in Uniper SE.

Fortum's nearly four-billion-euro investment in Uniper was one of the most significant energy sector M&As in Europe in 2018, and it received a lot of media attention both in Finland and internationally. Uniper's management opposed Fortum's offer, which added to the transaction's interest in the public eye. There was also a lot of dialogue around the Russian authority clearances.

Other Fortum stakeholder representatives, such as sustainability-specialised investors and NGOs, also contacted Fortum about the issue. The biggest concerns raised by the various stakeholders have been the strategic fit of Uniper's fossil-based production with Fortum low-carbon assets and its impact on Fortum's carbon footprint.

### Dialogue with NGOs

In early 2018, a group of Finnish and international environmental and civic organisations sent an appeal to Fortum, requesting Fortum to shut-down its own and Uniper's coal-fired power plants. **Fortum responded to the organisations' letter** and invited the organisations' representatives to an engagement event in June. In November, the NGOs published a new appeal, to which **Fortum also responded**. It is important to Fortum that a broad-based dialogue is held on the means

by which Europe can transition towards low-carbon energy production in the upcoming decades.

Together Fortum and Uniper have the strategic mix of assets – both clean and secure – as well as the expertise required to successfully drive the transition towards a low-carbon energy system. As a Uniper shareholder, Fortum continues to be fully committed to its strategy and sustainability targets. Fortum's carbon footprint (gCO<sub>2</sub>/kWh) is already one of the smallest among European power companies, and we have a proven track-record on driving transition to a low-CO<sub>2</sub> direction. This is something that we consider one of our core competences and a competitive advantage.

### Policy decisions frame the phase out of coal

Fortum supports the target of a carbon-neutral EU by 2050, and we, along with other Nordic energy companies, have encouraged the European Commission to have a **more ambitious policy** to achieve the goal. In addition to energy production, actions to reduce emissions are needed also in all other sectors of society. The EU and the member countries must mutually agree on a path on which this transition can be achieved in a controlled manner without compromising security of supply. We believe that a well-functioning, market-based emissions trading system is the best way, in terms of security of supply, to implement the transition to a low-carbon energy system at the lowest cost to society.

In virtually every European country where Fortum or Uniper own coal-fired power plants, there is an ongoing dialogue about national decisions to discontinue the use of coal in energy production. These countries, along with the Nordic countries, are Great Britain, Netherlands, France and Germany. It is clear that the EU and governments are driving the phase out of coal and are assessing how they can simultaneously ensure security of supply and affordable energy for their citizens. Companies operating in the sector will abide by the decisions made by the governments.



Fortum owns less than 50% of Uniper's shares. Uniper is an independently operating listed company where operational decisions are made by the acting management. As a shareholder, we have influence in the Supervisory Board regarding the company's long-term strategy and on how the company responds to emissions reduction targets, while at the same time ensuring the security of supply and competitively priced energy for its own customers.



## Case | Solutions for promoting clean transportation



Fortum developed solutions in 2018 to promote clean transportation in Finland and internationally.

Fortum Charge & Drive is currently building the first high-power charging corridor for electric vehicles between Oslo and Helsinki to facilitate EV mobility in the Nordics. The first high-power charging station was opened outside Oslo, Norway, in April; in Kristinehamn, Sweden, in August; and in Lohja, Finland, in November 2018. The network enables the newest generation EV models, which have a range of over 300 kilometres, to drive from Helsinki to Oslo in the same amount of time as combustion engine cars.

Enhancing EV mobility in Europe was boosted early in the year when Fortum Charge & Drive and Plugsurfing joined forces; Fortum's Nordic charging network was connected as part of Plugsurfing's charging and payment application. Previously, a challenge for EV drivers was the numerous different charging networks requiring registration and the use of different payment applications. Now Plugsurfing connects 60,000 EV drivers to more than 200 charging networks, thus offering access to over 100,000 charging points in 31 European countries.

In India, the government is pursuing full electric mobility by 2030. Fortum's collaboration with the Clean Motion company supports the target by aiming to accelerate India's electrification of three-wheeled vehicles with a battery swap system. In September 2018, Fortum joined the international EV30@30 campaign to promote the electrification of vehicles. The campaign's goal is to accelerate EV adoption and reach a 30% sales share for electric vehicles by 2030.

In addition to external activities, Fortum is electrifying also its own employees' transportation. Since the beginning of 2018 in Finland, the company's employee car policy has allowed for only new EVs or plug-in hybrids as company cars. The same policy was adopted in November 2018 for employees in Sweden.



## Sustainability indices



Fortum was ranked in category B (scale from D to A, A being the highest score) among the Electric utility sector in the annual CDP Climate Change rating 2018. CDP collects information on climate risks and low carbon opportunities from the world's largest companies. CDP is an international, not-for-profit organisation involving several different market players.



Fortum is included in the Euronext Vigeo Eurozone 120 and Euronext Vigeo Europe 120 indices. Euronext Vigeo Eiris indices are composed of the 120 highest-ranking listed companies in the region according to their ESG performance. Ratings measure company performance against a set of risks that the rating agency defines to monitor and assess corporate responsibility. The assessment is based on 330 indicators.



In 2018, Fortum received a rating A (on a scale of AAA–CCC) in the MSCI ESG Ratings assessment. MSCI ESG Research LLC is the world's largest provider of ESG rating and research, and annually rates more than 13,000 companies. MSCI ESG Ratings helps investors to identify the environmental, social and governance related risks and opportunities in the investment portfolio.



ISS-oekom Corporate Rating has awarded Fortum a Prime Status (B-) rating. Prime status is awarded to companies that meet specific minimum requirements in Corporate Ratings and achieve the best ESG scores among their sector peers.



Fortum is included in the STOXX Global ESG Leaders index. The index offers a representation of the leading global companies in terms of environmental, social and governance criteria. The index is made of three ESG sub-indices.



Fortum is included among the Equileap Gender Equality TOP 200 companies, climbing in 2018 from place 134 to place 50. In 2018, Fortum received a ranking of B- (on a scale with A+ being the best and F the worst). The assessment criteria are related to the gender balance in leadership and workforce, equal compensation, work/life balance, and policies promoting gender equality in, e.g., recruiting and career development.

▶ [Fortum's sustainability indices and ratings](#)



# Climate and resources



Fortum’s aim is to provide customers environmentally benign and reliable products and services. We strive to continuously reduce the impacts our operations have on the environment by using the best available practices and technologies.

In our operations, we emphasise a circular economy, better resource and energy efficiency, and climate change mitigation. We base our energy production mainly on carbon dioxide-free hydro and nuclear power production, and on energy-efficient combined heat and power production, and we invest in renewable energy production, such as wind and solar power.



### Environmental impacts

Some of the environmental impacts of energy production are global or wide-reaching, some are regional or local. We manage our environmental impacts with environmental management systems. 99.9% of our electricity and heat production globally has ISO 14001 certified environmental management system.

In terms of Fortum's operations, the key environmental aspects include:

- Climate change
- Renewable energy production
- Circular economy and resource efficiency
- Flue-gas emissions
- Hydropower's environmental impacts and biodiversity
- Fuel procurement

### Climate change mitigation

We can reduce our greenhouse gas emissions by increasing carbon dioxide-free energy production and the use of renewable energy, and by improving the energy efficiency of our production. Our strategy is targeting to a multi-gigawatt wind and solar portfolio. In 2018, we made several new investment decisions and investments in wind and solar power.

### Circular economy boosts resource efficiency

We recycle significant amounts of waste and energy production by-products generated in our operations. Additionally, in circular economy services, we recycle, reuse and recover waste received from customers as materials or energy production. The continuous improvement of resource and energy efficiency is important in terms of the sufficiency of natural resources and climate change mitigation.

### Advanced combustion technology

Fuel use generates sulphur dioxide, nitrogen oxide and particle emissions that degrade air quality and cause acidification of soil and water systems. Flue-gas emissions can be effectively reduced with various flue-gas cleaning technologies and combustion technology solutions. All our power plants operate in line with environmental permits. We have supplied also other energy companies with combustion technology solutions designed to reduce nitrogen oxides.

### Mitigation of hydropower's environmental impacts

Damming rivers and regulating water systems change the natural water levels and cause changes in aquatic habitats. We actively take part in research activities in the sector and implement voluntary and permit-based measures to develop the biodiversity, fish populations and the multi-use of water systems where we produce hydropower.

- ▶ Environmental impacts from our energy production
- ▶ Sustainable fuel purchasing

**57%**

**Share of carbon dioxide-free electricity production of total power generation**





### Key figures related to climate and resource efficiency

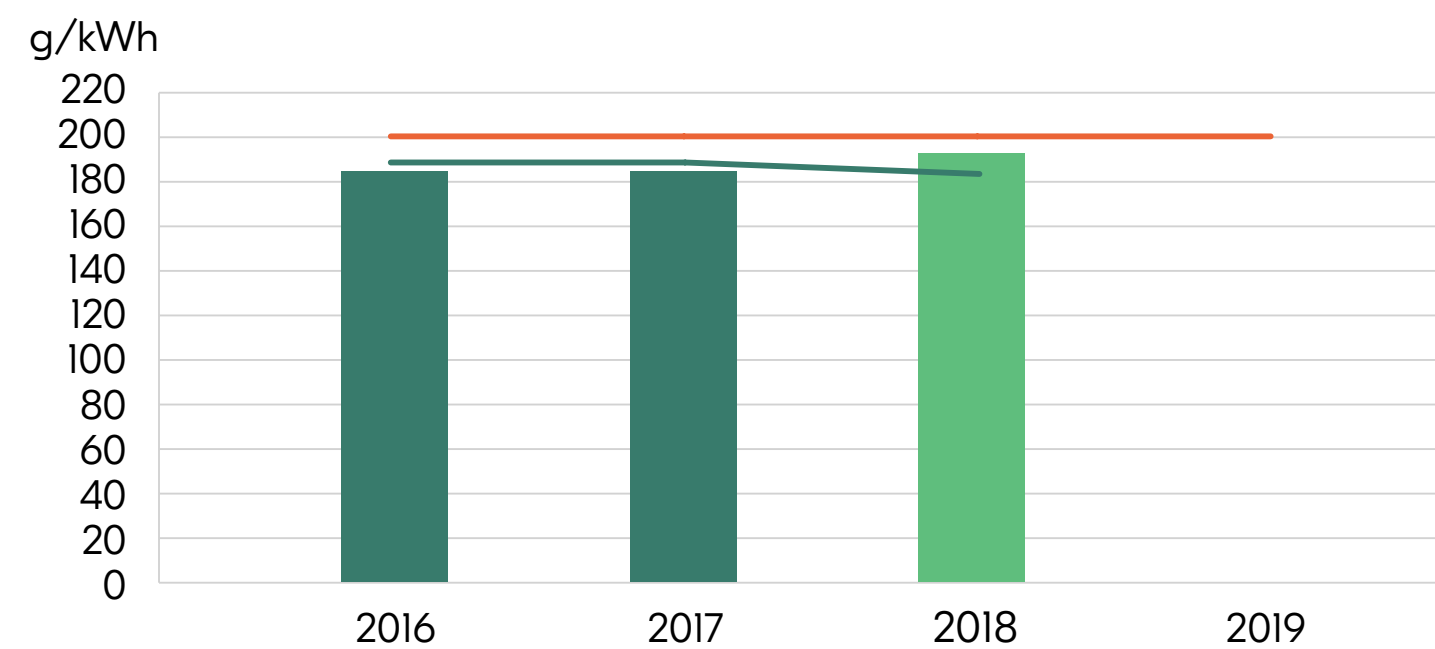
The table and graphs present our key targets and figures related to climate and resource efficiency.

### Key figures related to climate and resource efficiency

	2018	2017	2016
Carbon dioxide emissions (Scope 1), million tonnes	20.1	18.4 *	18.6
Sulphur dioxide emissions, 1,000 tonnes	16.8	18.8	22.5
Nitrogen oxide emissions, 1,000 tonnes	26.1	26.4 *	24.8 *
Particle emissions, 1,000 tonnes	9.6	15.8	16.8
Specific CO <sub>2</sub> emissions of power generation, g/kWh	186	174 *	173
Specific CO <sub>2</sub> emissions of power generation in the EU, g/kWh	26	28	28
Specific CO <sub>2</sub> emissions of total energy production, g/kWh	192	184	184
5-year average, g/kWh	186	188	188
Share of CO <sub>2</sub> -free energy in power generation, %	57	61	62
Share of renewable energy in power generation, %	28	30	30
Share of renewable energy in heat production, %	9	9	7
Energy-efficiency improvement, GWh/a	135	131	245
Utilisation of gypsum originated from energy production, %	99.5	100	100
Utilisation of ash originated from energy production, %	51	47	37
Material recovery rate of waste received from customers, %	59	57	-
Water withdrawal in production operations, million m <sup>3</sup>	2,140	2,130 *	2,140
of which cooling water, million m <sup>3</sup>	2,000	1,990 *	2,035
Major EHS incidents, no.	18	20	22
of which environmental permit violations, no.	2	2	11
ISO 14001 -certified operations in power and heat production, % of sales	99.9	99.8	99.9

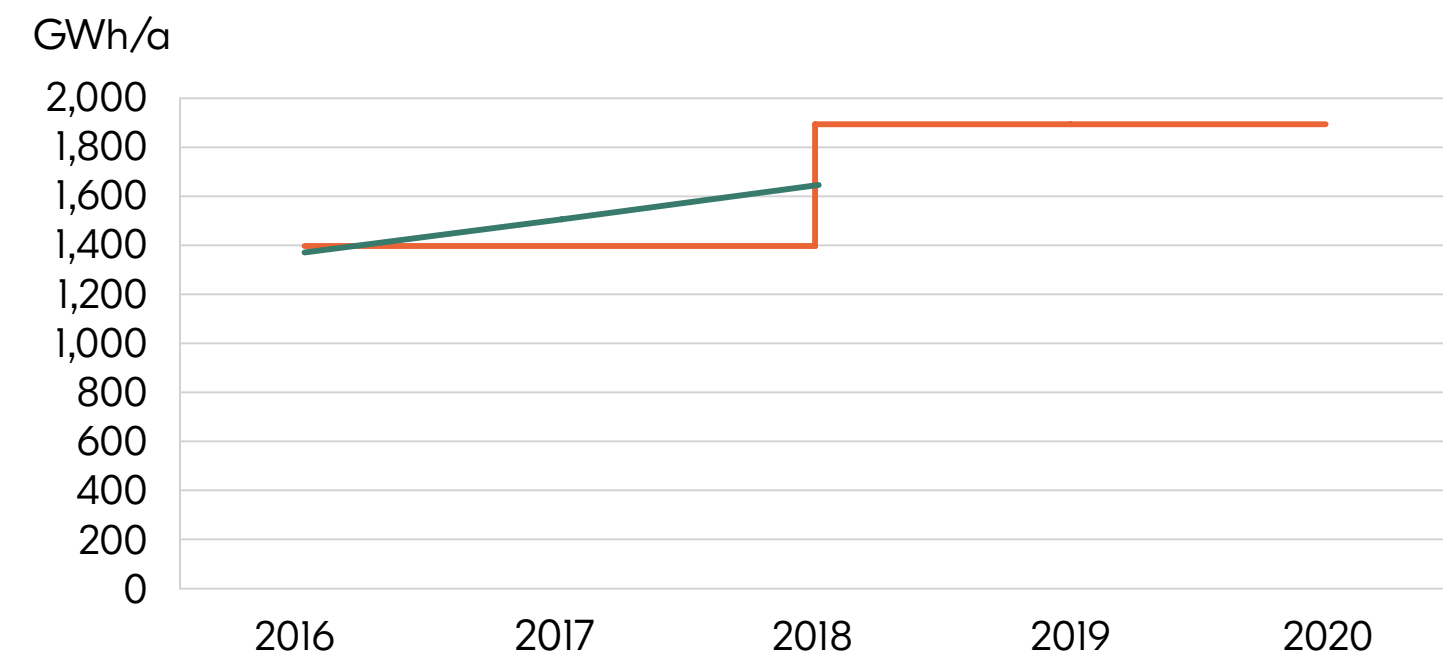
\* Figure revised

### Specific carbon dioxide emissions of total energy production in 2016–2018



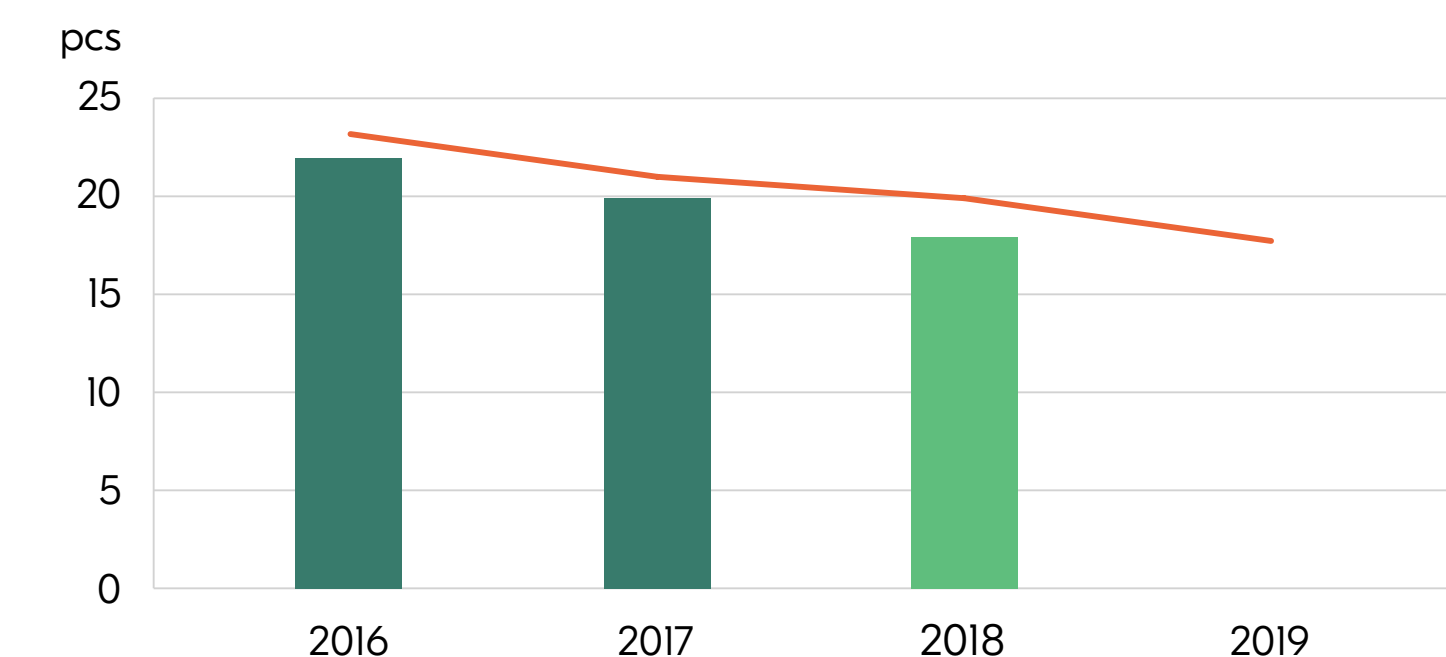
■ Annual specific emissions  
 — Specific emissions (5-year average)  
 — Target (5-year average)

### Annual energy-efficiency improvement achieved in 2016–2018



— Cumulative energy-efficiency improvement from 2012  
 — Target (by 2020)

### Number of major EHS incidents in 2016–2018



■ Number of major EHS incidents  
 — Target



# Sustainable energy production

Our energy production is based primarily on carbon dioxide-free hydro and nuclear power and on energy-efficient combined heat and power. Our strategy is targeting to a multi-gigawatt wind and solar portfolio.

Fortum’s power generation in 2018 was 74.6 (2017: 73.2) TWh and heat production 29.8 (2017: 28.6) TWh. 57% (2017: 61%) of our power generation was carbon dioxide-free and 28% (2017: 30%) was produced from renewable energy sources. About 9% (2017: 9%) of our heat production was produced from renewable, carbon-neutral energy sources.

The figures in the tables and graphs also include figures from Fortum’s share in associated companies and joint ventures that sell their production to the owners at cost.

## More renewable energy

In 2018, we made investment decisions and invested in new wind and solar power. In January, we commissioned the 35-MW Ulyanovsk wind farm in Russia. The wind farm is the first in Russia. In autumn 2018, we commissioned the 50-MW Ånstadblåheia wind farm in Norway, and construction of the 97-MW Sørjord wind farm continues. In Sweden, we commissioned the 76-MW Solberg wind farm in which Fortum has a 50% stake.

In June 2018, Fortum won the right to build 110 MW of solar capacity in a Russian Capacity Supply Agreement (CSA) auction. Solar power will be commissioned during 2021–2022.

Additionally, Fortum and Rusnano investment fund with 50/50 ownership has the right to build and commission 1,823 MW of new CSA-supported wind power in Russia in 2019–2023. A separate investment decision will be made for each project. In 2018, the investment fund constructed the 50-MW Ulyanovsk wind farm and it was commissioned at

Power generation by energy source in 2016–2018 (GRI 302-1)

TWh	2018	2017	2016
Natural gas	28.4	25.3	24.3
Nuclear power	22.8	23.0	24.1
Hydropower	19.1	20.7	20.7
Coal	2.2	2.6	2.8
Biofuels	0.9	0.8	0.8
Wind, solar	0.8	0.5	0.1
Waste-derived fuels	0.4	0.3	0.2
Other <sup>1)</sup>	0.2	0.1	0.1
<b>Total</b>	<b>74.6</b>	<b>73.2</b>	<b>73.1</b>

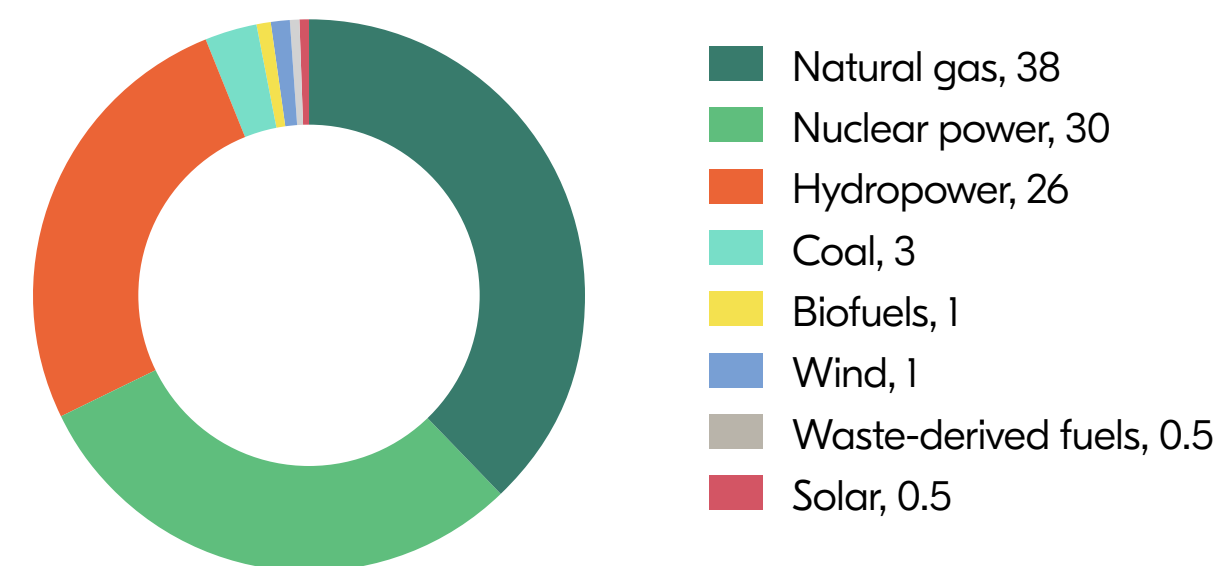
1) Peat, other

Heat production by energy source in 2016–2018 (GRI 302-1)

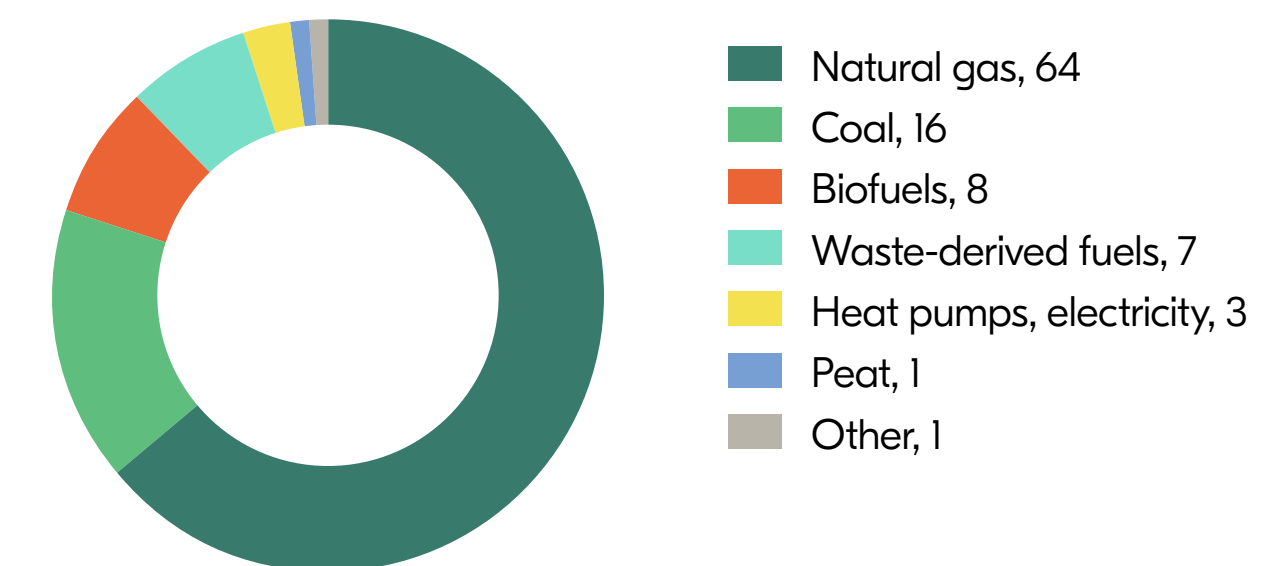
TWh	2018	2017	2016
Natural gas	19.2	18.6	19.7
Coal	4.7	4.8	4.7
Biofuels	2.3	1.9	1.9
Waste-derived fuels	2.0	2.3	0.8
Heat pumps, electricity	0.9	0.6	0.3
Peat	0.4	0.4	0.4
Other <sup>1)</sup>	0.2	0.0	0.0
<b>Total</b>	<b>29.8</b>	<b>28.6</b>	<b>27.8</b>

1) Fuel oil, other

Power generation by energy source, %



Heat production by energy source, %





the beginning of 2019. Additionally, the investment fund had 350 MW of new wind power capacity under construction.

In June 2018, Fortum won the new 250-MW Pavagada solar power project in Karnataka, India. At the beginning of August 2018 Fortum sold its majority share in the 185-MW solar power portfolio in India to free up capital for additional solar power investments. After the divestment, Fortum's share of the solar power plants in India is 85 MW.

Fortum signed a conditional contract with the State of Montenegro to build a 250-MW solar power plant in the Ulcinj solar site in Montenegro.

Refurbishments of Fortum's own hydropower plants in Sweden produced 4.5 MW of new renewable electricity production capacity in 2018.

### New, energy-efficient and low-carbon production

In September 2018, we started the trial run of the new Zabrze CHP production plant in Poland. The plant has a maximum capacity of 75 MW electricity and 145 MW heat. The plant combusts mainly refuse-derived fuel (RDF) and coal. The share of RDF is about 40–50%. Zabrze multi-fuel plant utilises locally collected municipality and industry waste and has a positive impact on the waste management in the area.

The new Zabrze CHP plant represents the best available technology and will eventually replace the old Zabrze and Bytom coal-fired power plants. It improves the energy production efficiency and reduces carbon dioxide and other flue-gas emissions into the environment in relation to the produced energy.

A high-pressure turbine was replaced during the 2018 annual outage of the Loviisa nuclear power plant's unit 2. This modification increased the plant unit's nominal output by 5 MW.

Fortum will replace some of the coal use in heat production in Finland by building a bioheat plant in Kivenlahti, Espoo. Its maximum heat output will be 58 MW. Construction started in late 2018, and production

is estimated to commence in 2020. Fortum and the City of Espoo have jointly committed to making Espoo's district heating carbon-neutral in the 2020s.

### ► Our energy production forms





## Climate change mitigation

Our vision — For a cleaner world — is based on the development of a low-emission energy system and optimal energy and resource use. Our main tools in climate change mitigation are increasing the share of renewable energy production, improving energy efficiency and offering smart energy solutions for customers.

### Climate change creates opportunities for demand growth

We believe that the growing awareness and concern about climate change will increase the demand for low-carbon and resource- and energy-efficient energy products and services. We are leveraging our know-how in carbon dioxide-free hydro, nuclear, wind and solar power and in energy-efficient combined heat and power (CHP) production by offering our customers low-carbon energy solutions. We also believe that the electrification of transportation, industry and services will increase the consumption of low-carbon electricity in particular. Our strategy is targeting to a multi-gigawatt wind and solar portfolio.

Our circular economy services also respond to this demand by utilising waste stream materials as efficiently as possible and by reducing the formation of greenhouse gases generated from biodegradable waste at landfills. Additionally, the use of non-recyclable and non-recoverable waste in energy production replaces fossil fuel.

### Risks related to climate change

The energy business is influenced by national and EU-level energy and climate policies and regulations. The impact of regulatory changes on operations in existing and new market areas has been examined in Fortum's strategy work. We also take into consideration the climate-related transition risks of potential new businesses, investments and

technologies. The Emissions Trading Scheme, carbon price and taxation of fuels have an impact on strategic decisions, for example, on the technology used at production plants and on fuel choices.

Our operations are exposed to the physical risks caused by climate change, including changes in weather patterns that could alter energy production volumes and energy demand. Fluctuating precipitation, flooding and extreme temperatures may affect, for instance, hydropower production, dam safety, availability of cooling water, and the price and availability of biofuels.

Hydrological conditions, precipitation, temperatures and wind conditions also affect the short-term electricity price in the Nordic power market. In addition to climate change mitigation, we also aim to adapt our operations and we take climate change into consideration in, among other things, the assessment of growth projects and investments, and in operation and maintenance planning.

### Towards low-carbon production

In Europe, we produce carbon dioxide-free electricity with hydropower, nuclear power and wind power and at CHP production plants that utilise biofuels and waste-derived fuels. In the EU area, 96% (2017: 96%) of our electricity production was carbon dioxide free in 2018. The rest of the electricity was produced mainly with coal.

Our electricity production in Russia is based on mainly natural gas and coal. Our new plant units in Russia are based on gas turbine technology, which represents the best available technology in natural gas combustion. Investment decisions and investments in new wind and solar power production have been also made in Russia. 57% (2017: 61%) of our total electricity production was carbon dioxide free.

The following investments and projects, among others, directly or indirectly reducing carbon dioxide emissions were completed in 2018:

- New wind farms in Norway, Sweden and Russia
- Replacement of the high-pressure turbine at unit 2 of the Loviisa nuclear power plant in Finland

- Pärnu power plant's boiler refurbishment, and the Tartu district heating and cooling network projects in Estonia
- Refurbishments of hydropower plants in Sweden

We have estimated that these projects will reduce annual carbon dioxide emissions by about 40,000 tonnes. Additionally, we estimate that the new Zabrze CHP plant will reduce carbon dioxide emissions by about 200,000 tonnes in relation to the produced energy. Projects under construction and decisions on new investments are described in more detail in the section [Sustainable energy production](#).

### Climate-benign products and services

We offer our customers a range of [energy services](#) and energy products to help them improve their energy efficiency and reduce their carbon footprint:

- CO<sub>2</sub>-free electricity products and carbon-neutral heat products
- Real-time monitoring and optimisation of energy consumption
- Electric vehicle charging systems
- Solar panel solutions

The growth of renewable energy increases the need for regulating power and storage solutions in the national energy system. In a demand response-based energy service, household customers' water heaters are connected as part of a [Virtual Battery](#), reducing the need to start-up fossil fuel-fired reserve power plants and supporting the use of renewable energy by balancing peak consumption in the electricity network.

Customers can also supply excess heat generated in their buildings and other operations to our open district heating network in Finland. Homes in the district heating network are heated with excess heat generated, for example, by data centres, industrial facilities and wastewater treatment plants.



We are expanding our offering also by investing in startups that are developing new technologies. At the end of 2018, Fortum announced the new ▶ **Valo Ventures** growth fund, which invests in early- and growth-stage technology companies.

### Innovative fuels

▶ **Fortum HorsePower** is a service concept in which Fortum delivers bedding to horse stables and picks up the bedding-manure mixture for combustion. In 2018, the bedding-manure mixture was collected from about 300 horse stables in Finland and about 75 in Sweden. Fortum combusts the bedding-manure mixture at the Järvenpää power plant, and it was delivered also to other energy companies for fuel. In Sweden, the fuel received the Bra Miljöval label in 2018.

In 2018 the Joensuu bio-oil plant produced about 5,000 tonnes of ▶ **bio-oil**, the majority of which was used at a heat plant in the Joensuu power plant area and at the Vermo heat plant in Espoo.

### Emissions trading

About 77% of carbon dioxide emissions from our energy production in the Nordic countries, the Baltic countries and Poland are within the sphere of the EU's emissions trading scheme. We had a total of 53 (2017: 50) plants in six member countries within the EU's emissions trading scheme in 2018. Fortum was granted free emission allowances corresponding to 0.8 (2017: 1.0) million tonnes. Our carbon dioxide emissions within the EU's emissions trading scheme were 2.5 (2017: 2.4) million tonnes. In terms of the emissions allowances, we have a deficit and will purchase the shortfall of emissions allowances from the markets.

Fortum's view is that EU emissions trading is the most cost-efficient and flexible way to achieve emissions targets. In April 2018, a revision to the EU emissions trading directive for 2021–2030 took effect, and the national adoption of it is underway in member countries. The price for an EU emissions allowance has more than tripled during the past

year. Fortum expects that the revised directive will further improve the efficiency of emissions trading.

We also want to promote the establishment of a global carbon pricing and carbon market. We are participating in a number of international initiatives promoting the role of business in climate change mitigation. These include, for example, the UN Global Compact's Caring for Climate initiative and the World Bank's Carbon Pricing Leadership Coalition. In Finland, Fortum is a member of the Climate Leadership Coalition.

### Carbon funds

Fortum is a participant in the international Prototype Carbon Fund (PCF) climate fund. In 2018, we received a total of about 66,000 CER emission reduction units from this fund. So far, we have received a total of 2,820,000 emission reduction units, and we estimate that we will still receive about 52,000 units during the PCF's operating period. Fortum uses the emission reduction units it has received from the PCF to compensate greenhouse gas emissions generated by employee air travel. Emissions from employee air travel have been compensated since 2007.

### Greenhouse gas emissions

Our greenhouse gas emissions in 2018 totalled 26.4 (2017: 23.4) million tonnes. Scope 1 emissions were 20.2 million tonnes, Scope 2 emissions 0.1 million tonnes, and Scope 3 emissions 6.1 million tonnes. Greenhouse gas emissions are reported on a pro forma basis and the figures of the comparison years have not been adjusted because of partially insufficient data.

### Direct greenhouse gas emissions – Scope 1

The majority of our greenhouse gas emissions are generated from the use of fossil fuels in electricity and heat production. A small amount of emissions is generated from the use of company vehicles. Our direct greenhouse gas emissions were 20.2 (2017: 18.5) million CO<sub>2</sub>-equivalent tonnes. The share of carbon dioxide from our direct greenhouse gas

emissions was 99.5%. The share of Scope 1 greenhouse gas emissions from our total greenhouse gas emissions was about 77%. The direct CO<sub>2</sub> emissions figure for 2017 has been revised with the change in the reporting approach in electricity and heat production in Lithuania.

### Direct greenhouse gas emissions (Scope 1) in 2016–2018 (GRI 305-1)

Mt CO <sub>2</sub> -ekv	2018	2017	2016
CO <sub>2</sub>	20.1	18.4 *	18.6
CH <sub>4</sub>	0.01	0.01	0.01
N <sub>2</sub> O	0.09	0.09	0.17
HFCs	0.00	0.00	0.00
SF <sub>6</sub>	0.00	0.00	0.00
<b>Total</b>	<b>20.2</b>	<b>18.5 *</b>	<b>18.8</b>

\* Figure revised

### Direct carbon dioxide emissions by country in 2016–2018 (GRI 305-1)

Million tonnes	2018	2017	2016
Finland	1.7	1.7	2.0
Russia	16.9	15.4	15.5
Poland	0.8	0.7	0.8
Other countries	0.8	0.6 *	0.3
<b>Total</b>	<b>20.1</b>	<b>18.4 *</b>	<b>18.6</b>

\* Figure revised

Of the direct carbon dioxide emissions, 84% (2017: 84%) originated from the Russian operations and 8% (2017: 9%) from Finland. Direct carbon dioxide emissions increased from the previous year by about 1.7 million tonnes, mainly because of the increased electricity production in Russia. Fortum's direct biogenic carbon dioxide emissions were 1.5 (2017: 1.4) million tonnes.

The calculation of greenhouse gas emissions covers carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), fluorinated hydrocarbons



(HFCs) and sulphur hexafluoride (SF<sub>6</sub>). Carbon dioxide emissions as well as methane and nitrous oxide emissions have been calculated on the basis of plant-specific fuel data. The amounts of HFC compounds and SF<sub>6</sub> are reported on the basis of the amounts of gas added to the equipment. Specific emission factors of gases are based on IPCC publications.

### Indirect greenhouse gas emissions – Scope 2

Greenhouse gas emissions from the production of electricity purchased for our own use were 92,200 (2017: 102,700) tonnes of carbon dioxide-equivalent. Carbon dioxide emissions accounted for 99.6% of this in 2018. The share of Scope 2 greenhouse gas emissions of our total greenhouse gas emissions was 0.4%.

About 80% of Scope 2 greenhouse gas emissions have been estimated on the basis of information received from electricity suppliers. The rest, including Scope 2 greenhouse gas emissions in Russia, has been estimated on the basis of country-specific breakdown of electricity production.

### Indirect greenhouse gas emissions (Scope 2) in 2016–2018 (GRI 305-2)

t CO <sub>2</sub> -ekv	2018	2018 (Location-based)	2017	2016
CO <sub>2</sub>	91,800	93,300	102,300	95,000
CH <sub>4</sub>	100	155	75	76
N <sub>2</sub> O	290	555	370	375
<b>Total</b>	<b>92,200</b>	<b>94,000</b>	<b>102,700</b>	<b>95,500</b>

### Other indirect greenhouse gas emissions – Scope 3

The majority of our Scope 3 greenhouse gas emissions are caused by the purchases of goods and services, investments and the production and transportation of fuels. The transportation of waste received

from customers also creates greenhouse gas emissions in our circular economy business. Other operations (e.g. employee travel and waste management) account for less than 1% of Scope 3 greenhouse gas emissions.

Our Scope 3 greenhouse gas emissions in 2018 were an estimated 6.1 (2017: 4.8) million tonnes. The share of Scope 3 emissions was 23% of our total greenhouse gas emissions. We estimate that all our Scope 3 emissions come from fossil energy sources.

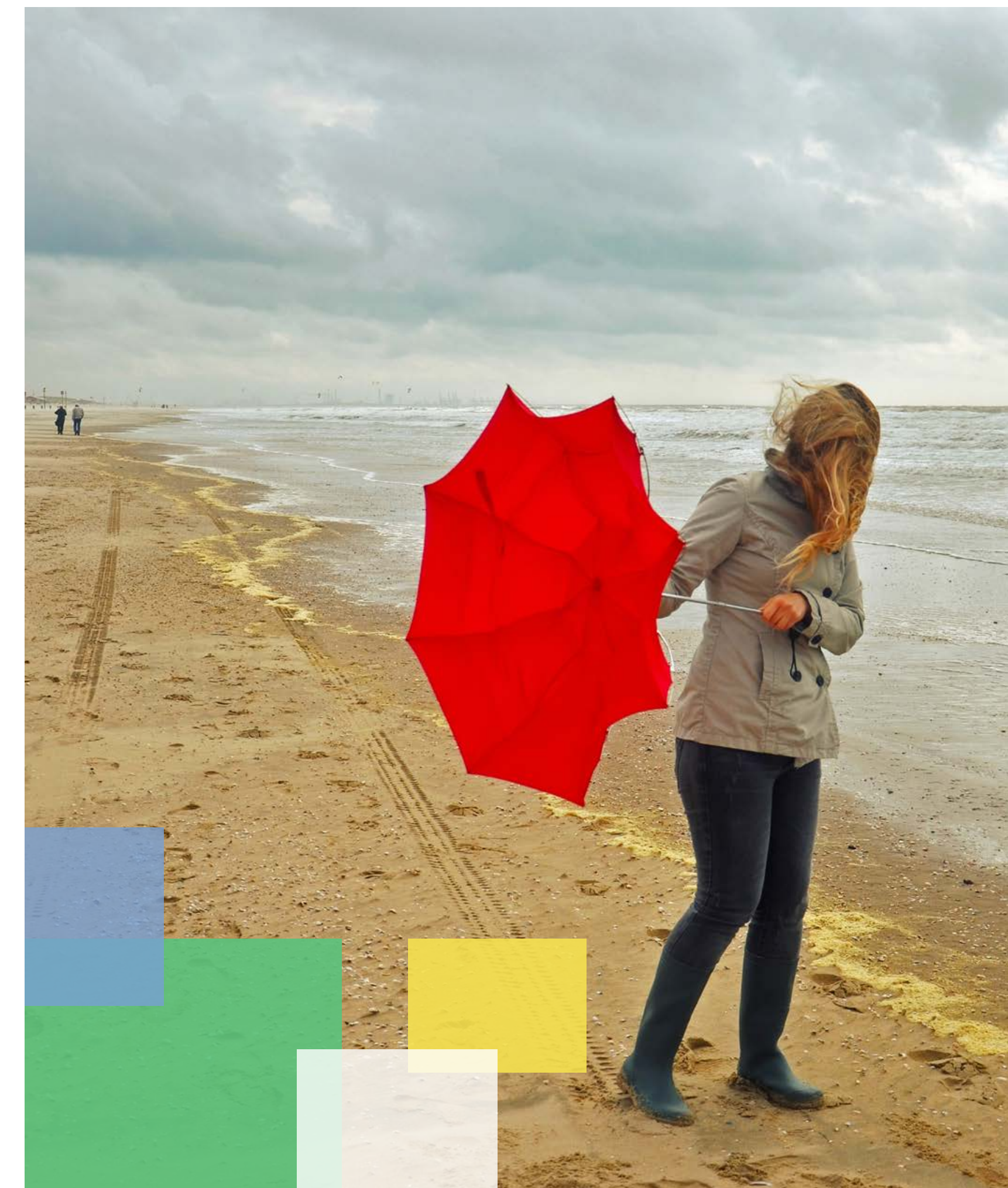
### Indirect greenhouse gas emissions (Scope 3) in 2016–2018 (GRI 305-3)

t CO <sub>2</sub> -ekv	2018	2017	2016
Fuel procurement	5,489,600	4,225,800	4,347,900
Purchased goods and services	260,900	371,700	233,700
Capital goods	310,700	229,400	142,700
Other activities	19,700	17,600	17,500
<b>Total</b>	<b>6,080,900</b>	<b>4,844,500</b>	<b>4,741,800</b>

We report Scope 3 greenhouse gas emissions in accordance with the requirements of the Corporate Value Chain (Scope 3) Accounting and Reporting standard. The volumes describing the scope of the various activities have been obtained from our monitoring and reporting systems.

About 12% (2017: 18%) of the purchases were excluded from the purchasing categories defined by Fortum's Procurement function, due to insufficient reporting. The emissions for these are estimated with the average emissions factor of the specified purchasing categories. The specific emission factors used in calculating the greenhouse gas emissions are based on different literature sources. In 2018, we updated the emissions factors, so the calculated emissions are not fully comparable with previous years.

▶ [Fortum's CDP Climate Change 2018 response](#)





Case | Reducing CO<sub>2</sub> emissions with carbon capture



Photo: Einar Aslaksen

In order to take concrete steps towards decarbonisation, the Norwegian government has launched a Carbon Capture and Storage (CCS) project. The City of Oslo is aiming for a 50% reduction in greenhouse gas emissions by 2022 and a 95% reduction by 2030. The CCS project at Fortum Oslo Varme's Klemetsrud waste-to-energy plant is the single most important initiative to achieve the target.

Launched in August 2018, the CCS project at the Klemetsrud waste-to-energy plant is currently in the preliminary planning phase. The plant uses municipal waste in the production of electricity and heat. Because the waste cannot be recycled or recovered as material, using it in energy and heat production reduces the amount of waste ending up in landfills. The process removes hazardous gases and other substances, but still produces carbon dioxide emissions. The problem can be solved using CCS technology that is already in use in Canada.

Fortum Oslo Varme's plan is to capture 400,000 tonnes, i.e. 90%, of the waste-to-energy plant's CO<sub>2</sub> emissions. In the plan, the captured carbon dioxide is converted into a liquid form, transported to a port, and shipped to an intermediate storage on the west coast of Norway. Finally, in collaboration with partners (e.g. Equinor), the CO<sub>2</sub> is pumped below the seabed and stored in old, depleted oil and gas reservoirs. In addition to the CO<sub>2</sub> from Norway, the reservoirs can also be used to store liquefied carbon dioxide from other European countries.

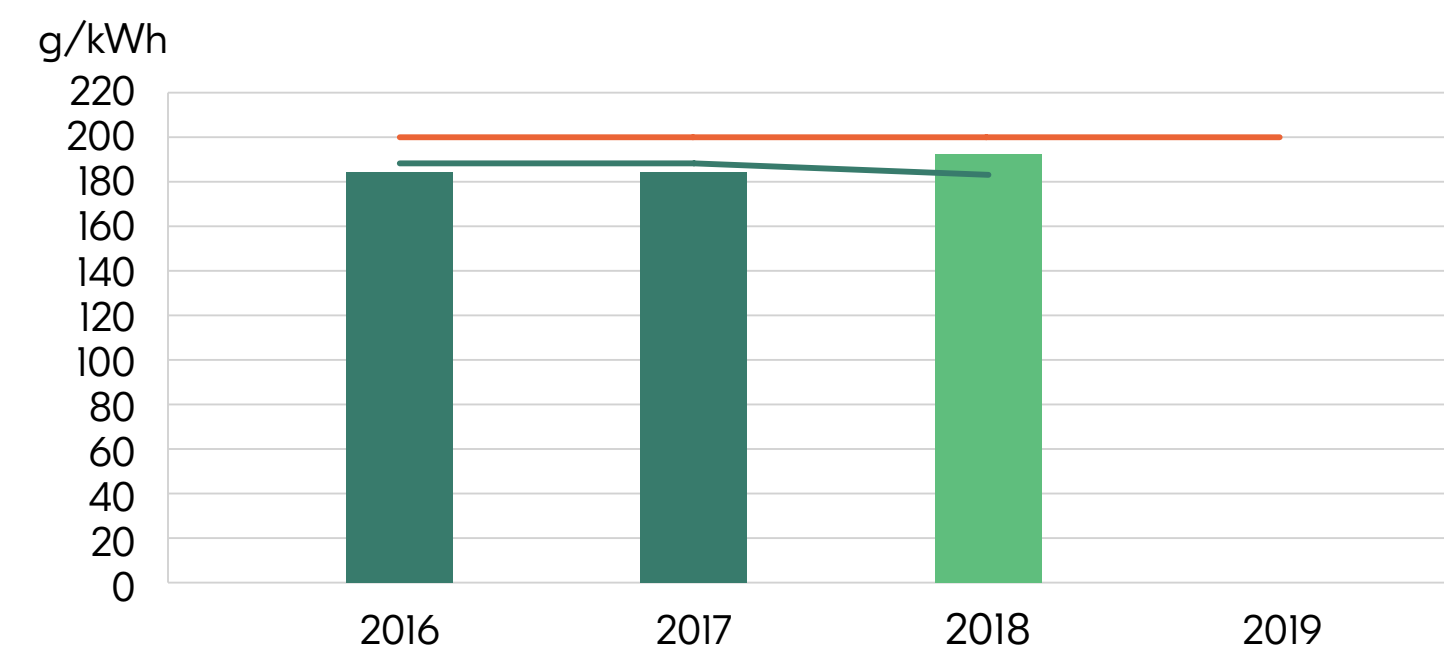
The Oslo CCS project's target is to submit the final project plan to the Norwegian government in August 2019. The Parliament's decision on the matter is anticipated in 2020 or 2021. The project is expected to be launched in 2023 or 2024.



### Specific carbon dioxide emissions

Our specific carbon dioxide emissions (Scope 1) from total energy production in 2018 were 192 (2017: 184) g/kWh. The five-year average, including 2018, was 186 (2017: 188) g/kWh, which is below the Group-level target of 200 g/kWh.

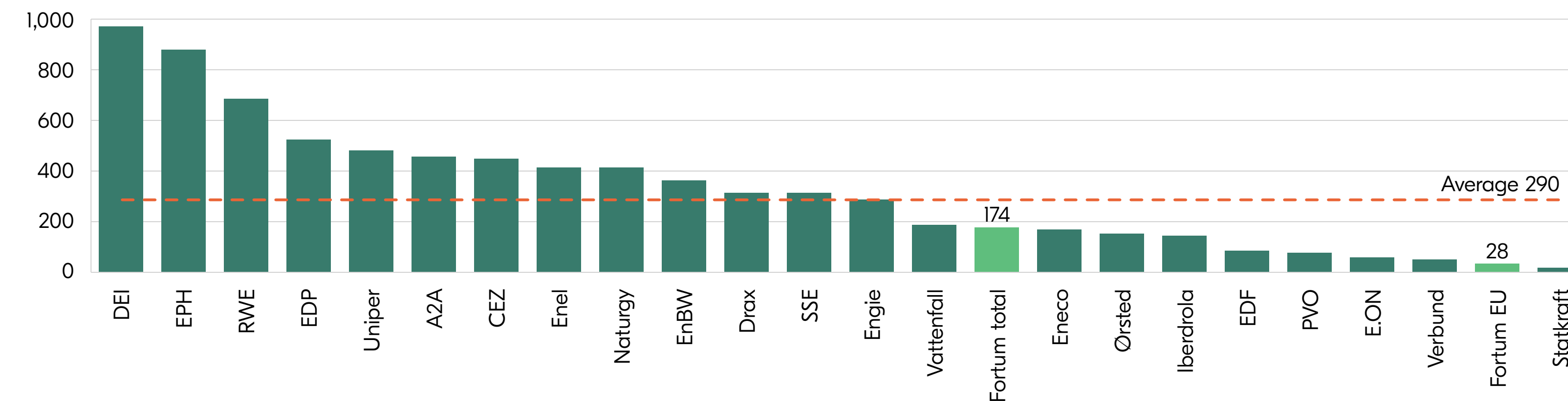
### Specific carbon dioxide emissions of total energy production in 2016–2018 (GRI 305-4)



- Annual specific emissions
- Specific emission (5-year average)
- Target (5-year average)

Our specific carbon dioxide emissions from total electricity production (Scope 1) in 2018 were 186 (2017: 174) g/kWh. Our specific carbon dioxide emissions from electricity production in the EU area were 26 (2017: 28) g/kWh. The specific carbon dioxide emissions from our electricity production, measured as g CO<sub>2</sub>/kWh, are low compared to other European electricity producers. Our specific emissions in 2017 were one of the smallest among European major electricity utilities. European reference data for 2018 is not yet available.

### Specific CO<sub>2</sub> emissions of major utilities in Europe, g CO<sub>2</sub>/kWh electricity, 2017



Note: All figures, except "Fortum total", include only European power generation. Fortum's specific emissions of the power generation in 2018 in the EU were 26 g/kWh and in total 186 g/kWh. Source: PwC, December 2018, Climate Change and Electricity, Fortum

The boundary for specific carbon dioxide emissions generated from electricity production differs from other **environmental reporting principles**. The figures include also figures from Fortum's share in associated companies and joint ventures that sell their production to the owners at cost. This electricity production is based on hydro, wind and nuclear power, and the production doesn't cause direct carbon dioxide emissions.

In the calculation of electricity production's specific emissions, CHP plant emissions have been allocated for electricity and heat using the efficiency method presented in the Greenhouse Gas Protocol guidelines, with heat production efficiency of 90% and electricity production efficiency of 40%.

## 186 g/kWh

Specific CO<sub>2</sub> emissions,  
5-year average

Target: <200 g/kWh



## Improving energy efficiency

We can reduce emissions to the environment in relation to the produced energy, mitigate climate change, and decrease our production costs by improving the energy efficiency of electricity and heat production.

Improving energy efficiency at power plants refers to measures we implement to increase the efficiency of production processes or reduce the energy consumption of plants or equipment. This enables us to produce more electricity or heat for our customers without increasing fuel consumption.

The energy efficiency of power plants can be increased through investments and technical improvements, preventive maintenance, and by training personnel in the optimal operation of the plant and in monitoring the plant's operating economy. Improving power plant availability also increases energy efficiency, as unplanned plant start-ups are reduced.

### Energy-efficiency investments

In fuel-based energy production, we aim to utilise the fuel's energy as efficiently as possible. Our most important means to improve the energy efficiency of fuel use is to increase combined heat and power (CHP) production. In CHP production, up to 90% of the energy content of the fuels can be utilised. Separate electricity production's efficiency is about 40–60%.

In 2018, the high-pressure turbine was replaced at the Loviisa power plant's unit 2. The unit's nominal output increased by 5 MW, which means that in an average year it can produce 40 GWh more electric energy. Similar modernisations were implemented at the Loviisa plant during the annual outages in 2016 and 2017.

In addition, other projects to improve energy efficiency were completed in 2018:

- Pärnu power plant's boiler refurbishment and fuel and air supply improvements in Estonia, 28 GWh
- Hydropower plant refurbishments in Sweden, 15 GWh

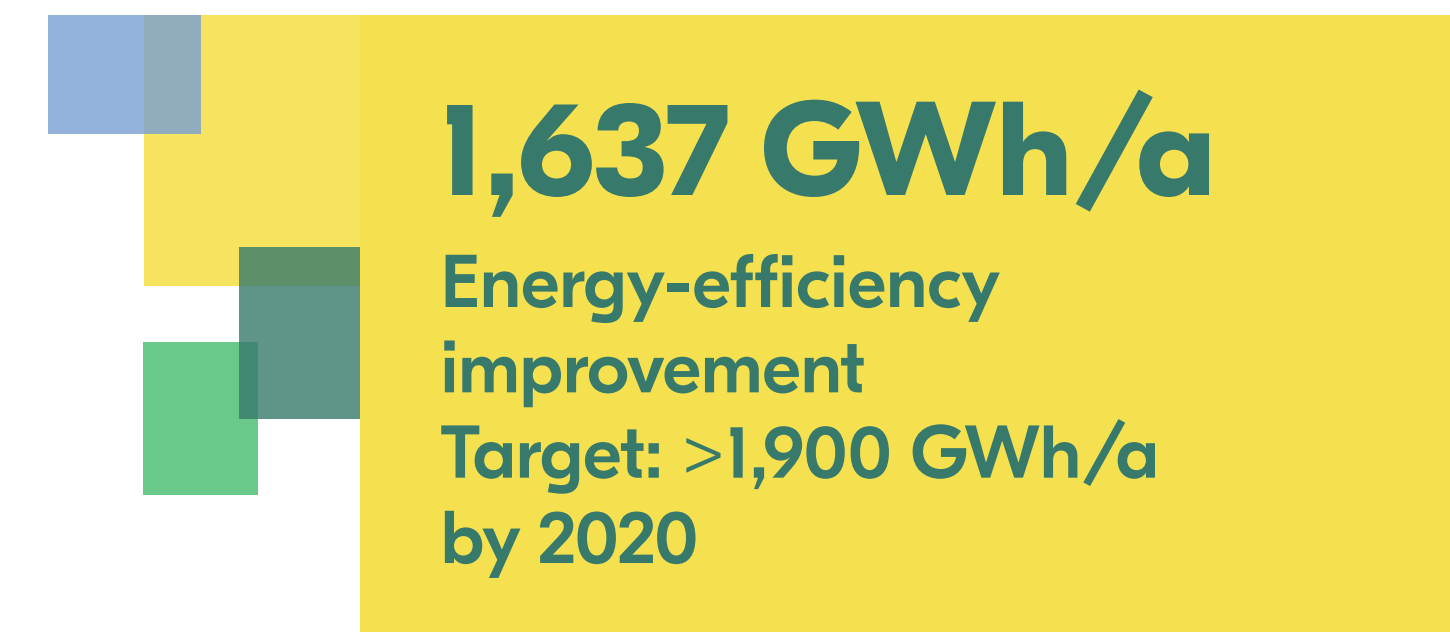
The combined annual energy savings of the energy-efficiency improvement projects is about 135 GWh. Fortum's target is to achieve an annual energy-efficiency improvement of more than 1,900 GWh by 2020 compared to 2012. By the end of 2018, the annual cumulative energy-efficiency improvement achieved was 1,637 GWh. By the end of 2017, we exceeded the previously set cumulative annual energy-efficiency target of 1,400 GWh by about 100 GWh, so the annual target was raised by 500 GWh.

### Energy-efficiency services for homes and businesses

Fortum has introduced energy-efficiency services for private customers in Finland and Sweden. Fortum's customers can, for instance, monitor their electricity consumption with an in-home display or control and optimise the heating of their homes based on electricity price and use.

Fortum's operation and maintenance services have been improving the energy efficiency of our customers' power plants already for decades. Our energy-efficiency services review, in addition to an individual power plant, the development of a broader urban area and the profitability and environmental impacts of investments related to them. In addition to production, the review takes into consideration the energy distribution to customers and the changes in energy consumption.

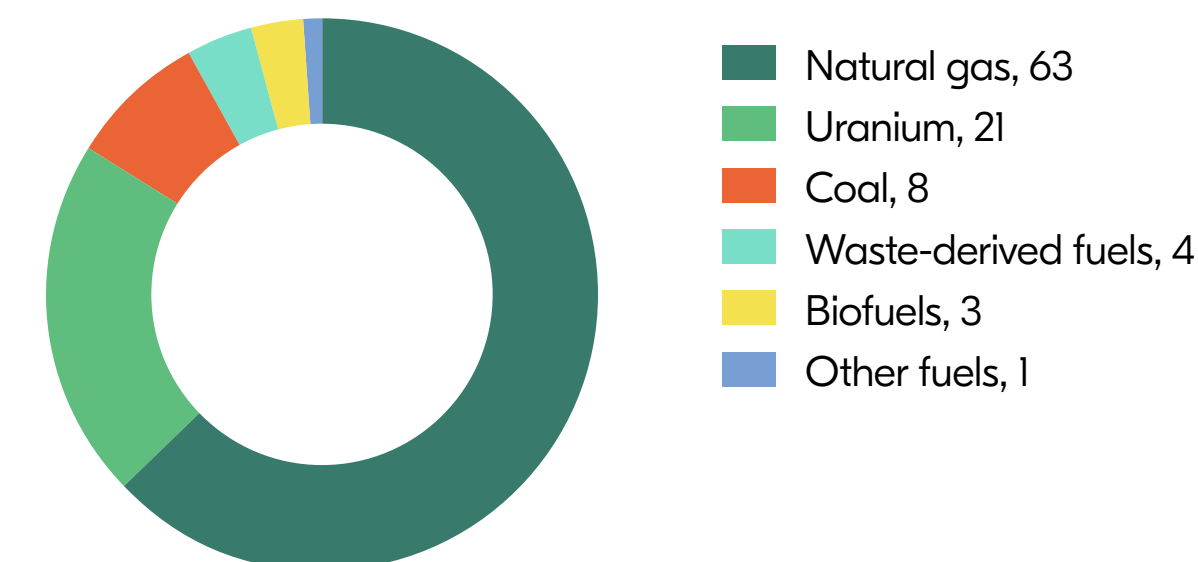
- ▶ Energy-efficiency services for homes
- ▶ Energy-efficiency services for businesses



### Fuel consumption

The most significant fuel used in our energy production was natural gas, and the next highest fuel used was uranium and coal. Our goal in the future is to produce increasingly more added value from biofuel and waste-derived fuel. The share of waste-derived fuel used in energy production in 2018 increased due to the growth of our circular economy business.

Fuel consumption in energy production, %





**Fuel use in 2016–2018, energy (GRI 302-I)**

Petajoules	2018	2017	2016
Natural gas	272.7	246.1	247.6
Nuclear fuel	91.4	83.8	91.1
Coal	36.4	39.0	40.6
Waste-derived fuel, fossil	8.8	7.6	3.6
Peat	2.1	1.9	1.8
Other fossil fuels	0.4	0.3	0.6
<b>Non-renewable fuels total</b>	<b>411.8</b>	<b>378.8</b>	<b>385.4</b>
Biofuel	11.9	11.2	10.2
Waste-derived fuel, renewable	6.3	4.4	2.5
<b>Renewable fuels total</b>	<b>18.2</b>	<b>15.6</b>	<b>12.7</b>
<b>Fuels total</b>	<b>430.0</b>	<b>394.4</b>	<b>398.1</b>

**Fuel use in 2016–2018, mass/volume (GRI 301-I)**

	2018	2017	2016
<b>Non-renewable fuels</b>			
Natural gas, million m <sup>3</sup>	8,058	7,151	6,710
Coal, 1,000 t	1,782	1,999	2,208
Waste-derived fuel, fossil, 1,000 t	863	751	344
Peat, 1,000 t	221	190	178
Fuel oil, 1,000 t	16	10	21
Nuclear fuel, t	20	23	20
<b>Renewable fuels</b>			
Biofuel, 1,000 t	1,180	1,142	1,041
Biogas, million m <sup>3</sup>	3	3	3
Waste-derived fuel, renewable, 1,000 t	589	428	225

The energy-specific fuel consumption has been calculated based on the usage volumes and fuel-specific caloric values measured at the power plants. Uranium consumption has been calculated from the thermal heat generation in the reactors. In 2018, Russia's share of our total energy-specific fuel consumption was about 67%. Russia accounted for 98% of our use of natural gas and 56% of our use of coal.

**Energy intensity**

In 2018, our fuel consumption in electricity and heat production was a total of 119 (2017: 110) TWh, or 430 (2017: 390) PJ. Additionally, we acquired 530 (2017: 480) GWh, or 1.9 (2017: 1.7) PJ, of electricity from external electricity suppliers. With these energy resources, we produced 55,600 GWh of electricity, 29,300 GWh of heat, 40 GWh of cooling, and 20 GWh of bio-oil. The total energy consumption, calculated as the difference between the procured energy resources and net production, was 51,000 (2017: 45,000) GWh, or 180 (2017: 160) PJ.

In combustion-based energy production, we aim to utilise the fuel as efficiently as possible. In 2018, our average fuel use efficiency was 58% (2017: 59%). The increased condensing power production in Russia and the increased use of waste-derived fuels have contributed to the decrease in the fuel use efficiency. The efficiency has been calculated by dividing the electricity and heat energy produced with the fuel by the energy content of the fuel used in the production.

The energy intensity of our own production was 1.7 (2017: 1.7). The intensity figure has been calculated by dividing the amount of used energy resources by the total net production of energy products, including also hydropower, wind power and solar power.

▶ **Origin of our fuels**

**Fuel use by country in 2018 (GRI 301-I)**

	Finland	Russia	Poland	Estonia	Denmark	Other countries	Total
<b>Non-renewable fuels</b>							
Natural gas, million m <sup>3</sup>	97	7,932	1	7		21	8,058
Coal, 1,000 t	330	1,093	358				1,782
Waste-derived fuel, fossil, 1,000 t	198		0		196	469	863
Peat, 1,000 t	134			76		10	221
Fuel oil, 1,000 t	8	1	2		3	4	16
Nuclear fuel, t	20						20
<b>Renewable fuels</b>							
Biofuel, 1,000 t	368		154	469		189	1,180
Biogas, million m <sup>3</sup>	3						3
Waste-derived fuel, renewable, 1,000 t	259		0			330	589



# Circular economy

Challenges for rapidly growing major cities and growth centres include not only the management of emissions, but also growth in waste volumes. Our goal is to offer customers sustainable circular economy services and expert solutions. Reliable waste management and resource efficiency are important in a sustainable society.

Fortum's aim is to promote the transition towards a more comprehensive circular economy. By circular economy we mean that materials are utilised as efficiently as possible and hazardous materials are removed from circulation. We also recover by-products and wastes generated in energy production whenever possible.

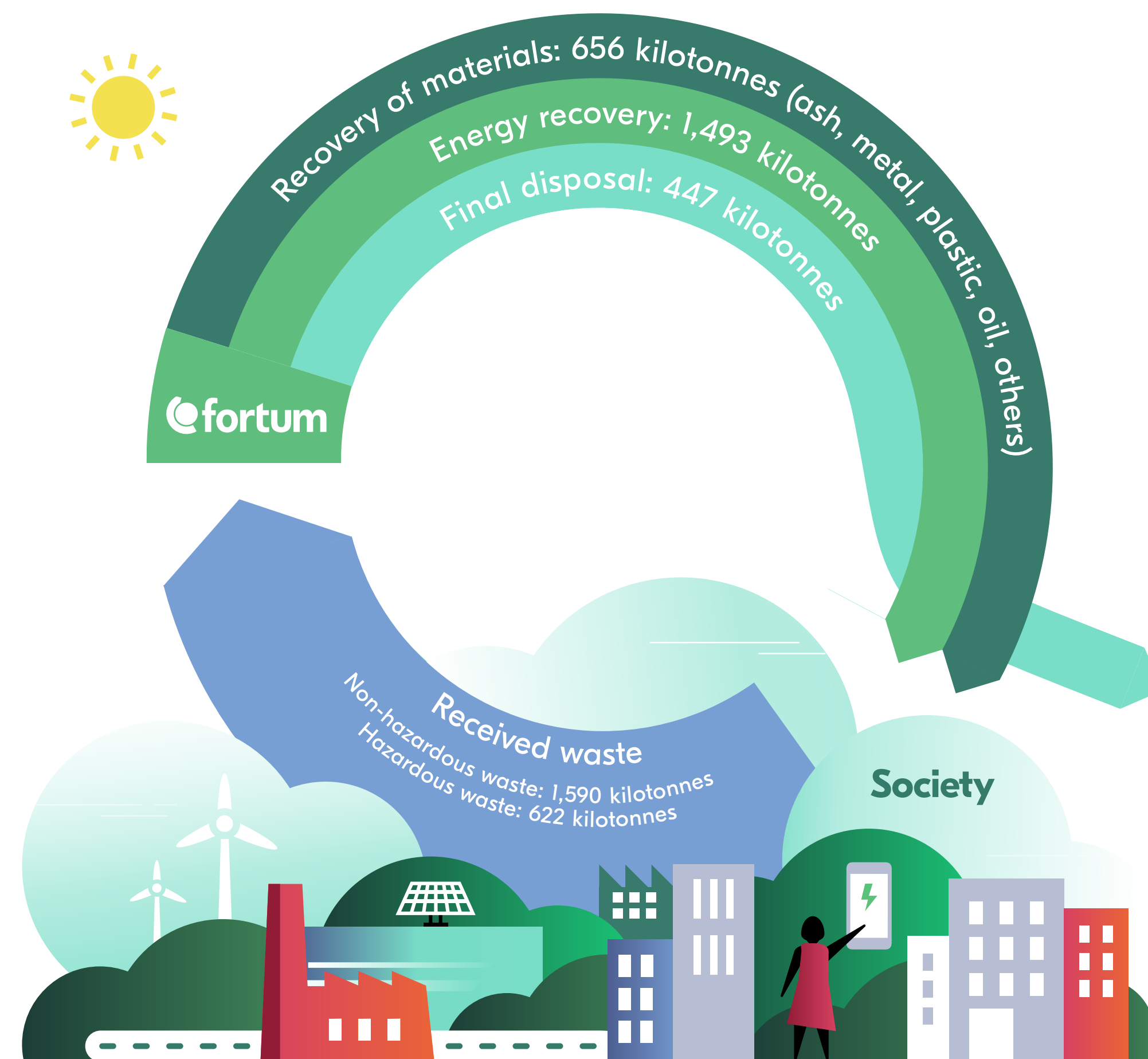
## Circular economy business is expanding

In September 2018, we opened a new processing line at the Riihimäki plastic refinery in Finland. The investment triples the refinery's processing capacity to about 30,000 tonnes a year. At the Riihimäki plastic refinery, Fortum produces mechanically recycled plastic from packaging waste recycled by consumers and industry, saving energy and natural resources.

We expanded high-value recycling to metals by acquiring the recycling business of the Finnish Fincumet in late 2018. The business receives and treats metals. After treating, the raw material is sold for reuse or downstream processing in Finland and abroad.

Additionally, we started the trial run of the new Zabrze CHP plant in Poland. The plant also combusts refuse-derived fuel (RDF), and the share of waste is about 40–50% of the fuel use.

## Received and treated waste from customers in 2018



In 2018, **98%** of Inkoo power plant's demolition waste was recovered.



### Waste management services

We offer waste management services for customers in the Nordic countries and Lithuania. As much of the waste stream as possible received from customers is recycled, reused or recovered as raw material.

In 2018, we received a total of approximately 1.6 (2017: 1.5) million tonnes of non-hazardous, conventional waste from our customers. Of the conventional waste, contaminated soil accounted for 149,000 (2017: 212,000) tonnes, and ash 191,000 (2017: 301,000) tonnes. We also received about 600,000 (2017: 700,000) tonnes of hazardous waste from our customers; contaminated soil accounted for 60,000 (2017: 88,000) tonnes of that amount and ash 79,000 (2017: 88,000) tonnes.

Waste that is unsuitable for recycling or reuse as a material is incinerated in our waste-to-energy plants. This reduces the use of virgin fossil or renewable fuels in electricity and heat production. Waste that is unsuitable for recovery is disposed of at landfilling sites.

### Received and treated waste from customers in 2018

kilotonnes, 1,000 t	Finland	Sweden	Norway	Denmark	Other countries	Total
<b>Received waste from customers</b>						
Non-hazardous waste	743	212	378	0	257	1,590
Hazardous waste	220	185	0	217	0	622
<b>Recovery and disposal</b>						
Recovery of materials <sup>1)</sup>	238	330	53	32	3	656
Energy recovery (waste incineration)	484	163	379	210	257	1,493
Final disposal <sup>1)</sup>	218	73	65	13	79	447

1) Includes received waste from customers and also ash from waste incineration

### Recovery of materials

Various types of waste can be reused as raw materials. Of the waste received from our customers in 2018, we recovered as materials about 656,000 (2017: 634,000) tonnes; environmental construction materials accounted for about 418,000 (2017: 362,000) tonnes of that amount and recoverable ash accounted for about 128,000 (2017: 159,000) tonnes, and processed raw materials and products about 72,000 (2017: 68,000) tonnes. The material recovery rate of the waste was 59% (2017: 57%).

In addition, about 225,000 (2017: 226,000) tonnes of recoverable materials originated at Fortum's own power and heat plants.

We are continuously developing activities that increase the proportion of waste materials kept in circulation:

- We produce **recycled plastic** out of plastic packaging waste received from customers.
- We pick up and process customers' waste oils to be refined and recycled as industrial lubrication oils.

- We recycle scrap metals generated in the maintenance activities of our power plants and other facilities. We also process and recycle metals separated from customers' waste and boiler slag from energy production.
- We process slag, sand, sludge, dredging masses and slurry from energy production and other industries for reuse in various types of environmental construction and earthwork.

### Hazardous waste treatment

We offer solutions to treat hazardous waste, we take hazardous waste out of circulation in a sustainable manner and we clean the hazardous substances from materials that end up in recycling. At the same time, we produce energy and ensure the safe final disposal of waste. High-temperature incineration is the best available solution for the destruction of hazardous substances.

We have three high-temperature incineration plants: in Riihimäki, Finland; Kumla, Sweden; and Nyborg, Denmark. At these facilities, 359,000 (2017: 353,000) tonnes of hazardous waste and 457,000 (2017: 390,000) tonnes of non-hazardous waste were incinerated in 2018, producing electricity and district heating for the surrounding areas.

### Contaminated soil

In 2018, we received and treated about 209,000 (2017: 300,000) tonnes of contaminated soil from our customers. We directed metal, rocks, concrete and wood, sieved from the soil for reuse as raw materials. Soil that is suitable for environmental construction is used at our own construction sites and industrial waste treatment centres. In addition, we treated about 30,000 (2017: 140,000) tonnes of contaminated soil at customers' sites.



## Case | Demolition of Inkoo coal-fired power plant turns waste into raw materials



Fortum is demolishing its old, decommissioned coal-fired power plant in Inkoo, Finland. A circular economy principle is being applied at the demolition site. The demolition project got under way in spring 2017 and is one of the biggest in Finland’s industrial history. Fortum’s waste management services is responsible for the demolition work.

The work site’s biggest recyclable fractions are scrap metal and pulverised concrete. The pulverised concrete is used as fill for the site’s old ash basins and to level the land at the site. Scrap metal is sold as raw material for new products.

In February 2018, a load of scrap metal was shipped – for the first time in Fortum’s history – from Inkoo to Turkey. The scrap metal ended up as raw material for local industry, i.e. the metal from the power plant’s walls will be reused. In 2018, an average of 1,000–2,000 tonnes of scrap steel per month was also transported by truck to Imatra, Finland, to the project’s single biggest scrap metal recycling facility. Recycling metal saves natural resources and reduces carbon dioxide emissions because the metal can be reused in new products again and again.

The demolition of the power plant is estimated to generate a total of about 180,000 tonnes of various materials. In 2018, the demolition project generated a total of 24,000 tonnes of waste, about 1,000 tonnes of which was hazardous waste. In 2018, 98% of the demolition waste was recovered. The amount of recycled scrap metal alone in 2018 was above 19,000 tonnes.

Of all the power plant demolition waste generated from the beginning of the project to the end of December 2018, 96% has been recycled or reused on site. The demolition site is an excellent example of Fortum’s circular economy business, where waste is converted into valuable raw materials.



## Waste and by-products

Ash is a by-product generated in the use of fuels in power and heat production, and gypsum and other desulphurisation products are by-products of flue-gas desulphurisation. Ash and desulphurisation products account for a more than 90% share, on average, of the by-products and waste from our energy production.

The maintenance of power and heat plants generates scrap metal and other conventional industrial waste and, to a smaller extent, waste oil and other hazardous waste. We aim for the highest possible utilisation and recovery of by-products and waste. The waste management service providers we use are properly licensed and reliable waste management companies.

In addition to conventional industrial waste, the Loviisa nuclear power plant also generates radioactive waste, which we treat in accordance with the requirements of Finnish nuclear energy legislation. The volume of radioactive waste generated is small, but special solutions are needed in their treatment and final disposal.

The total volume of by-products and waste generated at all Fortum's power and heat plants in 2018 was about 770,000 (2017: 850,000) tonnes. Of this volume, about 50% (2017: 45%) was recovered. With the growth of our circular economy business, the use of waste-derived fuel has increased and, consequently, the volume of by-products.

### Ash and gypsum

Ash is created in the combustion of all solid fuels. Almost 70% of the ash from our plants operating in Europe is utilised as a raw material, e.g. for the construction industry, road construction and soil improvement, and as backfill. Ash from the power plants in Russia is stored in ash basins, because there is no demand for wet ash sludge in Russia.

Coal-fired power plants generate either a wet or semi-dry desulphurisation by-product. Gypsum created as a by-product in the wet desulphurisation process at the Meri-Pori power plant in Finland is suitable for use as raw material for the construction industry. In 2018, 99.5% (2017: 100%) of the gypsum was recovered. The desulphurisation

product created at the Suomenoja power plant is not suitable for utilisation.

In 2018, about 730,000 (2017: 810,000) tonnes of ash, 3,300 (2017: 4,000) tonnes of gypsum, and 11,600 (2017: 12,800) tonnes of the other desulphurisation product were generated. About 25% of the ash was generated at Russian plants, 24% in Finland and 15% in Poland. The ash recovery rate was 51% (2017: 47%).

By-products that cannot be utilised are transported to the appropriate final disposal at landfilling sites. In 2018, about 373,000 (2017: 446,000) tonnes of by-products were transported for landfilling, or in Russia for ash basins.

The reported volumes of ash and gypsum from our European power plants are based on the weighing of the truckloads. Ash volumes at our Russian power plants are calculated on the basis of the ash content of the coal.

### Ash and gypsum handling in 2016–2018 (GRI 306-2)

t	2018	2017	2016
Ash recovery	370,000	377,000	255,000
Ash disposal	360,000	433,000	440,000
Gypsum recovery	3,300	4,000	8,500
Gypsum disposal	15	0	0

### Other waste

Other, conventional waste generated during the operation and maintenance of power and heat plants is sorted and waste that can be recycled, such as metal, is sent for further processing. Hazardous waste is delivered to licensed hazardous waste treatment facilities.

The power and heat plants generated a total of about 34,700 (2017: 34,200) tonnes of other waste, approximately 1,700 (2017: 3,200) tonnes of which was hazardous waste. In addition, about 800 (2017: 500) tonnes of contaminated soil was removed for disposal in

Finland. The reported volumes of other waste are based mainly on the information provided by the waste management companies.

### Waste handling in energy production plants in 2016–2018 (GRI 306-2)

t	2018	2017	2016
Material recovery of non-hazardous waste	8,900	3,100	5,500
Energy recovery of non-hazardous waste	500	300	300
Final disposal of non-hazardous waste	23,500	27,500	20,900
Material recovery of hazardous waste	450	200	200
Energy recovery of hazardous waste	300	800	300
Disposal of hazardous waste	1,000	2,200	2,300
<b>Total</b>	<b>34,700</b>	<b>34,200</b>	<b>29,400</b>

### Radioactive waste

The Loviisa nuclear power plant's low-level radioactive maintenance waste is disposed of in Loviisa's repository. In 2018, 13.9 (2017: 19.0) tonnes of low-level radioactive waste went into final disposal.

Intermediate-level radioactive liquid is generated mainly from spent ion exchange resins and wastewater from the controlled area. Liquid waste is processed into solid form at the solidification plant for liquid radioactive waste before final disposal in Loviisa's repository.

High-level spent nuclear fuel is stored in an interim storage at the Loviisa power plant site. In 2018, 20.3 (2017: 23.4) tonnes of spent nuclear fuel was removed from Loviisa power plant's reactors. 2.6 (2017: 2.9) g/MWh of spent fuel was generated per produced energy unit.

Fortum and Teollisuuden Voima have established Posiva Oy to handle the technical implementation of the final disposal of the spent fuel, and final disposal is scheduled to begin at Olkiluoto in Eurajoki in the 2020s.

▶ Nuclear waste management

▶ Final disposal of spent nuclear fuel



# Biodiversity

The degradation of biodiversity is one of the biggest environmental problems globally. We need to know our impacts and dependencies on biodiversity and ecosystem services to be able to assess the related risks and opportunities.

## Our impacts on biodiversity

Our impacts on biodiversity are primarily related to Fortum's hydropower production operations in Finland and Sweden. Hydropower construction and the related water regulation alter the conditions in water systems and thus impact locally the diversity of the aquatic habitat and, in particular, the fish population. Emissions from fossil fuel-based energy production may decrease local biodiversity, especially in Russia. Indirect impacts may be caused by, for example, large-scale procurement of biomass and other fuels. However, our production of carbon dioxide-free energy replaces fossil fuel-based energy production and thus mitigates climate change, which is globally one of the greatest threats to biodiversity.

## Our biodiversity engagement

In 2017, we updated Fortum's [Biodiversity Manual](#), which defines Fortum's approach in biodiversity management. According to the manual, biodiversity issues are systematically considered as part of our environmental management processes and our operations throughout Fortum. The manual contains specific instructions for biodiversity issues in current operations, new projects and the supply chain, as well as for reporting and communication. In 2018, we also published our first [Biodiversity Action Plan](#), the content of which has been designed based on the voluntary measures compiled by the Generation division. The Biodiversity Action Plan describes Fortum's goals, responsibilities, timelines and partners for biodiversity activities.

Sustainable use of biomass fuels has been actively debated in recent years. Fortum has called for EU-wide, harmonised and binding sustainability criteria for all bioenergy. The sustainability criteria defined in the Renewable Energy directive approved in 2018 are in line with Fortum's position. Sustainability of biomass is assessed on a risk-basis and primarily country-specifically. Certification systems offered by third parties can also be used to show sustainability. The implementation of the directive has started in member countries, and at the same time the Commission is preparing lower level guidance on, e.g., sustainability criteria.

Fortum is a member of the Bettercoal initiative and uses the Bettercoal Code and tools in assessing the sustainability of the coal supply chain. Biodiversity aspects related to coal mining are covered in Bettercoal assessments.

We aim to improve biodiversity in connection with our operations, carry out biodiversity-related projects and cooperate with our stakeholders in projects. We assess the impacts of our new projects. We offset and reduce the biodiversity impacts of hydropower production. In 2018, we carried out our obligatory fish care measures valued at EUR 2.5 million and several types of voluntary environmental projects valued at EUR 400,000.

## Habitat restoration and other projects

Most of our habitat restorations and other projects improving biodiversity are related to hydropower production. The actions described below are included in our Biodiversity Action Plan. Additional information about our hydropower-related projects supporting biodiversity is available on our [website](#).

## Hydropower's environmental project portfolio

In 2018, we created a portfolio for hydropower's environmental projects. The purpose of the portfolio is to ensure the systematic assessment of project ideas originating from different entities so that

the most important and most effective projects advance from idea to implementation. At the moment, the portfolio focuses on short-term, realisable measures on Swedish rivers. The portfolio content is affected by not only our own river strategies, but also by collaboration with our external partners, like environmental authorities.

## River continuum renovation projects

In autumn 2018, we removed the dam that regulates Lake Kolsjö in Arvika municipality in Sweden. The dam could be removed because it was deemed to have minor significance in regulating waters and thus in energy production. The project included habitat restoration measures, including the opening of a local passage route for fish and other organisms. The project was jointly financed with Fortum's Bra miljöver environmental fund.

We monitored the development of water levels and riparian vegetation in the vicinity of the outlet of Lake Acksjön, where a dam had been removed for the same reason in 2017. Additionally, we have submitted an application to Sweden's Environmental Court to remove four small dams on the River Klamma.

The above mentioned projects are part of Fortum's small dams programme in Sweden. The programme covers about 80 dams that are no longer of significance for hydropower production. The environmental impacts of each dam removal are assessed. If the dam can be removed without causing adverse impacts on the locals, permission to remove it is applied for. In conjunction with the removal work, the migration connection is restored and, at the same time, the river aquatic habitat is restored. Collaboration with local actors is key so that the measures can be approved and implemented.

## Restoring fish habitat

In 2018, Fortum restored a 1.9 kilometre stretch of the River Bratta, a tributary of the River Norsälven in Sweden. The goal was to increase spawning opportunities for brown trout in the river, so the main



emphasis has been on restoration of spawning gravel areas. The project created a total of 28 spawning areas. The restoration of the River Bratta habitats has also taken into consideration the planned restoration project of the near-by River Rottnan, which also aims to support local brown trout.

**Protection of red-listed species**

At Lake Oulujärvi in Finland, we are taking part in biodiversity enhancing measures in the Önnköri area in Käkilahti. The project is focused on the removal of overly dense aquatic vegetation and on creating wetland habitats for moor frogs, dragonflies, other damselflies, and several bird species.

In autumn 2018 in Sweden, we restored the River Klarälven riverbank, which is a natural habitat for an endangered ground beetle (*Cicindela maritima*). The beetle needs open sand but suffers if the habitat becomes overgrown. The restored banks of the River Klaraälven are the only area on the river where the beetle has been observed in recent years. In addition to the river restoration, we have mapped possible measures to support habitat biodiversity of the areas surrounding eight hydropower plants on the River Klarälven.

Downstream of the River Gullspångsälven in Sweden, we have a joint project with the area’s authorities, the municipality and Karlstad University to strengthen the life-cycle of the endangered landlocked salmon. In the project we are aiming to restore the remaining and the potential habitats in the lower part of the River Gullspångsälven. In 2018, we measured the river bed, flow rates, and the bottom quality of the rapid areas so that we can plan the optimal restoration for the salmon using advanced 3D habitat modelling. Additionally, for four consecutive years we have taken samples and analysed the DNA of salmon roe taken from spawning nests in the rapids areas. The results indicate a positive trend in the spawn volumes of wild salmon in the River Gullspångsälven.

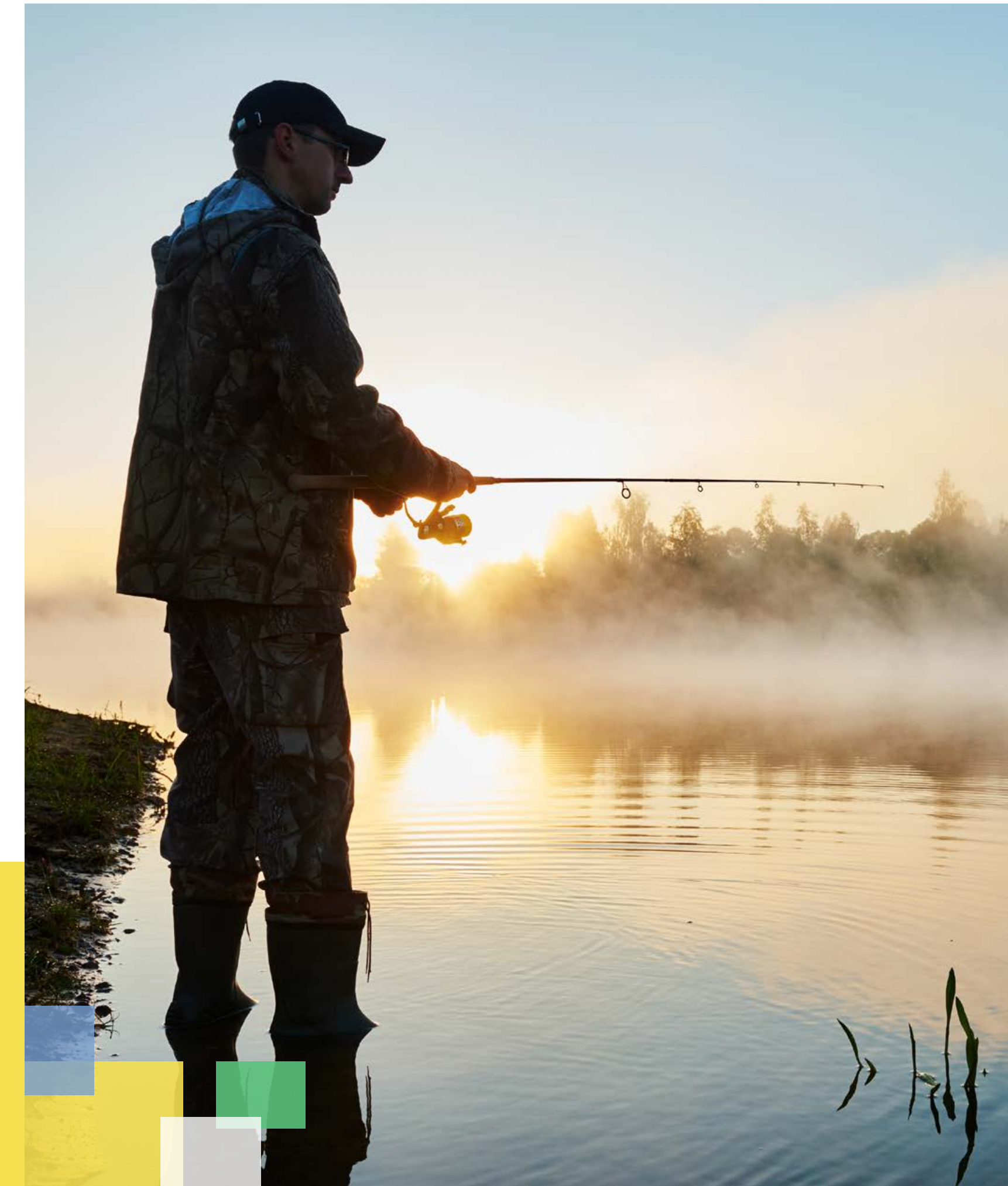
**Biomass fuel-related actions**

Forest certification schemes will continue to play a strong role in verifying the sustainability of wood-based biomass. Certified wood-based biomass fuel originates from sustainably managed forests in which special attention is paid to biodiversity. We annually collect data on the volume of certified wood-based biomass fuel used in our power plants in Finland, Sweden, Norway, Poland and the Baltic countries.

In 2018, we built elements of a Chain of Custody management system for wood-based biomass fuel. Our goal is that 80% of all wood-based biomass fuel we use is verified by a third party by the end of 2020.

► **Environmental impacts of hydropower production**

**In 2018, we published a Biodiversity Action Plan that focuses on environmental impacts from hydropower production and on biodiversity improvements.**





# Emissions into air

Fuel use generates various emissions into the air. We aim to control emissions caused by our operations and to reduce their environmental impacts with combustion technology solutions and flue-gas cleaning technology.

Greenhouse gases that accelerate global climate change are generated primarily from the use of fossil fuels and the combustion of fossil-based waste. Flue-gas emissions causing local environmental and health effects are generated from all incineration.

## Improving air quality

Nitrogen oxides are generated from the nitrogen contained in the fuel and in the combustion air. Sulphur dioxide, in turn, is generated from the sulphur that is an impurity in, for example, coal, peat and oil. Particle emissions are fine-grained ash generated primarily in the combustion of solid fuels and waste. Depending on the origin of the fuel and waste, the particles contain various heavy metals.

It is possible to decrease nitrogen oxide, sulphur dioxide and particle emissions through fuel choices, combustion technology, and various flue-gas cleaning technologies. Fortum has world-class know-how in combustion technology, and we have delivered combustion technology solutions to reduce nitrogen oxide emissions to many customers' power plants. In 2018, we implemented projects to reduce the nitrogen oxide emissions of customers' coal-fired boilers in Poland, Finland and India, and a peat-fired boiler in Ireland.

In Finland, our Meri-Pori and Suomenoja power plants are equipped with a desulphurisation plant. Our waste incineration plants located in Riihimäki, Finland; Kumla, Sweden; Nyborg, Denmark; and Oslo, Norway, are equipped with efficient flue-gas cleaning systems. Harmful emissions into air are minimised with various filters and scrubbers selected on the basis of the waste to be incinerated.

## Stricter standards

The EU has set very strict limits for flue-gas emissions; meeting the requirements necessitates the use of best available technology (BAT). Emissions limits became even stricter when the Industrial Emissions directive came into force in 2016. Our nitrogen oxide, sulphur dioxide and particle emissions have decreased significantly in our European production over the past decades.

All Fortum power plants operate in compliance with the terms of their environmental permits, and the plants meet the new emissions requirements, for the most part. In Finland, to reduce the Suomenoja power plant's nitrogen oxides emissions, modifications were made in 2018 to the coal-fired boiler; an investment was also made to boost the operational efficiency of the desulphurisation plant. In Poland, investments will be made in 2018–2019 at the Rejtana heat plant for a flue-gas cleaning system. The investments reduce nitrogen oxide emissions and sulphur and particle emissions into the air.

Emissions at Russian power plants are limited in accordance with Russian legislation. Upon enactment of new legislation in Russia, the emissions regulations may become stricter.

## Flue-gas emissions

Our nitrogen oxide (NO<sub>x</sub>) emissions were 26,100 (2017: 26,400) tonnes, sulphur dioxide (SO<sub>2</sub>) emissions were 16,800 (2017: 18,800) tonnes, and particle emissions 9,600 (2017: 15,800) tonnes. 80% (2017: 80%) of nitrogen oxide, 75% (2017: 77%) of sulphur dioxide, and 97% (2017: 98%) of particle emissions originated from Russian operations. In 2018, the most significant source of particle emissions, 4,900 (2017: 9,200) tonnes, was the Argayash CHP power plant in Russia.

In 2018, our SO<sub>2</sub> emissions decreased by about 11% and our particle emissions decreased by about 39%. A better quality of coal was used in Russia, and the Argayash CHP plant also used the wet flue-gas cleaning system.

The reporting of sulphur dioxide, nitrogen oxide and particle emissions from our European power plants is based on continuous measurement. Other flue-gas emissions data is based on discontinuous measurements or are calculated using fuel consumption data and specific emission factors. Specific emission factors are based on measurements taken at regular intervals, on information from the equipment supplier, or on regulatory norms.

Carbon dioxide emissions are reported in the section [Greenhouse gas emissions](#).

## Flue-gas emissions in 2016–2018 (GRI 305-7)

t	2018	2017	2016
SO <sub>2</sub> , t	16,800	18,800	22,500
NO <sub>x</sub> , t	26,100	26,400 *	24,800 *
Particles, t	9,600	15,800	16,800
HCl, t	930	960	1,180
Lead, kg	4,240	3,990	4,140
Mercury, kg	118	118	150
Cadmium, kg	103	96	116
Dioxins and furans, mg	630	430	504

\* Figure revised

In 2018, continuous monitoring of flue-gas emissions was implemented at the Chelyabinsk CHP4 plant in Russia. The emissions can be monitored publicly on the Internet.



# Water use

We monitor the water use of our power plants and other functions and implement measures to make water use more efficient when needed. Making water use more efficient reduces environmental impacts and also generates cost savings.

## Risks and opportunities related to water use

The risks related to Fortum’s water availability are, based on our assessment, relatively small. The majority of our water withdrawal is seawater for cooling at condensing power plants. In most cases we don’t consume water in our operations; it is discharged into the same water system from which it was withdrawn.

With efficient water management in hydropower production we can optimise our production and manage the impacts on the environment and on stakeholders. In Sweden, implementation of the EU Water Framework directive will reduce the country’s total amount of hydropower production by about 2% at most. Fortum is a participant in the hydropower environmental fund, which enables compensation for production losses and effective targeting so that the environmental benefits are maximised and the impact on the renewable energy production system is minimised.

Fortum has an advanced risk management process to reduce risks related to dam safety. A long-term program is in place to develop condition monitoring of dams and for securing the discharge capacity in extreme flood situations.

In our operations we are preparing for changes in water availability also in the future as the climate changes. The preparation is related to, for example, production planning, investments, dam safety, flood protection and the rise in the cooling water temperature. In hydropower production planning we are preparing for climate change by taking into consideration changes in precipitation and temperature and extreme weather phenomena, which can cause droughts or flooding. We are also

monitoring the need for adjustments to regulation permits with changes in seasonal variation.

The Loviisa nuclear power plant is prepared for extreme weather phenomena and possible oil spillage resulting from an accident at sea with a seawater-independent back-up cooling system, which includes also air-cooled cooling towers. The temperature increase of the cooling system’s discharge water can be responded to with optimal production planning.

Improving the efficiency of water use at our power plants can reduce environmental impacts, generate cost savings, ensure the acceptability of our operation, and ensure the supply of water also for other purposes.

## Our water use in water-stressed areas

According to the WRI Aqueduct Water Risk Atlas, of Fortum’s power plants the four Chelyabinsk CHP plants and the Argayash CHP plant in Russia are located in an area with a high (40–80%) water-stress level. All Chelyabinsk CHP plants use cooling water towers, which reduces the amount of make-up water needed for cooling. The Argayash CHP plant withdraws cooling water, which is discharged into fresh surface water after use.

The Argayash CHP plant withdraws water from a nearby lake. The water volume of the lake can be increased with water pumped in from another lake. Until 2017, the amount of additional water pumped in wasn’t sufficient and the water level decreased significantly. The permit limits in effect in 2017–2018 have ensured the sufficient availability of water, and the water level has risen again. Fortum is also planning an investment project to improve the efficiency of water use in ash processing. The plan is expected to be ready in 2019; at that time, approval from the authority can be applied for. When the investment project is completed, water will be returned to the plant’s production process, thereby reducing the amount of water withdrawal.

In 2018, temporary permit limits for wastewater discharges were in force at the Russian Chelyabinsk CHP2 and CHP3 and the Argayash CHP plants.

At the end of August 2018 Fortum sold its majority share in the Indian solar power plants, which are located in areas with a high (40–80%) or very high (>80%) water-stress level. Water is used to clean the solar panels at solar power plants.

## Water withdrawal and forms of water use

The majority of our power and heat production capacity is located in the Nordic countries, Russia and Poland. The Baltic Sea and local fresh water systems are the most important water sources for our energy production plants. Additionally, municipal water is used at CHP plants and in waste treatment services. The reported water withdrawal and water use volumes are based on measurements and on calculations of water consumption.

## Water withdrawal in production operations in 2016–2018 (GRI 303-3) <sup>1)</sup>

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Seawater	1,508	1,519	1,533
Fresh surface water	626	605 *	605
Municipal tap water	3	2	2
Groundwater	0.1	0.1	0.1
Other external water supplier	0.3	0.3	0.2
<b>Total water withdrawal</b>	<b>2,140</b>	<b>2,130 *</b>	<b>2,140</b>

<sup>1)</sup> The figures also include the separately reported water withdrawal in water-stressed areas

\* Figure revised



### Water withdrawal in water-stressed areas in 2016–2018 (GRI 303-3)

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Fresh surface water	306	289	299
Municipal tap water	0.5	0.5	0.6
Groundwater	0.01	0.003	0.004
<b>Total water withdrawal</b>	<b>307</b>	<b>289</b>	<b>299</b>

Our water withdrawal in 2018 was 2,140 (2017: 2,130) million m<sup>3</sup>, of which seawater accounted for about 94%. Our water withdrawal in water-stressed areas was 307 (2017: 289) million m<sup>3</sup>, which was about 14% of our total water withdrawal. Virtually all the water withdrawal in water-stressed areas is in Russia.

From the beginning of 2018 to the end of August, Indian water withdrawal was about 22,000 (2017: 6,000) m<sup>3</sup>, i.e. only 0.001% of our total water withdrawal. While our water withdrawal has been very small, we have aimed to increase the efficiency of water use in India.

### Water use in production operations in 2016–2018 <sup>1)</sup>

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Cooling water	2,003	1,990 *	2,031 *
of which seawater	1,508	1,519	1,532
and fresh surface water	496	471	499
Process and auxiliary water	125	125 *	97 *
of which at fish farms	37	43	33
and water supplied to external customers	8	8	8
Make-up water for district heating network	9	11	12
Water recycling	13	13	13

1) The figures also include the separately reported water use in water-stressed areas

\* Figure revised

### Water use in water-stressed areas in 2016–2018

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Cooling water, fresh surface water	242	231	241
Process and auxiliary water, fresh surface water	65	59	58
of which water supplied to external customers	7	7	8
Make-up water for district heating network	8	6	7
Water recycling	6	6	5

### Cooling water in energy production

Condensing power production requires large volumes of cooling water. Cooling water accounts over 90% of our water withdrawal. Fortum has two condensing power plants in Finland: the Loviisa nuclear power plant and the Meri-Pori power plant. Both are located in coastal areas and use direct seawater cooling. No water is consumed in the cooling process, and water withdrawn from the sea is discharged back into the sea. The only change is an approximately 10°C increase in the temperature of the cooling water. Additionally, in Russia, Fortum has the Nyagan condensing power plant, which uses river water for cooling.

Of the water we withdrew in 2018, we used 2,003 (2017: 1,990) million m<sup>3</sup> as cooling water. The Loviisa nuclear power plant withdrew and discharged back into the sea 1,311 (2017: 1,372) million m<sup>3</sup> of cooling water.

Condensing power is occasionally produced also at our CHP plants. In most cases, the cooling water is withdrawn from a local water system, such as a river or lake. Several CHP production plants in Russia and Poland use cooling towers, in which some of the cooling water evaporates into the atmosphere.

### Process water

A power plant needs water in the water-steam cycle when electricity is generated with a steam turbine. Because of leaks in the pipes, occasionally water must be added to the water-steam cycle. Water is also needed in power plant auxiliary processes, for example in flue-

gas cleaning with wet scrubber technology, and in radioactive waste handling and storage at nuclear power plants. Additionally, water is used in processes at waste treatment facilities.

### District heating network

Fortum is a major supplier of district heating in Finland, Norway, Poland, the Baltic countries and Russia. Fortum has a total of about 3,400 kilometres of district heat pipes in these countries. Water is used as the heat transfer medium in district heating. Because of leaks in district heating pipelines, make-up water must be occasionally fed into district heating networks. The volume of make-up water for district heating networks in 2018 was 9 (2017: 11) million m<sup>3</sup>.

### Hydropower production and fish farming

Fortum produces hydropower from water flowing in rivers in Finland and Sweden. Our power plants are typically located in big rivers that have no problems in terms of water supply. Water is not consumed in hydropower production, the water quality is not changed, and it is not typically directed to another water system. However, the water system is often regulated for hydropower production, and the regulation changes the water flow and level patterns compared to their natural state. The water use-related environmental projects implemented with stakeholder groups are reported in the section **Corporate citizenship**.

We have precise knowledge of the water situation in those waterways where we produce hydropower, and we use real-time hydrological forecasts in production planning. Fortum doesn't report river flows as a hydropower production-related water withdrawal.

We farm and stock fish to offset the impacts of hydropower production. The majority of the fresh water withdrawn for fish farming is returned into the bodies of water with only a slight change in its properties.



### Water discharge

We pipe the majority of cooling water and a significant share of wastewater back into the same water system from which the water was withdrawn. In 2018, the water discharge was 2,063 (2017: 2,054) million m<sup>3</sup>. Of this, wastewater accounted for about 3%. The reported wastewater and other water discharge volumes are based on measurements and calculations.

#### Water discharge by recipient in 2016–2018 (GRI 303-4) <sup>1)</sup>

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Sea, cooling water	1,508	1,519	1,532
Fresh surface water, cooling water	496	471	499
<b>Cooling water total</b>	<b>2,003</b>	<b>1,990</b>	<b>2,031</b>
Sea, process water	0.7	0.7	0.7
Fresh surface water, process water	57	62	54
of which from fish farms	37	43	33
Municipal sewage	1.7	1.7	1.3
Other recipient	0.1	0.1	0.1
<b>Wastewater total</b>	<b>59</b>	<b>64</b>	<b>56</b>
<b>Discharge water total</b>	<b>2,063</b>	<b>2,054</b>	<b>2,087</b>

1) The figures also include the separately reported water discharge in water-stressed areas

#### Water discharge in water-stressed areas in 2016–2018 (GRI 303-4)

million m <sup>3</sup> i.e. 1,000 megalitres	2018	2017	2016
Fresh surface water, cooling water	242	231	241
Fresh surface water, process water	12	11	14
Municipal sewage	0.5	0.6	0.6
Other recipient	0.09	0.09	0.09
<b>Discharge water total</b>	<b>255</b>	<b>242</b>	<b>256</b>

Our water consumption includes cooling water that has evaporated from cooling water towers in Russia and Poland, make-up water added to district heating networks, water used in power plant and other production plant processes, and water used to move ash in Russia. Fortum doesn't include water supplied to external customers, 8 million m<sup>3</sup>, in its own water consumption. In 2018, our own water consumption

was about 68 (2017: 65) million m<sup>3</sup>. In the water-stressed area in Russia, our water consumption was about 44 (2017: 40) million m<sup>3</sup>.

The thermal load discharged into water systems with cooling water was 16 (2017: 17) TWh. The Loviisa nuclear power plant's share of this was 15 TWh. Temperature measurements indicate that the cooling water has increased the temperature of surface water by 1–2°C within a 1–2 kilometre radius from the discharge point.

#### Wastewater treatment and effluents

Wastewater generated at power plants and other production facilities is treated either at the plant's own wastewater treatment plant and discharged into a water system or it is piped to a municipal wastewater treatment plant for further processing. In Russia, the wet method is used to pump ash from power plants into ash ponds. Some of the water from the ponds is recycled back to the power plant and some is released into a water system after sedimentation.

Even after treatment, plant wastewater may contain solids, and nutrients, like nitrogen and phosphor, and heavy metals. Wastewater effluents can impact local water quality as well as the nutrient and oxygen balance of the water system. In 2018, our plants generated 59 (2017: 64) million m<sup>3</sup> of wastewater, 97% of which was purified, when needed, and discharged back into the environment, and 3% was piped to municipal wastewater treatment plants. About 1.0 (2017: 1.0) tonnes of oil were released into water systems through wastewater.

About 62% of the wastewater is discharged water from fish farms. Discharged water is purified and its nutrient content is monitored in line with permit conditions. The sludge water separated from the process water at the Montta fish farm in Finland has been piped to a municipal wastewater treatment plant since 2016, which has reduced the nutrient load on the water system.

#### ▶ Fortum's CDP Water Security 2018 response





## Environmental non-compliances

At the Group level, we monitor the number of major EHS incidents, which, in part, reflects the quality of environmental management.

In 2018, there were 18 (2017: 20) major EHS incidents, and 6 (2017: 10) of these were significant environmental incidents. Significant environmental incidents include spills and leaks of over 100 litres into the environment, significant environmental violations, and other environmental non-compliances that have a significant impact on environment.

### Spills and leaks into the environment

In 2018, there were four (2017: 8) spills and leaks of more than 100 litres into the environment. There were two incidents of refrigerant leaks at the Suomenoja heat pump plant in Finland. Also a filtrate water leak occurred at a waste treatment plant in Finland. A fly ash leak took place at the Kumla waste incineration plant in Sweden, in conjunction with the emptying of a silo. The incidents have been investigated to develop preventive maintenance activities and to determine the corrective actions. The incidents did not have significant environmental impacts.

### Environmental violations

There were two (2017: 2) significant environmental permit violations in 2018. At the Riihimäki waste incineration plant in Finland, the mercury emissions limit was exceeded in the flue-gas emissions and wastewater. The incidents have been investigated to determine the corrective actions. The incidents did not have significant environmental impacts.

In 2018, one police investigation and one investigation request regarding a possible environmental violation were initiated. The first investigation targets the handling of the water used to extinguish the significant fire at the Kumla waste incineration and treatment site in Sweden in June. In the other investigation, the authority requested a

police investigation of the possible impact on the aquatic habitat arising from the concrete dust created at the Imatra power plant's dam work site in Finland, as well as the reason for the incident.

### Fires

In 2018, there were 11 (2017:5) significant fires. Seven of the fires took places in recycling and waste solutions. The hot and dry spring and summer seasons, which increase the fire risk for stored waste in particular, contributed to the number of fires. The fires have been investigated to develop and improve operations.

### Environmental enquiries and grievances

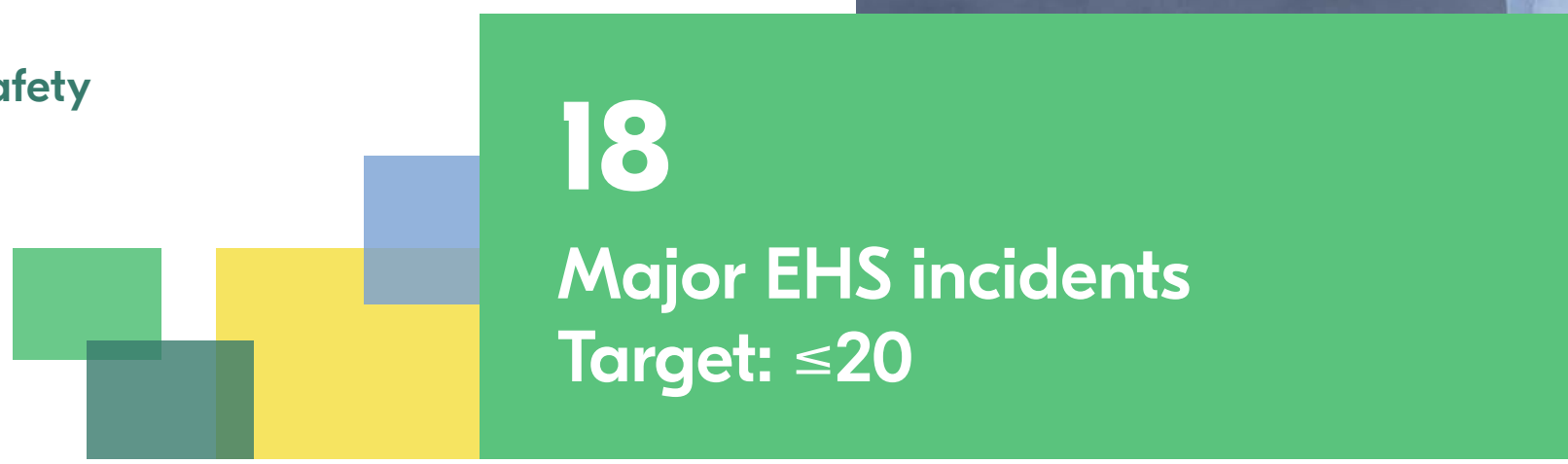
Power plants receive environmental enquiries and other contacts every year, and they are mainly handled locally. The aim is to communicate in advance about upcoming measures that have possible environmental impacts, for example, through local media and at public events.

Fortum's website also has a grievance channel that our stakeholders can use to report problems possibly caused by our operations. No new environment-related grievances were reported to us through this channel in 2018.

### Fines

In 2018, a Fortum employee was fined zloty 400 (EUR 94) for violation of an emission reporting commitment in Poland.

- ▶ Business ethics and compliance
- ▶ Occupational and operational safety





# Personnel and society



We aspire to be a responsible employer and to offer a safe workplace for our employees and for the contractors who work for us. We impact the daily lives of millions of people by securing the functioning of society through an uninterrupted and reliable supply of energy. We engage in an active dialogue with different stakeholder groups and we strive to find a balance between their various expectations.



### Impacts on personnel and society

The emphasis in Fortum’s personnel responsibility is particularly on operational and occupational safety and on employee wellbeing and development. As a financial player, the company has a significant role in Finland, Sweden, Norway, Russia, Poland, and the Baltic countries. An uninterrupted and reliable energy supply for customers is critical for society to function. Satisfied customers are key to Fortum's success and active consumers will have a significant role in the future energy system.

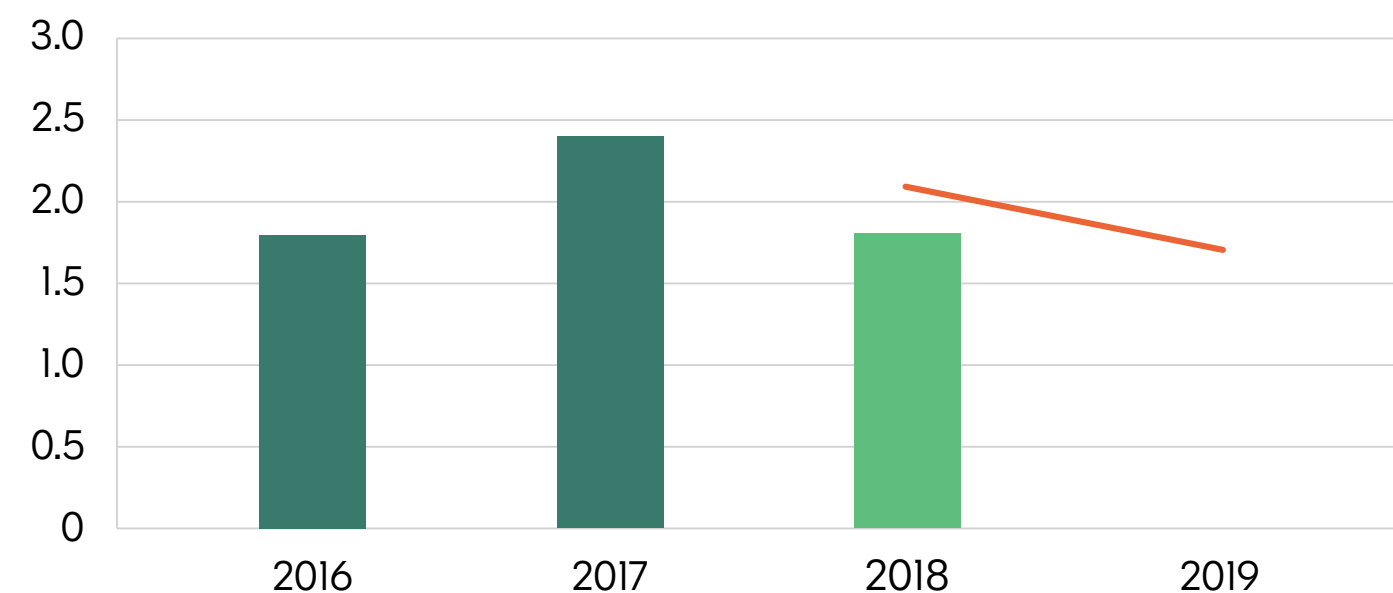
Fortum also has indirect responsibility for its supply chain. We conduct business with viable companies that act responsibly and comply with the Fortum Code of Conduct and the Supplier Code of Conduct. Ethical business practices and respecting internationally recognised human rights are the foundation of Fortum’s Codes of Conduct. Fortum’s sustainability approach also includes being a good corporate citizen and taking care of the surrounding communities.

### Key figures for personnel and social responsibility

Our key figures for personnel and social responsibility are presented in the table and graphs.

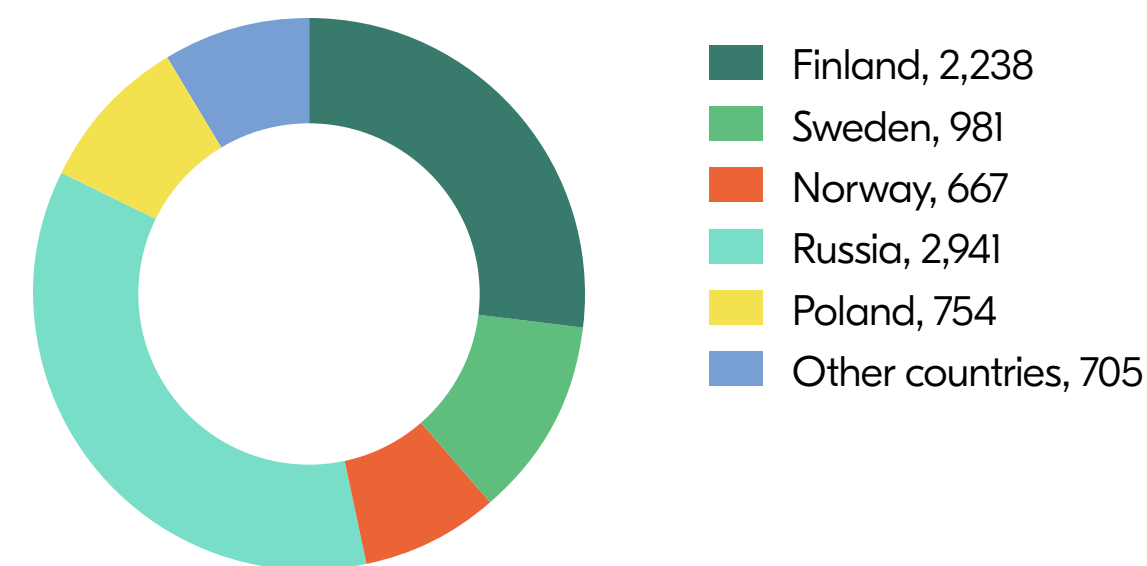
#### Business ethics and compliance

### Combined injury frequency (LWIF), own personnel and contractors



■ LWIF (own personnel and contractors)  
— Target

### Number of employees by country, 31 December 2018



### Key figures for personnel and social responsibility

	2018	2017	2016
CHP plant energy availability, %	96.4	96.1	97.4
Average number of employees	8,767	8,507	7,994
Number of employees, 31 December	8,286	8,785	8,108
Departure turnover, %	16.1	10.5	13.0
Female employees, %	32	32	29
Females in management, %	30	29	25
Sickness-related absences, %	2.8	2.2 *	2.3 *
Lost workday injury frequency (LWIF) <sup>1)</sup> , own personnel	0.2	1.2	1.0
Lost workday injury frequency (LWIF) <sup>1)</sup> , contractors	4.8	4.2	3.0
Severe occupational accidents <sup>2)</sup> , own personnel and contractors	4	1	5
of which fatalities to contractors	2	0	0
Safety-certified <sup>3)</sup> operations in power and heat production, % of sales	97.0	98.4	99.9
Supplier audits, number	13	11	13
Support to society, EUR million	3.8	4.9	2.9

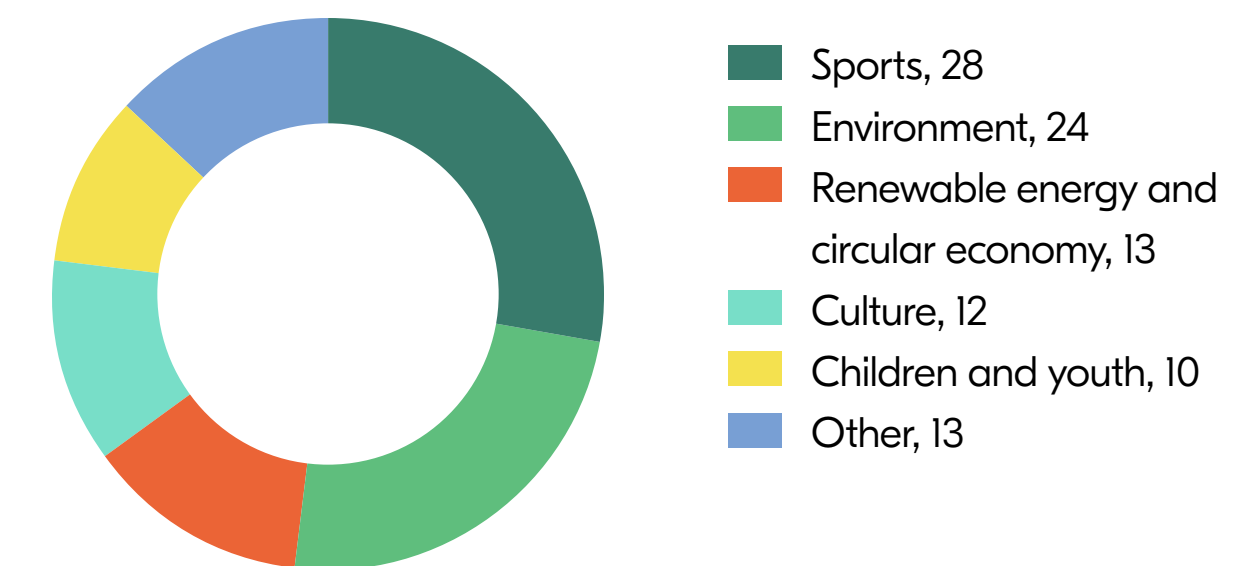
1) LWIF = Lost Workday Injury Frequency, injuries per million working hours

2) Fatality or an accident leading to permanent disability or an accident with severe and life-threatening injuries

3) OHSAS 18001 or ISO 45001

\* Excluding DUON, Hafslund

### Fortum’s support to society by target, %





# Personnel

The change towards a low-carbon energy system requires a new direction in energy production. We can make this change together. We aspire to be a responsible employer that offers a motivating work environment and invests in personnel development and wellbeing.

In 2018, an average of 8,767 (2017: 8,507) employees worked at Fortum. The highest number of employees was in Russia, 3,378 (2017: 3,710) on average. The average and the year-end total personnel figures include 117 employees who are not included in the other figures and tables presented in this report. These individuals are independent contractors working in the Consumer Solutions division in Poland.

Permanent employees accounted for 95.9% (2017: 95.2%) of the personnel. Of these, the share of full-time employees was 98.2% (2017: 98.1%). During the year, 799 (2017: 734) new employees joined Fortum and 1,258 (2017: 855) employment relationships were terminated, 692 of which by the employer. The number of employment relationships terminated due to production and financial reasons was 25. Departure turnover in 2018 was 16.1% (2017: 10.5%). In particular, the transfer of the 500 or so employees to the Yustek joint venture in Russia contributed to the increased turnover. Voluntary departure turnover was 7.2% (2017: 5.4%).

Contractors' employees worked at Fortum sites for a total of approximately 1,007,500 (2017: 1,249,000) days during the year. The figure is based on contractors' hourly logs and on estimates made on the basis of job costs and average hourly rates. The figure has been calculated on the basis of an 8-hour work day.

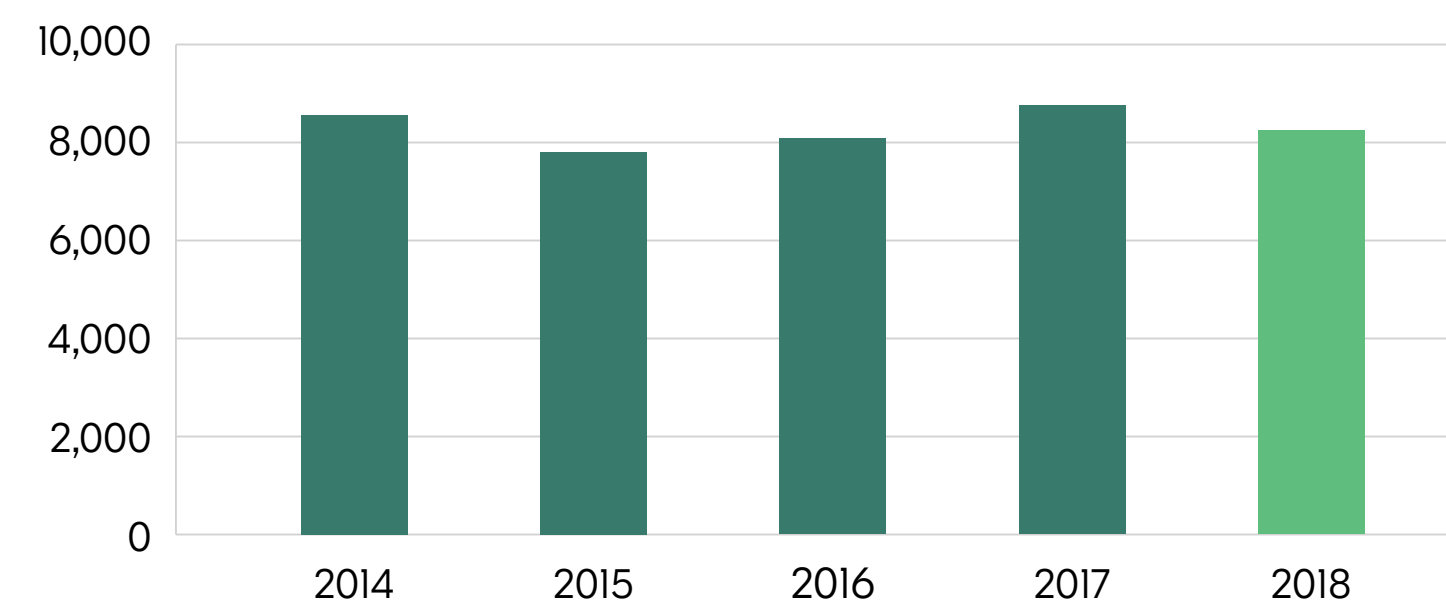
## Personnel statistics from 2018, by country of operation

	Finland	Sweden	Norway	Russia	Poland	Other countries	Total
Personnel at year-end	2,238	981	667	2,941	754	705	8,286
male	1,589	589	403	2,179	441	474	5,675
female	649	392	264	762	313	231	2,611
Personnel, average	2,252	984	670	3,378	798	686	8,767
Personnel expenses, 1,000 euros	194,835	80,853	60,848	68,780	17,848	36,044	459,207
Personnel expenses per person, 1,000 euros	86.5	82.2	90.8	20.4	22.4	52.5	52.4

## Workforce by employment contract and employment type, by region and by gender (GRI 102-8)

	Finland		Sweden		Norway		Russia		Poland		Other countries		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Employment contract</b>	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Permanent	1,534	615	565	374	392	256	2,123	696	344	257	465	212	5,423	2,410
Fixed-term	56	35	24	18	10	7	56	66	10	26	9	19	165	171
<b>Employment type (permanently employed)</b>	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Full-time	1,518	590	556	336	391	242	2,123	694	344	252	456	190	5,388	2,304
Part-time	16	25	9	38	1	14	0	2	0	5	9	22	35	106

## Number of employees, 31 December





### Diversity and equal opportunity

We promote equal treatment and opportunities in the recruiting, remuneration, development and career advancement of personnel, regardless of the employee’s ethnic background, religion, political views, gender, age, nationality, language, sexual orientation, marital status or disabilities.

The average age of our permanent employees was 42.9 (2017: 43.6) years. The share of employees over 50 years old was 29% (2017: 29%). Females accounted for 32% (2017: 32%) of our total personnel. Females accounted for 30% (2017: 29%) of the Group- and division-level management. At the end of 2018, the Board of Directors comprised eight members, three of them were women.

We have previously reported the personnel distribution by age group, gender and personnel group (blue-collar and white-collar employees). From 2018 onward, we are no longer reporting the distribution of personnel groups because the classification of jobs at Fortum is much more fine-grained, and dividing personnel into the two groups mentioned above is not justified.

Any form of harassment is forbidden and addressed immediately. In Finland, Sweden, and India, for example, there are separate guidelines in place for workplace harassment and discrimination. One incident of discrimination was reported in 2018. The investigation of the incident determined that no further actions were required.

### Service years of permanent employees in 2016–2018, %

Years of service	2018	2017	2016
0–5	39	37	33
6–10	18	20	21
11–15	13	10	10
16–20	8	10	10
21–25	7	8	9
26–30	7	7	8
31+	8	7	8

### Total number and rate of new employee hires and employee turnover, by age group, gender and region (GRI 401-I)

	Finland		Sweden		Norway		Russia		Poland		Other countries	
	M	F	M	F	M	F	M	F	M	F	M	F
<b>New employee hires</b>												
age group	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
under 30	26	15	46	25	37	26	60	16	7	18	13	3
30–50	86	29	39	18	23	13	130	51	11	14	23	16
over 50	10	1	6	3	3	1	15	8	0	1	5	1
<b>New recruits, %</b>	<b>8.0</b>	<b>7.3</b>	<b>16.1</b>	<b>12.3</b>	<b>16.1</b>	<b>15.6</b>	<b>9.7</b>	<b>10.8</b>	<b>5.2</b>	<b>12.8</b>	<b>8.8</b>	<b>9.4</b>

	Finland		Sweden		Norway		Russia		Poland		Other countries	
	M	F	M	F	M	F	M	F	M	F	M	F
<b>Employees leaving</b>												
age group	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
under 30	17	9	28	19	12	7	77	46	5	11	4	0
30–50	59	27	32	16	30	25	288	167	18	13	20	9
over 50	7	4	7	6	3	2	188	80	1	0	17	4
<b>Departure turnover, %</b>	<b>5.4</b>	<b>6.5</b>	<b>11.9</b>	<b>11.0</b>	<b>11.5</b>	<b>13.3</b>	<b>26.0 *</b>	<b>42.1 *</b>	<b>7.0</b>	<b>9.3</b>	<b>8.8</b>	<b>6.1</b>

\* Departure turnover was impacted by the transfer of employees to a joint venture in the district heating business.

	Finland		Sweden		Norway		Russia		Poland		Other countries	
	M	F	M	F	M	F	M	F	M	F	M	F
<b>Employees leaving, employee initiative</b>												
age group	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
under 30	16	9	25	19	11	7	23	10	3	9	4	0
30–50	55	24	30	15	29	25	84	31	15	11	16	9
over 50	4	5	6	4	3	2	33	18	1	0	7	3
<b>Voluntary departure turnover, %</b>	<b>4.9</b>	<b>6.2</b>	<b>10.8</b>	<b>10.2</b>	<b>11.0</b>	<b>13.3</b>	<b>6.6</b>	<b>8.5</b>	<b>5.5</b>	<b>7.8</b>	<b>5.8</b>	<b>5.7</b>



Case | **Non-discrimination and equality vigorously supported at Fortum**



Non-discrimination and gender equality have been central topics in the social debate in 2018. Fortum has participated in the discussion by demonstrating its support for workplace equality both internationally and in Finland.

In May 2018, Fortum joined the Equal by 30 campaign at the Clean Energy Ministerial meeting held in Copenhagen. The campaign aims to get governments, the energy industry and other organisations to endorse the principles of equal pay, equal opportunities, and equal leadership by 2030, in line with the UN Sustainable Development Goals (SDG).

In 2018, Fortum also took part in the Work does not discriminate campaign launched by the Confederation of Finnish Industries. The campaign aims to change attitudes and reduce discrimination in the Finnish workplace and to make workplace equality in Finland self-evident.

Fortum also received recognition for its work to promote equality by ranking 50th in the Equileap Gender Equality TOP 200, climbing up more than 80 places from the previous year. Equileap annually collects data on over 3,000 companies in 23 countries. Its assessment criteria are related to the gender balance in leadership and workforce, equal compensation, work/life balance, and policies promoting gender equality in, e.g., recruiting and career development.





### Equal remuneration

Salary levels at Fortum are compliant with established industry practices in each country, local legislation and sector-specific labour market and other agreements.

Remuneration is based on job grade levels, job performance and the individual's competence development. We remunerate personnel for achievement of the strategic business targets and successful implementation of changes. The short-term incentive pay portion of the annual salary is determined based on the individual's job. The amount of incentive pay to be paid is based on the individual's salary and on the achievement of the goals of the business unit and the individual.

The global human resources data system and the harmonised job-grade classification system enable the examination of pay equality for the base salary in all our operating countries. In the table, we have reported the most significant countries in terms of the number of personnel. There is no reporting for other operating countries due to the low numbers of employees. With the corporate acquisitions made in 2017 and 2018, the companies merged with Fortum – and for which the job-grade classification is not complete – are not included in the figures.

Our reporting covers all personnel groups except individuals working in blue-collar positions, which account for 29% of Fortum's total personnel. A male/female comparison of blue-collar positions is not reported because of the small group sizes.

The total number of personnel included in the comparison was 3,068, of which 1,198 (39%) were female. The base salaries of female employees in 2018 were, on average, 4% lower than the male base salaries. When examining the differences by employee group and by country, the differences ranged between -21% and +8%.

### Basic salary and service years of women compared to men (GRI 405-2)

Country	Difference between basic salaries				Difference between service years
	All roles, %	Operational specialists and managers, %	Broad operational professionals and managers, %	Tactical and strategic leaders and middle management, %	Average service years
Finland	-3	N/A *	-1	-7	-1
Sweden	-4	-3	-3	-9	0
Norway <sup>1)</sup>	-7	-2	-9	N/A <sup>2)</sup>	0
Denmark <sup>2)</sup>	-4				-5
Russia	-16	-11	-21	-17	2
Poland	-6	-9	-6	N/A <sup>2)</sup>	-4
Estonia <sup>2)</sup>	-9				-4
Latvia <sup>2)</sup>	3				3
Lithuania <sup>2)</sup>	8				0

1) Excluding personnel transferred from Hafslund companies

2) Role-specific differences are not reported because of the small group sizes

\* No uniform job-grade classification

### Age distribution of permanent employees, by age group and gender (GRI 405-1)

age group	Finland		Sweden		Norway		Russia		Poland		Other countries		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
under 30	136	59	108	82	88	57	224	52	24	81	35	17	615	348
30–50	909	358	283	189	225	156	1,328	443	161	140	256	133	3,162	1,419
over 50	489	198	174	103	79	43	571	201	159	36	174	62	1,646	643

### Group and division-level management, by age and gender (GRI 405-1)

age group	Male	Female
under 30	0	0
30–50	32	11
over 50	25	14



## Employee-employer relations

Fortum’s business operations are developed and strengthened in good collaboration with employees. We believe that the successful management of business is built on relationships of trust between management and employees and on the free flow of information. Fortum respects employees’ freedom of association and the right to collective bargaining.

In our operating countries, freedom of association and collective bargaining are guaranteed by law. The exception to this is India, which has not ratified the International Labour Organisation’s (ILO) Convention on the right to freedom of association and collective bargaining. In India, we comply with the same practices as in other countries of operation, and we do not limit or prohibit the right to freedom of association.

We apply local collective bargaining agreements in compliance with the scope of each respective agreement in all our operating countries. Collective bargaining agreements cover nearly 85% of Fortum’s employees in our biggest operating countries and range from about 4% coverage in Latvia to about 100% in Finland, Sweden, Norway and Russia. There are no collective bargaining agreements in Lithuania, Poland and India. In these countries, employment contracts are based on local legislation and on the company’s human resources policy.

## Fortum European Council

Fortum European Council (FEC) is Fortum’s Europe-level cooperation function in which personnel and employer representatives meet. In 2018, the FEC held a meeting in Finland, and personnel representatives from Finland, Sweden, Norway, Poland, Estonia and Denmark participated. The Council’s meeting focused on, among other topics, Fortum’s strategy and business outlook, the Open Leadership concept, work capacity and wellbeing in the changing working environment, and occupational safety.

Additionally, the FEC personnel representatives convened on their own twice during the year. In addition to Fortum European Council meetings, local level meetings are held several times a year in different countries as needed.

## Restructuring situations

In situations of organisational restructuring, we negotiate with personnel representatives in compliance with each country’s local legislation and contractual procedures. In situations involving personnel reductions, we want to primarily support the reemployment of the personnel.

In restructuring situations, the length of the obligatory negotiation period depends on the scale of upcoming changes and varies in Fortum’s different operating countries. The shortest period for obligatory negotiations is three weeks (Finland) and the longest is 90 days (India). There is no statutory obligatory negotiation period in Sweden, Norway and Lithuania.

The minimum notice period is based on local legislation, collective labour agreements or employment contracts, which are in harmony with the local legislation and agreements.

In situations involving personnel reductions, we offer outplacement services on a per case and per country basis, and, in cooperation with local unemployment authorities or service providers, we investigate the possibilities to arrange vocational or other training that enhances employability. Retraining for employees who continue working is arranged based on organisational and individual needs. In situations involving personnel reductions, the content of the support package that we offer is decided based on local needs. The financial compensation of the package is usually based on the years of employment at Fortum.

## Employee wellbeing

By improving work wellbeing, we support the work environment and a business culture that promotes our employees’ health, occupational safety and the functionality of the work community.

## Energise Your Day wellbeing programme

The Energise Your Day wellbeing programme aims to support and encourage all Fortum employees to maintain and improve their overall wellbeing.

The Energise Your Day programme starts with a self-assessment-based wellbeing survey, which 400 Fortum employees responded to in 2018, resulting in a response rate of 63%. Based on the responses, the most sought after support and tools are for recovery and stress management.

Based on the wellbeing survey results, employees are offered various wellbeing services, such as lectures, coaching clinics, campaigns and other wellbeing activities. The focus areas in 2018 were smart working methods to support new ways of operating and enhancing wellbeing by utilising brain research studies, as well as sleep and recovery. In conjunction with the move of the headquarters, there was a special focus on ergonomic workstations and on being active during the work day, e.g., by providing physical activity stations for use during breaks and other opportunities to exercise.

In 2018, we adopted a new survey related to employee wellbeing. The Wellbeing Pulse Survey is carried out twice a year. Based on the feedback of the total 6,900 Fortum employees who responded to the survey, work wellbeing is at a good level. According to the personnel, wellbeing can be further improved, e.g., by focusing on work-life balance.

**The Energise Your Day programme was expanded to Fortum Recycling and Waste Solutions’ sites in Finland, Sweden and Denmark, and is now under way in ten of our operating countries.**



We promote wellbeing at the workplace also through what is called an early-support model. We increase open communication between employees and supervisors by discussing and mapping the reasons for absences. Training is arranged for supervisors in the management of working capacity and work wellbeing.

### Occupational safety and health care

Occupational safety and health care are organised in our operating countries in line with local legislative requirements. The occupational safety committees represent all personnel groups, and they regularly address issues related to occupational safety and workplace wellbeing.

All our employees are within the sphere of occupational health care. We emphasise the significance of preventive activities in promoting wellbeing in the company. The occupational health care costs per person in Finland, before the share reimbursed by Kela (The Social Insurance Institution of Finland), were EUR 485 (2017: 533).

Fortum conducts regular medical examinations of its personnel in accordance with local laws. Employees who in their work are exposed to, e.g., noise, dust, radiation or who perform shift work are within the sphere of the examinations. Occupational health care also participates in various discussions and assessments in the work community. The occupational health care professionals support supervisors by providing information on preventive actions as well as alternatives when the ability to work decreases. Occupational health care also offers methods and tools for these situations. In 2018, there was a special emphasis on the use of occupational physiotherapist services for preventive purposes in Finland.

In 2018, the percentage of sickness-related absences was 2.8 (2017: 2.2), which was higher than the target level of ≤2.2. Sickness absences increased slightly in all countries, but especially in Sweden, Norway and Poland. For males, the percentage of sickness-related absences was 2.3 (2017: 1.9) and for females 4.0 (2017: 2.9). The sickness absence rate is calculated based on the theoretical working hours of the

permanent employees. In addition to expansion of the Energise Your Day occupational wellbeing programme, the management of sickness-related absences was one of our focus areas in 2018.

There were five (2017: 1) cases of suspected occupational disease in Finland; three were related to noise and two were related to asbestos. All the cases of suspected occupational diseases involved males. One of the suspected noise-related cases was determined to be an occupational disease and compensated as such and one was determined to be non-occupational. One of the suspected asbestos-related cases was determined to be an occupational disease and compensated as such. Investigations are still under way for the other suspected cases.

An indication of the good management level of working capacity and workplace wellbeing at Fortum is the average retirement age, which was 62 (2017: 62) years. In 2018, the average effective retirement age in the earnings-related pension scheme in Finland was 61.3 years (Source: Finnish Centre for Pensions).

### Sickness absence rate of permanent employees in 2016–2018, %

	2018		2017		2016	
	M	F	M	F	M	F
Finland	2.3	2.6	2.2	2.6	2.4	3.5
Sweden	3.6	9.5	2.8	8.0	2.6	6.3
Norway <sup>1)</sup>	3.6	6.6	-	-	-	-
Russia	1.5	1.9	1.5	1.5	1.8	1.6
Poland	3.1	5.9	2.7	3.1	2.6	3.8
Other countries	3.0	2.2	2.5	2.3	2.2	3.5

<sup>1)</sup> The figures from 2016 and 2017 are not reported because they are not comparable with the 2018 figures due to the change in the number of personnel



2.8%

Sickness-related absences  
Target: ≤2.2



## Employee development

Our goal is to be a forerunner in the future energy system. This means that we must continuously invest in the development of leadership and personnel competence and in the support of an open and flexible corporate culture.

In 2018, more than 800 supervisors participated in the Strategy & Open Leadership events that focused on strategy communications and more in-depth open leadership. The goal of the events was to improve, e.g., self-management, collaboration and networking, and to showcase the new tools supporting them. Additionally, during the year training programs on the circular economy, utilisation of data, communication skills, and stress management were arranged for management, supervisors and experts.

In 2016, Fortum launched four Must Win Battle development programmes. In 2018, we updated these programmes to better match our current development needs, and we made Open Leadership a separate programme. The other programmes focus on, e.g., digitalisation and sales development.

The total number of all training hours in 2018 was 64,831 (2017: 62,189). We have previously reported training hours also by

### Level of education of permanent employees in 2016–2018, %

Level of education	2018	2017	2016
Doctorate	1	1	1
University	41	40	43
Lower university	9	8	7
College	18	19	24
Vocational	18	18	17
Compulsory	3	3	3
Not indicated	10	11	5

## Training hours in 2018

	Total number of training hours for employees	Average training hours per employee	Total number of training hours for females	Average training hours per female	Total number of training hours for males	Average training hours per male
Finland	41,822	19	8,798	14	33,024	22
Other countries <sup>1)</sup>	23,009	4	7,829	4	15,183	4
<b>Total</b>	<b>64,831</b>	<b>8</b>	<b>16,627</b>	<b>7</b>	<b>48,207</b>	<b>9</b>

<sup>1)</sup> Excluding personnel transferred from Hafslund companies in Norway

personnel group (blue-collar and white-collar employees). From 2018 onward, we are no longer reporting the distribution of personnel groups because the classification of jobs at Fortum is much more fine-grained, and dividing personnel into the two groups mentioned above is not justified. There is no significant difference in the number of training hours for blue-collar and white-collar workers. Training costs in 2018 totalled EUR 4.0 (2017: 3.6) million.

## Performance and development discussions support the achievement of targets and professional growth

We support employee development through the annual performance and development discussions; all employees are within the scope of the annual discussions. The main target of the performance and development discussion is to ensure that the employee has clear targets that align with the business as well as the competencies supporting the achievement of the targets and professional growth.

The achievement of the targets forms the basis for payment of incentives. All employees who have a minimum of three months of employment in Fortum are within the scope of Fortum's incentive scheme.

## Faster feedback from personnel

The most important elements of Fortum's leadership principles include giving and getting feedback. That is why we use a real-time and flexible pulse tool to find out employee opinions; the tool allows supervisors and employees to see the results as soon as the feedback is given. The opportunity to constantly track the development of issues supports a coaching management approach.

Almost monthly, we ask employees for feedback on various issues related to them. Every six months, we measure personnel engagement and satisfaction with ten questions. The response rate of the survey carried out in November 2018 was 60% (2017: 69%). According to the results, 66% (2017: 68%) of the personnel feel a commitment to the company and 83% (2017: 83%) is proud to work at Fortum. Based on the survey results, the personnel see a clear connection between their own work duties and the company's targets. Fortum is also considered an innovative company that pursues new ways to operate.

Based on the survey results, and like last year, targets of development included increasing the collaboration between the divisions and units, encouraging smart risk-taking, and decreasing the decision-making hierarchy. The aim is to impact these issues with the Open Leadership and Must Win Battle development programmes.



## Safety and security

For Fortum, excellence in safety is the foundation of our business, and safe performance is a sign of professionalism. We strive to be a safe workplace for our employees and for the contractors and service providers who work for us.

### Occupational and operational safety

We believe that all work injuries and EHS non-compliances are preventable when competence and the right attitude prevails, when potential risks are addressed and when measures are taken to safeguard against them.

### Occupational health and safety management

Fortum has Group-level EHS instructions and minimum requirements that set requirements for all the operations for which we have operative responsibility. The requirements are updated regularly, and the divisions' performance in complying with the revised requirements is assessed yearly. Fortum's goal is a high level of environmental and safety management in all business activities. Calculated in terms of sales, 97.0% (2017: 98.4 %) of Fortum's electricity and heat production operations at the end of 2018 were OHSAS 18001 or ISO 45001 certified.

For 2018, we set Group-level targets for the following key figures:

- Lost workday injury frequency (LWIF) <sup>1)</sup>, own personnel and contractors
- Number of severe occupational accidents <sup>2)</sup>
- Quality of investigation process of injuries, major EHS incidents and near misses
- GAP index, implementation of EHS minimum requirements

1) LWIF = Lost Workday Injury Frequency, injuries per million working hours

2) Fatality or an accident leading to permanent disability or an accident with severe and life-threatening injuries

Fortum's Board of Directors has approved the above indicators as Group targets also for 2019. In addition, a Contractor safety improvement index was approved as a new Group target. The index focuses on identified actions that are based on the Group's requirements for contractor management to enhance safety. These include, for example, the requirement to meet with main contractors to discuss safety and to give feedback in cases where low performance is detected in order to ensure corrective actions. It also requires that a system to use both incentives and sanctions is in place. The safety targets apply to all Fortum employees and are part of the Group's **short-term incentive scheme**.

### Safety performance

2018 was a year of outstanding performance improvements, but also a year of challenges in terms of occupational safety. In particular, the severe occupational accidents occurred were a major disappointment: 4 (2017: 1) severe occupational accidents took place in the company's operations; one in Sweden, one in Lithuania and two in Russia. The Group target in 2018 was zero severe occupational accidents.

The severe accidents in Sweden and in Lithuania tragically led to a fatality of a contractor employee. The incident investigation has been conducted for both incidents and corrective actions have been implemented. As a result, also Group requirements have been updated to better mitigate risks related to very high risk work requiring specific professional competences.

The combined lost-workday injury frequency (LWIF) for own personnel and contractors was 1.8 (2017: 2.4), which was clearly better than the set target of  $\leq 2.1$ . This result indicates that Fortum has managed to get back to the safety performance level that prevailed before the major acquisitions. In particular, Recycling and Waste Solutions significantly improved its safety results: the unit managed to reduce its lost workday injury frequency by half. The safety of our own

employees was at a record high, and the LWIF obtained was 0.2 (2017: 1.2).

The target level (3.0) for the quality of investigation process of occupational accidents, major EHS incidents, and serious near misses was achieved. The GAP index, describing the implementation of the Group's EHS minimum requirements at the power plant level, was 2.0, which did not achieve the set target level of 3.0. The most significant deviations were detected in companies that Fortum has acquired in recent years and in the sites operated by contractors. The deviations were related to work permits, high risk work, and contractor management processes.

### Occupational safety risk assessment and incident investigation

Fortum's senior management is responsible for occupational safety risk management principles, targets, and development and maintenance of risk management process, as well as for evaluating the effectiveness of risk management. Local management is responsible for the practical risk assessment and management work.

In common work places, such as construction sites, Fortum's organisation has responsibility for the overall risk management. At construction sites, site-specific risk assessments and management plans are the main contractor's responsibility. Contractors are responsible for risk management concerning their work.

The risk management process is developed based on continuous improvement principles. Input for development includes incidents and deviations at Fortum and other companies. During incident investigations it is concluded whether the risk assessments have been correct and preventive actions sufficient.

Fortum line management is responsible for the incidents investigation as well as for providing the required resources and taking care of the communication. When relevant, Fortum's crisis management and crisis communication procedures are followed. Line management



**Key safety figures in 2016–2018 (GRI 403-9)**

	Target 2019	Target 2018	2018	2017	2016
Lost workday injury frequency (LWIF) <sup>1)</sup> , own personnel and contractors	≤1.7	≤2.1	1.8	2.4	1.8
Lost workday injury frequency (LWIF) <sup>1)</sup> , own personnel			0.2	1.2	1.0
Lost workday injury frequency (LWIF) <sup>1)</sup> , contractors			4.8	4.2	3.0
Lost workday injuries, own personnel			3	17	14
Lost workday injuries, contractors			39	42	27
Severe <sup>2)</sup> occupational accidents	0	0	4	1	5
of which fatalities, own personnel			0	0	0
of which fatalities, contractors			2	0	0
Major EHS incidents <sup>3)</sup>	≤18	≤20	18	20	22

1) LWIF = Lost Workday Injury Frequency, injuries per million working hours

2) Fatality or an accident leading to permanent disability or an accident with severe and life-threatening injuries

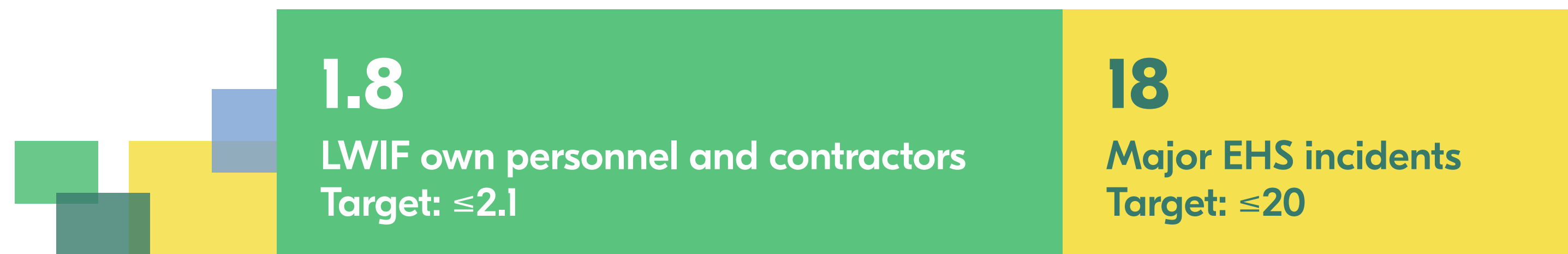
3) Major fires, leaks, explosions, dam safety incidents, environmental non-compliances and INES events level ≥1

INES = International Nuclear and Radiological Event Scale

**Occupational accidents, accident frequencies and absence days due to occupational accidents in 2018 by region (GRI 403-9)**

	Finland	Sweden	Norway	Russia	Poland	Others
<b>Own personnel</b>						
Occupational accidents causing absence	0	0	0	1	0	2
LWIF	0.0	0.0	0.0	0.2	0.0	2.1
Absence from work due to occupational accidents, days	0	0	0	50	0	14
<b>Contractors</b>						
Occupational accidents causing absence	20	4 *	5	3	3	4 *
LWIF	9.1	4.7	18.3	1.4	1.5	6.5
Absence from work due to occupational accidents, days	272	20	76	65	48	19

\* Including a fatal accident



is responsible for designating the individuals responsible for the classification of incidents, determining the investigation level and conducting the investigations. Every organisation has a group of trained incident investigators who are actively involved in investigations.

The findings of investigations are documented in Fortum’s incident-handling system FRIDA. The learnings are shared with the organisations through digital safety bulletins. The quality of conducted investigations is verified with process maturity assessments. Assessments are done by the divisions quarterly.

**Training and development projects related to occupational safety**

In 2018, we initiated an extensive training programme in order to improve our occupational safety performance. The training was conducted by one of the world’s leading consultant companies in the field of safety. The programme included safety training for all division management teams, as well as site-level projects at the Riihimäki production plant and the Inkoo demolition site. Specific training on contractor safety management was also organised for EHS experts and the purchasing function. The training included both theoretical lessons and on-site exercises. Special attention was paid to the prevention of unsafe behaviour, problem solving, the provision of positive feedback, and safety leadership team establishment.

We also implemented tools to assess contractor safety performance as part of the supplier qualification process and evaluated their safety practices in a more systematic manner during work. Selected sites were audited in order to assess how well the instructions, guidelines and agreed practices have been taken in use and where we could improve.

**Operational safety**

We track major environmental, health and safety (EHS) incidents as a Group target; these incidents cover major fires, leaks >100 litres into the environment, explosions, nuclear and dam safety incidents, and



environmental non-compliances. There were 18 (2017: 20) EHS incidents in 2018; the target was ≤20. The majority of the incidents were fires. There were zero (2017: 1) incidents that reached INES 1 (International Nuclear and Radiological Event Scale) or higher. The incidents did not cause significant harm to people, operations or the environment.

### Dam safety

In 2018, Fortum carried out high-quality work on a daily basis to ensure dam safety and continued to develop dam safety processes and practices.

In addition, preparation and implementation of our dam safety investments proceeded according to plan. Currently, Fortum has three major dam safety projects ongoing (Långströmmen and Ljusneströmmar in Sweden and Imatra in Finland), and a new project was launched in 2018 in Västerdalälven, Sweden.

The major activities of the projects include upgrading the existing dams to fulfil current structural dam safety requirements and securing safe water management also in extreme hydrological conditions. Operative challenges faced during 2018 were high spring floods, a minor dam breach in Sweden, as well as very warm summer and forest fires in Sweden.

### Nuclear safety

The Loviisa nuclear power plant's automation modernisation, implemented over several years, was completed in 2018. In the project's final phase, the old part of the plant's scram system was replaced with new digital systems. Changes and improvements were also made to ensure the safety functions of the secondary circuit. Additionally, the polar crane in the Loviisa 2 reactor building was renewed, which will significantly reduce the risk of a heavy load drop.

### Corporate security

Through corporate security, we strive to ensure the uninterrupted continuity of business and the safety of people, information, our assets

and processes in normal and exceptional situations. Uninterrupted energy production and distribution is important both for Fortum's business operations and for an energy-dependent society, as is the safety of the products and services we offer to customers. Our Corporate Security unit is responsible at the Group level for personnel and operational security. Cyber security is also an important part of corporate security.

### Securing personnel and business

Compliance with the minimum security requirements improves our operational ability to withstand and recover from disruptions and thus reduces unplanned maintenance outages and improves productivity.

We assess risks related to people, business and information in all geographical areas where Fortum has potential operations and business travel. Risks impacting the company and business operations may be related to political situations, terrorism, crime, conflicts and business partners.

Corporate security is improved also by gaining a deeper understanding of the security situation so that we can anticipate and prevent risks before they materialise.

### Cyber security

Security with the information we handle and with our IT systems ensures that we can meet society's and our customers' expectations. Our cyber security programme is currently divided into data, digital and IT services security, and security of automation systems. The aim is to ensure the production and distribution of power and heat and the functioning of new digital services, like Internet of Things applications.

In information security, we aim to ensure the accessibility, integrity and confidentiality of critical information. We also take seriously our compliance with the regulations related to the protection of personal data. Customer data protection is discussed in the [▶ Product responsibility](#) section.

We actively engage in collaboration with authorities and other stakeholders to understand and prevent new and growing cyber threats. We launch campaigns to increase employee awareness of information security risks. We promote ways of operating that take information security into consideration by, e.g., providing guidelines and online training to personnel.

### Contingency planning

The main disaster and emergency situations we prepare for are related to our critical operations, such as power plant and dam safety, and securing other operations.

For dam and nuclear safety, emergency preparedness obligations in Finland and Sweden are based on regulatory provisions; likewise, there are terrorism-related preparedness obligations in Russia. Otherwise, emergency preparedness obligations prescribed by authorities are of a general nature. Based on its own risk assessments, Fortum independently defines the crisis and exceptional situations it prepares for and drafts action plans for.

Fortum's crisis and emergency management instructions are prepared for Group, division and site levels. We are updating the crisis management plans to correspond with the changes implemented in the business functions and organisations. The testing and updating of the crisis management and continuity plans are the responsibility of each division and line organisation. Crises impacting Group operations more broadly are managed at the Group level. Crisis management and crisis communication instructions have been prepared for, e.g., power and heat outages and for the Loviisa nuclear power plant. Corporate Security is responsible for crisis management development, e.g., for organising rehearsals and supporting planning. Group Communications is responsible for crisis communication. In 2018, the annual emergency preparedness exercise related to a nuclear power accident was held at the Loviisa power plant.



# Economic impacts

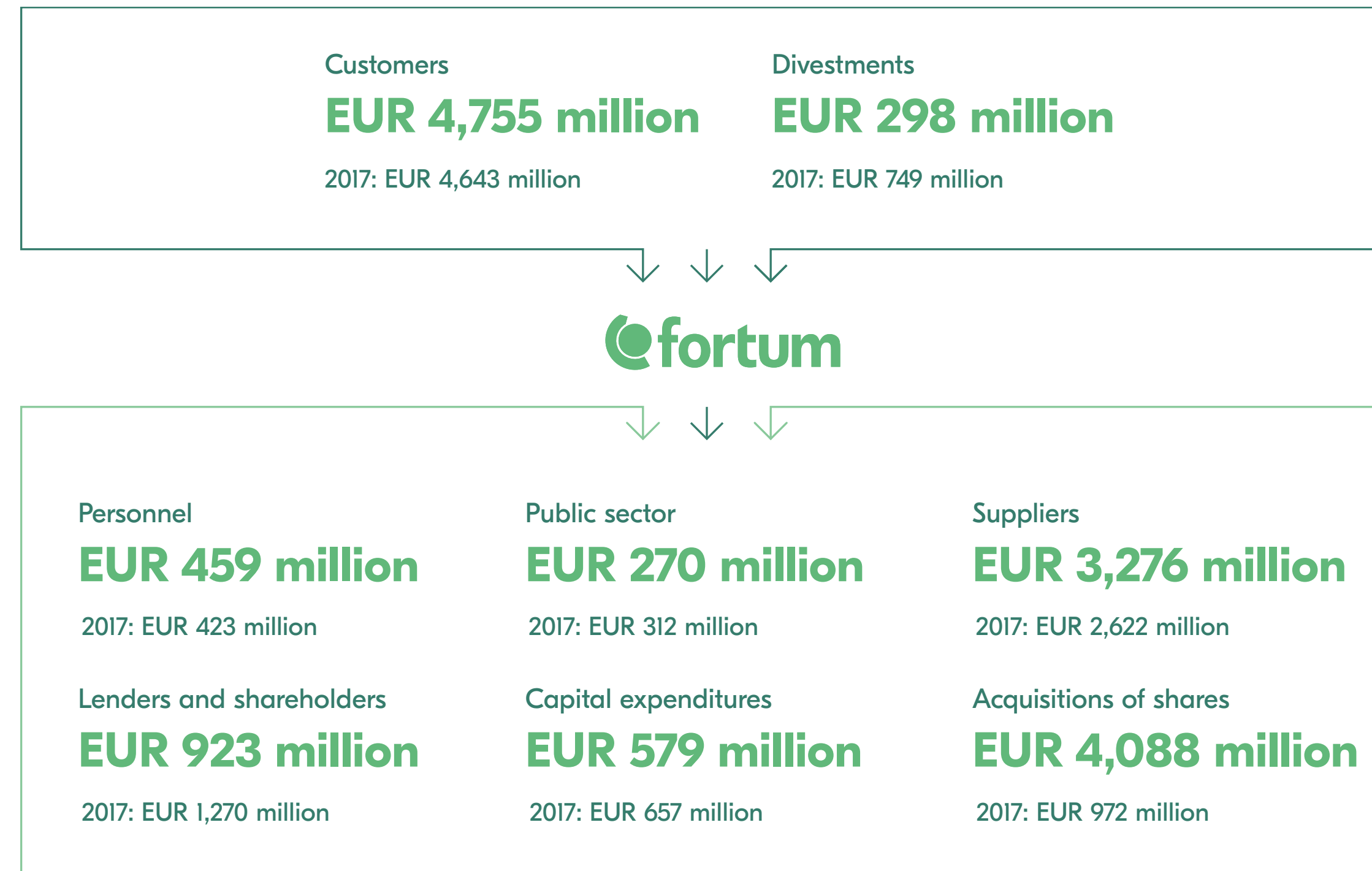
Fortum is a significant economic actor in Finland, Sweden, Russia, Poland, Norway and the Baltic countries. We continuously monitor the impact and added value generated by our operations to our stakeholders. The key stakeholders include lenders and shareholders, customers, personnel, suppliers of goods and services, and the public sector.

## Direct and indirect impacts

The most significant direct monetary flows of Fortum’s operations come from revenue from customers, procurements of goods and services from suppliers, compensation to lenders, dividends to shareholders, growth and maintenance investments, employee wages and salaries, and taxes paid.

Our operations also have indirect economic impacts. The Finnish State owns 50.8% of Fortum’s shares, and we contribute to a functioning society by, among other things, paying taxes and dividends. These secure society’s basic functions and build wellbeing. Investments and the procurement of goods and services provide employment both locally and outside our operating areas. New investment proposals are assessed against sustainability criteria. In terms of suppliers of goods and services, we also assess the global impacts, paying particular attention to suppliers of goods and services operating in risk countries. The wages and taxes paid have a positive impact on local communities. In 2018 we published our [Tax principles](#).

## Distribution of added value





**Monetary flows by stakeholder group in 2016–2018 (GRI 201-1)**

EUR million		2018	2017	2016
<b>Generation of added value</b>				
Income from customers	Income from customers on the basis of products and services sold and financial income	4,755	4,643	3,705
Divestments	Income from divestment of shares, business activities or plants	298	749 **	49
Purchases from suppliers	Payments to suppliers of raw materials, goods and services	-3,276	-2,622	-2,128
Fortum produced added value		1,777	2,770	1,627
<b>Distribution of added value</b>				
Employees compensation	Wages, salaries and remunerations and other indirect employee costs	-459	-423	-334
Lenders and shareholders compensations	Dividends paid to lenders, interest, realised foreign exchange gains and losses and other financial expenses	-923	-1,270	-1,086
Public sector	Income and production taxes paid, support for society and donations	-270	-312	-514
Distributed to stakeholders, total		-1,652	-2,004	-1,934
<b>Surplus/deficit cash</b>		<b>125</b>	<b>765</b>	<b>-307</b>
Capital expenditures		-579	-657	-599
Acquisitions of shares		-4,088 *	-972 **	-695
<b>Surplus/deficit including investments</b>		<b>-4,542</b>	<b>-864</b>	<b>-1,601</b>

\* In 2018 acquisitions of shares mainly include the acquisition of Uniper SE shares. Further information in Financial Statements Note 3 Acquisitions and disposals.

\*\* In 2017 divestments and acquisitions of shares are mainly related to the restructuring of the ownership in Hafslund

In 2018, the difference between added value generated and distributed to stakeholders was EUR 125 (2017: 765) million for the development of own operations.

The distribution of the economic added value generated by our operations to the most significant operating areas is reported in the following parts of the annual reporting:

- ▶ **Sales by market area based on customer location:**  
Financial Statements, Note 6
- ▶ **Employee costs by country**
- ▶ **Tax footprint 2018**

We have included investments in our own assessment of economic impacts, as their annual volume and impact on the society is significant. In 2018 we invested EUR 278 (2017: 375) million in CO<sub>2</sub> free energy production. Capital expenditure by country and by production type is presented in the Financial Statements, Note 18.2 Capital Expenditure.

Provisions related to nuclear power are covered in the Financial statements, Note 29 Nuclear related assets and liabilities. Financial implications and other risks and opportunities due to climate change, as well as emissions trading are reported in the section ▶ **Climate change mitigation**. Our pension arrangements conform to the local regulations and practices in each operating country; the arrangements are discussed in the Financial Statements, Note 31 Pension obligations.



**Support from the public sector**

In 2018 we received financial support from the public sector in the form of investments, R&D and other significant grants totalling EUR 4,0 (2017: 1.7) million. The figure excludes free emission allowances and electricity certificates as well as electricity and heat price related subsidies.



## Security of supply

A functional society requires an uninterrupted and reliable supply of energy. Fortum is committed to working for cleaner energy production. Implementing our vision – For a cleaner world – requires a reliable supply of economically priced energy delivered to customers.

Hydropower balances the growing, but weather-dependent, fluctuating production of other renewable energy forms like solar and wind. The flexibility of hydropower is needed to secure the functionality of the energy system and the power grid and to balance fluctuations in the price of electricity.

If a sufficient supply of hydropower is not available, adjustable power production based on natural gas can be used to balance fluctuations in renewable energy production and to secure the supply of electricity. With planned preventive maintenance and condition monitoring, we ensure that our power plants operate reliably to produce the electricity and heat customers need.

### Power plant availability at a good level

We measure the availability of our CHP and hydropower plants with an energy availability indicator. Energy availability is calculated by dividing the power plant’s actual production in the period under review by the theoretical maximum production. Planned maintenance outages are not included in the calculation. If the outage at a CHP plant is longer than planned, it is considered a production interruption, which decreases the energy availability. The energy availability of our CHP plants in 2018 was, on average, 96.4% (2017: 96.1%), outperforming the target of >95.0%.

For hydropower plants, outages due to a failure and unplanned or prolonged outages decrease the availability factor only if they lead to spillage. The energy availability of our hydropower plants was 98.5% (2017: 98.2%).

The load factor describing the availability of the Loviisa nuclear power plant is among the best in the world for pressurised water reactor power plants. The Loviisa nuclear power plant’s load factor in 2018 was 88.4% (2017: 92.7%).

### Interruptions in heat distribution

Fortum has about 3,400 km of district heating networks in Finland, Norway, Poland, the Baltic countries and Russia. The aim is to keep interruptions in district heat distribution as short as possible by carrying out planned and preventive refurbishment and maintenance activities.

96.4%

CHP plant energy availability

Target: >95.0%





## Customer responsibility and reputation

As a responsible actor in the electricity, heat and circular economy business, Fortum offers consumers environmentally friendly and cost-efficient products and services. It also ensures the reliability of its marketing and communications. Fortum mirrors its operational responsibility through customer satisfaction and reputation amongst various stakeholders.

### Product responsibility

Fortum is the third largest power generator and the largest electricity retailer in the Nordic countries. We are one of the world's largest producers of heat. We also offer district cooling, energy efficiency services, recycling and waste solutions, and the largest electric vehicle charging network in the Nordic countries.

### CO<sub>2</sub>-free and guarantee-of-origin-labelled electricity

Hydro and nuclear account for two-thirds of our electricity production, making us one of the Nordic countries' leading sellers of carbon dioxide-free and guarantee-of-origin-labelled electricity. All the electricity we sold to household customers in Finland and Sweden in 2018 was carbon dioxide-free hydro, wind, solar or nuclear power. The origin of the electricity produced from renewable energy sources was guaranteed with European guarantees of origin. Some of the electricity we sell is also guaranteed with the pan-European EKOenergy label granted by environmental organisations and, in Sweden, with the Bra Miljöval label.

### Services for customers

In recent years, Fortum has introduced many new services that reduce environmental impacts and give customers better opportunities to control their electricity consumption and costs. The sustainable solutions we offer in energy production, traffic and waste management

also support a circular economy. The number of consumers participating in energy production is growing. The solutions offered by Fortum for this area are related to home automation, smart EV charging, local energy production and storage, and flexible demand. Additionally, we offer diverse expertise services for energy systems, electricity and heat production and for the process industry.

### Marketing communications and customer data protection

Our goal is to present products and services truthfully in all our marketing and communication materials. We follow responsible marketing communication guidelines, and we do not present misleading statements. In statements regarding environmental issues, we follow the regulations for environmental marketing.

In 2018, Fortum received from the Finnish Energy Authority a request to clarify certain terms of agreement for consumers. These changes have been implemented. In addition, Fortum received from the Energy Authority certain requests for clarification regarding consumer products. These requests for clarification have been addressed within the deadline.

The consumer authority in Sweden has instructed Fortum to implement certain changes to the marketing communications and sales practices. Fortum is cooperating with the authority and is in the process of implementing the requested changes. Fortum is no longer pursuing the appeal in the earlier matter at the Energy Market Inspectorate, due to changes in the product portfolio.

Fortum has received from the Norwegian Consumer Authority certain inquiries and instructions relating to the sales processes with consumer customers. Fortum has been in dialogue with the Consumer Authority and is in the process of implementing the requested changes.

Fortum has received from the Polish Consumer Authority instructions on how to provide adequate and reliable information on the terms and conditions of consumer products. Fortum is in the process of implementing these instructions.





Data protection laws have changed in recent years. In 2016, the EU published the Data Protection Regulation, which came into effect in May 2018. In response to these changes, in 2017 we launched a privacy programme as well as several development projects for personal data processing; these have been completed. The Fortum Privacy Programme ensures that we have the appropriate processes in place so that the rights of our customers are being fulfilled and that our business is able to utilise and process data in accordance with laws. Fortum has received inquiries from the Data Protection Supervisory Authorities in Poland and Finland about its data processing activities related to marketing activities. Fortum has provided the authorities with responses to these inquiries.

► Products and services

### Customer satisfaction and reputation

For Fortum, customer satisfaction and reputation are a top priority in implementing the company’s strategy and in growing the business. We have set Group-wide targets for customer satisfaction and for our reputation.

### Customer in the centre

The Group-wide Customer in the centre development programme was launched in 2015 with the aim of promoting a customer-centric culture in our company. The programme continued in 2018 and contains specific projects to improve the customer experience and our offering in the various business functions, e.g., by leveraging the opportunities brought by digitalisation and collaboration with innovative startups.

### One Fortum Survey provides information about all stakeholder groups

We use the extensive One Fortum Survey to annually measure customer satisfaction and our reputation and the factors that impact them. The

survey is conducted yearly in spring and it covers customers, decision makers, capital markets, non-governmental organisations and opinion leaders as well as Fortum’s personnel. In Finland, Sweden and Norway, we also survey the views of the general public and media. In autumn, we also conduct a follow-up survey among our consumer customers.

We conducted the One Fortum Survey in 2018 in Finland, Sweden, Norway, Poland, the Baltic countries, Russia and India. Over 8,000 customers and nearly 4,700 other stakeholders were interviewed for the survey. The Consumer Solutions division used also the Net Promoter Score (NPS) method to measure the satisfaction of electricity sales customers.

### Customer satisfaction

Several new business functions were included within the sphere of the spring 2018 One Fortum Survey: Fortum Nuclear Services, Fortum HorsePower, Fortum Charge & Drive, and major customers in electricity sales. As a whole, the customer satisfaction for a large share of Fortum’s business functions is on a good level (>70 on a scale of 0–100) or a very good level (>75).

Of all Fortum’s customer groups, Fortum HorsePower has the most satisfied customers; its rating in 2018 was excellent (83). Satisfaction amongst our district heating customers remained virtually unchanged and was on a good level in most countries. A new target we measured in our heat business was Fortum Oslo Varme’s customer satisfaction, which was lower compared to other countries.

Satisfaction was clearly increased amongst Fortum Sweden’s electricity retail customers. By contrast, customer satisfaction decreased amongst Fortum’s customers in Norway and Poland, as did the results for the Fortum-owned consumer brands of Kotimaan Energia and NorgesEnergi.

Customers of the Fortum eNext business unit gave slightly higher ratings in 2018 compared to the previous year, and satisfaction was on a very good level. Fortum Nuclear Services also received a very good rating. Satisfaction among Recycling and Waste Solutions customers

decreased clearly compared to the previous year, but still remained on a very high level (78). Fortum Charge & Drive, offering charging solutions for electric vehicles, has the most room for improvement: its customer satisfaction was on a satisfactory level.

Our Group-level target for all business areas in 2018 was to achieve a customer satisfaction rating of good, i.e. 70–74 on a scale of 0–100, in the One Fortum Survey. The target was achieved in all business areas with the exception of retail electricity sales to major customers and in EV charging solutions for consumers and businesses. The customer satisfaction target using the NPS method (-6) was not achieved amongst electricity sales customers; the score was -18.

The customer satisfaction target set for 2019 is the same for all business areas, i.e. a rating of “good” measured with the One Fortum Survey. The NPS method is no longer used as a Group-level metric.

### Other public customer satisfaction results

The international and independent EPSI Rating annually surveys the level of satisfaction of electricity retail company customers in Finland, Sweden and Norway.

### Customer satisfaction <sup>1)</sup> in 2016–2018

	2018	2017	2016
<b>Finland</b>			
Fortum	74.1	75.6	73.3
<b>Sweden</b>			
Fortum	59.8	56.1	53.4
Göta Energi <sup>2)</sup>	64.4	64.7	62.9
SverigesEnergi <sup>2)</sup>	58.2	60.5	61.0
<b>Norway</b>			
Fortum	-	71.1	72.7
Hafslund Strøm <sup>2)</sup>	66.5	68.2	70.3
NorgesEnergi <sup>2)</sup>	68.6	71.9	71.3

1) In Finland and Norway, the survey is conducted by EPSI Rating. In Sweden the survey is conducted by Svenskt Kvalitetsindex, which is part of the international EPSI Rating Group.

2) Brands acquired through the Hafslund acquisition



### Reputation

In 2018, our reputation strengthened the most amongst decision makers, boosting the reputation index to an excellent level (81 on a scale of 0–100). There was also positive development amongst personnel, and we reached our all-time record high rating (79).

Ratings from investors (74) and media (67) remained on par with the previous year. Reputation decreased the most amongst opinion leaders (76), and the rating decreased significantly, particularly in terms of Finland. As in previous years, the reputation index is the lowest amongst the general public (58).

Our most significant strengths in terms of reputation are our operational expertise and reliability as an employer. We have most room for improvement in social responsibility and customer centricity instead.

The Group-level target for our reputation in 2018 was a rating of 73.0 in the One Fortum Survey, measured as the average rating given by all stakeholders included in the One Fortum Survey, apart from customers. Ratings given by customers are not included in the reputation index calculation because we treat customer satisfaction as a separate entity. In 2018, we achieved an average rating of 72.5 amongst these stakeholder groups. Our target set for 2019 (73.0) includes the same stakeholder groups as in 2018.

### Brand

We continuously monitor also brand development, i.e. the image of our brand. The survey includes the measurement of, e.g., brand awareness, preference and brand attributes. The survey is conducted amongst the general public.



63–83

Customer satisfaction  
Target: 70–74

72.5

Reputation  
Target: 73.0



Case | Valuable products from biomass



Biomass contains lots of valuable raw materials. The target of Fortum's Bio2X programme is to explore the resource-efficient utilisation of the raw materials. The programme is developing the upgrading of wood and bioeconomy residues into high-value products. At fractioning technology-based biorefineries, these lignin cellulose-containing raw materials can be separated into three clean components: cellulose, hemicellulose and lignin. These intermediate products can be further refined into, e.g., textiles, cosmetics and industrial products, like glues.

New biorefinery products save natural resources and can reduce dependency on non-renewable or otherwise unsustainable raw materials. For example, sustainably produced textile fibres from lignin cellulose use less water than cotton. Additionally, the fibre doesn't load water systems with micro-plastics, like polyester or other artificial fibres do. Unlike using biomass in energy production, biorefinery products store the carbon dioxide that has been absorbed in the biomass for years.

Bio2X is tasked with finding and ensuring sustainable ways to use biomass. Among other things, we are researching the possibility of using recycled materials and agricultural residues, like wheat straw and rice straw, as biorefinery raw materials. Especially in developing countries, straw is generally combusted in the fields, significantly increasing the air pollution; in the worst cases, the small particle content that is harmful to humans is 30 times higher than recommended levels. When straw is used as a raw material at biorefineries, its combustion can be avoided and additional earning opportunities for farmers can be created. Fortum's goal through the straw supply chain is to create positive impacts for local communities without compromising the nutrient and carbon balance of fields.



# Supply chain management

Fortum is a significant purchaser of goods and services. We actively strive to reduce the environmental impacts caused by our supply chain and to improve economic and social wellbeing. We also manage risks related to our supply chain. The aim is that open and efficient collaboration creates value for both parties.

## Electricity purchases and investments play a significant role

Fortum's purchasing volume in 2018 was EUR 3.7 (2017: 3.2) billion. Electricity purchased from the Nordic wholesale electricity market for retail sales, investments, and fuel purchases accounted for the majority of Fortum's purchases.

Of our purchases, EUR 579 (2017: 657) million targeted various investments. The biggest investments, EUR 218 million, were made in Finland. A large share of the investments is contracted out in full with materials, installation and other service as well as contractor work included in the total purchase.

Fortum's fuel purchases in 2018 totalled EUR 561 (2017: 564) million. We purchase fuels from international and local suppliers. Our fossil fuel purchases totalled about EUR 496 (2017: 498) million, biomass fuels about EUR 61 (2017: 48) million, and nuclear fuel about EUR 32 (2017: 35) million.

The rest of our purchases, EUR 2.6 (2017: 2.0) billion, consist of other goods and services. The figure includes electricity purchased from the Nordic wholesale electricity market for retail sales. The other goods and services purchases were related to, for example, operation and maintenance as well as to other functions, such as IT solutions, marketing and travel.

## Over half of purchases from Europe

Over half, i.e. 59%, of the purchasing volume was purchased from suppliers operating in Europe, mostly in Finland, Sweden and Poland. This does not include electricity purchases from the Nordic wholesale market. 39% (2017: 47%) of Fortum's purchases were from risk countries. The majority of these purchases were from Russia.

Violations related to work conditions and human rights are more likely in risk countries than in non-risk countries. Fortum's risk-country classification is based on the ILO's Decent Work Agenda, the UN Human Development Index and Transparency International's Corruption Perceptions Index.

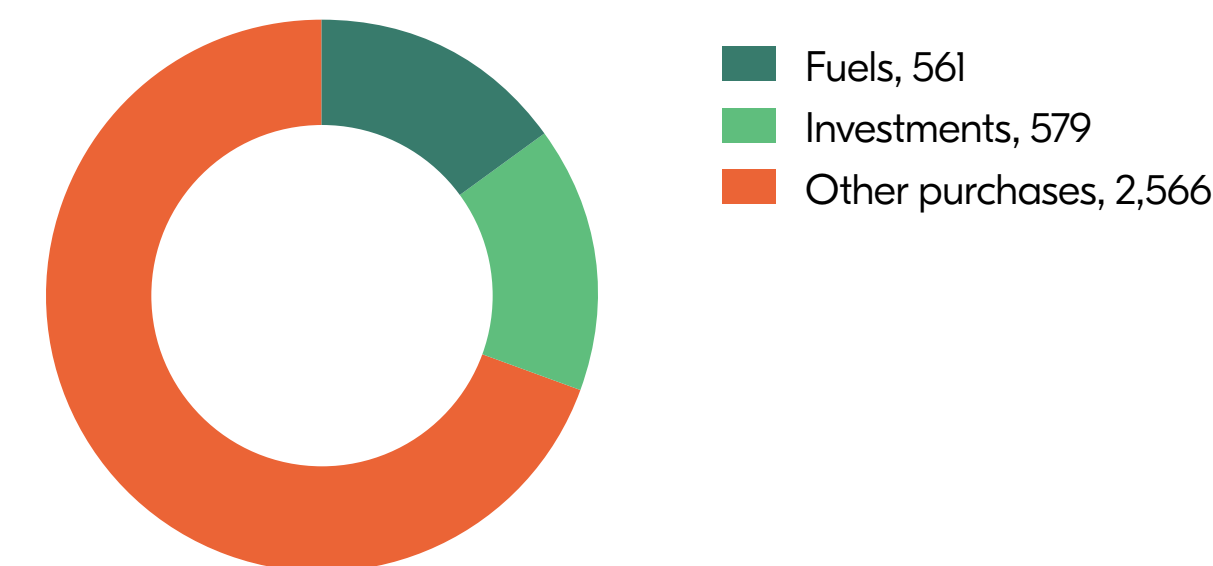
In 2018, we had about 14,000 (2017: 16,000) suppliers of goods and services. About 1,400 of the suppliers were in risk countries. Excluding the Russia Division's local suppliers, there were about 300 suppliers in risk countries.

## Sustainable fuel purchasing

The most significant environmental impacts of our supply chain are related mainly to fuels, particularly to coal and biomasses. There are significant environmental aspects associated with open-pit coal mining, including natural resource efficiency, emissions to air, water and soil, and impacts on biodiversity. Significant occupational health and safety risks can be related to working in underground mines. The sustainability aspects of biomass sourcing are related primarily to biodiversity, but risks particularly outside the EU can also include, for instance, illegal logging or human rights violations.

In fuel purchasing, special attention is paid to the origin of the fuel and to responsible production. In 2018, we had about 110 suppliers in our fuel supply chain, 6% of them operated in risk countries.

Purchases, EUR million



Purchases <sup>1)</sup> excluding investments, 2016–2018

EUR million	2018	2017	2016
Nordic countries	2,184	1,548	1,106
Russia	588	586	505
Poland	286	375	279
Other countries	69	56	53
<b>Total</b>	<b>3,127</b>	<b>2,565</b>	<b>1,943</b>

1) Includes purchases of fuel, power and other materials and services



### Natural gas

The natural gas used in Russia, the Baltic countries and Finland originated from several different suppliers in Russia. The natural gas used in Poland originated mainly from Poland and the natural gas used in Norway originated from Norway.

### Coal

The coal used in Finland originated from Russia. The coal used in Poland originated mainly from Poland. The power plants in Russia used coal originating from Russia and Kazakhstan. Fortum is a member of the [Bettercoal initiative](#), and uses the Bettercoal Code and tools in assessing the sustainability of the coal supply chain. There is more about Bettercoal assessments in the section [Supplier audits support assessments](#).

### Biomass

The biomass we used consisted mainly of forest residue chips, chips from roundwood and industrial wood residues that originated from Finland, Russia, the Baltic countries, Norway and Poland. More than 60% of the wood-based biofuel used by Fortum in 2018 originated from certified sources. The share was nearly 80% in Finland.

Our goal is that 80% of the wood-based biomass fuel we use is verified by a third party by the end of 2020. In 2018, we built elements of a Chain of Custody management system for wood-based fuel by documenting the system, by further developing our fuel procurement data system, and by launching a systematic assessment of risks related to supply chains and procurement countries.

The bio-oil plant integrated with Fortum's Joensuu power plant has a sustainability system approved by the Finnish Energy Authority. The system is used to prove compliance with nationally legislated sustainability criteria.

### Waste-derived fuel

We use waste-derived fuel at our power plants in Finland, Sweden, Norway, Denmark, Lithuania and Poland. The fuel used is mainly municipal and industrial waste collected locally.

### Uranium

The fuel assemblies used at the Loviisa power plant in Finland are completely of Russian origin. The fuel supplier acquires the uranium used in the fuel assemblies from Russian mines in accordance with Fortum's agreement. In 2018, the uranium originated from the Krasnokamensk, Khiagda and Dalur mines.

All three uranium mines have ISO 14001 environmental certification. The Khiagda mine has also an OHSAS 18001 certified occupational health and safety management system. ARMZ Uranium Holding Co., a uranium producer, and TVEL, which is responsible for refining and manufacturing uranium, have certified environmental and occupational safety systems in place in all their plants, as do the plants manufacturing zirconium material, uranium oxide pellets and fuel assemblies.

We regularly assess the quality, environmental, and occupational health and safety management systems of our nuclear fuel suppliers and the manufacturing of nuclear fuel assemblies. In summer 2018, Fortum's representatives assessed the operations of Fortum's Russian fuel supplier's uranium mine. The mine was in good technical condition, and its quality and environmental management systems were certified.

### ► Fuel consumption

### Origin of fuels used at Fortum in 2018 <sup>1)</sup>

Fuel	Country of origin
Biomass	Finland, Poland, Russia, Norway, Baltic countries
Coal	Russia, Kazakhstan, Poland
Natural gas	Russia, Poland, Norway
Uranium	Russia
Oil	Russia, Norway
Peat	Finland, Estonia

1) Biggest countries of origin by purchase volume in 2018

### Sustainable supply chain

We expect our business partners to act responsibly and to comply with the Fortum Code of Conduct and the Supplier Code of Conduct. Fortum's key tools in supply chain management are country and counterparty risk assessments, supplier qualification and supplier audits.

### Codes of conduct cover basic requirements

The Fortum Code of Conduct forms the foundation for ethical business conduct and defines how we treat others, engage in business, and safeguard our corporate assets. In 2018, the Code of Conduct e-learning training was updated and more than 90% of Group employees worldwide completed the training.

The Supplier Code of Conduct includes the sustainability requirements for suppliers of services and goods. The Supplier Code of Conduct is based on the principles of the United Nations Global Compact initiative and is divided into four sections: anti-corruption, human rights, labour standards, and the environment. The country and counterparty risk assessment follows the same structure.

The Supplier Code of Conduct is used in all our countries of operation and is included in all purchase agreements with a contract value of EUR 50,000 or more. Training related to the Supplier Code of Conduct



was arranged in 2018 for the Recycling and Waste Solutions personnel in Denmark and for Fortum Oslo Varme personnel in Norway.

### Supplier qualification

We assess the level of operations of our business partners through supplier qualification and supplier audits. A supplier qualification is made when the purchase volume is EUR 50,000 or more. In the qualification process, suppliers respond to a survey that we use to help determine, among other things, the supplier's possible operations in risk countries, certified management systems, and the occupational safety level of the contractors. We pay special attention also to anti-corruption practices.

If potential risks in the supplier's operations are identified through the questionnaire, a more extensive self-assessment questionnaire may be sent or a supplier audit is conducted. The extensive self-assessment questionnaire is always sent to fuel suppliers and the suppliers of Fortum India.

The Russia Division uses its own supplier qualification process that is based on Russian procurement law. In the Russian operations, we set supplier requirements for business principles, ethics, environmental management, and occupational health and safety practices.

**By 2020, we are committed to purchasing 70% of coal from suppliers whose mines have undergone a Bettercoal assessment.**

### Supplier audits support assessments

In supplier audits, we assess the supplier's compliance with the requirements in Fortum's Supplier Code of Conduct. Audits are always done on-site, and they include production inspections, employee interviews, and reviews of documents. If non-compliances are found, the supplier makes a plan for corrective actions and we monitor the implementation of them.

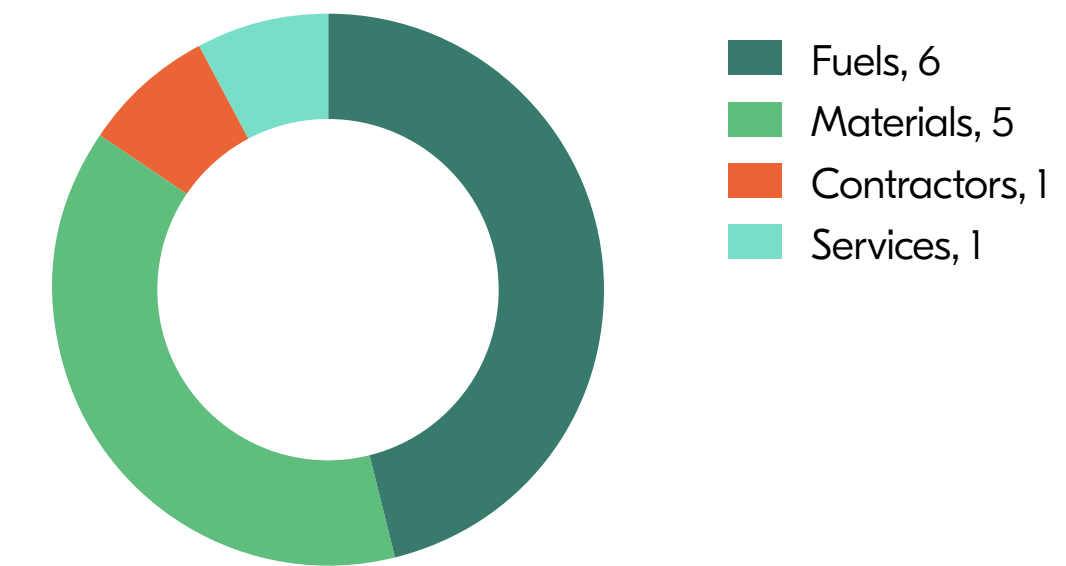
Fortum uses an international service provider for conducting audits, especially in risk countries. In Fortum's own operating countries, the audits are performed mainly by own personnel.

In 2018, we conducted a total of 13 (2017: 11) supplier audits in Finland, Lithuania, Poland, Netherlands, Russia, Vietnam and India.

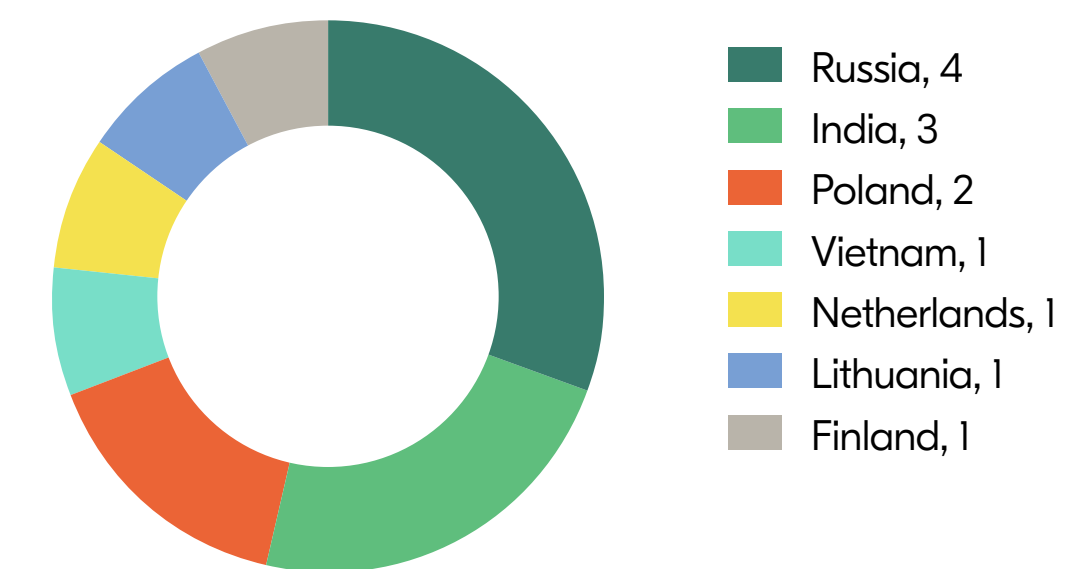
The majority of the non-compliances identified in the audits were related to occupational safety, overtime hours and remuneration. A non-compliance related to employee collective bargaining rights was discovered with a Vietnamese supplier and an Indian supplier. We didn't find any non-compliances with the requirements related to discrimination and forced or child labour, but we did give a Vietnamese and an Indian supplier a recommendation to strengthen their practices to prevent possible discrimination and forced or child labour.

Fortum uses the Bettercoal Code and tools in assessing the sustainability of the coal supply chain. The Bettercoal Assessment Programme includes the suppliers' Letter of Commitment, self-assessment, and site-assessment. Site-assessments are always performed by an external auditor approved by Bettercoal. In 2018, two of Fortum's Russian coal suppliers' mines were assessed against the Bettercoal Code, and a Kazakhstani coal supplier performed a self-assessment. Additionally, two of Fortum's coal suppliers have been audited in previous years.

### Supplier audits by supplier type



### Supplier audits by country





# Human rights

Fortum supports and respects internationally recognised human rights, which are included in the key human rights agreements. Our own operations have a direct or indirect impact on the realisation of the human rights of our own personnel, those working in the supply chain, and members of local communities.

## Management of human rights issues and personnel training

Our goal is to operate in accordance with the UN Guiding Principles on Business and Human Rights, and to apply these principles in our own operations as well as in country and partner risk assessments and supplier audits.

Fortum's approach to the management of human rights issues is described in more detail in Appendix 4: [Sustainability management by topic, Human rights](#).

Fortum's Corporate Sustainability unit is responsible for coordinating and developing sustainability, including human rights issues, at the Group level.

The e-learning for Fortum's Code of Conduct includes training in human rights-related issues. The e-learning is part of the induction programme for new employees. In 2018, the Code of Conduct e-learning training was updated and more than 90% of Group employees worldwide completed the training.

The Supplier Code of Conduct includes human rights requirements for suppliers and they are reviewed as part of the Supplier Code of Conduct training. Training was arranged in 2018 for the Recycling and Waste Solutions personnel in Denmark and for Fortum Oslo Varme personnel in Norway.

## Assessment of human rights impacts

A sustainability assessment is carried out for our investment projects and it takes into consideration the environmental, occupational health and safety, and social impacts of the project. The sustainability assessment includes a human rights evaluation, especially in new operating areas. A human rights assessment is also part of the assessment of country and counterparty risks when planning a project.

The process has two parts: a light and a deep assessment. A light assessment is done for all new countries in which one of our business units is planning the sales of products or services, and it is based on publically available sources. In 2018, seven of these assessments were made. Additionally, one of the deep assessments started in 2017 was continued.

Fortum's supplier audits cover the most important human rights aspects related to purchases. The supplier audits conducted in 2018 and their results are described in more detail in the section [Sustainable supply chain](#).

## Identified impacts on human rights, corrective measures and grievances

All forms of child and forced labour are strictly prohibited and in violation of Fortum's Code of Conduct. We have not identified risks related to the use of child or forced labour in our own operations. Support of employees' right to freedom of association and collective bargaining are discussed in the section [Employee-employer relations](#).

In June 2018, Fortum's subsidiaries operating in Great Britain published a statement required by the Modern Slavery Act on [Fortum's website](#). We support the principles defined in the Act and condemn practices that are in violation of the Act. We ensure compliance with our principles and Code of Conduct through internal monitoring and reporting practices and supplier assessments.

Internal reporting channels used for reporting any suspected misconduct relating to labour conditions or human rights violations are defined in Fortum's Code of Conduct. In addition to internal reporting channels, Fortum has an external "Raise a concern" channel, which is available to all stakeholders.

During the year there was one grievance filed regarding discrimination, which is reported in the section [Diversity and equal opportunity](#). There were no other grievances related to human rights or labour rights filed through formal grievance channels, nor were there any grievances carried over from the previous year.



# Corporate citizenship

Social responsibility is a cornerstone of Fortum’s operations. Our operations impact the local communities where our plants are located, and we engage in many kinds of collaboration with local stakeholders. We support activities promoting the common good in society, including the work of organisations and communities in our operating countries. Fortum also engages in significant collaboration with different research and development projects with universities.

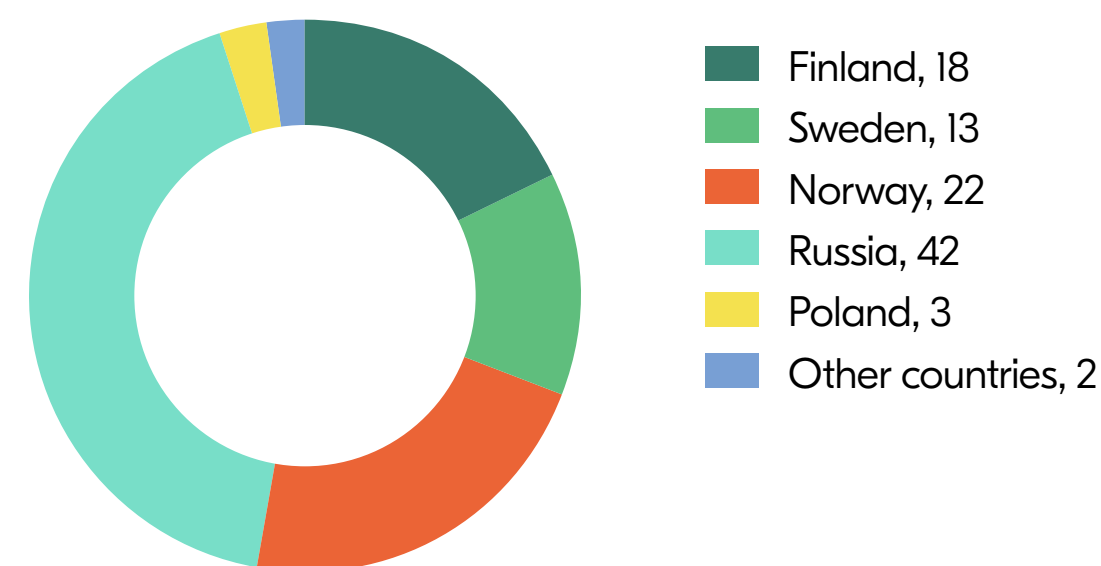
## Local impacts and collaboration with local communities

We are an important employer and significant tax payer in our operating areas. In addition, our investments improve the local infrastructure. Of our energy production forms, hydropower has the most significant **impacts on local communities** and local forms of land use.

Hydropower construction and use may alter the fluctuation range and rhythm in the discharge and water level in waterways as well as the fish fauna. These changes impact fishing, recreational use, and boating. We mitigate and compensate the adversities caused by hydropower production through numerous measures, such as stocking fish and building boat launch ramps.

We communicate openly, honestly and proactively, and we engage in a dialogue with the stakeholder groups located in the vicinity of our power plants. We carry out collaboration projects with local communities. We conduct environmental impact assessments (EIA) for our projects in accordance with legislative requirements. The hearing of stakeholders is part of the EIA process. In addition, relevant stakeholders are heard in all permit procedures.

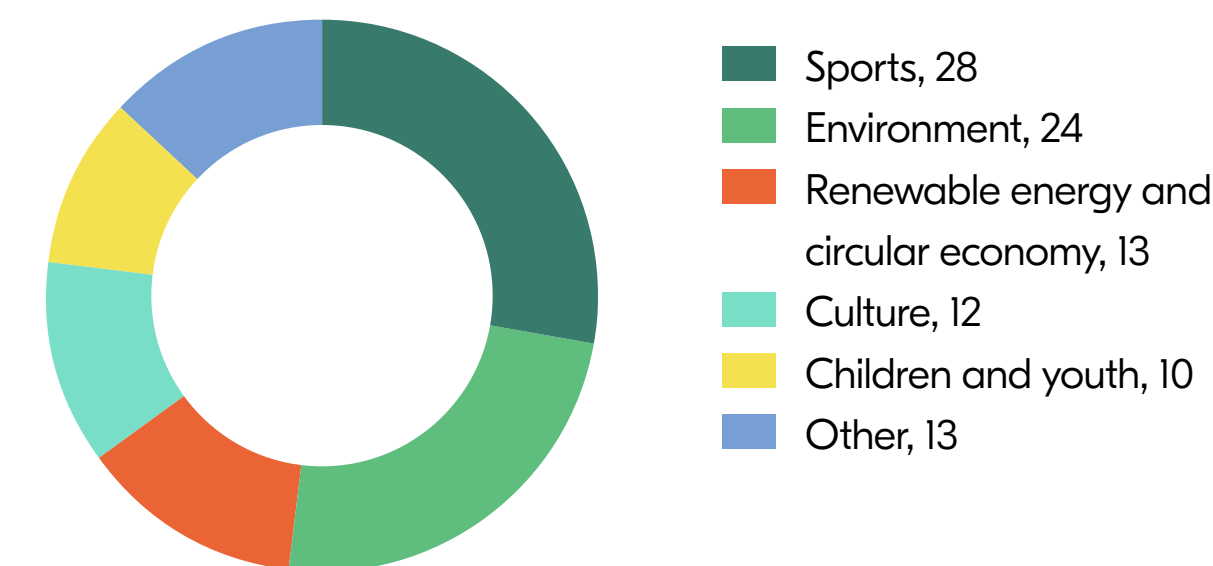
Fortum’s support to society by country, %



Examples of our activities with local communities in 2018:

- We arranged open-house events at power plants in different countries of operation; thousands of locals attended the events.
- We continued publishing the Naapurina ydinvoimala (Nuclear power plant as a neighbour) magazine in Loviisa, Finland, and maintained an active dialogue with local residents and representatives of the city of Loviisa.
- In Riihimäki, Finland, an active dialogue with local residents is supported by a cooperation council that convenes twice a year. In Wrocław, Poland, Fortum and a local community collaboration council created “Clean energy for Wrocław”, a programme that primarily aims to develop the district heating network in the city centre to improve air quality.
- **Projects** aiming to mitigate the adverse environmental impacts of hydropower were under way in Finland and Sweden in collaboration with municipalities, research facilities, fishermen and universities. Development of the environmental conditions and recreational use of

Fortum’s support to society by target, %



- the River Oulujoki continued together with local partners based on the multi-year framework agreement. In Vuoksi River, we sponsored the video monitoring of the Imatra city creek arranged by the Finnish Environmental Institute. A fish research programme for constructed waterways will continue, as we and other energy sector companies and authorities agreed on the launch of a new multi-year research programme with the Natural Resources Institute Finland. In the lower course of the River Gullspångsälven in Sweden, we have an ongoing joint project with regional authorities, the municipality, and Karlstad University to strengthen the life-cycle of the endangered Gullspång landlocked salmon.
- We held the sixth River Clean-Up for sports clubs in Sweden. More than 1,850 children and adults raised money for sports activities by collecting 30 tonnes of trash along the banks of four rivers (Dalälven, Klarälven, Ljusnan and Gullspångälven) where Fortum has hydropower plants.



- In Estonia, Fortum became a member of the Corporate Social Responsibility forum, which promotes corporate responsibility issues. Among other things, Fortum participated in the national occupational safety campaign.
- In Poland, we arranged and supported circular economy training for local communities. In Russia, we continued the About Energy programme, which was in use in 60 schools, reaching about 6,000 students in 2018 in Tyumen, Chelyabinsk, Nyagan and the Ulyanovsk region. The programme aims to teach children about using resources efficiently and to encourage them to take environmental issues into consideration in their thinking.
- We continued supporting local communities with several projects in the vicinity of the Kapeli and Amrit solar power plants in India. Among other things, Fortum has improved the water and electricity supply in the villages and has supported local schools by building a new classroom and furnishing the kitchen for providing lunch for the children. In the villages near the Bhadla power plant, a community development programme was continued. Within its framework, local adults have been taught to read, programmes to support the digital skills of teachers and students have been implemented, advice related to health and hygiene has been provided, and the livelihood of women in particular has been supported by teaching them tailoring and how to sew clothes on a sewing machine. The Self Help Group for local women started the previous year has also continued its activities.

### Support for society

According to Fortum's Policy for Sponsoring and Donations, our sponsoring focuses on the wellbeing of children and youth, renewable energy projects, R&D and innovations supporting Fortum's strategy, recycling, recovery and reuse. In 2018, Fortum's support for activities promoting the common good totalled about EUR 3.8 (2017: 4.9) million. Additionally, we support research, education and development in the natural, technical and economical sciences in the energy sector through

Fortum Foundation. The grants awarded by Fortum Foundation in 2018 totalled about EUR 680,000 (2017: 696,000). Fortum Foundation is not part of Fortum Group.

The goal of the collaboration with universities and colleges is to develop Fortum's business, promote energy-sector research and development, and foster Fortum's recruiting and training opportunities. In 2018, we participated in, e.g., two EU Horizon 2020-funded research projects in the Baltics. The Estonian RELaTED project is developing an Ultra-Low Temperature (ULT) district heating network solution. The concept utilises low temperature heat sources, and it enables more efficient utilisation of waste heat and the reduction of CO<sub>2</sub> emissions. In Latvia, Fortum is taking an active part in the THERMOS (Thermal Energy Resource Modelling and Optimisation System) project that will provide advanced energy system data and models to make heat network planning faster, more efficient, and more cost effective.

### Sponsorship projects

Fortum has a collaboration agreement until the end of 2019 with **Yrityskylä**. The Yrityskylä learning environment for sixth-graders is a school-aged children's society, a miniature city where students work in a profession and earn money for their work. In addition, the students act as consumers and citizens as part of Finnish society. In Fortum's miniature company, students perform activities in various tasks related to renewable energy.

In 2018, we started a collaboration with the **Crisis Management Initiative** (CMI). The CMI is an independent Finnish organisation that works to prevent and resolve violent conflicts through informal dialogue and mediation. During Ahtisaari Days held in November, the organisation's representatives visited Espoo schools with the goal of teaching the students skills related to conflict-resolution, peace mediation and reconciliation.





## Appendix I: Reporting principles

We report on sustainability in this Sustainability Report. Non-financial reporting, in line with the Accounting Act, is included in the Operating and Financial Review in the Financials. Additionally, we describe sustainability-related governance practices in the Corporate Governance Statement, and strategy and the CEO's view in the CEO's Business Review. Our reporting entity also includes the Tax Footprint.

We apply specific disclosures of the GRI Sustainability Reporting Standards we have identified as material.

We gain information about our stakeholders' views through the One Fortum Survey, the stakeholder sustainability survey and other stakeholder collaboration. Our selection of material topics is based on Fortum's own and our stakeholders' views regarding the materiality of Fortum's impacts.

We report sustainability information annually in Finnish and English. In our annual reporting we describe Fortum's operations in 2018 as well as some information from January–February 2019. The previous reporting was published in March 2018, and our next reporting will be published in February/March 2020. In addition to the annual reporting, we report on our sustainability activities in Fortum's interim reports.

### Reporting scope and boundaries

Reporting related to operations and management covers all functions under Fortum's control, including subsidiaries in all countries of operation. The figures for power and heat generation and investments include also figures from Fortum's share in associated companies and joint ventures that sell their production to the owners at cost. Possible deviations to these principles are reported in conjunction with information applying different boundaries. A list of Fortum's subsidiaries

is included in the ▶ **Financial Statements** Note 40 Subsidiaries by segment on 31 December 2018.

Information from previous years is mainly presented as pro forma information, i.e. on the basis of the organisation and the functions of each year; the impacts of ownership changes in production facilities, for example, have not been updated afterwards in the previous figures.

Stockholm Exergi is treated in the Financial Statements as a joint venture and Uniper as an associated company. Both companies are consolidated with the equity method.

Stockholm Exergi and Uniper are not included in Fortum's sustainability targets and indicators nor in the descriptions of management practices. Stockholm Exergi's and Uniper's sustainability information are available in the companies' sustainability reports that can be found on the companies' own web pages.

Exceptions to the accounting practice are presented in conjunction with each figure.

### Capacity changes

In 2018, Fortum commissioned 123 MW of new wind power capacity in Russia, Norway and Sweden. The new capacity is included in the reporting starting from its commissioning. Fortum started the trial run of the new Zabrze CHP plant (75 MW electricity and 145 MW heat) in Poland in late 2018. The new Zabrze plant is included in the reporting starting from its start-up. Fortum divested its majority stake in India's 185-MW solar power farms in autumn 2018. Capacity divested during the year is removed from the reporting upon finalisation of the sale.

### Measurement and calculation principles

Data for economic performance indicators is collected from the audited Financial Statements and from financial accounting and consolidation systems.

The environmental information of the report covers the plants for which Fortum is the legal holder of the environmental permit. In such

cases, the plant information is reported in its entirety. An exception is the calculation of specific CO<sub>2</sub> emissions and fuel use from the Meri-Pori power plant, where the calculation covers only Fortum's share of the figures as specified in the operation agreement between Fortum and Teollisuuden Voima Oy.

Fortum utilises a Group-wide database with instructions for collecting site-level environmental data. Sites are responsible for data input, emissions calculations and the accuracy of the information provided. The Corporate Sustainability unit compiles the data at the Group level and is responsible for the disclosed sustainability information.

Fortum's CO<sub>2</sub> emissions subject to the EU's emissions trading scheme are annually verified at the site level by external verifiers. Direct and indirect greenhouse gas emissions have been reported in accordance with the Greenhouse Gas (GHG) Protocol on the basis of the Greenhouse Gas Analysis performed by an external consultant.

Fortum's human resources (HR) management system is used in all Fortum's operating countries and is the main system for employee-related personal and job data. In Russia, the employee data system covers mainly superiors. In addition, Russian operations have their own, local data system.

Other social responsibility data, such as occupational health-related data, originates from various data systems.

Designated individuals collect the information and deliver it to the Corporate Sustainability unit primarily in the format recommended by the GRI Standards.

### ▶ Financials 2018



**Assurance**

Deloitte Oy has provided limited assurance for the 1 January 2018 to 31 December 2018 reporting period for GHG emissions calculations (Scope 1, 2 and 3) based on the Greenhouse Gas (GHG) Protocol according to the requirements published by CDP (Verification of Climate Data).

**Global Compact and Caring for Climate reporting**

Fortum has been a participant of the United Nations Global Compact initiative since 2010. In our 2018 Sustainability Report, we describe the realisation of the Ten Principles of the Global Compact initiative in our operations in the sections: ▶ **Climate and resources**, ▶ **Personnel and society**, and ▶ **Business ethics and compliance**. We use the GRI Sustainability Reporting Standards disclosures to measure compliance with the principles of human rights, labour standards, the environment and anti-corruption.

Fortum joined the UN Caring for Climate initiative in 2013. Fortum meets the reporting requirements of the Caring for Climate initiative by annually participating in the assessment in the CDP Climate Change questionnaire and by publishing its response on the CDP website.




UN GLOBAL COMPACT

COMMUNICATION ON PROGRESS

This is our **Communication on Progress** in implementing the principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.



## Appendix 2: Reported GRI disclosures

This Sustainability 2018 Report references the following Disclosures from the GRI Topic-specific Standards presented in the table.

All other standards except Water and Effluents (GRI 303) and Occupational Health and Safety (GRI 403) follow version 2016. The new standards, GRI 303 and GRI 403, follow version 2018.

DISCLOSURE	DESCRIPTION	SECTION
<b>GRI 103: MANAGEMENT APPROACH</b>		
103-1	Explanation of the material topics	<ul style="list-style-type: none"> <li>▶ Sustainability approach / Key sustainability topics</li> <li>▶ Appendix 4, Sustainability management by topic</li> </ul> Additionally reported by topic
103-2	The management approach and its components	<ul style="list-style-type: none"> <li>▶ Sustainability approach / Governance and management</li> <li>▶ Sustainability approach / Policies and commitments</li> <li>▶ Appendix 4, Sustainability management by topic</li> <li>▶ Sustainability approach / Business ethics and compliance</li> <li>▶ Climate and resources / Environmental non-compliances</li> <li>▶ Personnel and society / Human rights</li> </ul>
103-3	Evaluation of the management approach	<ul style="list-style-type: none"> <li>▶ Appendix 4, Sustainability management by topic</li> </ul> Additionally reported by topic

DISCLOSURE	DESCRIPTION	SECTION
<b>ECONOMIC RESPONSIBILITY</b>		
GRI 201: Economic Performance		
201-1	Direct economic value generated and distributed	▶ Personnel and society / Economic impacts
201-2	Financial implications and other risks and opportunities due to climate change	<ul style="list-style-type: none"> <li>▶ Climate and resources / Climate change mitigation</li> <li>▶ Financials / Operating and financial review / Risk management</li> </ul>
201-3	Defined benefit plan obligations and other retirement plans	▶ Financials / Notes to the consolidated financial statements / 31 Pension obligations
201-4	Financial assistance received from government	▶ Personnel and society / Economic impacts
GRI 205: Anti-corruption		
205-1	Operations assessed for risks related to corruption	▶ Sustainability approach / Business ethics and compliance
205-2	Communication and training about anti-corruption policies and procedures	▶ Sustainability approach / Business ethics and compliance
205-3	Confirmed incidents of corruption and actions taken	▶ Sustainability approach / Business ethics and compliance
GRI 206: Anti-competitive Behavior		
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	▶ Sustainability approach / Business ethics and compliance
Nuclear plant decommissioning		
103	Management Approach	▶ Financials / Notes to the consolidated financial statements / 29 Nuclear related assets and liabilities
System efficiency		
EU11	Average generation efficiency of thermal plants	▶ Climate and resources / Improving energy efficiency / Energy intensity



DISCLOSURE	DESCRIPTION	SECTION
<b>ENVIRONMENTAL RESPONSIBILITY</b>		
GRI 301: Materials		
301-1	Materials used by weight or volume	▶ Climate and resources / Improving energy efficiency / Fuel consumption
301-2	Recycled input materials used	▶ Climate and resources / Improving energy efficiency / Fuel consumption ▶ Climate and resources / Circular economy
GRI 302: Energy		
302-1	Energy consumption within the organisation	▶ Climate and resources / Improving energy efficiency / Fuel consumption ▶ Climate and resources / Sustainable energy production ▶ Climate and resources / Improving energy efficiency / Energy intensity
302-3	Energy intensity	▶ Climate and resources / Improving energy efficiency / Energy intensity
302-4	Reduction of energy consumption	▶ Climate and resources / Improving energy efficiency
GRI 303: Water and Effluents		
303-1	Interactions with water as a shared resource	▶ Climate and resources / Water use ▶ Personnel and society / Corporate citizenship
303-3	Water withdrawal	▶ Climate and resources / Water use
303-4	Water discharge	▶ Climate and resources / Water use ▶ Climate and resources / Environmental non-compliances
303-5	Water consumption	▶ Climate and resources / Water use
GRI 304: Biodiversity		
304-3	Habitats protected or restored	▶ Climate and resources / Biodiversity
GRI 305: Emissions		
305-1	Direct (Scope 1) GHG emissions	▶ Climate and resources / Climate change mitigation / Greenhouse gas emissions
305-2	Energy indirect (Scope 2) GHG emissions	▶ Climate and resources / Climate change mitigation / Greenhouse gas emissions
305-3	Other indirect (Scope 3) GHG emissions	▶ Climate and resources / Climate change mitigation / Greenhouse gas emissions
305-4	GHG emissions intensity	▶ Climate and resources / Climate change mitigation / Greenhouse gas emissions
305-7	Nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), and other significant air emissions	▶ Climate and resources / Emissions into air

DISCLOSURE	DESCRIPTION	SECTION
GRI 306: Effluents and Waste		
306-2	Waste by type and disposal method	▶ Climate and resources / Circular economy / Waste and by-products
306-3	Significant spills	▶ Climate and resources / Environmental non-compliances
GRI 307: Environmental Compliance		
307-1	Non-compliance with environmental laws and regulations	▶ Climate and resources / Environmental non-compliances
GRI 308: Supplier Environmental Assessment		
308-2	Negative environmental impacts in the supply chain and actions taken	▶ Personnel and society / Supply chain management / Sustainable supply chain
<b>SOCIAL RESPONSIBILITY</b>		
102-8	Information on employees and other workers	▶ Personnel and society / Personnel
102-41	Collective bargaining agreements	▶ Personnel and society / Personnel / Employee-employer relations
GRI 401: Employment		
401-1	New employee hires and employee turnover	▶ Personnel and society / Personnel
GRI 403: Occupational Health and Safety		
403-1	Occupational health and safety management system	▶ Personnel and society / Safety and security / Occupational and operational safety
403-2	Hazard identification, risk assessment, and incident investigation	▶ Personnel and society / Safety and security / Occupational and operational safety
403-3	Occupational health services	▶ Personnel and society / Personnel / Employee wellbeing
403-5	Worker training on occupational health and safety	▶ Personnel and society / Safety and security / Occupational and operational safety
403-6	Promotion of worker health	▶ Personnel and society / Personnel / Employee wellbeing
403-9	Work-related injuries	▶ Personnel and society / Safety and security / Occupational and operational safety
403-10	Work-related ill health	▶ Personnel and society / Personnel / Employee wellbeing



DISCLOSURE	DESCRIPTION	SECTION
<b>GRI 404: Training and Education</b>		
404-1	Average hours of training per year per employee	▶ Personnel and society / Personnel / Employee development
404-2	Programs for upgrading employee skills and transition assistance programs	▶ Personnel and society / Personnel / Employee development
404-3	Percentage of employees receiving regular performance and career development reviews	▶ Personnel and society / Personnel / Employee development
<b>GRI 405: Diversity and Equal Opportunity</b>		
405-1	Diversity of governance bodies and employees	▶ Personnel and society / Personnel / Diversity and equal opportunity ▶ Governance / Corporate governance statement / Governing bodies of Fortum / Board of directors
405-2	Ratio of basic salary and remuneration of women to men	▶ Personnel and society / Personnel / Diversity and equal opportunity
<b>GRI 406: Non-discrimination</b>		
406-1	Incidents of discrimination and corrective actions taken	▶ Personnel and society / Personnel / Diversity and equal opportunity
<b>GRI 407: Freedom of Association and Collective Bargaining</b>		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	▶ Personnel and society / Personnel / Employee-employer relations ▶ Personnel and society / Supply chain management / Sustainable supply chain
<b>GRI 408: Child Labor</b>		
408-1	Operations and suppliers at significant risk for incidents of child labor	▶ Personnel and society / Human rights
<b>GRI 409: Forced or Compulsory Labor</b>		
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	▶ Personnel and society / Human rights

DISCLOSURE	DESCRIPTION	SECTION
<b>GRI 412: Human Rights Assessment</b>		
412-1	Operations that have been subject to human rights reviews or impact assessments	▶ Personnel and society / Human rights
412-2	Employee training on human rights policies or procedures	▶ Personnel and society / Human rights
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	▶ Personnel and society / Human rights
<b>GRI 413: Local Communities</b>		
413-2	Operations with significant actual and potential negative impacts on local communities	▶ Personnel and society / Corporate citizenship
<b>GRI 414: Supplier Social Assessment</b>		
414-2	Negative social impacts in the supply chain and actions taken	▶ Personnel and society / Supply chain management / Sustainable supply chain
<b>GRI 415: Public Policy</b>		
415-1	Political contributions	▶ Sustainability approach / Business ethics and compliance
<b>GRI 417: Marketing and Labeling</b>		
417-3	Incidents of non-compliance concerning marketing communications	▶ Personnel and society / Customer responsibility and reputation / Product responsibility
<b>GRI 419: Socioeconomic Compliance</b>		
419-1	Non-compliance with laws and regulations in the social and economic area	▶ Sustainability approach / Business ethics and compliance ▶ Personnel and society / Personnel / Diversity and equal opportunity ▶ Personnel and society / Human rights ▶ Personnel and society / Customer responsibility and reputation / Product responsibility
<b>Disaster/Emergency planning and response</b>		
103	Management Approach	▶ Personnel and society / Safety and security / Corporate security
<b>Access</b>		
EU30	Average plant availability factor	▶ Personnel and society / Security of supply



## Appendix 3: Independent limited assurance report on Fortum's Greenhouse Gas Emissions 2018

### To the Management of Fortum Corporation

We have been engaged by Fortum Corporation (hereafter: Fortum) to provide a limited assurance on Fortum's Greenhouse Gas Emissions calculations (Scope 1, 2 and 3) based on Greenhouse Gas (GHG) Protocol according to the requirements published by CDP (Verification of Climate Data) for the reporting period of January 1, 2018 to December 31, 2018 (hereafter: GHG Emissions Disclosures). The information subject to the assurance engagement is presented in the section "Climate change mitigation" of Fortum's Sustainability Reporting 2018 (hereafter: GHG Reporting).

### Management's responsibility

Management is responsible for the preparation of the GHG Reporting in accordance with the reporting criteria as set out in Fortum's Reporting principles and the Greenhouse Gas Protocol (hereafter: GHG Protocol). This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of the GHG Reporting that are free from material misstatement, whether due to fraud or error, selecting and applying appropriate criteria and making estimates that are reasonable in the circumstances.

### Assurance provider's responsibility

Our responsibility is to express a limited assurance conclusion on the reported GHG Emissions Disclosures within Fortum's GHG Reporting based on our engagement. Our assurance report is made in accordance with the terms of our engagement with Fortum. We do not accept or assume responsibility to anyone other than Fortum for our work, for this assurance report, or for the conclusions we have reached.

We conducted our assurance engagement in accordance with International Standard on Assurance Engagements (ISAE) 3410 to provide a limited assurance on GHG Emissions Disclosures. This Standard requires that we comply with ethical requirements and plan and perform the assurance engagement to obtain a limited assurance

whether any matters come to our attention that cause us to believe that the GHG Emissions Disclosures have not been presented, in all material respects, in accordance with the reporting criteria.

We did not perform any assurance procedures on the prospective information, such as targets, expectations and ambitions. Consequently, we draw no conclusion on the prospective information.

A limited assurance engagement with respect to the GHG Emissions Disclosures involves performing procedures to obtain evidence about the reported GHG Emissions. The procedures performed depend on the practitioner's judgment, but their nature is different from, and their extent is less than, a reasonable assurance engagement. It does not include detailed testing of source data or the operating effectiveness of processes and internal controls and consequently they do not enable us to obtain the assurance necessary to become aware of all significant matters that might be identified in a reasonable assurance engagement.

Our procedures on this engagement included:

- A review of management systems, reporting and data compilation processes
- Selected interviews of persons conducting Scope 1, 2 and 3 analysis and data owners
- Review of assumptions and emission factors used in calculations
- Analytical testing of consolidated data
- Testing of source data on spot check basis

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

### Our independence, quality control and competences

We complied with Deloitte's independence policies which address and, in certain cases, exceed the requirements of the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants in their role as independent assurance providers and in

particular preclude us from taking financial, commercial, governance and ownership positions which might affect, or be perceived to affect, our independence and impartiality and from any involvement in the preparation of the report. We have maintained our independence and objectivity throughout the year and there were no events or prohibited services provided which could impair our independence and objectivity.

Deloitte Oy applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. This engagement was conducted by a multidisciplinary team including assurance and GHG Reporting expertise with professional qualifications. Our team is experienced in providing reporting assurance.

### Conclusion

On the basis of the procedures we have performed, nothing has come to our attention that causes us to believe that the information subject to the assurance engagement is not prepared, in all material respects, in accordance with the GHG Protocol or that the GHG Emissions Disclosures are not reliable, in all material respects, with regard to the reporting criteria.

Our assurance statement should be read in conjunction with the inherent limitations of accuracy and completeness of the GHG Reporting.

Helsinki 28 February 2019

Deloitte Oy

Reeta Virolainen  
Authorized Public Accountant

Lasse Ingström  
Authorized Public Accountant



## Appendix 4: Sustainability management by topic

Sustainability management in the areas of economic responsibility, environmental responsibility and social responsibility is described in the accompanying tables. Additionally, more detailed information about the management of different topics and impacts as well as about the measures, processes and projects is presented by topic in this report. Fortum's "Raise a concern" channel has been described in the section [► Business ethics and compliance](#). The purpose of the sustainability management approach is to ensure our operational compliance and to avoid, mitigate and offset the adverse impacts from our operations and to increase the positive impacts.

### Management of economic responsibility

	Description
Targets and approach	<p>For Fortum economic responsibility means competitiveness, performance excellence and market-driven production that creates long-term value for our stakeholders and enables sustainable growth. Satisfied customers are key to our success and active consumers will have a crucial role in the future energy system. Fortum has indirect responsibility for its supply chain. We conduct business with companies that act responsibly.</p> <p>Each new research and development project is assessed against the criteria of carbon dioxide emissions reduction and resource efficiency. Likewise, new investment proposals are assessed against sustainability criteria as part of Fortum's investment assessment and approval process. In our investments we seek economically profitable alternatives that provide the opportunity to increase capacity and reduce emissions.</p> <p>We measure financial performance with the return on capital employed (long-term target: at least 10%) and capital structure (long-term target: comparable net debt/EBITDA around 2.5x). The realisation of financial targets in 2018 is reported in the Financial performance and position section of the <a href="#">► Financials</a>.</p>
Policies and commitments	<p>The financial management system is based on Group-level policies and their specifying instructions, and on good governance, effective risk management, sufficient controls and the internal audit principles supporting them. Other key elements steering financial management are presented in the section <a href="#">► Policies and commitments</a> and in <a href="#">► Appendix 5</a>.</p>
Responsibilities	<p>The CFO and the Group's Financial unit, division management, and ultimately the CEO and the Board of Directors are responsible for issues related to finances and financial statements and for broader financial responsibility issues.</p> <p>Our sustainability responsibilities are presented in the section <a href="#">► Governance and management</a>.</p>
Monitoring and follow-up	<p>The Board decides on the company's financial targets as a part of the annual business planning process. Realisation of the targets is monitored on a monthly basis both at the division level and by Fortum Executive Management. Fortum's management monitors the realisation of financial targets quarterly as part of the business performance assessment, and key indicators are regularly reported to Fortum's Board of Directors. Financial key indicators related to investments are monitored in divisions' investment forums and by Fortum Executive Management.</p> <p>We report regularly on the financial impacts on our most important stakeholder groups. Fortum also uses the GRI Sustainability Reporting Standards indicators to measure economic responsibility.</p>

### Management of environmental responsibility

	Description
Targets and approach	<p>Fortum's aim is to provide its customers environmentally benign and reliable products and services. We strive to continuously reduce the impacts our operations have on the environment by using the best available practices and technologies. In our operations, we emphasise circular economy, better resource and energy efficiency and climate change mitigation. Our company's know-how in carbon dioxide-free hydro and nuclear power production and in energy-efficient combined heat and power production, investments in renewable energy, such as wind and solar power, as well as circular economy and resource efficiency play a key role in environmental responsibility.</p> <p>We measure the realisation of the environmental responsibility with the following indicators, for which we have set <a href="#">► Group-level targets</a>:</p> <ul style="list-style-type: none"> <li>• Specific CO<sub>2</sub> emissions</li> <li>• Energy efficiency</li> <li>• Major EHS incidents</li> <li>• Quality of investigation process of occupational accidents, major EHS incidents and near misses</li> <li>• GAP index, implementation of EHS minimum requirements</li> </ul> <p>Additionally, we have a target for the number of supplier audits.</p>
Policies and commitments	<p>Environmental management is based on Fortum's Sustainability Policy. Other key elements steering environmental management are presented in the section <a href="#">► Policies and commitments</a> and in <a href="#">► Appendix 5</a>.</p> <p>We assess environmental risks as part of the Group's risk assessment process. The risk assessment process is reported in the section Operating and financial review/Risk management of the <a href="#">► Financials</a>. Climate-related risks are described in the section <a href="#">► Climate change mitigation</a>.</p>
Responsibilities	<p>Our sustainability responsibilities are presented in the section <a href="#">► Governance and management</a>.</p>
Monitoring and follow-up	<p>The Group's key indicators are reported regularly to Fortum's Board of Directors and are published in Fortum's interim reports. Major EHS incidents are reported monthly, specific carbon dioxide emissions and the quality of investigation process of major EHS incidents are reported quarterly, and energy-efficiency improvements as well as the GAP index are reported annually to Fortum Executive Management.</p> <p>The divisions and sites follow and develop their operations with audits required by environmental management systems. Internal and external auditors regularly audit our ISO 14001 standard-compliant management system.</p> <p>The CO<sub>2</sub> emissions of plants within the sphere of the EU's emissions trading scheme are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's carbon dioxide emissions.</p> <p>Our supply chain monitoring system covers also environmental responsibility and is presented in the section <a href="#">► Personnel and society: Sustainable supply chain</a>.</p> <p>We map our stakeholders' views annually with the One Fortum Survey and with separate sustainability survey.</p>



## Management of social responsibility: Employees

	Description
Targets and approach	<p>We aspire to be a responsible employer who invests in the development and wellbeing of our employees. We aim to be a safe workplace for our employees and for the contractors and service providers working for us.</p> <p>We measure the realisation of social responsibility with the following indicators, for which we have set <b>► Group-level targets</b>:</p> <ul style="list-style-type: none"> <li>• Lost workday injury frequency (LWIF), own personnel and contractors</li> <li>• Number of severe occupational accidents</li> <li>• Quality of investigation process of occupational accidents, major EHS incidents and near misses</li> <li>• GAP index, implementation of EHS minimum requirements</li> <li>• Contractor safety improvement index (2019)</li> <li>• Percentage of sickness-related absences</li> </ul>
Policies and commitments	<p>Safety management is based on Fortum's Sustainability Policy. Other key principles steering labour practices and safety management are presented in the section <b>► Policies and commitments</b> and in <b>► Appendix 5</b>.</p> <p>Occupational safety risk assessment process is presented in the section <b>► Safety and security</b>. Everyday safety management is guided with about 20 Group-level Environment, Health and Safety (EHS) instructions.</p>
Responsibilities	<p>Our sustainability responsibilities are presented in the section <b>► Governance and management</b>.</p>
Monitoring and follow-up	<p>Fortum employee and contractor injury frequencies and the number of serious occupational accidents are reported monthly to Fortum Executive Management. The Group's key safety indicators are reported regularly to Fortum's Board of Directors and are published in Fortum's interim reports. The divisions and sites follow and develop their operations with audits required by safety and quality management systems. Internal and external auditors regularly audit our OHSAS 18001 or ISO 45001 standard-compliant management system.</p> <p>Work wellbeing, indicated as a percentage of sickness-related absences, is reported to the Fortum Executive Management every quarter. In addition, work wellbeing is monitored through other Group-level indicators, such as the ratio between actual retirement age and the statutory start of the retirement pension. Feedback about the personnel's wellbeing and job satisfaction is received also from wellbeing surveys as part of the Energise Your Day programme and from employee survey.</p> <p>We map our stakeholders' views annually with the One Fortum Survey and with separate sustainability survey.</p>

## Management of social responsibility: Human rights

	Description
Targets and approach	<p>Fortum supports and respects internationally recognised human rights, which are included in the key human rights agreements. Our goal is to operate in accordance with the UN Guiding Principles on Business and Human Rights.</p> <p>Our social responsibility includes taking care of our own employees and the surrounding communities. We advance responsible operations in our supply chain and more broadly in society.</p> <p>We have set a target for the number of supplier audits. Targets related to our own personnel are presented in the section <b>► Personnel and Society: Personnel</b>.</p>
Policies and commitments	<p>Key elements steering our human rights management are presented in the section <b>► Policies and commitments</b> and in <b>► Appendix 5</b>.</p>
Responsibilities	<p>Our sustainability responsibilities are presented in the section <b>► Governance and management</b>.</p>
Monitoring and follow-up	<p>The key tools for monitoring the impacts of human rights are country and partner risk assessments, supplier qualification, and supplier audits. A sustainability assessment is carried out for our investment projects and takes into consideration also human rights. The assessments are presented to Fortum Executive Management and to the Board of Directors when needed.</p> <p>Fortum has set a target for the number of audits, and the audits that are conducted are reported in our interim reports. For coal, we use the Bettercoal Code and tools in assessing the sustainability of the supply chain.</p> <p>Monitoring systems related to our own personnel are presented in the section Personnel and society: Personnel.</p> <p>We map our stakeholders' views annually with the One Fortum Survey and with separate sustainability survey.</p>



## Appendix 5: Fortum's main internal policies and instructions guiding sustainability

### Management of social responsibility: Business ethics (incl. anti-corruption and anti-bribery)

	Description
Targets and approach	We believe that an excellent financial result and ethical business are intertwined. We follow good business practices and ethical principles defined in our Code of Conduct in all our operations. We work within the framework of competition laws and Group competition instructions. We avoid all situations where our own personal interests may conflict with the interests of the Fortum Group. Notably, we never accept or give a bribe or other improper payment for any reason. Our customer relations are based on honesty and trust. We treat our suppliers and subcontractors fairly and equally. We select them based on their merit and we expect them to consistently comply with our requirements and with Fortum's Supplier Code of Conduct.
Policies and commitments	Key elements steering social and compliance management are presented in the section <a href="#">Policies and commitments</a> and in Appendix 5.
Responsibilities	Our sustainability responsibilities are presented in the section <a href="#">Governance and management</a> .
Monitoring and follow-up	Suspected misconduct and measures related to ethical business practices and compliance with regulations are regularly reported to the Fortum Executive Management and to the Board's Audit and Risk Committee. Fortum has a <a href="#">grievance channel</a> available to all stakeholder groups for the reporting of misconduct. Monitoring systems related to the supply chain are presented in the section <a href="#">Personnel and society: Sustainable supply chain</a> .

### Management of social responsibility: Product responsibility

	Description
Targets and approach	Uninterrupted supply of energy is necessary for a functioning society. We ensure the reliable operation of our power plants with preventive maintenance and continuous monitoring. Our goal is to present products and services truthfully in all our marketing and communication materials. We follow responsible marketing communication guidelines and the regulations for environmental marketing. We assume responsibility for customer data protection and comply with the valid regulations related to the handling of customer data. We have set Group-level targets for the energy availability of CHP plants and for customer satisfaction and reputation indices.
Policies and commitments	Key elements steering product responsibility management are presented in the section <a href="#">Policies and commitments</a> and in Appendix 5.
Responsibilities	Our sustainability responsibilities are presented in the section <a href="#">Governance and management</a> .
Monitoring and follow-up	The Group's key indicators are reported regularly to Fortum's Board of Directors and are published in Fortum's interim reports. Figures related to the availability of power plants are reported monthly to Fortum Executive Management. Customer satisfaction is monitored annually with the One Fortum Survey. The results of the survey are presented to Fortum's management and they are used to develop the business.

	Economic responsibility	Environmental responsibility	Social responsibility		
			Social and employee matters	Human rights	Anti-corruption and bribery
Values	x	x	x	x	x
Code of Conduct	x	x	x	x	x
Supplier Code of Conduct	x	x	x	x	x
Disclosure Policy	x		x		
Group Risk Policy	x	x	x	x	x
Sustainability Policy (including environmental, and health and safety policies)	x	x	x	x	x
Minimum Requirements for EHS Management		x	x	x	
Biodiversity Manual		x			
Group Manual for Sustainability Assessment		x	x	x	x
Human Resources Policy			x	x	
Leadership Principles			x	x	
Accounting Manual	x	x	x		
Investment Manual	x	x	x		x
Tax Principles	x		x		
Group Instructions for Anti-Bribery	x		x		x
Group Instructions for Safeguarding Assets	x		x		x
Group Instructions for Conflicts of Interest	x		x		x
Anti-Money-Laundering Manual	x		x		x
Compliance Guidelines for Competition Law	x		x		x
Security Guidelines		x	x	x	
Policy for Sponsoring and Donations	x		x	x	x
Group Instructions for Compliance Management	x	x	x	x	x

## Contact information

[Sustainability contact information on our website](#)