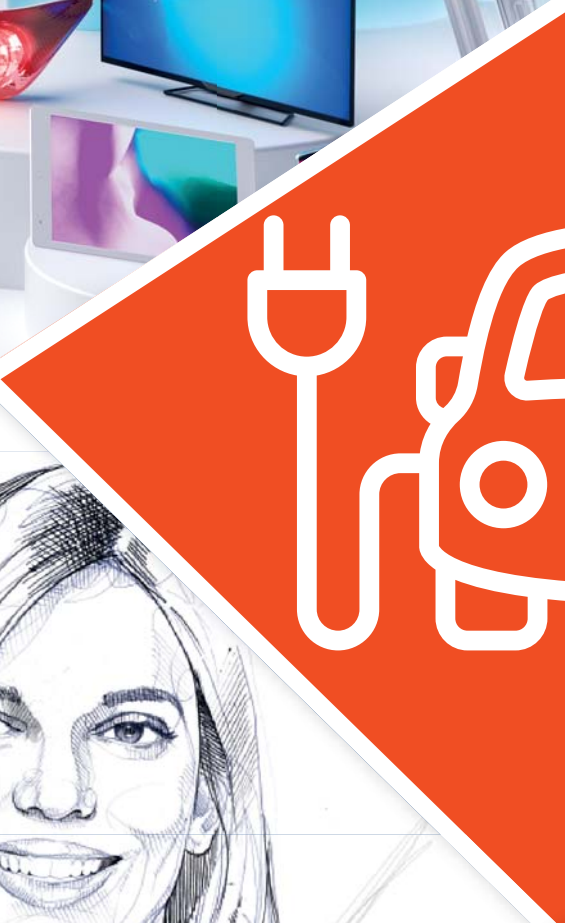


SOCIAL RESPONSIBILITY 2018

COMMUNICATION ON PROGRESS



EXTRACT FROM 2018 REFERENCE DOCUMENT





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S O C I A L
R E S P O N S I B I L I T Y
2018

COMMUNICATION ON PROGRESS

Extract from 2018 Reference document



MESSAGE FROM THIERRY LE HÉNAFF

CHAIRMAN AND CHIEF EXECUTIVE OFFICER



Dear stakeholders,

I am pleased to renew Arkema's support for the UN Global Compact. Our commitment to this initiative and its 10 principles, together with the Responsible Care® initiative and the contribution to the SDGs, drive our sustainability approach and continuous improvement programs.

Global social and environmental challenges are growing. A rising world population, the need to protect the environment, climate change, the growing scarcity of resources and digital transformation all present challenges, but also valuable opportunities for an industrial and technology-oriented company like ours.

In this context, to share the understanding of our CSR approach with all stakeholders and ensure that our sustainable development culture is embedded and embraced across the organization, in 2018 we formalized our Social Commitment Charter around three key commitments:

- offering a range of sustainable solutions driven by innovation,
- acting as a responsible manufacturer of chemical products,

- fostering open dialogue and close relations with stakeholders.

Supporting our customers in their quest for sustainable performance is a centerpiece of our strategy. Our innovation platforms echo sustainability megatrends and we intensify our efforts and partnerships to develop new technologies notably in batteries for electric mobility, light weighting materials, 3D printing or the circular economy. In order to drive our sales towards an even higher contribution to sustainability, we have in 2018 initiated a program to systematically assess our portfolio of solutions in light of sustainability criteria.

In the management of our operations, we want to rank among the best for safety and environmental footprint. The initiatives involving best practices, capital expenditure and pivotal programs have once again in 2018 resulted in significant progress. 2025 targets have already been reached for several environmental KPIs including the intensity of direct greenhouse gas emissions which has been cut by half since 2012. Some new targets will be defined for the coming period.

We operate in 55 different countries. Supporting communities and acting locally are important values to Arkema. In 2018, more than 1,000 citizenship initiatives have tightened local relationships as part of our Common Ground® program for which education and youth inclusion, as well as promotion of biodiversity are our primary focuses.

Supporting sustainability along the value chain, we promote the 10 principles and participate in the Together for Sustainability initiative. In 2018, 60% of our reassessed suppliers improved their CSR performance.

Arkema is committed to pursuing value creation for society. To do so, developing its 20,000 employees, maintaining a high level of engagement and promoting gender and nationality diversity are key objectives for Arkema. Through our 2018 European internal survey, employees expressed their strong engagement to Arkema's values and long-term vision.

This report details our ambitions, commitments and management systems in the field of Corporate Social Responsibility, as well as our achievements in this area.

I sincerely thank you for your continued support and valuable contribution to improving our sustainable performance.

Thierry Le Hénaff

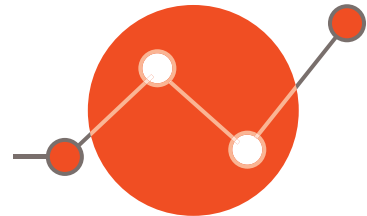
Chairman and Chief Executive Officer

PROFIL, AMBITION AND STRATEGY



GROUP PROFILE

A MAJOR PLAYER IN SPECIALTY CHEMICALS AND IN ADVANCED MATERIALS, WITH A LEADING INDUSTRIAL AND COMMERCIAL PRESENCE, AND A BALANCED GEOGRAPHICAL FOOTPRINT WITH STRONG POSITIONS IN EUROPE, NORTH AMERICA AND ASIA.



SALES OF
€8.8 billion

Thanks to its innovative solutions developed by its three divisions - High Performance Materials, Industrial Specialties and Coating Solutions -, Arkema contributes to address the world's current and future challenges in areas such as lightweight materials, new energies, access to drinking water, home comfort and bio-based products. With leading positions in its main product lines, the Group supports its customers in their quest for sustainable performance and their long-term development.

As a responsible industrial company with a global footprint, Arkema is committed to achieving continuous improvement and operational excellence, driven by the collective energy of its 20,000 employees.

Drawing on its solid entrepreneurial culture, Arkema engaged in a strong transformation process toward specialty chemicals since its stock market listing in May 2006, thanks to a strategy based on three key growth drivers: innovation for sustainable development, targeted acquisitions in high value-added businesses and industrial investments in high-growth regions. Thanks to this transformation, the Group has multiplied its EBITDA by four and the share price has more than tripled since 2006.



20,000
EMPLOYEES



A PRESENCE IN
55 countries



136
PRODUCTION SITES



€237 million
R&D EXPENDITURE



3 regional
R&D HUBS

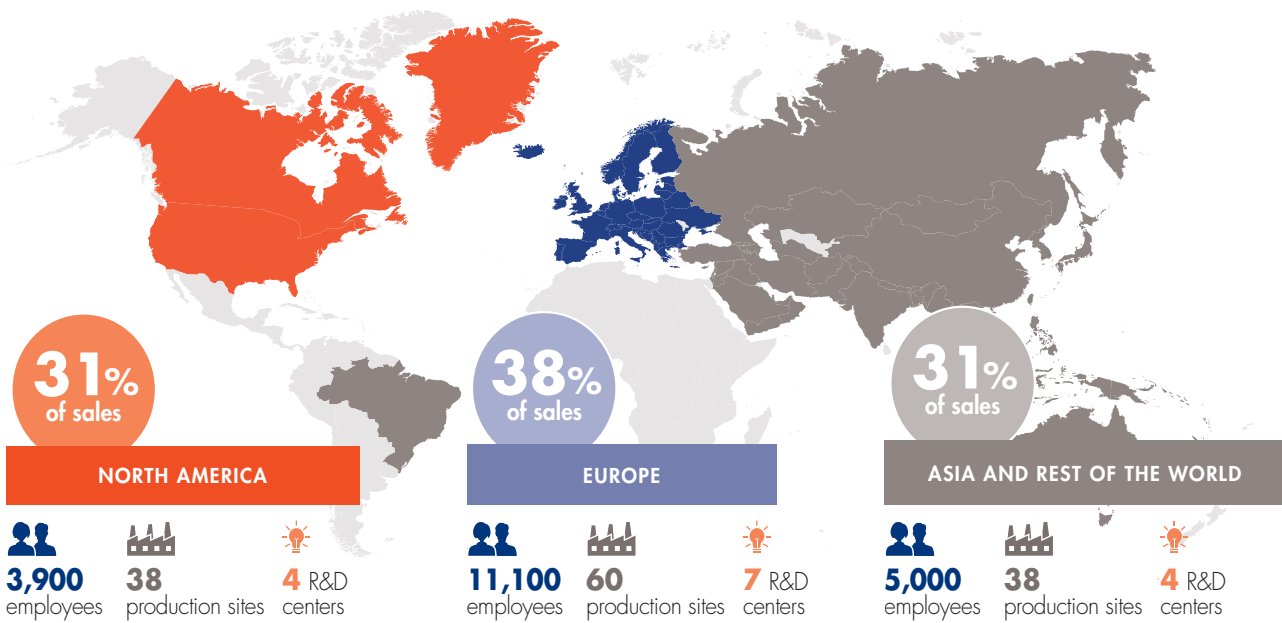


€561 million
CAPITAL EXPENDITURE ⁽¹⁾

(1) Recurring and exceptional capital expenditure.

Data for 2018

A GLOBAL INDUSTRIAL COMPANY

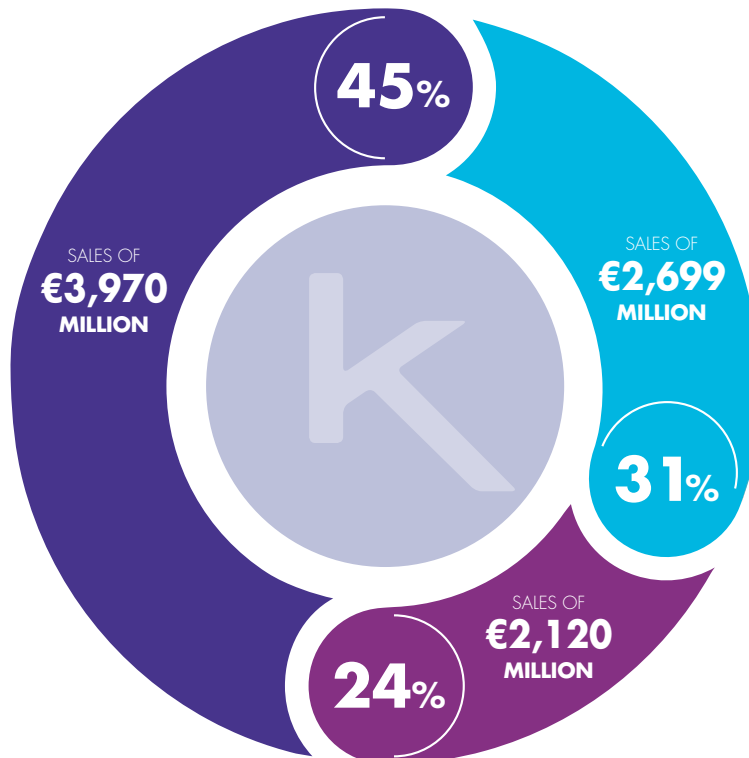


THREE DIVISIONS



HIGH PERFORMANCE MATERIALS

Innovative, high value-added solutions to address sustainable development challenges and its clients' technical challenges



INDUSTRIAL SPECIALTIES

High-profitability, integrated industrial niches with global leading positions



COATING SOLUTIONS

Performance resins, notably for decorative paints and industrial coatings, with extensive, global product ranges

KEY FIGURES

KEY FINANCIAL DATA

	2018	2017	2016	2015	2014
<i>(In millions of euros unless otherwise stated)</i>					
Sales	8,816	8,326	7,535	7,683	5,952
EBITDA	1,474	1,391	1,189	1,057	784
EBITDA margin	16.7%	16.7%	15.8%	13.8%	13.2%
Recurring operating income (REBIT)	1,026	942	734	604	447
REBIT margin	11.6%	11.3%	9.7%	7.9%	7.5%
Net income – Group share	707	576	427	285	167
Adjusted net income	725	592	418	312	246
Net income per share (euros)	8.84	7.17	5.24	3.42	2.53
Adjusted net income per share (euros)	9.51	7.82	5.56	4.23	3.72
Dividend per share (euros)	2.50⁽¹⁾	2.30	2.05	1.90	1.85
Shareholders' equity	5,028	4,474	4,249	3,949	3,573
Net debt	1,006	1,056	1,482	1,379	154
Gearing	20%	24%	35%	35%	4%
Net debt/EBITDA	0.7	0.8	1.2	1.3	0.2
Capital employed	6,996	6,554	6,829	6,466	4,565
Return on average capital employed	15.1%	14.1%	11.0%	11.0%	10.4%
Working capital on sales	13.4%	13.1%	14.5%	14.6%	16.1%
Free cash flow	499	565	426	442	21
EBITDA to cash conversion rate	38%	41%	36%	42%	18%
Recurring capital expenditure	500	420	423	431	346
Exceptional capital expenditure	61	10	0	0	124

Definitions of the main financial indicators are given in the glossary and in note C.1 "Alternative performance indicators" to the consolidated financial statements at 31 December 2018.

(1) Dividend proposed at the annual general meeting on 21 May 2019.

KEY NON-FINANCIAL DATA



INNOVATION

	2018	2017	2016	2015	2014
R&D expenditure <i>(in millions of euros)</i>	237	235	222	209	155
Number of patent applications filed	244	239	196	193	186
Number of patent applications filed relating to sustainable development	154	150	116	121	128



EMPLOYMENT

	2018	2017	2016	2015	2014
Headcount	20,010	19,779	19,637	18,912	14,280
Percentage of women in senior management and executive positions	21%	19%	18%	17%	17%
Percentage of non-French nationals in senior management and executive positions	39%	37%	39%	N/A	N/A



SAFETY

	2018	2017	2016	2015	2014
Total recordable injury rate (TRIR) ⁽¹⁾	1.3	1.6	1.5	1.5	1.9
Process safety event rate (PSER)	4.4	3.9	N/A	N/A	N/A

(1) The TRIR includes injuries to both Group and subcontractor employees.



ENVIRONMENT

(in EFPI terms compared with 2012)

	2018	2017	2016	2015	2014
Greenhouse gas emissions	0.46	0.52	0.60	0.62	0.70
Volatile organic compound emissions	0.62	0.66	0.80	0.83	0.79
Chemical oxygen demand	0.59	0.70	0.78	0.93	1.03
Net energy purchases	0.88	0.89	0.92	0.98	0.99



GLOBAL TRENDS

A WORLD UNDERGOING SIGNIFICANT CHANGE

AS A RESPONSIBLE INDUSTRIAL COMPANY, ARKEMA CONTRIBUTES TO ADDRESSING FOUR CURRENT AND FUTURE MAJOR CHALLENGES THANKS TO ITS INNOVATIVE SOLUTIONS AND THE OPTIMIZATION OF ITS INDUSTRIAL OPERATIONS.



INCREASING URBANIZATION

By 2050, the world population is expected to reach around 10 billion people, an increase of nearly 30%, driven mainly by emerging countries.

Growth is concentrated in urban areas, with urban populations expected to rise by around 2.5 billion people between now and 2050. This trend is accompanied by a gradual increase in living standards.

- Strong demand for the construction and renovation of buildings and infrastructure
- Increased demand for transportation, energy, water and services
- Changing lifestyles and consumer behavior
- Increasing concern about housing quality, comfort and energy efficiency



RESOURCE SCARCITY

The growth in the world population, increasing living standards and the rapid pace of industrialization are all driving an increase in the use of the world's resources. Based on current conditions, the consumption of raw materials could therefore triple by 2050.

- Scarcity of non-renewable resources
- Increasing difficulties in accessing safe drinking water



CLIMATE CHANGE

Urbanization, industrialization and the increase in the number of cars and air travel all contribute to global warming and climate change.

To address these issues, the Paris Agreement aims to keep the global temperature rise by the end of the century to below 2°C.

- Increase in the global temperature and its social and environmental consequences
- Increase and intensification of extreme weather events
- Need to speed up the transition to more sustainable lifestyles and economic models (decoupling)



NEW TECHNOLOGIES

New technologies, such as artificial intelligence, material sciences and robotics are growing fast, creating new commercial and industrial possibilities.

- Changing lifestyles and consumer behavior (e.g. percentage of the population equipped with connected objects)
- Significant increase in available data
- Increased production rates



THE CHEMICAL INDUSTRY

Seen by many as the “industry of industries”, the chemical industry manufactures a wide range of products for other major industries, including the construction, chemical, automotive, coatings, electronics, energy, food and pharmaceutical industries. In 2017, it generated estimated sales of around **€3,475 billion** ⁽¹⁾ worldwide.

The chemical industry operates on a global scale and more particularly in three regions: Europe, North America and Asia-Pacific. The latter has seen its share increase continuously in recent years. It now represents around **62% of global production** in value terms ⁽¹⁾ and is expected to continue to record the fastest growth over the coming years.

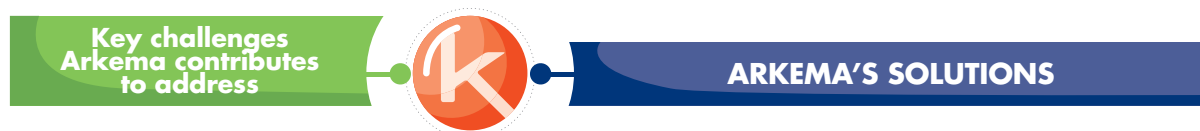
Lastly, the chemical industry is highly fragmented, in terms of products (several tens of thousands), end markets, and industry players (the top ten competitors have no more than a 10% share of the global market ⁽²⁾). This level of fragmentation offers opportunities for consolidation in certain segments such as adhesives.

(1) Source: Cefic Facts and Figures 2018. Europe accounts for around 19% and North America for 15%.

(2) Source: Arkema internal estimates.

OUR SOLUTIONS

TO CURRENT AND FUTURE CHALLENGES



INCREASING URBANIZATION

- Facilitate the transportation of energy and water, as well as access to high-quality water.
- Treat domestic and industrial wastewater and other waste.
- Meet changing demand for consumer products.
- Improve thermal and acoustic insulation, comfort and air quality in housing.

- **Advanced materials** for water ultrafiltration (Kynar® PVDF) and transportation (Rilsan® polyamides)
- **Hydrogen peroxide and acrylics** to disinfect water and treat wastewater
- **Acrylics and adhesives** for hygiene, **thiochemicals** for animal feed and **advanced materials** for sport, cosmetics and packaging
- **Adhesives and sealants** by Bostik for insulation and sealing and low-VOC **coating resins** for paints



RESOURCE SCARCITY

- Contribute to the development of new energies, such as lithium-ion batteries for electric vehicles, photovoltaics and wind power.
- Promote eco-design:
 - Develop products made from bio-based, renewable or recycled raw materials
 - Extend products' lifespan
 - Recycle end-of-life products.
- Optimize the consumption of energy, raw materials and water.

- **Advanced materials** for new energies: Kynar® PVDF for batteries and solar power, Apolhya® for solar power, Elium® recyclable resin for wind power
- **Bio-based** Rilsan® polyamides 11 and 10, made from castor oil plants
- Kynar® and Kynar Aquatec® coatings for reflective roofs and Kercoat® and Opticoat® coatings for glass bottles
- Elium® recyclable resin for composites and the Cecabase RT® additive for asphalt



CLIMATE CHANGE

- Make vehicles and aircraft lighter, to limit their fuel consumption and reduce their CO₂ emissions.
- Improve buildings' energy performance to reduce energy, heating and air-conditioning needs.
- Reduce greenhouse gas (GHG) emissions across the whole value chain.

- **Lightweighting solutions:**
 - **Advanced materials used as substitutes for metal:** Rilsan® HT, Kepstan® PEKK and thermoplastic composites (Elium®)
 - Altuglas® ShieldUp as a substitute for glass
 - **Adhesives** for the assembly of metal parts, as a substitute for mechanical bonding
- **Thermal insulation solutions:**
 - Adhesives and sealants by Bostik
 - Kynar® Aquatec coatings for reflective roofs
- Development of HFO refrigerants with a very low global warming potential
- 2025 target to reduce GHG emissions by 50% compared with 2012



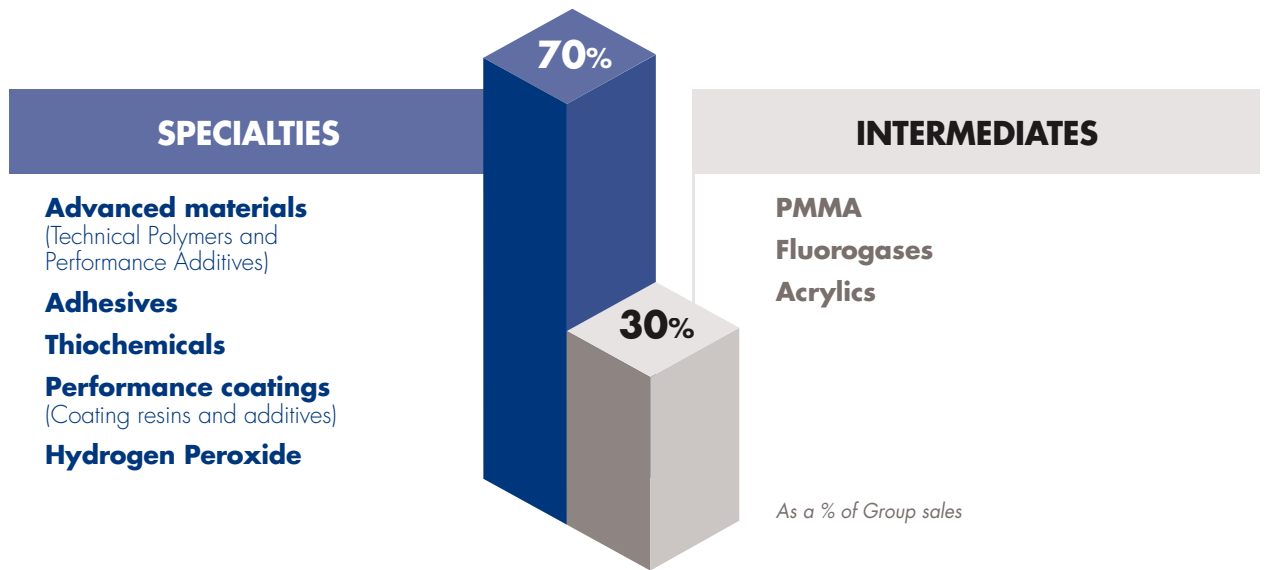
NEW TECHNOLOGIES

- Contribute to the development of new markets (e.g. consumer electronics, sensors).
- Speed up the expansion of new production technologies such as 3D printing.
- Leverage digital technologies to support operational and commercial excellence.

- **Advanced materials** for digital mobility devices (technical polymers for smartphones and tablets and Kynar® for batteries)
- **Full range of resins for 3D printing:**
 - Sartomer's N3xDimension® photocure resins, Kepstan® PEKK, Rilsan® polyamides
 - for all types of additive manufacturing
- **Digital plant** thanks to the deployment of predictive maintenance tools and 3D and 4D technologies

A BALANCED PORTFOLIO OF BUSINESSES

THE GROUP'S BUSINESS PORTFOLIO COMBINES STRONG POSITIONS IN SPECIALTY BUSINESSES, WITH HIGH GROWTH POTENTIAL, AND GLOBAL, COMPETITIVE INTERMEDIATE PRODUCT LINES. THIS COMPLEMENTARITY ENABLES ARKEMA TO ADAPT TO DIFFERENT ECONOMIC ENVIRONMENTS, AS DEMONSTRATED BY THE STRONG INCREASE IN ITS RESULTS OVER THE PAST YEARS.



High value-added activities combining differentiation and innovation:

- High technological innovation
- Solutions tailored to customers' specific needs
- Long-term partnerships with major industrial players, leaders in their field
- Well-known brands
- Proprietary technologies

High-growth niche markets:

- Driven by sustainable megatrends: lightweight materials, bio-based products, 3D printing, home efficiency, new energies
- Limited number of players

Globally resilient businesses, close to end markets and particularly well-placed to contribute to the world's current and future major challenges

Global leading positions:

- Number 2 or 3 worldwide
- Cutting-edge proprietary technologies
- Global and competitive production footprint, with platforms in Europe, North America and Asia
- Strong customer partnerships

Businesses with high profitability but greater exposure to supply/demand balances



LONG-TERM TARGET

More than 80%

OF SALES GENERATED BY SPECIALTY BUSINESSES

STRONG ASSETS

ARKEMA CAN LEVERAGE A SET OF SOLID ASSETS AND STRENGTHS TO ROLL OUT ITS STRATEGY AND CARRY OUT ITS NUMEROUS PROJECTS, ENABLING THE GROUP TO STRENGTHEN ITS POSITION AMONG THE WORLD LEADERS IN SPECIALTY CHEMICALS.

In the top 3 globally on 90% of total sales

Well-known brands

Contributing to customer loyalty.



Strong long-term customer partnerships

With leading industrial customers in areas such as 3D printing, composites, water treatment and batteries.

Experienced, committed teams

Who contributed to shaping Arkema into a leading industrial group, thanks to their ability:

- to carry out complex industrial projects such as the construction of a thiochemicals platform in Malaysia, in a new country for the Group, with a new partner and based on an innovative process;
- to ensure smooth integration of major acquisitions such as Bostik; and
- to adapt to the different macro-economic environments that Arkema has faced over the last 13 years, and to strongly improve its financial performance.

A competitive and global presence

To support our customers in their geographical expansion thanks to:

- a strong manufacturing footprint in Europe, North America and Asia;
- proprietary manufacturing processes that are technologically complex; and
- significant expertise in large-scale investment projects, with high efficiency in terms of costs, timing and technical implementation.

Extensive R&D capabilities

Enabling us to launch new products, provide our customers with the technical support they need, and further improve the efficiency of our manufacturing processes, thanks to:

- the expertise of our 1,600 researchers at our 15 research centers worldwide;
- a portfolio of close to 9,000 patents; and
- 244 new patent applications filed in 2018.

A solid financial structure

- Excellent cash generation and a high EBITDA to cash conversion rate.
- Tightly-controlled net debt, representing, at end-2018, 0.7 times annual EBITDA and 20% gearing.

Giving us the financial flexibility needed to carry out our ambitious investment and targeted acquisitions policy while ensuring regular dividend growth.

THE GROUP'S AMBITION

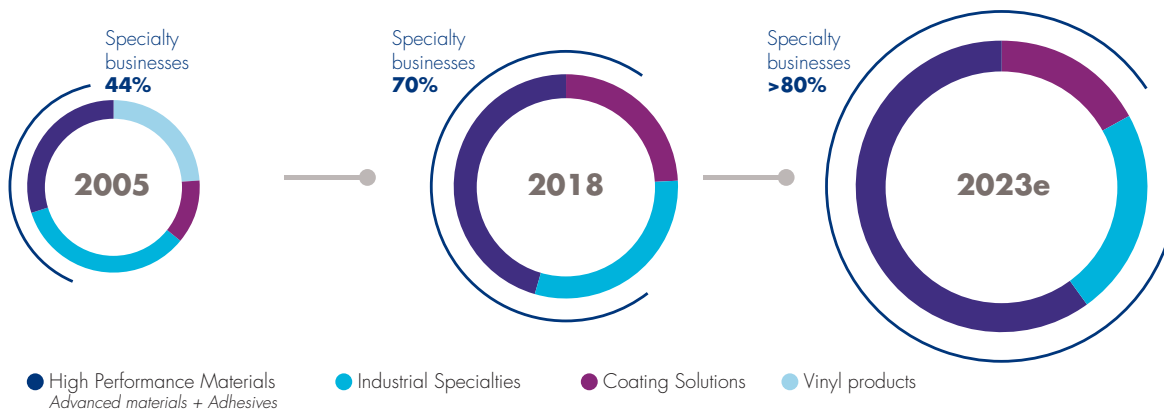
MEDIUM- AND LONG-TERM TARGETS

ARKEMA'S AMBITION IS TO CONSOLIDATE ITS POSITION AMONG THE GLOBAL LEADERS IN SPECIALTY CHEMICALS BY ACCELERATING THE DEVELOPMENT OF THESE BUSINESSES.

Following the stock market listing in May 2006, Arkema started an in-depth transformation to reposition its portfolio of businesses toward a significantly higher proportion of specialty chemicals, which are more resilient, close to end markets, and offer strong growth potential.

Accelerating the development of specialty businesses

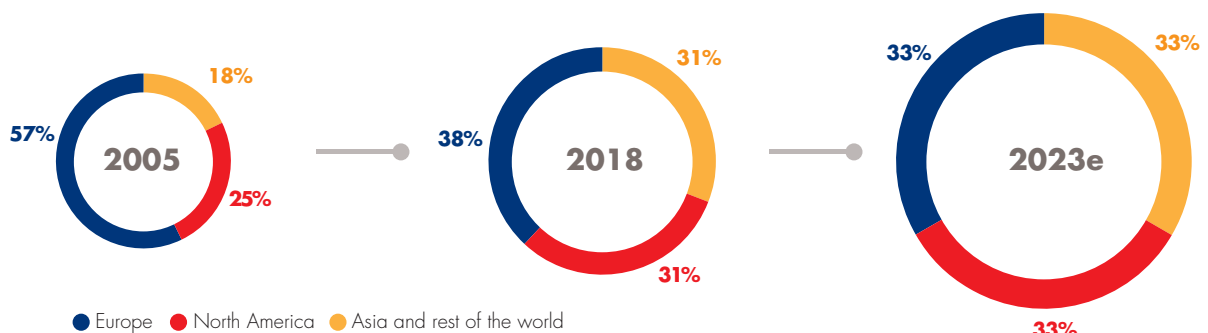
Arkema's target is for these businesses to account for **more than 80% of Group sales** by 2023, compared with 70% today, thereby contributing to resilient growth and regular cash generation for the Group.



Continuing the geographic rebalancing

Together with its in-depth profile change, Arkema rebalanced its geographic exposure by developing its activities in North America and high-growth countries, primarily in Asia.

Arkema aims to finalize, by 2023, this geographic rebalancing with Europe, North America and Asia and the rest of the world each accounting for **one third of total sales**.



AMBITIOUS LONG-TERM FINANCIAL TARGETS

For 2023, Arkema is aiming to achieve a **REBIT margin** between **11.5%** and **12.5%** and a high **EBITDA to cash conversion rate** of **35%**.

This ambition will be achieved with strict financial discipline, notably a net debt to EBITDA ratio of less than 2 and a return on capital employed ⁽¹⁾ of at least 10%, while preserving a solid investment grade rating.

In the medium term, Arkema is aiming to achieve sales of €10 billion and an EBITDA margin close to 17% by 2020.

Defined in normalized market conditions.

(1) (REBIT - current taxes) / (net debt + shareholders' equity).

A STRONG CSR AMBITION

The Group has defined a well-established roadmap with a target to be amongst the top performers in this area. This includes non-financial targets for 2025 which demonstrate Arkema's commitment to continuous progress in safety, the environment and diversity.

SAFETY



Total recordable injury rate

TRIR < 1.2

(including subcontractor employees)

Process safety event rate

PSER < 3

ENVIRONMENT



-50%

Greenhouse gas emissions

-40%

Chemical oxygen demand

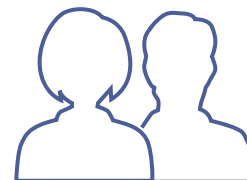
-15%

Net energy purchases

-33%

Volatile organic compound emissions

EMPLOYMENT



23% to 25%

Percentage of women in senior management and executive positions

42% to 45%

Percentage of non-French nationals in senior management and executive positions

OUR STRATEGY

TO ACHIEVE ITS AMBITION, ARKEMA CONTINUES TO IMPLEMENT AN AMBITIOUS TRANSFORMATION STRATEGY BASED ON THREE STRONG GROWTH DRIVERS: INNOVATION FOR SUSTAINABLE DEVELOPMENT, TARGETED ACQUISITIONS IN HIGH VALUE-ADDED SPECIALTIES, AND CUTTING-EDGE INDUSTRIAL INVESTMENTS TO SUPPORT CUSTOMERS AND PARTNERS IN HIGH-GROWTH REGIONS.

To grow further, the Group benefits from very solid foundations and is implementing initiatives in four cross-functional areas: commercial excellence, operational excellence, corporate social responsibility and digital transformation. Arkema will reinforce its efforts in these four areas over the coming years.

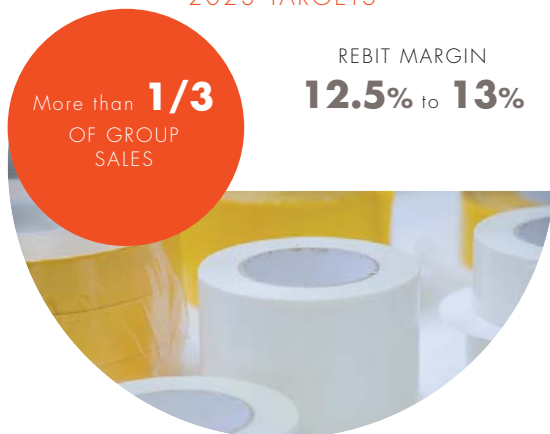


TWO MAJOR GROWTH PLATFORMS

ARKEMA IS MORE SPECIFICALLY ROLLING OUT ITS STRATEGY TO ACCELERATE THE DEVELOPMENT OF TWO MAJOR PLATFORMS OF ITS MEDIUM- AND LONG-TERM GROWTH: ADHESIVES AND ADVANCED MATERIALS. THESE TWO BUSINESSES SHOULD ACCOUNT FOR AROUND 60% OF SALES IN 2023 (VERSUS 45% IN 2018).

BOSTIK ADHESIVES: bolt-on acquisitions and increasing profitability

2023 TARGETS



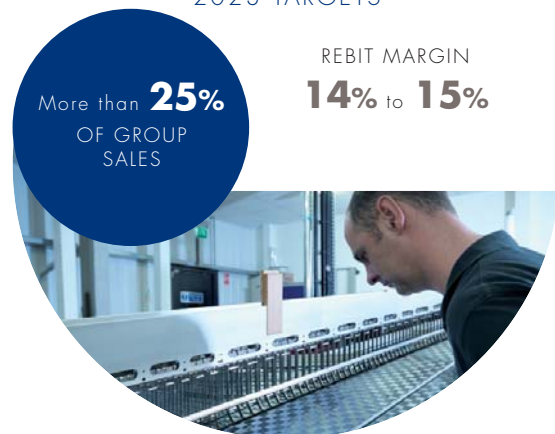
Arkema aims to more than double its sales in adhesives (from a 2016 baseline of €1.6 billion), with the increase coming from **organic growth for one third** and from **bolt-on acquisitions for the other two thirds**. Arkema therefore intends to participate fully in the consolidation of this attractive but still fragmented market.

To achieve its ambition, Bostik is actively pursuing:

- its geographic expansion, particularly in emerging countries;
- its innovation efforts, notably in structural adhesives and engineering adhesives, two very fast-growing niche markets;
- its initiatives to enhance operational excellence and simplify processes and its organization; and
- the implementation of acquisition synergies.

ADVANCED MATERIALS⁽¹⁾: innovation and geographic expansion

2023 TARGETS



Thanks to their properties, **advanced materials** offer significant opportunities for innovation in such areas as lightweight materials, bio-based polymers, new energies and consumer goods design.

Arkema supports its customers' development in fast-growing countries thanks to the **numerous industrial projects** under way in:

- photocure resins in China;
- PEKK in the United States; and
- specialty polyamides in Asia and France.

Thanks to these projects, the Group is targeting organic growth of around 5% in this business by 2023.

(1) Technical Polymers and Performance Additives.

PROFILE, AMBITION AND STRATEGY

Ambition and strategy

FIRST STRATEGIC PRIORITY

INNOVATION FOR SUSTAINABLE DEVELOPMENT

TECHNOLOGICAL INNOVATION IS AT THE HEART OF ARKEMA'S STRATEGY AND A KEY GROWTH DRIVER, FOSTERING THE DEVELOPMENT OF SUSTAINABLE SOLUTIONS IN PRODUCTS, PRODUCT APPLICATIONS AND PRODUCTION PROCESSES



Supporting customers address today's challenges

Arkema develops new products and applications to meet customers' increasingly demanding needs in leading-edge sectors such as aerospace, automotive, consumer electronics, new energies and oil and gas. Thanks to its 15 R&D centers across the world, the Group adapts its solutions to customers' specific expectations in each region.

Anticipating future trends

Arkema anticipates technological and market changes and is developing today, through a dedicated incubator structure, the breakthrough innovations that will meet society's needs in the years to come. For example, Arkema developed Kepstan® PEKK – a material for extreme environments that can withstand temperatures of up to 260 degrees – following ten years' R&D work, for which a production unit started operating recently in the United States.

Contributing to operational excellence

The Group's R&D department provides innovations to production facilities to allow them to produce safely and competitively, whilst reducing their environmental footprint.

Assessing the sustainability of our solutions

In 2018, the Group initiated a program to analyze and assess its portfolio of solutions in light of sustainability criteria and contribution to the United Nations' sustainable development goals. On completion of the pilot phase, the program will be rolled out across all Arkema businesses from 2019.

KEY R&D FIGURES (2018)



More than **1,600**
RESEARCHERS



€237m
IN R&D
EXPENDITURE



3.7%
OF ADVANCED
MATERIALS
SALES



**15 R&D
centers**
ACROSS
THE THREE HUBS
IN EUROPE, ASIA
AND NORTH
AMERICA



244
PATENT
APPLICATIONS FILED
> 60%
RELATING
TO SUSTAINABLE
DEVELOPMENT

6 innovation platforms ideally positioned to meet tomorrow's challenges

The chemicals industry will play an important role in addressing the world's many challenges. Arkema has identified major social trends in order to ensure its solutions adequately address market demand and specific customer expectations worldwide, and to optimize its research efforts.

Based on this work, which is updated on an ongoing basis, the Group has set up 6 innovation platforms which contribute to six United Nations' sustainable development goals.

BIO-BASED PRODUCTS



- Around 9% of Group sales
- Castor oil-based specialty polyamides 11 and 10

LIGHTWEIGHT MATERIALS AND DESIGN



- Specialty polyamides, Kepstan® PEKK and Elium® recyclable resin for thermoplastic composites used in the automotive, aerospace and oil and gas sectors
- Specialty polyamides, Kepstan® PEKK and N3xtDimension® UV curable resins for 3D printing

NEW ENERGIES



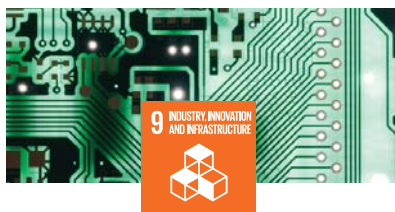
- Kynar® PVDF for batteries (separator coatings and binders)
- Kynar® PVDF for photovoltaic applications
- Elium® recyclable resin for the wind turbine industry

WATER MANAGEMENT



- Kynar® PVDF for micro-filtration
- Polyamides for water supply systems

ELECTRONICS SOLUTIONS



- Kynar® PVDF and specialty polyamides for tablets and smartphones
- Piezotech® piezoelectric polymers for connected objects

HOME EFFICIENCY AND INSULATION



- Adhesives and sealants for windows, doors and insulation panels
- Acrylic emulsions with low volatile organic compounds content



Numerous partnerships
WITH UNIVERSITIES
AND PUBLIC AND
PRIVATE RESEARCH
LABORATORIES

HIGHLIGHTS

- Inauguration of an International Teaching and Research Chair on innovative materials, with the *École polytechnique* in France
- Partnerships in thermoplastic composites, with:
 - Hexcel, one of the world's leading manufacturers of high-performance composite materials for the aerospace industry; and
 - Barrday, for the oil and gas industry.
- Opening of a center of excellence in the United States dedicated to 3D printing

2018

PROFILE, AMBITION AND STRATEGY

Ambition and strategy

SECOND STRATEGIC PRIORITY

INVESTMENT IN HIGH-GROWTH REGIONS

ARKEMA HAS AN AMBITIOUS INVESTMENT STRATEGY IN NORTH AMERICA AND HIGH-GROWTH COUNTRIES, PRIMARILY IN ASIA, WHICH COVER KEY GROWTH MARKETS FOR THE GROUP, INCLUDING CONSUMER PRODUCTS (ELECTRONICS, SPORTS, HYGIENE), NEW ENERGIES AND TRANSPORTATION.

AS A RESULT, ARKEMA HAS REBALANCED ITS GEOGRAPHIC EXPOSURE IN 2018, MAKING 31% OF SALES IN ASIA AND THE REST OF THE WORLD, 31% IN NORTH AMERICA AND 38% IN EUROPE.

An ambitious investment policy

To support its customers' geographic expansion, Arkema aims for recurring capital expenditure to average **5.5% of sales** per year, with 45% dedicated to growth projects and 55% to maintenance, safety and the environment.

In addition to this recurring capital expenditure, the Group will invest around **€500 million in exceptional capital expenditure** in the period 2018-2021 on:

- a doubling in production capacity of the thiochemicals platform in Malaysia; and
- a major investment plan announced in specialty polyamides in Asia, notably with the construction of a new monomer and Rilsan® polyamide 11 production facility to support the high customer demand for lightweight bio-based materials in automotive, 3D printing and consumer products markets.

In 2019, Arkema's recurring and exceptional capital expenditure is expected to amount to around €610 million.

2019

ACRYLICS



90 kt acrylic acid reactor in Clear Lake (United States)

Markets: adhesives, paints, coatings, water treatment

ADVANCED MATERIALS



30% increase in Sartomer's production capacity in Nansha (China)

Markets: 3D printing, graphic arts, electronics

ADVANCED MATERIALS



50% increase in specialty powders production capacity (France)

Markets: coatings, composites, 3D printing

LARGE-SCALE INDUSTRIAL PROJECTS

2020

2021

THIOCHEMICALS



Twofold increase in production capacity in Kerteh (Malaysia)

Markets: animal feed, oil and gas, refining

ADVANCED MATERIALS



25% increase in PA12 global production capacity (China)

Markets: lightweight materials, sports, electronics

ADHESIVES



New world-class adhesives plant in Nara (Japan)

Markets: non-woven, industrial adhesives

ADVANCED MATERIALS



50% increase in PA11 global production capacity (Asia)

Markets: lightweight materials, sports, electronics

- North America
- Asia and rest of the world
- Europe

HIGHLIGHTS

- €561 million in recurring and exceptional capital expenditure
- Recurring capital expenditure at 5.7% of Group sales
- Ramp-up of the Honfleur specialty molecular sieve site in France following the doubling of production capacity
- Start-up of the Calvert City plant in the United States after a 20% increase in production capacity of Kynar® PVDF for water filtration, chemical engineering and high-performance cables markets
- Start-up in early 2019 of the Kepstan® PEKK facility in Mobile, United States, for aerospace, oil and gas and 3D printing markets

2018

THIRD STRATEGIC PRIORITY

TARGETED ACQUISITIONS TO STRENGTHEN HIGH VALUE-ADDED SPECIALTIES

ARKEMA PURSUES A POLICY OF TARGETED, SMALL TO MID-SIZED ACQUISITIONS, FOCUSED ON ADHESIVES, ADVANCED MATERIALS AND DOWNSTREAM ACRYLICS. THESE TRANSACTIONS, WHICH COULD REPRESENT TOTAL SALES OF €1 BILLION TO €1.5 BILLION, WILL ENABLE THE GROUP TO INCREASE ITS MARKET SHARE IN THESE AREAS, STRENGTHEN ITS PORTFOLIO OF BUSINESSES AND INCREASE ITS RESILIENCE.

Acquisitions that create long-term value

In line with its ambition to carry out sustainable transactions that create value, the Group aims to make acquisitions offering significant synergies, thereby reducing the transactions' enterprise value to EBITDA multiple close to Arkema's own multiple, four or five years after the acquisition and following the full implementation of synergies.

These synergies could correspond to:

- cost synergies on purchases of raw materials, goods and services or logistics, or achieved by centralizing certain support functions or strengthening operational excellence programs; and
- new geographic, technological or commercial developments driven by the strategic fit between Arkema and the acquired businesses.

The potential acquisitions should also have an accretive impact on earnings per share and on cash generation between the first and second year of integration.

This ambition goes hand-in-hand with strict financial discipline. Arkema thus intends to maintain a very solid balance sheet and to keep a solid investment grade rating with the rating agencies and a net debt to EBITDA ratio below 2 by 2023.

HIGHLIGHTS

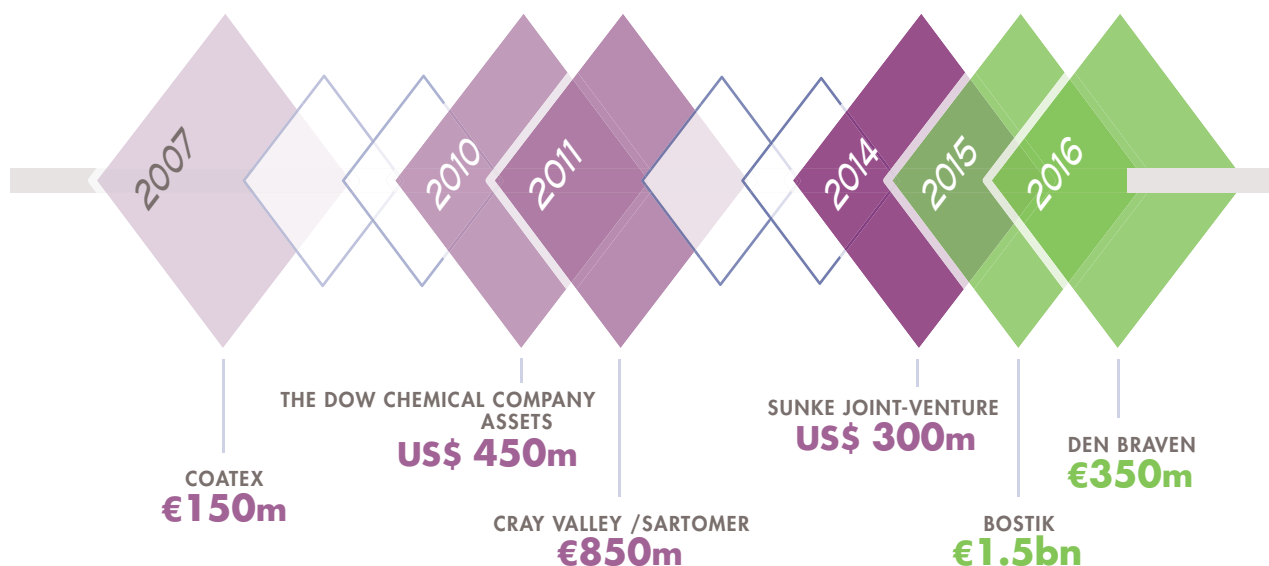
3 targeted acquisitions in adhesives:

- XL Brands, a floor covering adhesives business in the United States, for an enterprise value of US\$ 205 million;
- Afinitica, specialized in instant engineering adhesives; and
- Nitta Gelatin's industrial adhesives business in Japan.

2018

TRANSFORMATIONAL ACQUISITIONS

Since 2006, thanks to active portfolio management, Arkema has significantly increased its presence in the performance coatings value chain and entered the attractive adhesives market.



Sales

- Adhesives
- Performance coatings and acrylic monomers

A targeted divestment program

Arkema is also continuing its program to divest small non-core businesses representing a total of around €700 million in sales.

Arkema has thus finalized the following divestments:

- in late 2016, the activated carbon and filter aid business, which generated around €93 million in sales, for an enterprise value of €145 million;
- in late 2015, Sunclear, a plastic and aluminum sheet distribution business that generated sales of around €180 million, for an enterprise value of €105 million.



FIRST PILLAR

COMMERCIAL EXCELLENCE

CUSTOMERS ARE CENTRAL TO ARKEMA'S STRATEGY AND ITS INNOVATION POLICY. MEETING THEIR NEEDS AS EFFECTIVELY AS POSSIBLE AND PROMOTING THE DIVERSITY OF THE GROUP'S SOLUTIONS ARE THE TWO MAIN OBJECTIVES OF ARKEMA'S MARKETING AND COMMERCIAL EXCELLENCE PROGRAM. THIS PROGRAM ALLOWS ARKEMA TO SUPPORT ITS CUSTOMERS IN SUCH LEADING-EDGE SECTORS AS AEROSPACE, ELECTRONICS, OIL AND GAS EXTRACTION, AUTOMOTIVE, SPORT AND 3D PRINTING.



A cross-functional approach

Arkema has adopted a **cross-functional approach** notably based on:

- a network of key account managers who supervise and consolidate relationships with certain key customers in order to more effectively anticipate and meet their needs through customized solutions produced by the Group's various businesses;
- the deployment of advanced customer relationship management (CRM) tools;

- the creation of commercial platforms in certain important market segments; and
- the implementation of dedicated, ongoing training courses via the Group's Sales Academy.

Alongside initiatives to optimize customer service and enhance the competitiveness and reliability of our main production sites, this approach will help to continuously improve the customer experience.



Strategic partnerships

To strengthen its customer relationships over the long term, Arkema forges strategic partnerships with key customers that are leaders in their market or area of expertise. Some relate to industrial developments, such as the partnership with Daikin in refrigerants or with CJ CheilJedang and Novus in Thiochemicals. Others are R&D-oriented, like the partnerships signed in 2018 with Hexcel and Barrday in thermoplastic composites.



Promoting our solutions



Arkema organizes "Innovation Days" at the premises of certain customers and prospects to showcase its solutions in specific markets. The R&D and sustainable development teams, as well as the sales teams of the businesses concerned, all participate in these events, which may result in new commercial developments.

Arkema received an award from BMW in 2018, in the Sustainability category, among 15 suppliers recognized for their innovation efforts. This reward related to the Group's development of high performance polymers made from castor oil, a renewable resource for which a responsible sourcing approach is being implemented.



Expanded services portfolio

To support the sale of its products, Arkema regularly enhances its portfolio of services. The Careflex® technical assistance service, developed in the Thiochemicals business and dedicated to the use of DMDS at refineries and petrochemical plants, is a good example of this. The Group's experts work directly at client sites, worldwide, to advise and train the technicians who use its products, thereby ensuring the highest quality of service.

3D PRINTING SOLUTIONS BY ARKEMA

In late 2018, Arkema launched "3D Printing Solutions by Arkema", a commercial platform dedicated to its range of materials for 3D printing. The platform will maximize synergies between the various product lines involved and strengthen the Group's expertise and the close ties developed with its customers, partners and equipment manufacturers.

As part of this strategy, Arkema has teamed up with Autodesk and Farsoon to develop an optimized ecosystem combining printing software, hardware and advanced materials. The aim is to speed up industrial clients' adoption of polymer laser sintering technology for large-scale production.

SECOND PILLAR

CORPORATE SOCIAL RESPONSIBILITY

IN A WORLD FACED WITH A MULTITUDE OF ECONOMIC, ENVIRONMENTAL AND SOCIAL CHALLENGES, ARKEMA AIMS TO GENERATE SUSTAINABLE AND RESPONSIBLE GROWTH AND CONTRIBUTE TO ADDRESSING THOSE SOCIAL AND ENVIRONMENTAL ISSUES BY PROVIDING ITS CUSTOMERS WITH SUSTAINABLE AND INNOVATIVE SOLUTIONS THAT CONTRIBUTE TO THE SUSTAINABLE DEVELOPMENT GOALS DEFINED BY THE UNITED NATIONS.

THREE KEY COMMITMENTS



A clear roadmap

To measure long-term progress under its commitment to corporate social responsibility, Arkema has set a number of specific targets in three key areas:

- **4 environmental targets**, which contribute to reducing the Group's environmental footprint (emissions to air, greenhouse gas emissions, effluent releases and net energy purchases);
- **4 safety targets**, the most important ones being a reduction in the total recordable injury rate and in process safety events; and
- **2 diversity targets**, aimed at raising the percentage of women and of non-French nationals in senior management and executive positions.

Regular interaction with stakeholders

To validate its CSR approach and the relevance of the challenges identified with regard to its various stakeholders (employees, customers, research partners, suppliers, financial community, etc.), Arkema carried out in 2016 a materiality assessment and published its main challenges in a matrix. The results of this assessment have been taken into account both in the evolution of the CSR policy and the choice of performance indicators. In 2019, Arkema will carry out a further materiality assessment to determine possible changes in stakeholder expectations. This analysis may yield further areas for improvement.

A proactive improvement process

Arkema is engaged in a process to improve its CSR performance, with the aim of being included in the Dow Jones Sustainability Index (DJSI).

The Group's approach and performance in the various areas of CSR are regularly assessed by external stakeholders including customers and SRI rating agencies.



FTSE4Good



THIRD PILLAR

OPERATIONAL EXCELLENCE

DEVELOPING A CULTURE OF OPERATIONAL EXCELLENCE TO ENSURE THE COMPETITIVENESS OF ITS INDUSTRIAL SITES IS A PRIORITY FOR ARKEMA AND A KEY PILLAR OF ITS STRATEGY.

Our 5 commitments



1. Being a top-quartile performer in the chemicals industry for safety and the environment

Arkema continues to improve its safety and environmental performance in line with its 2025 targets.

2. Positioning its main production sites in the top quartile in terms of competitiveness and reliability

Through investments and the rollout of high-performance digital systems, Arkema is constantly improving its industrial facilities and strengthening the competitiveness and reliability of its main production sites.

Thanks to a global goods and services procurement strategy, Arkema also optimizes its operational costs and industrial investments.

To reduce variable costs, Arkema optimizes raw materials consumption and energy efficiency thanks to continuous process improvement developed under its R&D program and targeted investments under its Arkenergy program.

3. Improving the quality of customer service through an optimized supply chain

With its Ambition program whose roll-out was completed in 2017, Arkema reorganized its IT systems to optimize its supply chain and thereby improve its customer service quality. Arkema extended this program in 2018 by setting up a dedicated Supply Chain department, with ambitious targets on improving customer service quality and reducing working capital.

4. Develop the technological innovation policy across different activities

When designing new production units, Arkema implements the latest technological processes it has developed, as well as high-performance digital tools, in order to optimize both the time schedule of its projects as well as their operating costs and capital expenditure.

5. Promote and reinforce employee engagement

In order to sustain its safety and environmental performance, Arkema develops an operational excellence culture amongst employees and promotes their day-to-day actions that participate in the company's continuous progress.

Fixed and variable cost savings achieved thanks to its various actions will enable Arkema to offset at least half of annual fixed cost inflation.

Our approach

To implement its operational excellence program, Arkema launched a continuous progress initiative across all Group businesses and subsidiaries. It covers the following points:

- constant assessment of areas of improvement and progress potential in each of the Group's businesses;
- definition of precise targets for each production site on safety, the environment, reliability, productivity and raw materials consumption;
- monitoring of key performance indicators at each site;
- identification and sharing of best practices across the Group; and
- involving all employees in the process of improving the performance of production units, with the gradual roll-out of the Smart project.



The Smart project enables all employees at all levels to foster continuous improvement in the workplace by giving them the means to make active contributions, be it in terms of improving operational performance or solving problems that they encounter. It is being phased in at a pace of 15 to 20 sites per year, with rollout set to be completed across all Group sites by 2025.

FOURTH PILLAR

DIGITAL TRANSFORMATION

New digital technologies are deeply changing customer interactions and the understanding of our markets' evolution, thereby opening up new growth opportunities for the Group. Against this backdrop of increasing digitalization, Arkema decided in 2018 to create a Digital Transformation department, which reports directly to the Chairman and Chief Executive Officer. The Digital Transformation department is responsible for defining the Group's strategy in this area and speeding up the initiatives being undertaken.

Customer experience

By analyzing the large volumes of available data for market and customer experience to gain a **better understanding** of the needs and expectations of customers and end users, and by targeting its portfolio of solutions and adapting its marketing tools and content to the target market, Arkema can respond **more quickly and more efficiently** to the needs of its customers and prospects. The launch of dedicated websites, specific digital brands and targeted marketing campaigns – in Technical Polymers with Extremematerials.com and the Pebax Powered® brand or in 3D printing as part of the 3D Printing Solutions by Arkema commercial platform – is an inherent part of this strategy and helps to maintain Arkema's reputation as a leading expert in advanced materials. Bostik is also stepping up its consumer-oriented digital strategy with the deployment of e-business campaigns and online tutorials, like the ones which supported the launch of new product Fix & Flash.

Digital plant

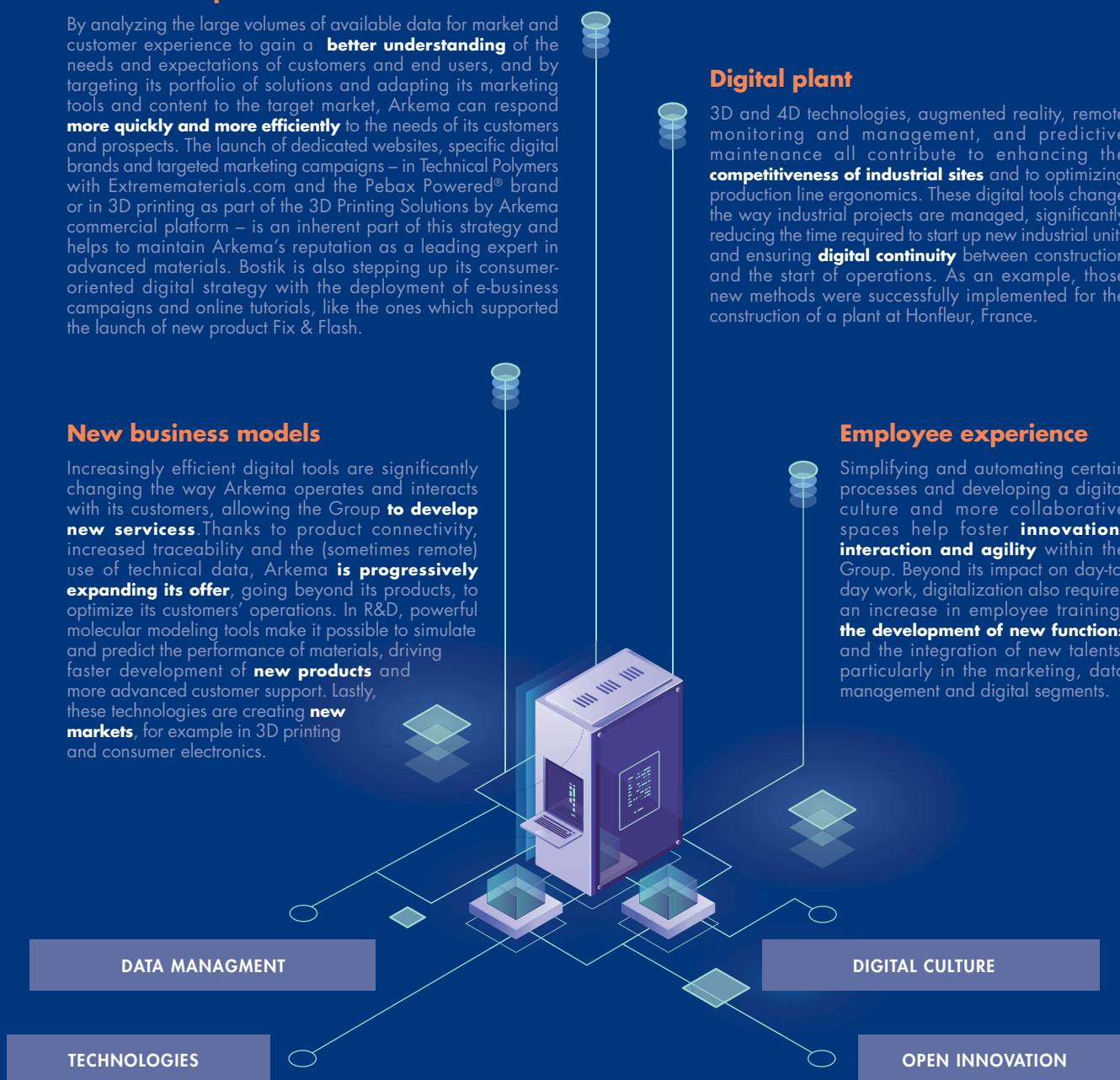
3D and 4D technologies, augmented reality, remote monitoring and management, and predictive maintenance all contribute to enhancing the **competitiveness of industrial sites** and to optimizing production line ergonomics. These digital tools change the way industrial projects are managed, significantly reducing the time required to start up new industrial units and ensuring **digital continuity** between construction and the start of operations. As an example, those new methods were successfully implemented for the construction of a plant at Honfleur, France.

New business models

Increasingly efficient digital tools are significantly changing the way Arkema operates and interacts with its customers, allowing the Group to **develop new services**. Thanks to product connectivity, increased traceability and the (sometimes remote) use of technical data, Arkema **is progressively expanding its offer**, going beyond its products, to optimize its customers' operations. In R&D, powerful molecular modeling tools make it possible to simulate and predict the performance of materials, driving faster development of **new products** and more advanced customer support. Lastly, these technologies are creating **new markets**, for example in 3D printing and consumer electronics.

Employee experience

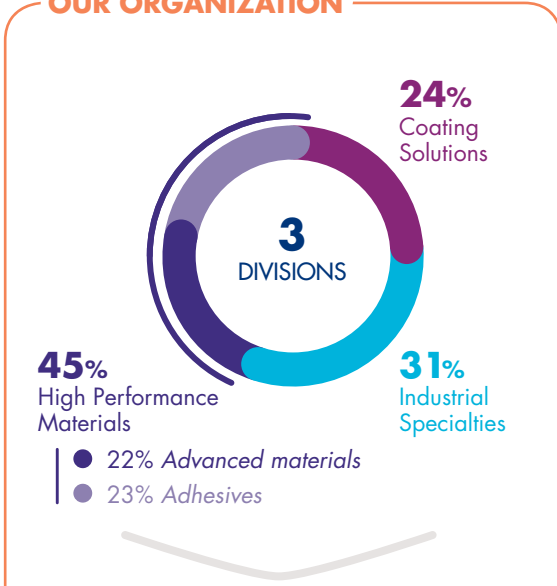
Simplifying and automating certain processes and developing a digital culture and more collaborative spaces help foster **innovation, interaction and agility** within the Group. Beyond its impact on day-to-day work, digitalization also requires an increase in employee training, **the development of new functions** and the integration of new talents, particularly in the marketing, data management and digital segments.



OUR BUSINESS MODEL

Our mission

Develop, as a responsible industrial company, innovative solutions adapted to our customers' main challenges and support them in their quest for sustainable performance

OUR STRENGTHS ⁽¹⁾	OUR VALUE CREATION MODEL
<p>COMMERCIAL STRENGTHS</p> <ul style="list-style-type: none"> - Top 3 positions in our main product lines - A worldwide presence in 55 countries - A balanced portfolio of businesses - Strong partnerships with leading customers <p>OPERATIONAL STRENGTHS</p> <ul style="list-style-type: none"> - A global footprint with 136 production sites - €5.5 billion tangible and intangible assets <p>R&D STRENGTHS</p> <ul style="list-style-type: none"> - 6 innovation platforms focused on the megatrends shaping the future - More than 1,600 researchers in 3 regional R&D centers worldwide - A robust intellectual property portfolio with around 9,000 patents <p>HUMAN CAPITAL</p> <ul style="list-style-type: none"> - 20,000 employees embracing the Company's values and engaged in its long-term project <p>FINANCIAL STRENGTHS</p> <ul style="list-style-type: none"> - Limited debt with a net debt to EBITDA ratio of 0.7x 	<p>OUR VALUES</p> <ul style="list-style-type: none"> PERFORMANCE ACCOUNTABILITY SOLIDARITY SIMPLICITY <p>OUR ORGANIZATION</p>  <p>45% High Performance Materials</p> <ul style="list-style-type: none"> ● 22% Advanced materials ● 23% Adhesives <p>24% Coating Solutions</p> <p>31% Industrial Specialties</p> <p>3 DIVISIONS</p> <p>Cross-functional initiatives in commercial excellence, CSR, operational excellence and digital transformation</p>

(1) See page 11.

(2) $(REBIT - \text{current taxes}) / (\text{net debt} + \text{shareholders' equity})$.

(3) Total recordable injury rate per million hours worked.

OUR AMBITION

OUR PRIORITIES

OFFER

*sustainable solutions
driven by innovation
and product stewardship*

- Develop **lighter materials**
- Increase the use of **renewable raw materials**
- Facilitate access to **safe drinking water**
- Contribute to the development of **new energies**
- Improve the **energy performance** of buildings
- Contribute to the development of **disruptive technologies**
- Extend products' **lifespan** and promote the **circular economy**

SUPPORT

*our customers in their geographic
expansion through a policy
of targeted investments*

ACT

*as a responsible manufacturer
deeply rooted in host communities*

- Ensure personal and equipment **safety**
- Reduce our **environmental footprint**
- Contribute to the development of host communities in countries where we operate

Ensure resilient growth and steady cash flow generation, led by specialty businesses that should account for **more than 80% of sales** in 2023

LONG-TERM (2023) FINANCIAL TARGETS

REBIT margin	EBITDA to cash conversion rate
11.5% to 12.5%	35%

Under strict financial discipline

ROCE ⁽²⁾ at **least 10%**

Net debt < **2x EBITDA**

Solid investment grade rating

LONG-TERM (2025) NON-FINANCIAL TARGETS

Safety

- Total recordable injury rate: TRIR ⁽³⁾ < **1.2**
- Process safety event rate: PSER < **3**

Environment (relative to 2012)

- Climate: **50%** reduction in greenhouse gas emissions
- Water: **40%** reduction in chemical oxygen demand
- Air: **33%** reduction in volatile organic compound emissions
- Energy: **15%** reduction in net energy purchases

Employment

- Percentage of women in senior management and executive positions: **23% to 25%**
- Percentage of non-French nationals in senior management and executive positions: **42% to 45%**

STRONG AND EFFICIENT GOVERNANCE

ARKEMA'S CORPORATE GOVERNANCE COMPRISES A BOARD OF DIRECTORS, WITH A CHAIRMAN AND CHIEF EXECUTIVE OFFICER, A SENIOR INDEPENDENT DIRECTOR, AS WELL AS TWO SPECIALIZED COMMITTEES. THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER IS ALSO SUPPORTED BY AN EXECUTIVE COMMITTEE COMPRISING 7 OPERATIONAL AND FUNCTIONAL EXECUTIVE VICE-PRESIDENTS.

THE BOARD OF DIRECTORS

Arkema's Board of Directors comprises 13 directors, including 6 independent directors, 1 director representing employees and 1 director representing shareholder employees. Independence rate is at 55%⁽¹⁾, in line with the recommendations of the AFEP-MEDEF Code. Except for the director representing employees, directors are appointed for a four-year term by the ordinary shareholders' meeting.



13
DIRECTORS



42%
WOMEN⁽²⁾



1
SENIOR
INDEPENDENT
DIRECTOR



97%
ATTENDANCE RATE
IN 2018



55%
INDEPENDENCE
RATE⁽¹⁾

Composition of the Board of Directors at 31 March 2019

		Age	Year of first appointment	Year current term expires	Other directorships in listed companies	Committees	
						Audit and Accounts	Nominating, Compensation and Corporate Governance
Thierry Le Hénaff	Chairman and Chief Executive Officer	55	2006	2020	1		
Yannick Assouad		60	2017	2021	2		
Jean-Marc Bertrand	Director representing shareholder employees	61	2018	2022	None		
Marie-Ange Debon		53	2018	2022	2	Chairman	
François Enaud	Senior independent director	59	2006	2019	None		•
Alexandre de Juniac		56	2018	2022	None		•
Victoire de Margerie		55	2012	2019	2		•
Laurent Mignon		55	2006	2019	2		
Hélène Moreau-Leroy		54	2015	2019	None		•
Thierry Morin		67	2006	2021	1		Chairman
Nathalie Muracciole	Director representing employees	54	2016	2020	None		
Marc Pandraud		60	2009	2021	None		
Fonds Stratégique de Participations represented by Isabelle Boccon-Gibod	Shareholder with more than 10% of voting rights	51	2014	2022	4		•

(1) Excluding directors representing employees and shareholder employees, in line with the AFEP-MEDEF Code.

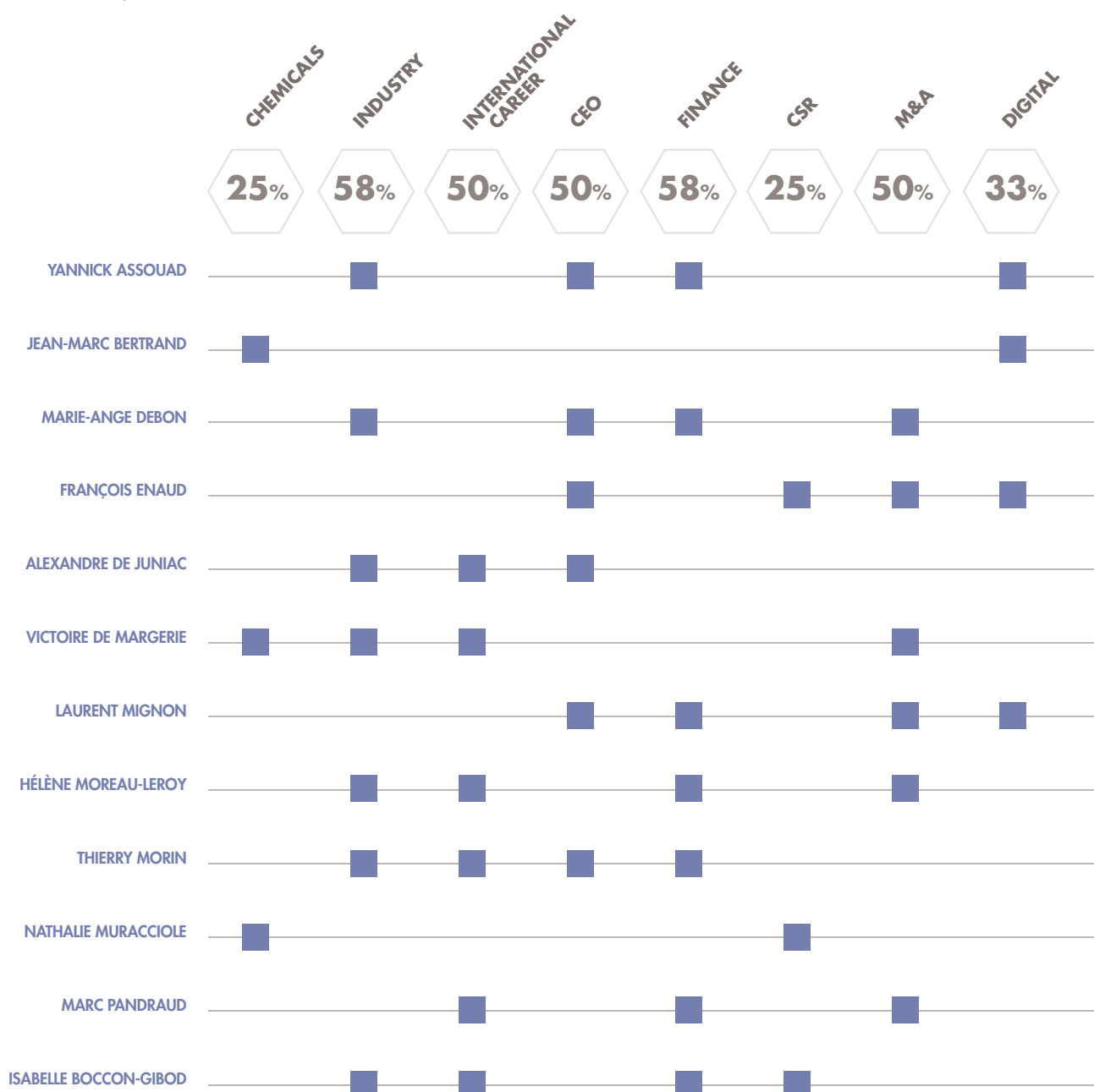
(2) Excluding director representing employees, in line with the AFEP-MEDEF Code.

AN EXPERIENCED AND DIVERSE BOARD OF DIRECTORS

In addition to gender balance in its composition, the Board is attentive to maintaining:

- a diversity of experience, in particular as regards international experience;
- skills complementarity, notably with current and former executives with experience in industry (the chemicals industry in particular), finance, acquisitions and their integration, corporate social responsibility and digital; and
- a majority of independent directors.

Director skills matrix (excluding the Chairman and CEO)



THE BOARD'S WORK

The Board of Directors decides the Group's overall business strategy and oversees its implementation.

Its approval is required for:

- industrial **investments** in excess of **€80 million**
- **acquisitions** or **divestments** with an **enterprise value** in excess of **€130 million**
- financial statements, with oversight on the quality of information provided to shareholders and financial markets.

More generally, the Board of Directors promotes long-term value creation by the Group, taking into consideration the social and environmental implications of its businesses.

TO ACCOMPLISH ITS MISSIONS,
THE BOARD IS SUPPORTED BY
2 specialized committees

1. The **Audit and Accounts Committee**, which oversees matters including the quality of internal control and the reliability of information provided to shareholders and financial markets.

2. The **Nominating, Compensation and Corporate Governance Committee**, which issues recommendations on matters including the composition of the Board, the compensation policy for the Chairman and Chief Executive Officer, and good governance practices.

Meetings of the Board and its Committees

BOARD OF DIRECTORS

6 MEETINGS

97% ATTENDANCE RATE

Including one meeting on Group strategy, with 100% attendance rate

AUDIT AND ACCOUNTS COMMITTEE

6 MEETINGS

100% ATTENDANCE RATE

NOMINATING, COMPENSATION AND CORPORATE GOVERNANCE COMMITTEE

3 MEETINGS

92% ATTENDANCE RATE

Annual assessment of the Board of Directors' operating procedures

An assessment of the Board of Directors' operating procedures was carried out by an external consulting firm in cooperation with the Chairman of the Nominating, Compensation and Corporate Governance Committee and the Secretary of the Board of Directors.

More than 75% of directors consider that the operating procedures of Arkema's Board of Directors continued to improve compared with the last external assessment carried out in 2016.

A large majority of directors who also sit on the Boards of comparable companies consider the operating procedures of Arkema's Board of Directors to be the best, thanks to:

- the quality of discussions led by the Chairman and Chief Executive Officer, the ability to speak freely, as well as the active contributions from all directors; and
- the regular review of the strategy through frequent discussions with management and attendance at a strategy seminar.

CORPORATE SOCIAL RESPONSIBILITY

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4

4.1 ARKEMA'S CORPORATE SOCIAL RESPONSIBILITY (CSR) APPROACH

Arkema aims to generate sustainable and responsible growth for its businesses and to meet societal and environmental challenges by providing its customers with sustainable and innovative solutions that contribute to the Sustainable Development Goals defined by the United Nations.

The Group's CSR policy is developed in compliance with the main international texts and standards in force and more particularly with the International Bill of Human Rights, the International Labour Organization's (ILO) Declaration on Fundamental Principles and Rights at Work, the OECD Guidelines for Multinational Enterprises, the ten principles of the United Nations Global Compact, to which Arkema committed in 2014, and the Responsible Care® program, of which the Group has been a member since 2006.

To facilitate the understanding of its CSR approach among all stakeholders and ensure that its sustainable development culture is embedded and embraced across the organization, Arkema

published a Social Commitment Charter in 2018, which has been approved by the Executive Committee. The charter is based on factors that have long been fundamental to Arkema, including a culture of safety, respect for the environment, innovation, employee issues and a culture of close dialogue. It sets out the three key commitments that structure the Group's CSR policy:

- offer a range of sustainable solutions driven by innovation;
- act as a responsible manufacturer; and
- foster open dialogue and close relations with stakeholders.

3 CSR COMMITMENTS

Deliver **sustainable solutions** driven by **innovation**



- **Solutions that address societal challenges**
- **Innovation at the heart of the activities**
- **Product stewardship**

Manage our activities as a **responsible manufacturer**



- **Safety of people and processes**
- **Health**
- **Environmental footprint reduction**

Cultivate an **open dialogue** and **close relations** with our **stakeholders**



- **Ethics**
- **Human rights**
- **Employee development**
- **Responsible value chain**
- **Corporate citizenship**

As an extension of its Social Commitment Charter, Arkema also created or updated its policies in support of these three commitments during the year. These include its Innovation Policy, its Health, Safety, Environment and Quality Policy (which replaced the existing HSEQ Charter), its Human Rights Policy and its Anti-Corruption Charter. The Group also has a Code of Conduct and Business Ethics, a Code of Conduct for Suppliers, a

charter for the promotion and respect of the International Labour Organization's conventions, an energy policy, a water policy, a policy on conflict minerals, and a policy on the use of Group products for medical applications.

These charters and policies are applied across the Group and all of its subsidiaries.

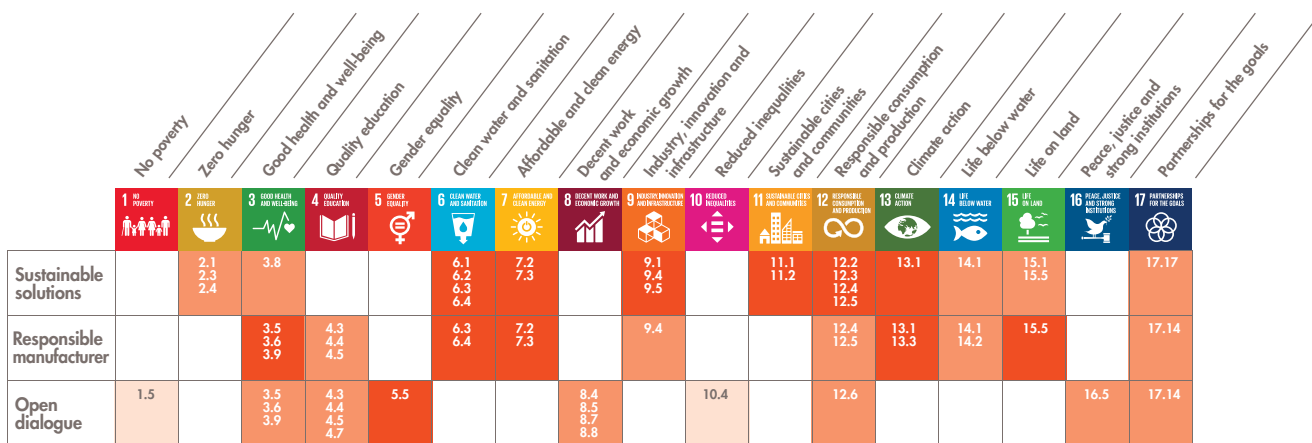
4.1.1 Description of key impacts, risks, and opportunities

Like all companies, through its activities, Arkema interacts with its social environment. The identification and analysis of the Group's impact on its employee and social environment are part of its sustainable development process in order to mitigate the negative effects and accentuate the positive effects of the Group's actions, both for Arkema itself and for its stakeholders.

Arkema has therefore been engaged for many years in a continuous process of reducing the main risks associated with its activities, particularly those relating to safety and the environment (described in section 2.1 of this document). At the same time, thanks to its capacity for innovation and its expertise, Arkema develops new products and solutions that provide a wide range of opportunities to contribute to meeting the challenges of

sustainable development (for additional detail, see section 1.1.2 of this document).

The Sustainable Development Goals (SDGs) defined by the United Nations Organisation set out the economic, social and environmental challenges facing our world today. Arkema's sustainable development initiatives are underpinned by these SDGs. Based on the expectations expressed by stakeholders, the Group's activities and the three commitments structuring its CSR policy, Arkema has mapped its contribution to the SDGs by identifying the extent of its commitments and actions with reference to the targets set for each of them. The aim of these actions is to mitigate social risks and to foster opportunities that contribute to the development of sustainable solutions.



- Strategic contribution (through strategic objectives or programs)
- Direct contribution (resulting from voluntary initiatives)
- Indirect contribution (resulting from the Group's activities)

The strategic contribution to the SDGs that relate to Arkema's sustainable solutions commitment is demonstrated by the Group's choice of the six strategic innovation platforms presented in section 1.1.2 of this document. The strategic contributions to the SDGs relating to its responsible manufacturer and open dialogue commitments are illustrated by the targets set for 2025, which are presented in section 4.1.6 of this chapter.

Consistent with its social commitment, Arkema develops buy-in of the SDGs across all its business and interactively with its value chain. As part of its commitment to responsibly manage its solutions portfolio, the Group began a systematic evaluation in 2018, factoring in contributions to the SDGs. This process is described in section 4.2 of this document, which focuses on the Group's sustainable solutions.

4.1.2 Consolidated non-financial information statement

In compliance with article L. 225-102-1 of the French Commercial Code (*Code de commerce*), Arkema takes into account the social and environmental consequences of its activities (those of the Company and of all its subsidiaries), as well their impact in terms of human rights and the fight against corruption and tax evasion.

The Group's business model is described in the 'Profile, ambition and strategy' section of this document.

The identification and review of the main risks associated with its activities are based on a number of sources: the general risks listed in the international reference documents cited in section 4.1.1 of this chapter; the risks targeted by the Responsible Care® program, which are specific to the chemicals industry; feedback from the Group's own experience; incidents that have occurred at companies with similar activities or scope; the material topics expressed by stakeholders during the materiality assessment presented in section 4.1.5 of this chapter; and the Group's duty of care plan. The risk identification and review process is carried out using a collaborative approach involving the Sustainable Development, Human Resources, Health, Safety and Environment, Legal Affairs, Procurement, and Internal Audit and Internal Control departments. The main non-financial risks are included in the risk map presented in chapter 2 of this document and are reviewed by the Risk Review Committee, in line with the risk management procedure described in section 2.2 of this document.

The main non-financial risks identified by the Group in the areas mentioned above are presented in this chapter, along with the due diligence procedures and policies implemented to prevent, identify and mitigate those risks and the outcomes of those policies in the form of performance indicators.

The main risks are:

- the risk of industrial accident liable to have social or environmental consequences;
- the risk of exposure to chemicals, whether involving Group or subcontractor employees, customers, end users or local residents;
- the risk of pollution and the risk of contributing to climate change, whether through Arkema's own activities or those of its upstream value chain or through the use of its products; and
- the risk of losing the skills and expertise necessary to continuously meet business, technological, social and environmental expectations in a proactive manner.

In addition to the risks mentioned above, the Group monitors the following general risks, which are also presented in this chapter: ethics and compliance risks, including those relating to the fight against corruption, the risk of human rights violations, and the risk of poor social and environmental performances by suppliers or subcontractors.

The Group's governance of CSR issues is described in section 4.1.4 of this chapter.

The non-financial information statement for the year ended 31 December 2018, which includes all the CSR performance indicators mentioned in this chapter, was reviewed by the independent third-party auditor, as indicated in its limited assurance statement in section 4.5 of this chapter.

In compliance with article R. 225-105-1 III of the French Commercial Code, reported non-financial information is published on the Group's website at the following address: <https://www.arkema.com/en/social-responsibility>.

CROSS-REFERENCE TABLE FOR THE NON-FINANCIAL INFORMATION STATEMENT

Articles L. 225-102-1 and R. 225-105 of the French Commercial Code (<i>Code de commerce</i>)	Sections in this document
Company business model	Profile, ambition and strategy
Description of the main risks involved in the way the Company takes into account the social and environmental consequences of its activities as regards human rights, and avoidance of corruption and tax evasion	2.2 (non-financial risks are tagged "CSR")
Social impact of the Company's activities	4.4.1
Environmental impact of the Company's activities	4.3.3
Impact of the Company's activities on human rights	4.1.3 and 4.4.3
Impact of the Company's activities on avoidance of corruption and tax evasion	4.4.2
Impact of the Company's activities and of the use of goods it produces and services it provides on climate change	4.3.3.2
Social commitments to sustainability, allowance made for social and environmental challenges in supplier and subcontractor relations, and measures taken regarding consumer health and safety	4.1 and sections and paragraphs indicated, 4.2.4 and 4.4.4

Articles L. 225-102-1 and R. 225-105 of the French Commercial Code (<i>Code de commerce</i>)	Sections in this document
Social commitments to the circular economy	4.3.3.3.4
Social commitments to combat food waste	Non-material risk for the Group
Social commitments to combat food insecurity	Non-material risk for the Group
Social commitments to animal wellbeing	4.2.4.3
Social commitments to fair, responsible and sustainable food	Non-material risk for the Group
Collective bargaining agreements signed within the Company and their impacts on its economic performance and on employee working conditions	4.4.1.4
Actions to counter discrimination and promote diversity	4.4.1.5
Measures to promote the recruitment of people with disabilities	4.4.1.5

4.1.3 Duty of care plan

Pursuant to the provisions of article L. 225-102-4 of the French Commercial Code, the Group has established and implemented a duty of care plan covering the activities of the Company and all the subsidiaries it controls. More specifically, Arkema has conducted an in-depth review of the consequences of its activities, and of those carried out by its suppliers and subcontractors that relate to their business relationship with Arkema, in order to identify any serious risk of violations of human rights and fundamental freedoms, as well as any serious health, safety and environmental risks, so that, as part of a continuous improvement approach, the Group can introduce or supplement the reasonable care measures necessary to prevent such risks or mitigate their impact.

MAPPING OF SERIOUS RISKS

The identification and review of these risks was carried out using a collaborative approach involving the Sustainable Development, Human Resources, Health, Safety and Environment, Legal Affairs, Procurement, and Internal Audit and Internal Control departments. This process resulted in a risk map that was presented to the Risk Review Committee in line with the risk management procedure described in section 2.2 of this document.

The methods for managing these risks and monitoring the effectiveness of the measures undertaken are different, depending on whether the risks relate to the Group's activities or those of its suppliers and subcontractors.

RISK MANAGEMENT AND EFFECTIVENESS MONITORING FOR RISKS RELATING TO THE GROUP'S ACTIVITIES

The identification and review of these risks are based on deductive analyses, internal feedback, incidents that have occurred at companies with similar activities or scope, and general risks

listed in international reference documents. Risk assessments are updated regularly to take into account lessons learned, advances in preventing risks and mitigating their impact, and any emerging risks deemed relevant. Stakeholder expectations, particularly the main issues identified in the materiality assessment presented in section 4.1.2 of this chapter, are taken into account in the duty of care plan. Similarly, the risks identified while drawing up the duty of care plan will be included in discussions with stakeholders during the next materiality assessment, which is expected to be carried out in 2019.

Risks are reviewed in light of a combination of factors that includes their impact and likelihood of occurrence and the level of control provided by existing prevention and management measures.

- Human rights and fundamental freedoms

Respect for human rights is of the utmost importance to Arkema. The Group therefore makes every effort to prevent human rights violations against its employees, partners and other stakeholders and to remedy any violations that do occur.

After reviewing internal feedback and the general risks presented in the International Labour Organization's Declaration on Fundamental Principles and Rights at Work and the International Bill of Human Rights, and assessing the impact, likelihood of occurrence and level of control that Arkema has over these issues, no risks of serious violations have been identified in this area.

Given the importance that Arkema places on human rights and fundamental freedoms, the Group has nonetheless decided to make its commitments and management of the risks in this area clearer and more visible for all stakeholders. A Human Rights Policy was therefore issued by the Group in 2018 and is available both internally and externally. For further details, see section 4.4.3 of this chapter.

- Health and safety

As a responsible manufacturer, Arkema places personal health and safety among its top priorities. This commitment is clearly expressed in its Health, Safety, Environment and Quality Policy. A harmonized approach, based on risk prevention, an integrated management system and the dissemination of a health and safety culture, has existed within the Group for many years and is managed centrally.

The main risks of serious harm to personal health and safety are:

- the social and environmental consequences arising from industrial accidents or acts of malice. Accident risks are described in section 2.1.1 of this document. The management system for these risks is described in detail in sections 4.3.1 and 4.3.2 of this chapter and includes risk prevention measures, as well as measures for mitigating impacts in the event of an incident or accident.

The effectiveness of the measures undertaken is monitored using numerous indicators, including the total recordable injury rate per million hours worked (TRIR) and the process safety event rate per million hours worked (PSER). In 2018, the TRIR, including accidents involving Group and subcontractor employees, was 1.3, a significant improvement on previous years' figures, which were already indicative of very good performance. The PSER, an indicator introduced in 2018, was 4.4. For further details, see section 4.3.2 of this chapter;

- exposure to substances that are toxic or hazardous to human health, whether involving Group or subcontractor employees, customers or people living near Group facilities, which is described in section 2.1.1 of this document. The management system for health and safety risks, which is described in detail in sections 4.3.1 and 4.3.3 of this chapter, includes risk prevention measures, as well as measures for mitigating impacts in the event of an incident or accident. In addition, product stewardship, including the transparency and availability of product information, is presented in sections 4.2.4 and 4.3.2 of this chapter.

The number of occupational illnesses related to exposure to chemicals is one of the indicators for monitoring the effectiveness of prevention measures over the long term. In 2018, 66 cases of occupational illness were reported Group-wide. Details on occupational illnesses are given in section 4.3.2.2.4 of this chapter.

- Environment

As a responsible manufacturer, Arkema places environmental risk management among its top priorities. This commitment is clearly expressed in its Health, Safety, Environment and Quality Policy.

A harmonized approach, based on the vision set out in this policy, has existed within the Group for many years and is managed centrally.

The main risk of serious damage to the environment is the pollution of air, water and soil, which is described in section 2.1.1 of this document. The management system for environmental risks is described in detail in sections 4.3.1 and

4.3.3 of this chapter and includes risk prevention measures, as well as measures for mitigating impacts in the event of an incident or accident, or in the case of legacy pollution. The effectiveness of the measures undertaken is monitored via numerous indicators, including two strategic, intensive Environmental Footprint Performance Indicators (EFPIs) for which targets have been set for 2025. One relates to the amount of volatile organic compounds (VOCs) released into the air (VOC EFPI). In 2018, the VOC EFPI was 0.62, well down on the 2017 figure and better than the 0.67 target set for 2025. The second relates to chemical oxygen demand (COD) in effluent discharges (COD EFPI). In 2018, the COD EFPI was 0.59, also well below the 2017 figure and in line with the 0.60 target set for 2025. For further details, see section 4.3.3 of this chapter. The results confirm the validity of the Group's programs and initiatives on reducing pollution risks.

Arkema is also attentive to the issue of climate change, one of the major challenges facing society today. The Group's climate policy and its management are described in section 4.3.3.2 of this chapter and include measures aimed at reducing emissions. The effectiveness of the measures undertaken is monitored via two strategic, intensive EFPIs for which targets have been set for 2025. The first relates to greenhouse gas (GHG) emissions from operations at the Group's industrial sites (GHG EFPI). In 2018, the GHG EFPI was 0.46, well down on the 2017 figure and better than the 0.50 target set for 2025. For further details, see section 4.3.3.2.1 of this chapter. The second indicator measures net energy purchases (Energy EFPI), which reflects the consumption of energy whose production generates greenhouse gas emissions. In 2018, the Energy EFPI was 0.88, below the 2017 figure and on track with the 0.85 target set for 2025. For further details, see section 4.3.3.2.2 of this chapter. The improvement confirms Arkema's contribution to reducing greenhouse gas emissions. However, given the extent of the challenges related to climate change, the Group decided in 2018 to initiate a process for assessing its impact in relation to the Paris Agreement. The results of this process may lead the Group to strengthen its initiatives aimed at combating climate change.

RISK MANAGEMENT AND EFFECTIVENESS MONITORING FOR RISKS RELATING TO THE ACTIVITIES OF SUPPLIERS AND SUBCONTRACTORS WITH WHICH ARKEMA HAS ESTABLISHED BUSINESS RELATIONSHIPS

Arkema has a number of suppliers involved in various activities relating to the supply of raw materials, energy, or goods and services. These activities are liable to entail various kinds of risks. To select suppliers and subcontractors and develop their sense of responsibility with a view to reducing the risk of serious violations of human rights and fundamental freedoms, harm to personal health and safety, and damage to the environment, Arkema takes a harmonized approach, set out in detail in section 4.4.4 of this chapter.

The effectiveness of the measures undertaken is monitored in terms of the number of suppliers assessed and the scores obtained. In 2018, more than 1,400 suppliers were assessed, up from around 1,000 in 2017. During the year, CSR scores rose for 60% of suppliers whose assessments were updated.

Some of the Group's products use raw materials of vegetable origin. Where raw materials producers are farmers rather than companies, the management system outlined above is not applicable. For supplies of castor oil, the main bio-based raw material used by the Group, an initiative is in progress under the Pragati project, launched in 2016, on environmentally socially responsible sourcing, as described in section 4.4.4.3 of this chapter.

REMEDIATION PROCESS

In the event of a major accident involving health, safety or the environment, a crisis unit is set up in accordance with the Group procedure described in section 4.3.2.3 of this chapter.

For non-accidental incidents, the remediation process is organized on a case-by-case basis with representatives from the departments involved and a management team adapted to the specific situation. Details on remediation measures regarding biodiversity are given in section 4.3.3.4 of this chapter.

Procedures for regular assessment

The duty of care plan is reviewed – overall and with respect to its implementation – at least once a year. The review is led by the Sustainable Development department and involves representatives from the Human Resources, Health, Safety and Environment, Legal Affairs, Procurement, and Internal Audit and Internal Control departments. The progress made and proposals for action are presented to the CSR Steering Committee and then to the Risk Review Committee, which validates the duty of care plan before submission to the Executive Committee then to the Board of Directors.

As part of the monitoring of the implementation of the duty of care plan and the assessment of its effectiveness, the internal audit and control system may be modified, if necessary, to take into account any additional items identified. For further details on the risk management and internal control system, see

section 2.2.3 of this document.

REPORT ON THE IMPLEMENTATION OF THE DUTY OF CARE PLAN

For risks liable to be entailed by the Group's activities, the following conclusions were drawn from the implementation of the duty of care plan:

- significant change is not necessary for the health, safety and environment management system, which is considered to meet duty of care requirements;
- judging from the main indicators, continuous progress initiatives appear to be effective, and should be continued in order to achieve the strategic goals the Group has set for 2025 on the following points:
 - total recordable injury rate (TRIR) < 1.2 and process safety event rate (PSER) < 3,
 - environmental impact, in particular for the four strategic EFPIs (VOC < 67%, DOC < 60%, GHG < 50% and Energy < 85%);
- no risks were identified of serious violations to human rights or fundamental freedoms, or in labor or business relations. Initiatives are nevertheless under way in this area. In 2019, for example, the Group plans to continue the roll-out and personnel buy-in of the Human Rights Policy drawn up in 2018.

Concerning risks relating to the activities of suppliers and subcontractors, the programs under way meet duty of care expectations. These programs are being stepped up in 2019:

- extended reach for the Together for Sustainability program, with special focus on sensitive suppliers and subcontractors;
- continuation of the Pragati project on castor bean production, and definition of future orientations with a view to extending this initiative.

In addition, a whistleblowing system introduced as part of the Group's compliance with the French Sapin II Law also meets the requirements of the law on duty of care. For further details, see section 4.4.2.3 of this chapter.

4.1.4 Participants in the CSR process

To ensure that the social, environmental and business aspects of Arkema's operations are managed consistently and in the interests of all stakeholders, the Group's CSR commitment is led by the Chairman and Chief Executive Officer of the Company and the Group Executive Committee. The Group's commitment to the United Nations Global Compact is renewed each year via its annual Communication on Progress, and in 2018, this commitment reached the GC Advanced level. Internally, environmental, social and ethics policies are validated by the Executive Committee

members, who are responsible for their dissemination and application across the Group. The operational entities are responsible for the effective implementation of these policies.

To fulfill its ambitious CSR approach, the Group has created a Sustainable Development department, comprising the Product Safety and Environment department and the Sustainable Development team. It reports directly to the Industry Executive Vice-President, who is a member of the Executive Committee.

In addition, a CSR Steering Committee guides and supports the Group's progress in the area of CSR. Its members include the Human Resources and Communication Executive Vice-President and a number of corporate Vice-Presidents, all of whom are actively involved in the CSR process, and it is chaired by the Industry Executive Vice-President. It meets at least twice a year.

The Group's CSR ambition, the main risks and opportunities, the related potential initiatives and their monitoring, the performance indicators and the sustainable development targets are defined and validated by the Executive Committee and presented once

a year to the Audit and Accounts Committee and the Board of Directors.

Arkema's governance of the CSR process is integrated into the Group's corporate governance. In particular, every year the Sustainable Development Vice-President reports to the Audit and Accounts Committee, presenting the scope of the CSR data audit and the findings of the independent third-party auditor. These findings appear in the auditor's opinion issued to the annual general meeting along with the Board of Directors' report, which also includes a variety of social and environmental information.

4.1.5 Stakeholders and materiality assessment

OPEN DIALOGUE

Consultation and open dialogue with internal and external stakeholders is a prerequisite for understanding their expectations, building relationships based on trust and cooperation, reducing social risks and creating value for all.

The following table summarizes the Group's dialogue with its main stakeholders.

Stakeholder	Context and purpose of dialogue	Form of dialogue
Customers	Business relationship and collaboration aimed at meeting the current and future needs of customers and end users	Arkema establishes ongoing dialogue with its customers at various levels of the organization. To increase the value added created, the Group capitalizes in particular on: <ul style="list-style-type: none"> dedicated management of global key accounts as part of a commercial excellence program; joint innovation programs with customers, including lifecycle analysis if required; development of new digital solutions that increase value added for customers and partners. For further details, see the section on Commercial excellence in Profile, ambition and strategy.
Suppliers	Business relationship and collaboration aimed at meeting the current and future needs of the Group and its customers	Arkema favors suppliers that have a global presence (Europe, Americas and Asia), are competitive and innovative (including in digital technology), and actively deploy a CSR policy. Arkema maintains open dialogue with its suppliers at various levels of the organization so that they support the Group in its developments over the short- and long-term. For further details, see section 4.4.4 of this chapter.
Research partners	Technology partnerships aimed at strengthening the Group's innovation performance by providing access to additional skills and discoveries that can drive breakthrough innovations	Arkema develops a diverse range of partnerships in various forms, including with academic institutions and industrial companies or as part of national or international cooperation efforts. Partnerships such as those involving the Group's innovation platforms contribute to fulfilling the United Nations' Sustainable Development Goals (SDGs). For further details, see sections 1.1.2 and 1.1.5 of this document.
Financial community, shareholders and SRI rating agencies	Inform the market of the Group's results and main operations Improve understanding of the Group's activities, strategy and outlook among investors, analysts and individual shareholders through transparent information	<ul style="list-style-type: none"> Results presentations; Meetings with institutional investors and analysts; Discussions with financial rating agencies; Completing questionnaires and discussions with SRI rating agencies; and Annual general meeting. For further details, see section 6.4 of this document.

Stakeholder	Context and purpose of dialogue	Form of dialogue
Employees and employee representative bodies	Dialogue with employee representative bodies and direct dialogue with employees	<ul style="list-style-type: none"> • Continuous social dialogue with employee representative bodies that goes beyond legal requirements and provides numerous opportunities for discussion and negotiation with a view to driving social progress; and • Consultation and dialogue with employees notably in the form of internal surveys. For further details, see section 4.4.1.4 of this chapter.
Neighboring communities	Neighbors and communities that interact locally with Group sites	The Common Ground® initiative described in section 4.4.4.5 of this chapter promotes local dialogue at each of the Group's sites.
Civil society and NGOs	Proactive and reactive dialogue	<ul style="list-style-type: none"> • Collaboration with NGOs on specific projects; • Discussions in relation to the materiality assessment; • Periodic meetings with the media; and • Responsible and transparent communication in the event of a crisis. For further details, see section 4.4.6 of this chapter.
Public authorities	Regular and occasional contact aimed at ensuring the responsible development of our activities	<ul style="list-style-type: none"> • Responding to periodic surveys; • Participation in various consultation and working groups; and • Occasional contact at various levels (departments and cabinets) on specific topics. For further details, see section 4.4.5 of this chapter.
Professional associations	Continuous contribution to defending the industry's interests vis-à-vis the public authorities and participation in identifying and disseminating best practices across the industry	Arkema participates actively in segment- or topic-specific working groups, commissions and statutory bodies within relevant associations and in the external initiatives carried out by such associations. For further details, see section 4.4.5 of this chapter.

MATERIALITY ASSESSMENT

In 2016, the Group conducted a formal process of exchange with stakeholders on CSR topics in the form of a materiality assessment. The resulting materiality map reveals a strong correlation between the materiality assessments of both internal and external stakeholders. It also enabled the Group to identify areas for improvement and set new strategic objectives.

The materiality assessment was carried out with the help of a third-party expert (Deloitte Sustainability Services). It was conducted in two phases, as follows:

1. A preparatory phase, during which key stakeholders were mapped and the 25 most material CSR topics were identified.

Map of the key stakeholders

The map covered internal stakeholders within the main corporate functions and representatives of the key regions in which the Group operates. In this way, the process involved representatives of subsidiaries, Business Lines, the production division and the Health, Safety and Environment department, as well as plant managers, purchasing managers, R&D representatives, corporate department representatives (finance, ethics and compliance, human resources, communication and institutional relations) and employee representative bodies.

External stakeholders included customers, suppliers, research partners, investors, non-financial rating agencies, NGOs, the media, public authorities, and professional associations.

Identified material CSR topics

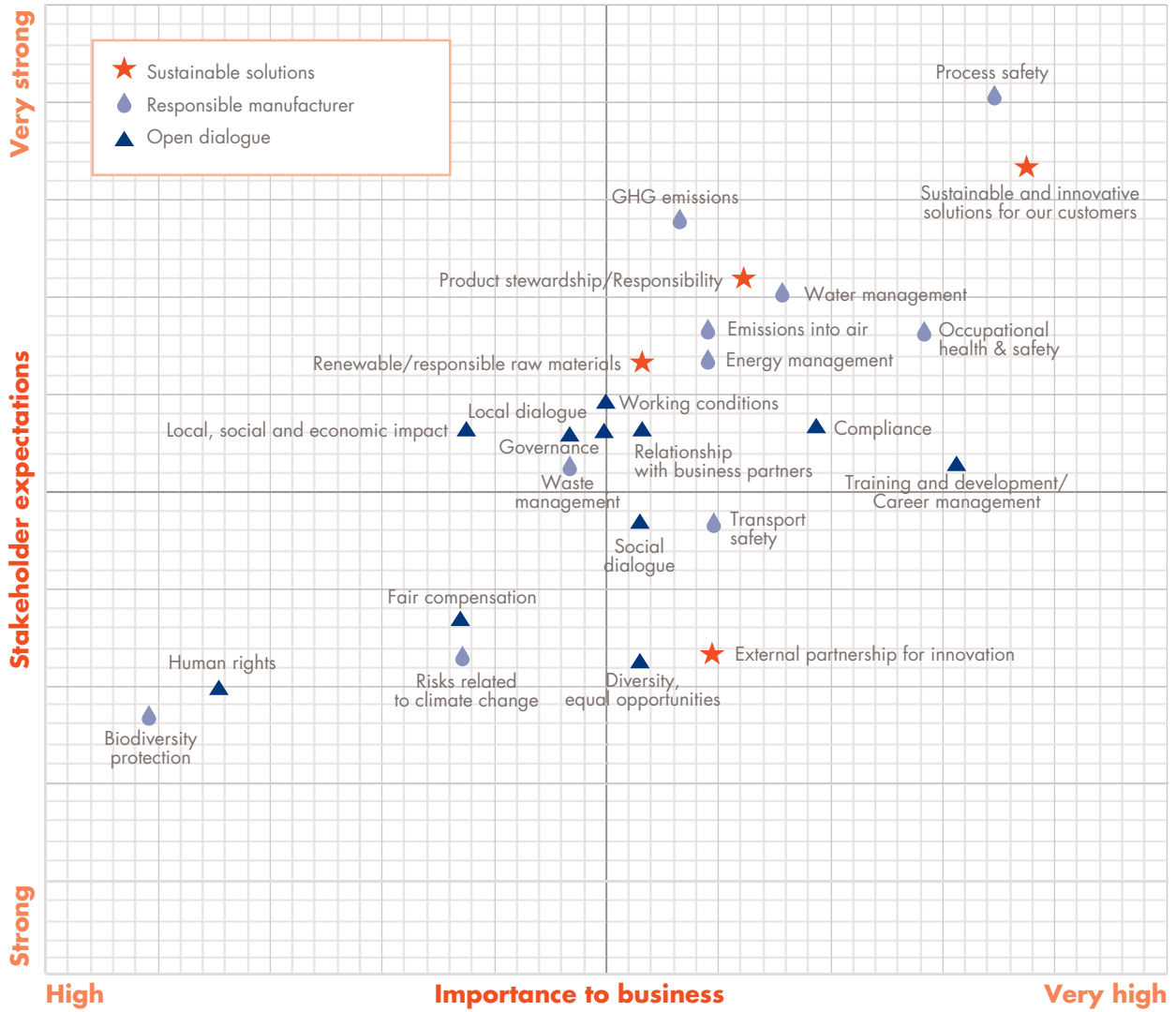
The preliminary list of the 25 most material CSR topics was prepared based on the knowledge of the Group's CSR experts, recognized international standards, a detailed literature review and benchmarking against industry peers. The topics were consolidated into the following categories: innovation, safety, environment, employment and society.

2. A survey phase, consisting of in-depth interviews, in which each participating stakeholder validated and prioritized the identified CSR topics and also, in a few cases, suggested other topics to be addressed.

The survey findings were analyzed in order to rank each topic according to two criteria, as shown in the matrix below:

- its importance to the Group, as seen by internal stakeholders; and
- its importance to external stakeholders, as measured by their expectations.

MATERIALITY MATRIX 2016



The material topics identified in the map have been classified into three levels of priority as follows:

	Sustainable solutions	Responsible manufacturer	Open dialogue
Priority topics	<ul style="list-style-type: none"> Sustainable and innovative solutions Product stewardship and responsibility 	<ul style="list-style-type: none"> Health and safety Process safety 	<ul style="list-style-type: none"> Resources management (water and energy) Diversity and equal opportunities
Important topics	<ul style="list-style-type: none"> Renewable/responsible raw materials 	<ul style="list-style-type: none"> Transport safety 	<ul style="list-style-type: none"> Compliance Governance Working conditions Relationships with business partners Local dialogue
Permanent topics	<ul style="list-style-type: none"> Open innovation 	<ul style="list-style-type: none"> Biodiversity protection 	<ul style="list-style-type: none"> Social dialogue Fair compensation Human rights Local, social and economic impact

In 2017, the Group pursued its stakeholder dialogue process by inviting representatives from each category of external stakeholders to provide feedback on the results of the materiality assessment and the priorities defined. The Group made a commitment to organize annual meetings in order to respond to this request.

In 2018, the discussions focused on Arkema's progress in addressing the issues identified as most material in the 2016 assessment and on its integration of the expectations expressed in 2017, especially as regards the sustainability and climate-change implications of the product portfolio.

To take into account changes to stakeholder expectations, a new materiality assessment will be carried out in 2019.

4.1.6 CSR key performance indicators

The following table summarizes Arkema's key CSR performance indicators. Tracking and analyzing these KPIs enables the Group to validate, year after year, the performance of its CSR process and upgrade it as required.

The Group's 2025 targets, which are set out in the table below, confirm its commitment to CSR. In 2018, the process safety event rate (PSER) was added to the strategic indicators, strengthening the Group's commitment to safety.

	2025 targets	2018	2017	2016
SUSTAINABLE SOLUTIONS				
Number of patent applications filed during the year relating to sustainable development		154	150	116
Percentage of sales from products made from renewable raw materials		9%	9%	10%
RESPONSIBLE MANUFACTURER				
Safety				
Total recordable injury rate (TRIR) ⁽¹⁾	<1.2	1.3	1.6	1.5
Process safety event rate (PSER) ⁽²⁾	<3	4.4	3.9 ⁽³⁾	N/A
Percentage of sites having implemented peer observation in the last three years	100%	64%	59%	56%
Percentage of AIMS audited sites	100%	74%	69%	63%
Environmental footprint (in EFPI terms compared with 2012)				
Greenhouse gas (GHG) emissions	0.50	0.46	0.52	0.60
Volatile organic compound (VOC) emissions	0.67	0.62	0.66	0.80
Chemical oxygen demand (COD)	0.60	0.59	0.70	0.78
Net energy purchases	0.85	0.88	0.89	0.92
OPEN DIALOGUE				
Employee development and diversity				
Percentage of women in senior management and executive positions	23% to 25%	21%	19%	18%
Percentage of non-French nationals in senior management and executive positions	42% to 45%	39%	37%	39%
Average number of training hours per employee		25	25	27
Corporate citizenship				
Percentage of plants taking part in the Common Ground® program		84%	78%	86%

(1) The TRIR includes injuries to both Group and subcontractor employees.

(2) The PSER is calculated in accordance with the criteria set out by the International Council of Chemical Associations (ICCA) and the European Chemical Industry Council (CEFIC).

(3) The method for calculating PSER was reviewed in 2018 (see section 4.3.2.3 of this chapter).

The Group's program on managing its solutions portfolio includes work on defining an indicator to measure its contribution to the UN Sustainable Development Goals, working on the basis of the materiality assessment, which placed sustainable and innovative solutions as a priority topic.

IMPROVEMENT PROCESS AND RECOGNITION

For several years now, Arkema has been strongly engaged in a process to improve its CSR performance, with the aim of being included in the Dow Jones Sustainability Index (DJSI). The Group's CSR approach is regularly assessed by external stakeholders, particularly customers and SRI rating agencies.

The very significantly improved ratings obtained in 2018 confirm the adequacy of Arkema's CSR approach and provide the Group with areas for improvement that will enable it to rank among the best performing companies in the industry.

 <p>ROBECOSAM We are Sustainability Investing.</p> <p>Participation since 2015, with a significantly improved assessment, in line with the Group's target of joining the DJSI</p>	 <p>FTSE4Good</p> <p>Renewed every year since its initial inclusion in 2015</p>	 <p>CDP DRIVING SUSTAINABLE ECONOMIES</p> <p>A- rating for Climate Change again in 2018, reflecting a very good performance, and B- rating for Water Security</p>	 <p>2017 CSR Rating GOLD ecoVadis</p> <p>Gold recognition level achieved in 2015 and renewed in 2017</p>	 <p>EURONEXT vigeo eiris</p> <p>Inclusion in the Europe 120 and Eurozone 120 indices since 2015</p>
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4.2 SUSTAINABLE SOLUTIONS

POSITION SUSTAINABLE SOLUTIONS AT THE HEART OF THE INNOVATION POLICY AND THE DEVELOPMENT OF THE PRODUCT RANGE

4.2.1 Management of the sustainable solutions portfolio

In a world faced with a multitude of economic, environmental and social challenges, Arkema aims to provide its customers with sustainable and innovative solutions that contribute to the Sustainable Development Goals (SDGs) defined by the United Nations Organisation. As indicated in section 4.1.4 of this chapter, product stewardship and the provision of sustainable and innovative solutions have been clearly confirmed as priorities in the materiality assessment.

Solutions that contribute to sustainable development are therefore central to Arkema's innovation policy and to the development of its product range. This opens up a vast array of opportunities, both for the Group and its partners.

Through its commercial excellence program, Arkema listens to its customers, enhancing its understanding of their needs with a view to developing innovative solutions adapted to their challenges and supporting them in their quest for sustainable performance.

Through its choice of research areas, its continuous development of employees' skills and its innovation structure and processes, Arkema endeavors to develop solutions with its partners that meet the global societal challenges of today and tomorrow.

Through product stewardship, Arkema also takes care to ensure that its products do not harm people's health or safety or damage the environment. These aspects are taken into account right from the product design stage.

In addition to complying with the regulations, which forms the foundation of its commitment, Arkema implements an approach aimed at continuously improving scientific knowledge so that it can adapt its range of solutions accordingly and provide its customers and end users with the information necessary for the appropriate use of its products.

FOCUS

Arkema rewarded by BMW for its innovation efforts

In 2018, Arkema received a sustainable development award from German automaker BMW for its investment in the development of high performance polymers made from castor oil, a renewable resource.

The importance of sustainable solutions is reflected in the Group’s organization. For example, the Product Safety and Environment team is an integral part of the Sustainable Development department. The overall governance of sustainable development is presented in section 4.1.4 of this chapter.

To supplement its innovation and product stewardship processes, Arkema initiated a program in 2018 to systematically assess its portfolio of solutions in light of sustainability criteria. The program is presented in section 4.2.3 of this chapter.

4.2.2 Innovation

Innovation is a strategic pillar in Arkema’s targeted growth strategy and a key component in its contribution to sustainable development. Innovation in manufacturing technologies, products and applications is a driving force behind the development of sustainable solutions consistent with the Group’s social responsibility commitment.

Arkema’s innovation strategy is outlined in section 1.1 of this document.

The number of sustainability-related patents filed reflects the Group’s dynamic in this field.

	2018	2017	2016
Number of patent applications filed during the year relating to sustainable development	154	150	116

4.2.3 Management of the solutions portfolio

ASSESSMENT OF THE SOLUTIONS PORTFOLIO

To shift its product range more assertively toward sustainable solutions, Arkema has initiated a program to systematically assess its portfolio of solutions in light of sustainability criteria.

The methodology selected corresponds to that set out by the World Business Council for Sustainable Development (WBCSD) in its publication entitled “Chemical Industry Methodology for Portfolio Sustainability Assessments (PSA)”. It takes into account all of the social, environmental and economic impacts.

Products are considered in the context of their applications and of the regions in which they are sold.

To the extent permitted by the information available, the assessment takes into account the entire value chain, including manufacturing processes, from raw materials to the product’s

end of life. It is carried out using three sets of criteria:

- basic requirements, which reflect (i) the Group’s commitments relating to product responsibility in the area of health, safety and the environment, (ii) the principles of ethics and respect for human rights, and (iii) profitability factors;
- current market expectations in relation to sustainable solutions and the changes foreseeable over the medium and long term; and
- contribution to the UN Sustainable Development Goals (SDGs), using the market’s standard solutions as a reference. The ten SDGs most relevant to Group activities were selected. In this way,



SUSTAINABLE DEVELOPMENT GOALS



solutions are classified into different levels of contribution, making it easier to more effectively target actions that favor a sustainable sales portfolio.

In 2018, Arkema rolled out the program in pilot mode on a selection of solutions from three Business Lines that are representative of the Group's diverse range of activities: Acrylics,

Technical Polymers and Bostik. The pilot phase will be followed by the program's gradual deployment across the product ranges of the various Business Lines, starting in 2019.

The Group intends to use these assessments of its portfolio of solutions to create an indicator that measures its contribution to the SDGs.

FOCUS

Kynar® PVDF: filtration membranes for drinking water with a doubled lifespan

Kynar® PVDF for ultrafiltration offers extreme chemical stability and excellent mechanical strength. The major innovation it brings with respect to alternatives on the market is that clogging is greatly reduced, which makes for reduced maintenance downtime. Kynar® PVDF membranes have a longer service life because filtration output returns close to initial levels after each rinse operation.

ECO-DESIGN

Reducing its environmental footprint is one of the Group's key commitments and an area in which stakeholder expectations are high. To meet those expectations, Arkema implements eco-design and circular economy techniques, as described in section 4.3.3.3.4 of this chapter.

	2018	2017	2016
Percentage of sales from products made from renewable raw materials	9%	9%	10%
Percentage of sales covered by a full life-cycle assessment	20%	20%	10%

4.2.4 Product stewardship

Arkema integrates health, safety and environmental protection into every product's design and throughout its life-cycle.

This product stewardship process, which in certain aspects exceeds regulatory requirements, engages stakeholders across the product chain, from raw material suppliers to end-customers.

The Group expresses its commitment to product stewardship in its Health, Safety, Environment and Quality Policy and by endorsing the International Council of Chemical Associations' (ICCA) Responsible Care® initiative.

Leveraging its organization and the scientific and regulatory expertise acquired over many years, Arkema ensures that product-specific HSE roadmaps are defined by country and are adapted to local conditions, thus helping to drive continuous improvement and deepen its knowledge of each product's features and conditions of use. In addition, the Group uses the Arkema Integrated Management System (AIMS) to manage HSE risks related to product modifications, particularly changes to product composition and manufacturing processes.

A training module on product stewardship has also been introduced internally and added to the training program for Business Line and Logistics teams.

4.2.4.1 REGULATORY COMPLIANCE

Regulatory compliance plays a key role in product safety for customers, the entire value chain and stakeholders.

In recent years, Arkema has notably deployed the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) and implemented the European Union’s Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulations, which came into effect in 2007 to make the production and use of chemicals safer throughout the European chemicals industry.

Deployment of GHS

GHS is a major United Nations initiative designed to replace the various chemical classification and labeling standards used in different countries with a global system based on consistent criteria. The Group has deployed it in every participating country, in line with its implementation in local legislation.

In Europe, the GHS has been transposed into the Classification, Labeling and Packaging (CLP) regulation governing chemical

products and mixtures. Arkema reassessed and classified all the substances contained in its product portfolio within the regulation’s deadline and updated the related safety data sheets and labels.

In addition, Arkema has deployed the system in other countries, in particular in the United States, South Korea, China, Malaysia, Australia and Turkey, again within the regulatory timeframe. Roll-out is proceeding apace in the countries that are currently phasing in the GHS, such as Canada and Russia.

REACH implementation in Europe

REACH is a European regulation that aims to make in-depth changes in the way chemical substances are managed by improving the level of knowledge of these substances, analyzing their environmental and health risks and defining measures to manage the risks arising from their use or manufacture.

An advocate of the regulation’s objectives since its inception, Arkema mobilized a team of more than 30 experts in toxicology, ecotoxicology and regulatory compliance – working both centrally within the Product Safety and Environment department as well as within the Business Lines and corporate departments – to successfully complete the final phase of registration. In all, the Group will have registered 425 substances during the various phases of registration, and the total cost of the REACH regulation is expected to be around €65 million for the 2008-2020 period.

More particularly, Arkema has filed the following registrations with the European Chemicals Agency (ECHA):

	Number of substances	Substances for which Arkema is lead or sole registrant	Number of filings submitted to the ECHA	Filings accepted by the ECHA
2010 and 2013 deadlines	277	122	311	100%
2018 deadline	148	47	207	100%

When the stages of registration have been completed, research on chemical substances will continue in line with the REACH regulation to further improve knowledge of their properties and applications. The regulation represents a significant source of progress in the areas of risk management and the protection of people and the environment.

It fits perfectly with the product stewardship strategy deployed by Arkema, which has gone beyond the ECHA’s demands by launching a project to improve its filings and by updating those filings in a proactive manner to take into account new data and changes to the guidelines.

Preventive updates designed to improve the filings accounted for around 40% of the Group’s filings maintenance activity in 2018.

Management of REACH-defined substances of very high concern (SVHC)

The European Union introduced its Community Rolling Action Plan (CoRAP) right from the first phase of registration, in order to be able to identify the substances of most concern by 2025. Since 2012, 352 substances have or will be evaluated under the plan. Twenty-nine of the Group’s substances have been listed in CoRAP and their state of advancement is as follows:

CoRAP	2012-2020	Evaluation completed	Additional information provided, awaiting conclusion	Additional information being acquired	Upcoming evaluation
Number of substances	29	5	8	9	7



Following evaluation, additional information may be requested to determine if the risks are effectively managed. This could eventually lead to proposed pan-European risk management measures, such as restrictions, the identification of substances of very high concern or other initiatives outside the REACH remit.

Arkema has put in place a dedicated process to track the REACH-defined SVHCs that are used in its productions or placed on the market. It was designed in response to the REACH substance authorization process, which has two phases:

- the first consists in identifying substances that could have potential negative impacts on human health or the environment. Once so designated, these “substances of very high concern” are added to a list of substances that may be subject to prior authorization for their specific use (Annex XIV); and

- the second phase aims to ensure that the risks from the use of these SVHCs are adequately managed and that the substances themselves are being gradually replaced by appropriate alternatives. These substances may not be placed on the market or used after a designated date unless an authorization is granted (or waived) for their specific use.

As soon as the authorities propose that a substance be listed as an SVHC, Arkema responds to the public hearings organized by the ECHA for substances whose use(s) may be subject to authorization.

In cases where these substances finally qualify as SVHCs and are included in the candidate list, a review is conducted to determine the most appropriate response, such as assessing alternative substances for the intended uses, applying for authorization when the substance is listed in Annex XIV, or converting the production unit and phasing out production.

ANALYSIS OF THE GROUP’S SVHCs

Substances of very high concern

	SVHCs contained in products placed on the market	Of which SVHCs contained in raw materials
SVHCs subject to REACH authorization	9	8
SVHCs on the REACH candidate list	41	37

In addition to Europe, the table above includes data for Asia and the United States, as well as for Bostik.

In November 2015, Arkema filed an application with the ECHA for the authorization of sodium dichromate, used as a processing aid at the Jarrie plant in France, while waiting for an alternative solution to be found. The request was accepted by the European Commission on 29 January 2018 for a period of 12 years.

At the end of 2018, the industry candidate list contained 191 substances, including (i) hydrazine produced at the plant in Lannemezan, France, (ii) 2-imidazolidinethione (ETU) produced by MLPC, and (iii) nonylphenol ethoxylates (NPE) produced by the surfactants and additives business.

On 13 June 2017, NPE was added to the list of substances that require authorization. In 2018, Arkema decided not to maintain these product lines in the applications subject to authorization.

REACH’s third component is the restriction procedure, which is intended to restrict or prohibit a substance’s production, marketing or use.

The restriction relating to perfluorooctanoic acid (PFOA) derivatives came into effect on 13 June 2017. However, the Group has not been affected by the measure because it voluntarily replaced these substances in its fluoropolymer production process back in January 2016, before the measure came into effect in Europe.

Previously recommended for authorization, cobalt chloride is now recommended for restriction, after an analysis of the most effective risk management option. The proposal prepared by the ECHA was published in October 2018 but has not yet entered the phase of analysis by the Risk Assessment Committee (RAC). The Group, which uses the substance as a processing aid at the Jarrie plant in France, is analyzing the impact and exploring various solutions, including replacement.

Compliance with other legislation

Outside Europe, Arkema markets its chemicals in accordance with national and regional regulations, as applicable. Due to its history and global presence, some of these products are already notified in many inventories. Should a need arise for a new product notification, applications can be filed in a timely manner thanks to the extensive database Arkema maintains on the characteristics of its products.

In particular, since 2015, this process has made it possible to respond to the three new REACH-like regulations that have been introduced in Asia (South Korea, Taiwan and Turkey). For example, Arkema has completed phase I registration of substances in Taiwan and has been submitting annual reports to the Korean authorities since 2016.

Arkema has also joined consortia formed to jointly register substances brought to market in South Korea, in accordance with article 15 of the Act on the Registration and Evaluation of Chemical Substances (ARECS), and registered nine substances before the first deadline of June 2018.

The Group is now preparing for upcoming pre-registration/registration deadlines in South Korea and Turkey.

Following the publication of rules aimed at reforming the Toxic Substances Control Act (TSCA) Chemical Substance Inventory in the United States, the Group notified the US authorities of active substances in its portfolio in February 2018.

On a more specific note, the Group does not manufacture any persistent organic pollutants (POPs).

The Group complies with regulations on genetically modified organisms (GMOs) in different countries and regions. The great majority of raw materials of vegetable origin used by Arkema is guaranteed GMO-free, and this can be traced if customers so require.

Lastly, the Group has a policy of restricting the use of its products in medical applications solely to temporary implants (less than 30 days). To assist the Business Lines in their choices, Arkema has set up medical applications assessment committees in order to assess the compliance of the intended products with prevailing laws and regulations.

4.2.4.2 PRODUCT INFORMATION

Arkema relies on an in-house team of expert toxicologists and ecotoxicologists which conducts product hazard studies and works closely with regulatory experts to assess risks in normal conditions of use. The findings are shared across the Group and externally in various forms, including Safety Data Sheets, labeling and Global Product Strategy (GPS) Safety Summaries.

Safety Data Sheets (SDSs)

In many countries, Arkema describes its product characteristics and conditions of use in Safety Data Sheets (SDSs), which are required to market chemicals classified as hazardous to human health or the environment. They are prepared in some forty languages based on a global database comprising the composition of every product and its toxicological, ecotoxicological and physicochemical data, thereby ensuring consistent information in every market. Arkema issues SDSs in accordance with regulatory requirements and posts them on the Group website or the online QuickFDS platform. As part of the product stewardship process, Arkema exceeds regulatory obligations by issuing SDSs even for products that are not classified as hazardous and by providing users with an emergency hotline available 24/7.

In Europe, the Group's organization and IT infrastructure have made it possible to issue extended "SDSs", the latest REACH compliant format, which improve risk management by including exposure scenarios for each identified use.

Labeling

Arkema has also developed systems to print labels with a consistent classification, regardless of the country in which the product is manufactured or marketed.

In addition, efficient IT systems enable Arkema to prepare compliance documents and align them as needed with the latest formats and data, notably when the GHS standardized classification and labeling system is introduced in a new country.

Poison control centers

The Classification, Labeling and Packaging (CLP) regulation makes alignment with the GHS a legal obligation throughout the European Union. In addition, under the regulation, companies that put hazardous mixtures on the market must provide information about those mixtures to the bodies appointed by their country. The appointed bodies make the information available to poison control centers so that they can provide medical advice rapidly in an emergency situation.

Under the new provisions of the CLP regulation, which came into effect in March 2017, these companies will be required over time to:

- use a harmonized format for the transmission of information via a portal hosted by the European Chemicals Agency (ECHA). This EU-wide format will gradually replace national requirements for the transmission of information; and
- generate a unique formula identifier (UFI) for each formula, which must be included on the product label. This establishes an unambiguous link between the product placed on the market and the information relating to the mixture, enabling accurate and rapid identification of the product's formula. Accurate identification is essential in order to provide the appropriate medical advice in an emergency.

With the help of its teams and its IT infrastructure, the Group has taken the measures necessary to meet the upcoming deadlines, the first of which is 1 January 2020.

Global Product Strategy (GPS)

Arkema remains actively engaged in the Global Product Strategy (GPS) program, which is designed to support the deployment of safer, more efficient chemicals management practices. As part of this process, a dedicated web page has been created and Safety Summaries are regularly posted on the ICCA and corporate websites as and when REACH registration applications are filed. To date, the Group has already published 145 GPS Safety Summaries, describing the intrinsic properties of the substances marketed by the Group, their potential risks for human health and the environment and the recommended ways of managing these risks effectively. However, the Europe-wide ECHA database contains an equivalent level of data, in the form of infocards and brief profiles, and has the advantage of being continuously updated. The European Chemical Industry Council (CEFIC) is therefore reviewing the utility of continuing to draw up GPS Safety Summaries.

4.2.4.3 ANIMAL TESTING

Given its business portfolio, Arkema neither conducts triage trials on substances derived from its research nor participates in toxicology research projects that could involve the use of laboratory animals.

The Group always conducts in-depth analyses of data in existing literature, thanks to constant tracking of information on Group substances, in order to use all of the available public information.

The Group does not conduct toxicology studies on vertebrate animals other than those required by the authorities and only after an in-depth analysis and application of up-to-date existing public information on the substances in question. The necessary

studies are contracted to outside laboratories which are subject to oversight by the relevant ethics committees.

As required by REACH, the Group applies, whenever possible, the rules for waiving standard testing when such tests are not justified (due to the absence of exposure) or when alternative methods can be used.

In addition, Arkema participates in the work of FRANCOIPA, a French platform dedicated to the development, validation and dissemination of alternative animal testing methods, using the 3Rs (reduction, refinement, replacement).

4.3 RESPONSIBLE MANUFACTURER

As part of its commitment to societal issues described in section 4.1 of this chapter, Arkema operates as a responsible manufacturer and resolutely observes a policy of continuous improvement and

operational excellence. Its goal is to rank among the leading chemical producers in terms of safety performance and to reduce the environmental footprint of its activities.

4.3.1 Health, safety and environmental management

Safety and protecting health and the environment are core priorities in the management of Arkema's business and manufacturing operations, and a major focus of its CSR policy. This focus is shown by the Group's involvement in the Responsible Care® program, an initiative undertaken by the chemical industry to responsibly manage its operations and products, based on a continuous improvement process.

The Group's safety and environment policy is structured around three areas: prevention of risks (related to safety, the environment and pollution), management guidelines, and a culture of safety and sustainability. It reflects prevailing legislation and the Group's own requirements, formally defined in a Health, Safety, Environment and Quality Policy (implemented in 2018 to replace the existing HSEQ Charter) and in a global standard: the Health, Safety and Environment (HSE) manual. This policy, which confirms the responsible manufacturer commitment expressed in the Group's Social Commitment Charter described in section 4.1 of this chapter, and this global standard form the basis of the HSE management systems for all Group entities.

The materiality assessment performed in 2016 confirmed that personal and process safety, climate change and resource management were among the key aspects of the Group's CSR approach.

The management system for this policy is handled globally by the Group Safety and Environment department and its experts in industrial hygiene, safety and the environment. The department head reports to the Industry Executive Vice-President, who is an Executive Committee member, and makes a monthly presentation to the Executive Committee to keep it informed of the progress made in its programs and any significant events.

Implementation of the Health, Safety, Environment and Quality Policy is handled by the operating teams in each region and Business Line.

4.3.1.1 RISK PREVENTION

Whether in the area of security, health, safety or the environment, risk prevention is everyone's responsibility. Arkema believes that all occupational accidents are preventable and that everyone has a role and a responsibility in ensuring occupational health and safety and protecting the environment and neighboring communities.

In the area of process safety, Arkema is continuously improving its risk prevention and management practices.

These measures are presented in detail in sections 4.3.2.2 and 4.3.2.3 of this chapter.

4.3.1.2 MANAGEMENT SYSTEMS AND AUDITS

The effective implementation of the Group’s safety and environmental policies is regularly audited, with a focus on measuring progress and harmonizing practices. These audits are an important management practice.

To ensure a highly efficient inspection and control process, all of the Group-led safety, environment and quality audits have been consolidated into a single audit, known as the Arkema Integrated

Management System (AIMS). It is based on all of the Group’s standards, both proprietary and endorsed, such as ISO 9001, ISO 14001, OHSAS 18001 and ISO 50001. This “all-in-one” approach has the dual benefit of being aligned with the Group’s corporate culture and ensuring consistency across all its safety, environment and quality management initiatives. AIMS audits are conducted every three years by teams comprising Arkema employees and representatives from an independent third-party auditor, with follow-up audits every year.

The 2025 target is for every facility to have been AIMS-audited within the past three years.

	2018	2017	2016
% of facilities AIMS-audited over the past three years	74	69	63

The increase in the percentage of AIMS-audited facilities over the last three years illustrates the continued deployment of this program, in particular at the Bostik plants included in early 2015.

Many facilities are audited simultaneously according to the AIMS standard and a variety of international standards, to earn or renew external certification, depending on their particular situation.

The number of sites certified in this way over the last three years is presented in the following table and attests in 2018, as for previous years, to the Group’s ongoing efforts in these areas:

Number of units certified according to each standard	2018	2017	2016
ISO 9001 (quality)	154	150	130
ISO 14001 or RCMS (environment)	86	84	72
OHSAS 18001 and ISO 45001 (health and safety)	85	74	66
ISO 50001 (energy)	30	29	21

The migration from OHSAS 18001 to ISO 45001 was initiated at the end of 2018 and will continue until early 2021.

53% of Group facilities have been OHSAS 18001 certified in Europe, 48% in America and 58% in Asia, representing 47% of Arkema’s workforce.

Depending on local conditions, certain facilities have been certified to standards other than ISO 14001, such as the Responsible Care® Management System (RCMS) in the United States.

	2018	2017	2016
% of facilities ISO 14001 or RCMS-certified	54	52	52

The ISO 14001 or, in the United States, RCMS certification systems, require each production facility to identify its environmental impact in terms of water, air (including greenhouse gas emissions), waste, noise, odors, soil, use of resources and logistics flows, and then to define an action plan with priority areas for improvement. Periodic environmental assessments enable the facilities to measure progress and determine new improvement targets.

In addition, the Group performs a large number of non-AIMS audits every year, including:

- operational safety audits: construction site inspections, pre-start-up reviews, and operational safety audits in areas such as mechanical integrity and explosive atmospheres;
- process safety audits, including fire safety audits, post-incident audits, risk analysis reviews and specific reviews of the management of safety instrumentation;



- regulatory hazardous materials transportation audits;
- supplier and supply chain audits: transportation companies and warehouses are inspected and assessed. These audits are performed in addition to third-party audits, such as the Safety & Quality Assessment System for overland transportation, the Chemical Distribution Institute for maritime shipping, and the European Barge Inspection Scheme for river shipping. A certain amount of packaging is also inspected;
- field safety audits led by plant employees to assess the safety culture and installation compliance on a continuous, sustainable basis. These assessments include task or process audits, short flash audits, scheduled general inspections and safety tours by management. They concern everyone working on the site, including Group and subcontractor employees, and are performed in every aspect of the site's operations, including production, logistics, maintenance, offices, construction sites and turnarounds;
- security audits; and
- environmental audits.

In addition to audits, teams from the Group Safety and Environment department (DSEG) lead safety support initiatives at facilities whose performance has fallen short of Group standards or which have reported a specific issue. DSEG experts share their findings of the facility's accident record and HSE activities with plant management, then discuss how to prepare, implement and follow up on the remedial action plans. In 2018 as in 2017, the DSEG continued to provide specific support to plants during their turnarounds and stepped up its participation in events organized by the Business Lines, plants (annual meetings with partner companies) and corporate departments (maintenance, R&D, etc.).

Another important tool in managing the deployment of the Group's safety process is feedback on material incidents. It consists in sharing experiences on relevant incidents so that ways can be found to avoid recurrence. Feedback takes place across the global organization, through various geographic, professional and technological networks. In the event of a material incident, the network issues a safety alert that enables other Group facilities that may encounter a similar incident to take corrective measures. The feedback process helps improve the Group's safety expertise and ensure the effectiveness of the deployed measures.

To harmonize the identification, assessment and analysis of environmental risks, in 2013 the Group rolled out a new methodology, with global application, while a dedicated IT system was deployed in Europe, the United States and Asia in 2016. In 2018, 75% of the Group's industrial sites received training in how to use the system and around 66% updated their environmental assessment in the system.

4.3.1.3 SAFETY AND ENVIRONMENTAL CULTURE

Instilling a culture of safety through employee training and development of hazard awareness

Behavior plays a critical role in managing and preventing risks. That is why a core aspect of the Group's safety process is the

development of a common safety culture that raises everyone's awareness of his or her responsibility and the importance of his or her personal behavior. To develop a shared safety culture across the organization, the Group uses a variety of programs and initiatives, including:

- general training in health, safety and the environment for new hires;
- the "Safety in Action" and "Essentials" programs;
- field initiatives, such as peer observations, flash audits, scheduled general inspections, safety tours and field safety audits;
- dedicated training courses, such as SafeStart®, "Human and Organizational Safety Factors", "Safety Culture and Leadership", "Transporting Hazardous Substances" and "Crisis Management"; and
- the Arkema Safety Academy, which enables every employee to share the Group's safety challenges, policies and tools.

In addition, since 2017, the Group has been progressively integrating the lessons learned from neuroscience to improve accident prevention. These programs and initiatives are detailed in this chapter.

In 2018, safety training ⁽¹⁾ totaled 193,274 hours (*i.e.*, 14 hours per year per employee trained), and the number of employees who attended at least one safety training session totaled 13,588 (73% of the Group headcount) ⁽¹⁾.

In addition, 8,539 people (46% of the Group headcount) took e-learning courses on safety in 2018 ⁽¹⁾.

Instilling an environmental culture through employee training and development of hazard awareness

Group employees are trained and made aware of the main characteristics of their plant, the real-world consequences of their actions, the operational management of all types of releases and emissions, the environmental impact of turnaround or start-up operations, and waste sorting.

At the 54% of Group facilities that earned ISO 14001 or, in the United States, RCMS certification in 2018, a dedicated environmental training program is offered after an environmental risk analysis has been performed in each workshop. At an increasing number of facilities, feedback on environmental incidents is being tracked in a common system for reporting incidents and following up corrective actions. The training program is regularly repeated to maintain employee awareness of the importance of critical parameters.

A communication campaign aimed specifically at fostering an environmental culture will be conducted across the Group in 2019.

Details on employee training and the new-hire induction process may be found in section 4.4.1.3 of this chapter, "Special professional training programs for employees". Environmental training totaled 15,795 hours in 2018, or an average of four hours per employee. In all, 3,919 employees, or 21% of the consolidated workforce, attended at least one environment-related course during the year (excluding e-learning) ⁽¹⁾.

(1) In companies at least 50%-owned by the Group and employing more than 60 people.

4.3.2 Health and safety information

BEING A TOP QUARTILE PERFORMER IN SAFETY IN THE CHEMICAL INDUSTRY

4.3.2.1 SAFETY MANAGEMENT

As part of its societal engagement, the Group places the management of personal and environmental risks among its top priorities. Its approach to industrial safety takes into account the potential risks at the Company level but also for the environment and other stakeholders.

The main risks associated with the Group's activities relate to personal safety, exposure to chemicals and process safety. For more information on these risks, see section 2.1 of this document.

The due diligence procedures and policies implemented to prevent, identify and mitigate these risks and the outcomes of such policies in the form of performance indicators are described in detail below.

The Group's commitment to safety has been materialized in three targets for 2025, which reflect the Group's willingness to continuously improve its performance in this area.

2025 TARGETS

- Reduce the total recordable injury rate (TRIR) to less than 1.2.
- Reduce the process safety event rate (PSER) to less than 3.
- Extend the peer observation program to every Group site *.
- Audit every Group site * in accordance with the Arkema Integrated Management System (AIMS).

* For newly acquired companies' sites, the roll-out of this programme takes place over a period of around three years.

By setting this strategic TRIR objective for 2025, Arkema is contributing to UN Sustainable Development Goal 3: Good health and well-being.

4.3.2.2 EMPLOYEE HEALTH AND SAFETY

Arkema considers protecting the health and safety of its own employees and those of its subcontractors as a core value and believes that every occupational accident is preventable.

As part of a prevention and continuous improvement process, the Group is committed to ensuring a good working environment for everyone, in particular by analyzing workstation health and safety risks and studying accident typologies.

Regarding safety, the Group has the same level of expectation for subcontractors working on its industrial sites as for its employees. In particular, all of them systematically take part in awareness initiatives designed to develop a safety culture and in the Group's safety processes and programs. In addition, the injury rates for both employees and subcontractors are tracked as part of the safety performance management system.

Since the analysis of accident data shows the importance of human factors, Arkema has launched a series of programs designed to foster commitment to health and safety among all employees.

Another priority concerns the attenuation of arduous working conditions, with the deployment several years ago of a dedicated program comprising workstation ergonomics and other remedial actions. Workplace well-being and the quality of life at work are also important factors in protecting employee health.

4.3.2.2.1 Personal safety

The "Safety in Action" and "Essentials" programs

The "Safety in Action" and "Essentials" programs, which concern both Group employees and subcontractors working on Group sites, are deployed worldwide. "Safety in Action" is designed to promote and deepen everyone's safety culture, while the "Essentials" program defines a set of rules that must be applied without compromise in every situation.

FOCUS

Using digital technologies to improve safety

Security experts have identified new technologies as one of the key avenues for improving safety. To take advantage of this potential, Arkema has initiated an investigation into how new technologies can contribute to health and safety, in particular by conducting various trials, such as the use of connected tools in France, tablets for safety inspections in the United States and drones for maintenance inspections in China. It also intends to pursue its investigations into this topic over the long term.

Peer observation

Peer observation is aimed at raising risk awareness in ways that help to reduce the number of occupational accidents. It capitalizes on positive experiences and a joint search for solutions to improve practices. Using a structured observation process, each site implements the method taking into account its own specific features (risks and operations). Initially based on observations between employees with similar qualifications, the program has now been extended to allow all employees to observe each other while carrying out their duties.

Peer observation has now been introduced in all of the Group's Business Lines, except for the Bostik Business Line, which already has its own system that is scheduled to be harmonized at a later date.

As a result, in 2018, 64% of all Group sites had put in place peer observation practices to improve safety, versus 59% in 2017. The 2025 target is 100% of the Group's sites.

As part of this same process, Arkema has put in place a number of special programs, such as Smart Zone and SafeStart®:

• **Smart Zone: identifying and rectifying shortfalls**

Bostik has developed a monitoring system to identify in-field non-compliance or shortfalls against best safety practices. Employees detecting such an incident can record it in a "Smart Zone" table. After immediate corrective action is taken, further measures can be discussed between the employee and the Smart Zone table manager. Implementation of the corrective solution is tracked in the Smart Zone through to completion, for fast, effective incident follow-up.

• **SafeStart® to make safety everyone's business**

To encourage the shift from a compliance to a commitment-based safety culture, the Group has rolled out the SafeStart® initiative, which is based on observing oneself and other people to

identify critical states, such as rushing, frustration, fatigue and complacency, that can lead to critical errors (eyes not on task, line of fire, mind not on task, loss of balance, traction or grip), which in turn transform minor risks into major ones. Techniques to reduce the incidence of critical errors in turn help to drive a continuous improvement in the prevention of accidents. All employees will be trained in the fundamentals of this approach by 2020.

Progressively integrating the lessons learned from neuroscience to improve accident prevention

Since 2017, the Group has initiated a review with a neuroscientist of the mechanisms associated with human error, particularly among experts (which most of the Group's employees are in their respective roles).

Program rollout has begun, furthering an understanding of behavioral approaches, and facilitating the adoption of safety tools and equipment by highlighting their utility.

Getting stakeholders involved in safety

In France, many entities organize Safety Days once or twice a year with their subcontractors, which are attended by local HSE employees, the Group contract manager and the contractor's sales manager. During these days, the Group is represented by local executives, business executives and, as applicable, representatives from the Group Procurement and Safety and Environment departments. These events provide an opportunity to share best occupational health and safety practices. Already well established in Europe, this approach is being rolled out across the Group.

In addition, a certain number of initiatives are carried out in order to obtain employee feedback:

- in China, an employee survey that includes a safety section is conducted every two years and the findings are integrated into site improvement plans;
- certain Business Lines, such as coating resins, carry out an annual employee satisfaction survey with a particular focus on safety; and
- in Europe, a survey including a safety section was carried out among all employees in 2018.

These surveys provide an overview of how committed employees really are to safety. In Europe, 97% of respondents said that "safety was always on their mind".

The Common Ground® initiative, presented in section 4.4.6 of this chapter, "Corporate citizenship and philanthropy", aims at developing constructive dialog with local communities.

Injury rates

The Group's safety performance ranks among the best in the global chemical industry, confirming the clear improvement dynamic underway for several years, driven largely by the deep involvement of every employee.

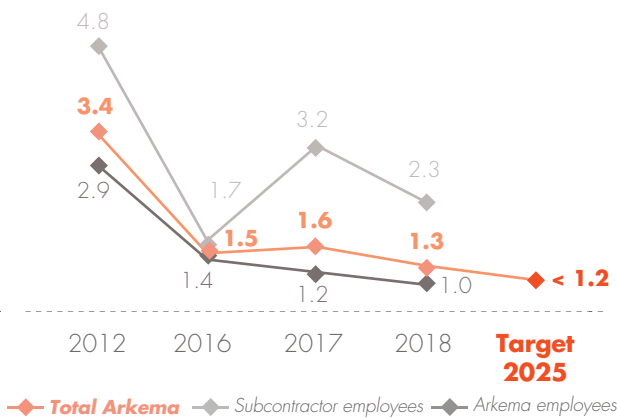
2025 TARGET

To further improve, the Group has set a target to achieve a total recordable injury rate per million hours worked (TRIR) of less than 1.2 by 2025.



The Group's safety performance saw a sharp rise in 2018, with TRIR of 1.3, down from 1.6 in 2017. This performance stems from excellent results for Group employees, with TRIR down to 1.0 in 2018 from 1.2 in 2017, and for subcontractor employees, with TRIR down to 2.3 in 2018 from 3.2 in 2017. These improvements owe much to the targeted action plans initiated in 2018.

TOTAL RECORDABLE INJURY RATE (TRIR) ⁽¹⁾



In 2018, a total of 34 Group employees were victims of reported injuries recorded in the TRIR for the year, of which 19 resulted in lost time, out of a total worldwide workforce of 20,010 people. The rate also reflected the 24 incidents involving subcontractor employees reported during the year, of which 16 were lost-time injuries. Analysis of the data shows a decrease in the number of potentially serious incidents, which account for a small proportion of the total. The Group remains set on further reducing this number, by means of a program on identification and analysis of potentially serious accidents. This will enable prevention measures to focus on these types of incidents as a first priority, thereby improving the effectiveness of prevention efforts.

4.3.2.2.2 Health at work

Arkema has also undertaken continuous improvement initiatives to prevent health risks and enhance employee well-being.

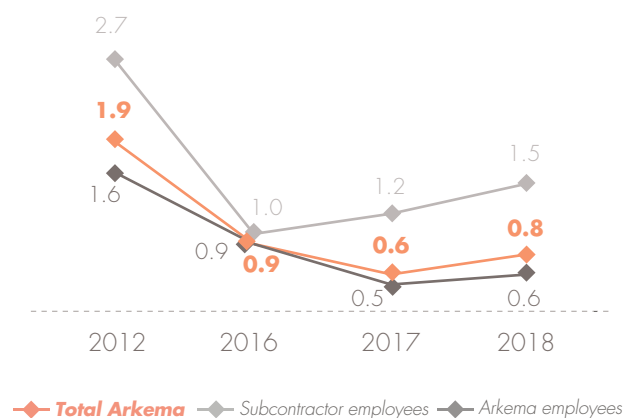
Protecting health at the workplace

To consolidate all of the workplace health and safety initiatives, the Group is developing a workplace risk assessment application,

The overall lost-time injury rate (LTIR) showed a slight rise, to 0.8 in 2018 from 0.6 in 2017. This overall rise was weighted by lost-time injuries among subcontractor employees, with an LTIR of 1.5, compared to the virtually stable LTIR of 0.6 for Group employees. An average of 52 days were lost per injury in 2018 across all Group and subcontractor employees, stable compared with 50 in 2016. No fatal accidents have been recorded since 2013.

The following charts show consolidated injury rates for the 2016 to 2018 period, in number of injuries per million hours worked, calculated according to the methodology described in section 4.5 of this chapter. They also show data for 2012, the baseline year used to set the Group's long-term CSR targets.

LOST-TIME INJURY RATE (LTIR) ⁽¹⁾



known as STARMAP, to prevent health and safety risks more effectively by capitalizing on globally managed data libraries and best practices. The application is being rolled out worldwide. At 31 December 2018, 48% of the Group's sites worldwide had entered their workplace risk assessment data into the STARMAP tool.

Integrating ergonomics and preventing arduous working conditions

Since 2012, the Group has undertaken a process to integrate ergonomics and prevent arduous working conditions.

In France, a new agreement on the prevention of arduous working conditions and the integration of ergonomics was signed in 2016 by all of the trade unions, following on from the previous one. In this context, numerous initiatives have contributed to improve working conditions, including the development of internal expertise through the implementation of a network of ergonomics correspondents and the integration of ergonomics into the industrial design of projects.

(1) A lost-time injury refers to any incident causing bodily harm or psychological trauma to an employee in the course of his or her duties and resulting in at least one day off work.



In the United States, a workstation ergonomics program, based on a set of e-learning modules, has been in place for several years. In addition, several facilities have launched a program to improve workstation ergonomics, primarily in packaging operations.

In China, research has been initiated into improving load handling.

Overall, numerous initiatives have been undertaken to improve ergonomics in various work situations, including load handling, packaging, unloading, equipment control, facility maintenance, and laboratory and office work.

Before implementing improvement initiatives, the Group organizes awareness sessions to improve understanding of ergonomics.

In 2018, the network of ergonomics correspondents continued to grow, particularly within Bostik. Two network meetings were organized during the year to facilitate the exchange of best practices. In addition, medical staff were given the same training in ergonomics as the ergonomics correspondents.

Lastly, HSE project reviews systematically address the integration of ergonomic factors.

Preventing stress and improving quality of work life

In 2008, Arkema France initiated a physician-supported stress management program for individual employees, whose stress levels are determined by taking a standardized stress, anxiety and depression test (OMSAD) during their annual check-up with the occupational physician. The Group has also undertaken a company-wide workplace stress prevention initiative to improve any working environment identified as being at risk, based on such proven indicators as an abnormally high percentage of employees diagnosed as being over-stressed.

In 2018, the initiative was strengthened by the signature of a "health and work" agreement covering stress prevention, ergonomics, disability and disconnection. The agreement aims to:

- ensure the relevance of the various measures taken in these areas by strengthening cohesion between the various parties involved and between the working groups set up under existing agreements;
- preserve and enhance the actions undertaken;
- anticipate changes to occupational health issues by gathering and sharing intelligence on these topics;
- strengthen the role of employee representatives by creating a Steering Committee as of 2019; and
- protect health in the workplace.

4.3.2.2.3 Medical care

Regular medical check-ups were available in 92.5% of Group companies in 2018, covering 92.7% of employees.

In France, pursuant to the decree on the modernization of occupational medicine dated 27 December 2016, all employees

now have access to individual exposure sheets to facilitate the monitoring of their health.

4.3.2.2.4 Occupational illnesses

Toxic or hazardous substances have been and continue to be used in the manufacture of the Group's products. Despite the safety and monitoring procedures in place Group-wide and in each production facility, employees may have been exposed to such substances and may develop illnesses arising from such exposure.

In this respect, like most manufacturers, the Group has used a variety of asbestos-based insulating or heat-proofing materials at its production facilities in the past. Consequently, certain employees may have been exposed to such materials before they were gradually removed and replaced.

Claims for occupational illnesses related to past asbestos exposure have been filed against the Group, mostly for periods before 1980. The risk of exposure to chemicals is described in section 2.1.1 of this document.

With respect to industrial hygiene, beyond the use of:

- enclosed industrial processes limiting emissions as much as possible;
- protective systems such as source capture of residual emissions, general improvement works designed to minimize exposure; and
- the use of appropriate personal protective equipment at each workstation;

the Group requires risk exposure to be assessed at each workstation and that employees' residual exposure to hazardous chemicals be regularly measured in order to prevent the risk of occupational illness in the future. Measurement data are stored in conditions that guarantee their long-term integrity.

In 2018, 66 occupational illnesses were reported Group-wide, of which 20 were related to exposure to asbestos and 32 to exposure to chemicals. These figures include illnesses not yet included in the tables listing occupational illnesses.

In France, the Group also deploys traceability programs to track potential exposure to arduous working conditions in its facilities (including chemicals exposure), as part of its global risk assessment report. Globally, the Group is working on digitizing its risk assessment data using the dedicated STARMAP tool (described in section 4.3.2.2.2 of this chapter), which guarantees internal traceability.

Agreements on early retirement for employees in asbestos-contaminated facilities

In France, four Group sites have been included by ministerial decree on a list of sites whose current employees would be entitled to the early retirement provisions for asbestos workers. The Group cannot exclude that other Group sites may be added to the list in the future.

In this context, on 30 June 2003, Arkema France signed an agreement with all of the representative trade unions that improved the terms of retirement for employees qualifying for this provision, and adjusted their retirement dates to facilitate the transfer of their skills and knowledge within the organization. These measures were extended to all Group companies in France by an agreement signed on 1 September 2007 with all of the unions. For more information, please refer to note 18 to the 2018 consolidated financial statements in section 5.3.3 of this document.

4.3.2.3 PROCESS SAFETY

The Group carefully analyzes the industrial risks associated with all of its production, transportation, loading/offloading and storage processes and pays particular attention to both internal and external feedback concerning incidents, accidents and best industrial risk management practices.

The aim of the risk analysis is to identify and manage potential risks that may cause harm to people, goods or the environment. This enables the Group to seek out processes that are inherently safer and to implement risk management measures that focus on prevention.

The analysis is carried out in compliance with applicable legislation, using systematic studies based on recognized methods, which are chosen in accordance with the type of process involved, the complexity of the operations and the size of the facility. The aspects taken into account include (i) the risks associated with the properties of the chemical products used, (ii) the risks associated with operating conditions, equipment characteristics and potential technical and human weaknesses, (iii) the risks associated with the location of units on a site and their potential interaction and (iv) natural risks.

The risks identified in this way are prioritized using a semi-quantitative process developed and led by a network of experts in Europe, the United States and Asia. The experts are also responsible for preparing the directives, procedures and guidelines required for effective risk management.

The risk analysis process and the corresponding measures are carried out prior to the implementation of new processes, of new facilities, of operations that require the use of new chemical products, and of extensions or modifications to existing facilities. The resulting risk analyses are updated periodically.

As a result, the Group regularly makes improvements to its existing production units. In 2018, Group capital expenditure allocated to safety, the environment and maintaining the production facilities to standard amounted to €270 million, versus €242 million in 2017.

At the same time, the Group is investing heavily to reinforce a culture of process safety among its employees. This involves not only technical training in process safety systems and methods, but also seminars in the United States, Europe and Asia for plant employees and managers, conducted by experts from the

Center for Chemical Process Safety of the American Institute of Chemical Engineers, companies specializing in process safety, or the Group. In 2018, the DSEG published a booklet entitled "Process safety fundamentals" for plant employees and managers to inform, train and share information with them on process safety values.

In France, Technological Risk Prevention Plans (*plans de prévention des risques technologiques* - PPRT) put in place in accordance with environmental legislation help manage urban development around the Group's upper-tier Seveso facilities. As of year-end 2018, 16 facilities operated by the Group in France are subject to a PPRT, for which the Group is required to part-finance related measures. Furthermore, the French ministerial decree of 29 September 2005, requiring that the probability of occurrence, kinetics, impact intensity and severity of potential accidents be assessed and addressed in the hazardous impact studies performed for classified installations subject to authorization, also entails the introduction of risk management measures at all of the sites classified as such.

In Europe, at the date of this document, 35 of the Group's production facilities are subject to reinforced monitoring in accordance with the provisions of the Seveso III directive (directive 2012/18/EU of 4 July 2012) concerning major accidents involving hazardous substances. This directive requires, in particular, the deployment of safety management systems and the regular updating of hazard studies.

In the United States, the management of industrial safety risks is primarily regulated by the Occupational Safety and Health Administration (OSHA) and its Process Safety Management of Highly Hazardous Chemicals standard and by the Environmental Protection Agency (EPA) and its Risk Management Plan (RMP) Rule, implementing section 112(r) of the Clean Air Act. In particular, these texts require companies to inform authorities if they use or store a quantity of a hazardous substance above a defined threshold and, if such a substance is stored, to implement specific risk management programs that include a heightened equipment inspection process, operator training and emergency plans. Other regulations at the federal, state or local level are applicable to the storage of chemicals, the safety of operators when handling stored products and the storage of highly hazardous substances.

For sites exposed to natural risks such as extreme weather events or earthquakes, risk scenarios are defined and regularly updated, together with the measures designed to mitigate their impact. For further details, see the risk of accidents at sites in section 2.1.1 of this document.

Crisis management

The in-plant crisis management procedures are broadly based on the Group Crisis Management directive, which covers the management of potentially critical situations in the areas of health, safety and the environment on Group sites and during transportation.

A year-round on-call system enables the Group to manage crises by setting up a dedicated crisis management team. The Group regularly offers training courses in "Crisis management and communication" and conducts simulations of crises and set-up of crisis management teams.

- Process safety events (PSEs)

The Group is intent on minimizing the number of process safety events. In 2017, Arkema adopted the new process safety event criteria published by the International Council of Chemical Associations (ICCA) and began reporting a new process safety indicator, the PSER (number of process safety events per million hours worked) based on ICCA and CEFIC criteria.

The Group is contributing to industry-wide efforts on reporting reliability and harmonization for this complex indicator, which is new for the chemicals sector. This explains why the 2017 PSER was recalculated.

2025 TARGET

Driving further efforts on reducing industrial accident risks, the Group has set the new strategic target of a PSER under 3 by 2025.

In 2018, the PSER was 4.4, compared to 3.9 in 2017. This increase was mainly the result of harmonization in indicator calculation.

Major PSEs are reported as soon as possible to Executive Committee members and to the surrounding community in the event of nuisances, applying the procedures specified for managing such events.

The number of PSEs is reviewed monthly by the Executive Committee.

Transportation-related events

Transportation-related events are events that occur during the transportation or handling of hazardous and non-hazardous goods at loading/offloading areas and on Group and customer sites. The Group uses six criteria to distinguish between major and minor events, primarily based on the regulations in effect for the transportation of hazardous goods.

Since 2016, major events have been communicated to the Executive Committee on a quarterly basis.

4.3.2.4 SECURITY

In the area of security, Arkema provides training and makes every effort to use the best technologies available in order to protect people and the facilities. The Group's action plans are notably based on recommendations by public authorities and on targeted audits.

To enhance protection against malicious acts, Arkema has decided to strengthen its security policy in several key areas:

- **cyber security:** heightened protection of the Group's corporate and industrial IT networks worldwide;
- **physical security:** guidelines defining the level of protection to be implemented in the event of an intrusion, depending on the site's criticality and the prevailing social conditions (particularly crime levels);
- **transportation:** additional measures to enhance transportation security;
- **intellectual property:** heightened security measures at research centers; and
- **travel:** increased employee protection during business travel.

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The "i-Safe" awareness program

This Group-wide program launched in 2018 is based on a set of 11 best cyber-security practices (known as "the Golden rules"), which are deployed every three months via team meetings that extend to all employees. The first topics covered in these meetings were: prudent use of USB flash drives and email, vigilance in the face of potential attacks, and safe business travel.

4.3.3 Environmental information

REDUCING THE ENVIRONMENTAL FOOTPRINT OF THE GROUP'S OPERATIONS

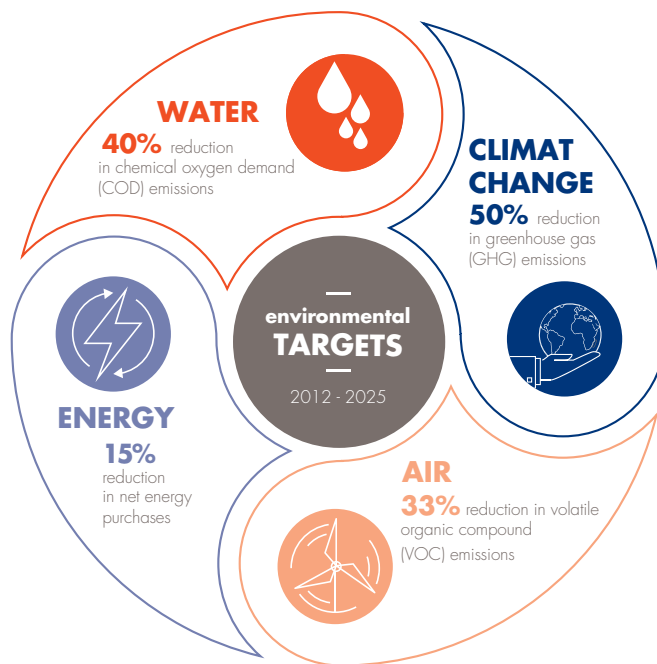
4.3.3.1 ENVIRONMENTAL MANAGEMENT

Reducing its environmental footprint and combating climate change are part of Arkema's commitment to being a responsible manufacturer. To achieve these objectives, the Group continues to upgrade its manufacturing practices to reduce emissions, optimize its use of energy, water and non-renewable raw materials, and support the circular economy. The Group's plants stringently track their effluent releases, air emissions and waste production and implement appropriate measures to manage the risks associated with the environment and climate change, taking into account their potential impact not only for Arkema but also for the environment and other stakeholders.

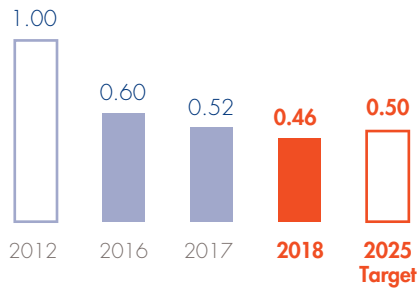
The main risks associated with the Group's activities relate to air, water and soil pollution, climate change and the use of resources. The due diligence procedures and policies implemented to prevent, identify and mitigate these risks and the outcomes of such policies in the form of performance indicators are presented in detail below and organized around the topics of climate change, resource management and impact on biodiversity.

In addition to these initiatives carried out at its industrial sites, Arkema also leverages its sustainable development-oriented innovation process to develop solutions for its customers that contribute to combating climate change, facilitate the management of water resources, support new energies and enhance energy efficiency, thereby providing new opportunities for growth. For further details, see section 1.1 of this document.

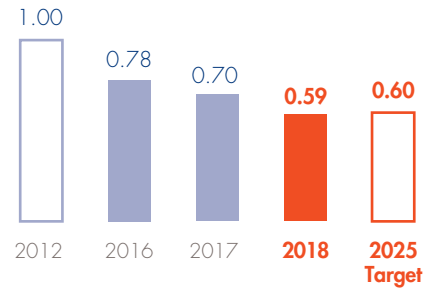
The materiality analysis set out in section 4.1.5 of this chapter confirms the importance for stakeholders of environmental topics, for which the Group has already defined four objectives. These objectives apply to intensive indicators, known as Environmental Footprint Performance Indicators (EFPIs), which are not impacted by changes in the scope of reporting, making them more effective in tracking the Group's industrial performance. The following charts illustrate the objectives and the progress made since the 2012 baseline. Through the efforts undertaken, a number of targets were reached ahead of time in 2018, and some could now be raised under the Group's continuous improvement initiative.



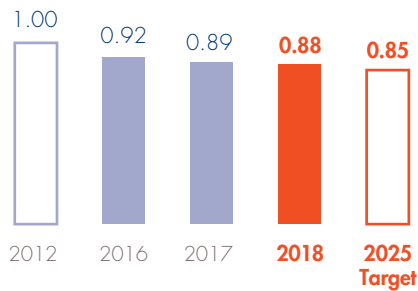
CLIMATE
(DIRECT GREENHOUSE GAS EMISSIONS EFPI)



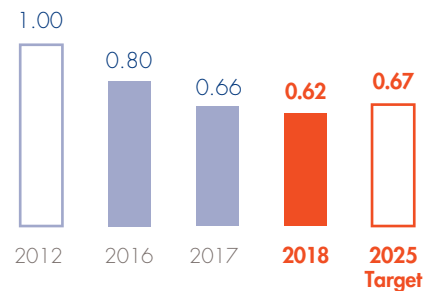
WATER
(CHEMICAL OXYGEN DEMAND EFPI)



ENERGY
(NET ENERGY PURCHASES EFPI)



AIR
(VOLATILE ORGANIC COMPOUNDS EFPI)



NB: the change in the EFPIs is expressed in relation to an index base of 1 in 2012.

In addition to the progress made in these four intensive indicators, the Group reports absolute figures for every parameter used to track the Group's environmental footprint.

To meet its targets, the Group has undertaken initiatives at two levels:

- continuous improvement programs, based on employee training and an action plan deployed in every unit; and
- a certification process, completed by internal audits, to assess the performance of each plant's environmental management system.

Regulatory and compliance monitoring

The Group ensures that its HSE network properly understands the applicable EU regulations, such as Phase III of the European Union Emissions Trading Scheme (EU ETS), the Industrial Emissions Directive (IED), the reviewed Best Available Techniques Reference (BREF) documents, as well as the latest environmental data reporting rules which concern it, thanks to the organization of awareness-building sessions and dedicated network meetings. The Group also performs regulatory compliance audits every three years at the US facilities. For China, a regulatory monitoring process has been set up with a specialized firm. European facilities

can monitor their compliance with applicable regulations using specific IT applications dedicated to each country's legislation.

Management engagement

Initiatives underway to reduce the environmental footprint are extensively reviewed and discussed within the Group:

- each business's entire environmental footprint, including its energy footprint, is reviewed annually in individual meetings with the business's Managing Director and industrial Vice-President(s) and the Group Safety and Environment and Sustainable Development Vice-Presidents. During this process, the managers concerned are assigned an environmental target for the following year. This target is a criterion for their annual performance review and compensation;
- the Group's annual environmental and energy reports presenting results for the reporting and prior years, along with historical environmental footprint data (excluding energy) for the trailing six years, are issued to all the departments concerned. These reports track the initiatives that helped to improve the Group's environmental performance. A total of 165 initiatives were undertaken in 2018. They covered the full range of environmental related topics, including water

withdrawals, the reduction in water effluent releases, GHG and COV emissions, soil contamination and waste production; and

- each year, the Group Safety and Environment Vice-President and the Sustainable Development Vice-President provide the Executive Committee with overviews of, respectively, the Group's environmental performance and the progress made in the key indicators towards the 2025 targets.

In addition to internally tracking the improvement plans deployed in each entity, the Group ensures alignment among the environmental management systems through an external certification process.

Environmental statement

The Group's statement concerning its environmental indicators is based on the principles of relevance, representativeness and consistency. The methodology applied is described in section 4.5 of this chapter.

4.3.3.2 CLIMATE CHANGE

A firm supporter of the fight against climate change, Arkema is striving to reduce its energy use and the greenhouse gas emissions associated with its activities through its Arkenergy program.

At the One Planet Summit in Paris in December 2017, Arkema reaffirmed its commitment to a low-carbon industry and economy by signing the French Business Climate Pledge along with ca. 100 other French companies.

The Group is also determined to enhance its product range, notably by developing solutions that help reduce greenhouse gas emissions. This is illustrated by changes to its fluorogases offering and by the development of the four innovation platforms described in section 1.1.2 of this document: "Lightweight materials and design", "New energies", "Home efficiency and insulation" and "Bio-based products".

Arkema's climate policy and its management of climate-related issues are included in the Group's environmental policy, which is described in section 4.3.1 of this chapter, as part of its commitment to being a responsible manufacturer.

Greenhouse gas emissions are reported in accordance with the GHG Protocol:

- Scope 1 emissions are direct emissions;
- Scope 2 emissions are indirect emissions relating to energy; and
- Scope 3 emissions are indirect emissions relating to the value chain, both upstream and downstream of the Group's activities.

4.3.3.2.1 Scope 1 and 2 greenhouse gas emissions

Scope 1 direct emissions

The Group's direct greenhouse gas emissions (Scope 1 GHG) arise from:

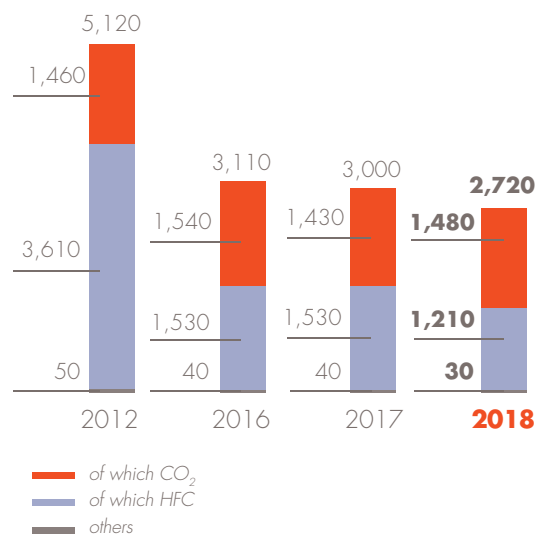
- hydrofluorocarbon (HFC) emissions from its fluorogas production units;

- fugitive emissions from cooling circuits using GHGs;
- burning of fuel oil and gas in production operations; and
- processes that generate carbon dioxide (CO₂), nitrous oxide (N₂O) or methane (CH₄) as a product, by-product, co-product or waste, and gas discharges from processes such as thermal oxidation, which converts VOCs into CO₂.

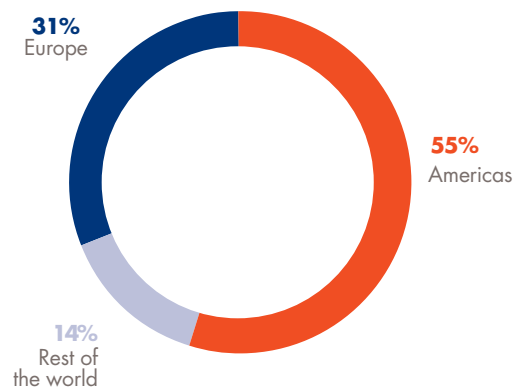
Absolute indicator for direct greenhouse gas emissions

The chart below details direct greenhouse gas emissions (in kt CO₂ eq.) from the Group's operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

DIRECT GHG EMISSIONS (in kt CO₂ eq. per year)



The net reduction in GHG emissions (primarily HFC) in 2018 was around 10%. Two of the contributory factors here were the reliability improvements made to the emission treatment systems at the Calvert City site (United States), and the shutdown of the R134a fluorogas production plant at the Pierre-Bénite site (France). The breakdown of direct GHG emissions by region is as follows:



To reduce its impact on global warming, the Group has undertaken a number of actions and deployed effective measures to minimize direct GHG emissions, such as:


- installing emissions scrubbers, notably at the plants in Calvert City (United States), Pierre-Bénite (France) and Changshu (China);
- introducing systematic leak detection programs at the fluorogas production facilities, so as to minimize fugitive emissions; and
- replacing boilers with more efficient installations as part of the Arkenergy program (see the section on energy below).

Intensive indicator for direct greenhouse gas emissions

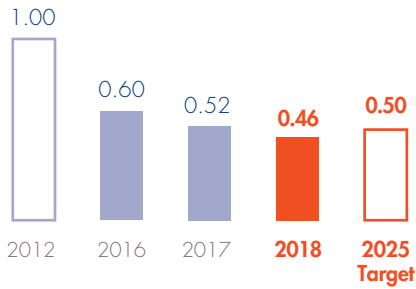
The chart below presents the direct greenhouse emissions EFPI from the Group's operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter. The index base is 1 for the year 2012. Emissions are calculated using the Group's biggest GHG emitters, which account for more than 80% of the consolidated total.

2025 TARGET

For 2025, the Group aims to reduce its GHG emissions, expressed in EFPI terms, by 50% compared with 2012.



DIRECT GHG EMISSIONS EFPI



The significant improvement in this indicator in 2018 comes from progress made at all of the most emission-intensive sites, such as the reliability improvements in effluent treatment at the Calvert City site.

The GHG target for 2025 was met in 2018, and the Group is now working to set new targets as part of work to assess its impact with regard to the Paris Agreement.

Scope 2 indirect emissions

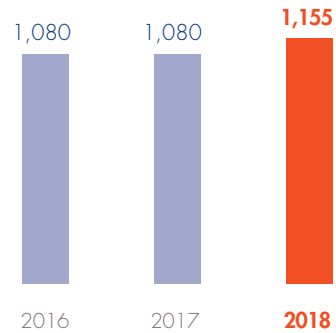
The Group analyzes the following indirect GHG emissions:

- Scope 2 CO₂ emissions from the suppliers of the electricity and steam purchased by the Group; and
- Scope 3 CO₂ emissions, categories 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12 and 15. See section 4.3.3.2.3 below.

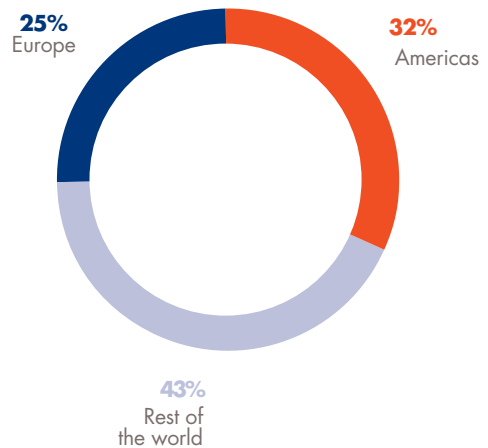
The chart below presents the Scope 2 emissions from the Group's operations in 2018, 2017 and 2016, as defined above and calculated according to the methodology described in section 4.5 of this chapter.

Scope 2 CO₂ emissions break down as follows:

INDIRECT GHG EMISSIONS (SCOPE 2) (kt CO₂ eq.)



INDIRECT GHG EMISSIONS BY REGION



Scope 2 CO₂ emissions increased compared to 2017 levels. This is chiefly explained by improved reporting for Scope 2 emissions in China and the purchase of steam at the Hengshui site (China), partially replacing on-site production. The Scope 1 and Scope 2 results for this site remain positive as regards greenhouse gas emissions.

Overall, the Group's GHG emissions (Scope 1 plus Scope 2) in 2018 were 5% down on 2017.

Internal carbon price

In 2016, to enhance its long-term approach, the Group set an internal price for Scope 1 and Scope 2 GHG emissions, expressed in terms of CO₂ equivalent, known as "internal carbon price". It is used to analyze strategic industrial investments and to steer investment decisions under the operational excellence program towards the lowest carbon solutions.

4.3.3.2.2 Energy

The Group deploys a wide range of actions to reduce Scope 1 and 2 CO₂ emissions as part of both the Arkenergy program and its operational excellence strategy (for further details, see the "Profile, ambition and strategy" section in this document).

Energy consumption

The Group uses a variety of energy sources, primarily in its industrial operations. To optimize energy consumption, the Group set the following target:

2025 TARGET

Reduce net energy purchases by 15% in EFPI terms by 2025.



To this end, the Group is rolling out the Arkenergy program in every subsidiary through a global network of Energy Leaders in the Business Lines, factories and relevant Procurement and Technical departments. It focuses on optimizing the energies used in the Group's production facilities and processes. Moreover, Arkenergy is structured to meet the following priorities:

- continuously optimize energy use and cost, from equipment design and procurement to day-to-day on-site operations;
- deploy an energy management system to systematically integrate best operational practices, define site-specific targets and periodically review them; and
- ensure compliance with energy efficiency legislation, regulations and other applicable standards.

As well as improving energy efficiency, the program is also contributing to reinforcing the production plants' competitiveness.

Based on energy efficiency audits worldwide, focusing on the plants that account for more than 85% of the Group's energy consumption, the Arkenergy approach covers the following main points:

- implementing the ISO 50001 energy management system in Europe and Asia. To date, a total of 30 sites are ISO 50001-certified, which corresponds to 54% of Arkema's total energy use;
- allocating a dedicated capital expenditure budget specifically for Arkenergy initiatives. In 2018, 50 capital projects were funded out of the budget, including 26 in Europe, 14 in the Americas and 10 in Asia; and
- since 2018, automating processes in order to continuously optimize the use of energy and raw materials.

The Group's deployment of digital technologies helps to optimize energy consumption through the introduction of data collection and analysis systems.

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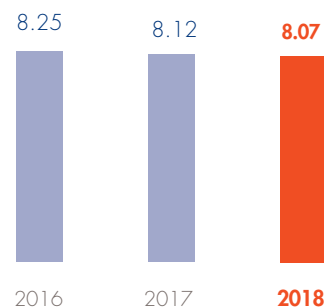
Advanced control programs

In 2018, an advanced control system was integrated into the production units at the *La Chambre* and *Lannemezan* facilities in France. The installation of "controllers" or IT systems enables comprehensive and coherent management of the units' various operating parameters. The resulting optimization has brought a reduction in the energy (steam) used, while maintaining product quality and operating stability. The expected full-year economic savings amount to several hundred thousand of euros.

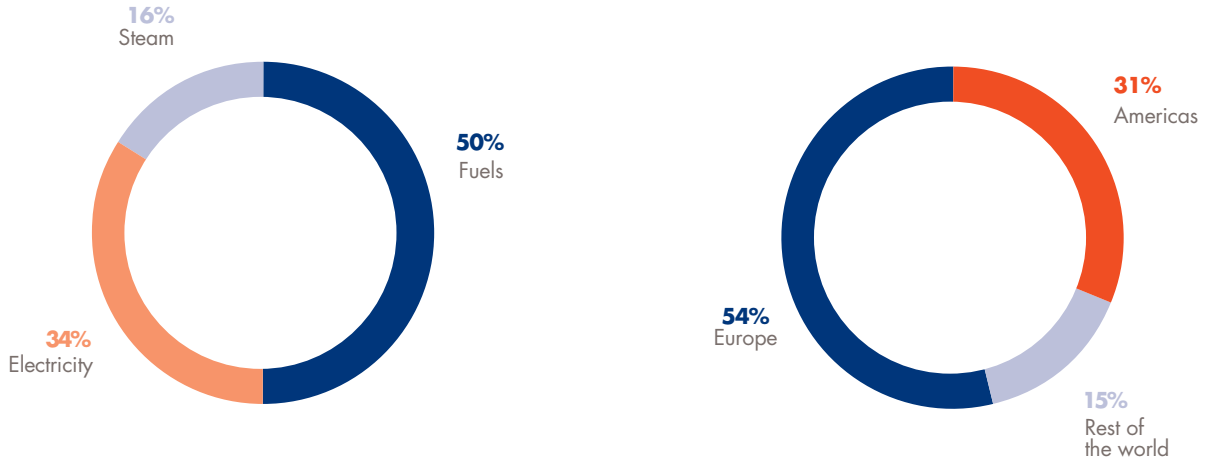
Absolute indicator for energy purchases

The chart hereafter presents consolidated net energy purchases in 2018, 2017 and 2016, calculated in terawatt-hours according to the methodology described in section 4.5 of this document.

NET ENERGY PURCHASES (in TWh)



Net energy purchases by region and by type of energy break down as follows:



In 2018:

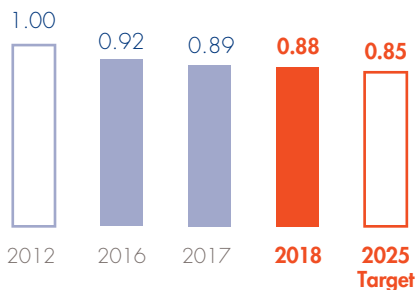
- 97% of the TWh generated by fuel were natural gas-fired, up from 93% in 2017. This increase stems primarily from the change in boiler fuel at the Hengshui site (China) in 2017.
- 22% of the net TWh purchased by the Group, regardless of source, were from low-carbon electricity, up from 18% in 2017. One of the factors behind this higher figure is the more detailed reporting of the energy mix with energy suppliers.

Intensive indicator for energy purchases

The chart below presents the net energy purchases EFPI for the Group’s operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter. Net energy purchases are calculated using the Group’s biggest net energy purchasing entities, which account for more than 80% of the consolidated total.

In 2018 we saw a slight improvement in this indicator, in a context of major regulatory maintenance shutdowns at sites making major contributions to energy purchases.

NET ENERGY PURCHASES EFPI



4.3.3.2.3 Scope 3 emissions inventory

Following an initial inventory of its indirect Scope 3 emissions in 2016, the Group calculates the Scope 3 emissions arising from its upstream and downstream value chain each year, in accordance with the GHG Protocol calculation guidance issued by the World Business Council for Sustainable Development (WBCSD). The guidance also supports compliance with French legislation and standards, including the provisions of French Law no. 2015-992 of 17 August 2015 concerning the energy transition to drive green growth.

According to the WBCSD, Scope 3 emissions arise from 15 categories of activities across the corporate value chain. Arkema has identified ten significant categories, three non-significant categories and two non-relevant categories. The emissions calculated for the Group in 2018 are presented by category in the table below. The calculation methods are described in the methodology presented in section 4.5.2.4 of this chapter.

Category number	Category name	Emissions (kt CO ₂ eq.)	Comment
1	Purchased goods and services	5,285	Very material. As is often the case in the chemicals industry, this category is material for Arkema.
2	Capital goods	1,231	Material
3	Fuel- and energy-related activities not included in Scope 1 or 2	717	Material
4	Inbound freight (upstream transportation and distribution)	Data not available	Material
5	Waste generated	588	Material
6	Business travel	31	Non-material
7	Employee commuting	32	Non-material
8	Upstream leased assets	26	Non-material
9	Downstream transportation and distribution	296	Material. The slight increase of around 14 kt CO ₂ eq. from 2017 to 2018 reflects better reporting by the subsidiaries and a significant increase in air freight.
10	Processing of products sold	Data not available	Material. Given the diversity of applications for the products sold by the Group, the indirect emissions relating to the processing of said products cannot be assessed reliably.
11	Use of products sold	Data not available	Very material. As is often the case in the chemicals industry, this category is the most material for Arkema. Current knowledge of product use data makes it impossible to estimate this category reliably. However, the Group has identified fluorogases as the most emission-intensive products. Arkema is developing new blends and products to enable the transition from the old generation of products (HCFCs) to current (HFCs) and new generations (HFOs).
12	End-of-life treatment of products sold	1,354	Very material. This estimate does not take into account the fluorogas or Bostik businesses.
13	Downstream leased assets	-	Not relevant. The Group does not lease any assets downstream of its value chain.
14	Franchises	-	Not relevant. The Group does not have any franchises.
15	Investments	Data not available	Material
TOTAL		9,560	

In 2018, estimated Scope 3 indirect GHG emissions came to 9,560 kt CO₂ eq., and were higher than Scope 1 and 2 emissions combined.

Building on this nine-category analysis of Scope 3 emissions in 2018, the Group will continue the data collection process, particularly for categories identified as material and for which the data is missing or incomplete. The goal is to prepare effective action plans to reduce the Group's material Scope 3 emissions.

Montreal Protocol

In addition to reporting on greenhouse gas emissions in accordance with the GHG Protocol, which is based on the Kyoto Protocol, the Group also records emissions of substances targeted by the Montreal Protocol. These are included in the GHG EFPI strategic indicator.

These emissions were down in 2018, as was the GHG EFPI, to 277 kt CO₂ eq., from 340 kt CO₂ eq. in 2017.

Non-financial rating

Arkema obtained an A- CDP Climate Change rating in 2018, as in 2017. It ranked among the 17% best-performing companies on

climate change management in the assessment of the CDP rating agency. This reflects the pertinence of the Group's approach, actions and contribution to meeting this key challenge.

4.3.3.3 RESOURCES

The Group's initiatives to reduce the environmental impact of its industrial sites are underpinned by its resource management policy and notably consist in optimizing their use of raw materials, energy and natural resources like water. New manufacturing units are designed to incorporate environmental footprint considerations into the choice of processes and equipment. Special attention

is also paid to operating conditions, and maintenance and development investments are regularly undertaken to optimize the use of water, energy and raw materials at Group plants.

To further optimize management of non-renewable resources, Arkema is also committed to stimulating the circular economy.

4.3.3.3.1 Energy use

Arkema has developed a climate policy, which is presented in section 4.3.3.2 of this chapter. Energy use has an impact on both resources and greenhouse gas emissions. Energy-related data are therefore presented under the heading “Energy”, in section 4.3.3.2 of this chapter.

4.3.3.3.2 Water use

Water is used in the Group’s industrial operations to:

- provide a reaction medium for certain production processes, cool production installations and clean products and equipment;
- generate steam; and
- operate hydraulic barriers to treat groundwater contaminated by legacy pollution on historical sites.

To contribute to optimizing the use of fresh water, whether withdrawn from the surface or the water table, the Group is upgrading production practices by installing water-saving systems and closed loops. These initiatives can cover a wide range of solutions, such as tracking usage more effectively, installing flow meters, deploying leak detection programs, changing technologies, upgrading fire-fighting systems, recovering rainwater and recycling water from scrubbing or boiler condensates.

The chart below presents consolidated water withdrawals in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

Water use	2018	2017	2016
Total water withdrawn (in millions of cu.m)	119	118	126

In 2018, water withdrawal was stable compared to 2017.

The CDP rating agency gave Arkema a Water security rating of B- in 2018, in recognition of the Group’s approach and actions in the area of responsible water management.

4.3.3.3.3 Raw material use

Arkema wants to contribute to optimizing the consumption of non-renewable raw materials used in its manufacturing process with the primary goal of reducing their use by deploying process

In 2016, as part of the operational excellence program, the Group launched the “Optim’O” project to optimize its production units’ water management. The analyses carried out as part of this project found that:

- 80% of water withdrawn from the natural environment is returned as surface water;
- 90% of consolidated water use is attributable to less than 17 plants, none of which are located in a water-stressed region; and
- facilities located in water-stressed regions represent less than 2% of the Group’s consolidated water use.

Drawing on these observations, the Optim’O project gives rise to numerous initiatives, particularly at the 35 sites that account for most of the Group’s water use and/or generate the most wastewater. The work carried out on the water network at the Pierre-Bénite site (France), for example, has reduced the use of drinking water by more than 25%.

FOCUS

Mapping water use

In 2018, the Rho facility in Italy created a comprehensive map of its various units’ water withdrawals and their use. The mapping process led to optimized water management and wastewater treatment, resulting in an overall reduction of 15% in the platform’s water needs.

control initiatives and developing best operating practices. These initiatives are described in more detail in the ‘Profile, ambition and strategy’ section of this document.

In addition, to optimize its own and its customers’ raw materials use, the Group undertakes, independently or in partnership with suppliers, such programs as recycling the reaction solvents used in its production processes. It also offers customers other recycling solutions and deploys the circular economy initiatives described below.

Lastly, the Group uses renewable and especially bio-based raw materials in its products. The Group products in question are presented in section 1.1.2 of this document. This ongoing commitment was demonstrated in 2018 by the fact that products at least 20% made from renewable raw materials accounted for around 9% of Group sales.

4.3.3.3.4 Circular economy

The Group takes action to preserve non-renewable raw materials and stimulate the circular economy. It reuses by-products and strives to limit the waste generated by its industrial processes. Thanks to eco-design, it extends the lifespan of customer products and facilitates recycling. It also helps its customers assess the environmental performance of their products.

Life-cycle assessments

To assess the environmental performance of certain products and in response to customer requests, life-cycle assessments (LCAs) are used to convert the entire inventory of a product's process material and energy inputs and environmental emissions into environmental impacts. The Group has developed dedicated LCA expertise at its Rhône-Alpes research center in France. It has also set up the global Arkema LCA Network, which is instilling this LCA culture across the organization, in particular through periodic employee training courses, and durably embedding it into the Group's CSR process.

The Group supplies LCA data at the request of customers to enable them to assess the environmental footprint of a given product all along its value chain. This particularly concerns the Rilsan®, Rilsamid®, Pebax®, Kynar® and Forane® ranges, as well as Bostik adhesives and synthetic intermediates. Assessments are also performed, through trade associations, for acrylic monomers, PMMA and resin dispersions for coating applications.

Depending on the type of product, internal experts assess the impacts in such areas as climate (greenhouse gas emissions), ozone depletion potential, contribution to acidification, and energy, water and land use. Their scope is generally limited to a cradle-to-gate analysis, *i.e.*, to production operations and upstream factors. In certain cases, this expertise may be shared with customers to help them implement their own eco-design process, by providing them with the impact data and discussing the most relevant indicators and the best practices associated with their assessment.

LCAs are performed in accordance with the recommendations of the International Reference Life Cycle Data System (ILCD) Handbook and the international ISO 14040 and ISO 14044 standards describing the principles and framework for LCAs.

Extending the lifespan of customer products

Arkema aims to constantly improve the lifespan of both its own and its customers' products.

For example, Kynar® offers a coating with a particularly long lifespan. The Aquatec® version, used for reflective roofs, retains a virtually intact white finish maintenance-free for an especially long time.

Arkema has also developed a line of organic peroxides for crosslinking rubber, which is then used to manufacture automotive and other parts that last longer than their conventional counterparts.

Recycling

Arkema is developing a number of solutions that are making it easier for customers to recycle their products.

For example, Elium® liquid thermoplastic resins are produced using the same equipment and processes as thermoset composites. Their properties make them easy to recycle, unlike parts made from thermoset resins such as epoxy.

The Group has also developed technologies to protect glass bottles (Kercoat®) and hide scuffs (Opticoat®), which significantly improve the appearance and useful lives of bottles by tripling the number of times returnable beer and other bottles can be reused.

The Adsorption business has developed a solution that increases the recycling rate of roadwork scrap. Using Cecabase RT® additives in the asphalt mix increases the aggregate recycling rate by 10% to 15% compared with conventional techniques. These additives also reduce the asphalt mix's workable heating temperature.

In Europe, the Reverplast project, under which a "Commitment to green growth" was signed with the French government in 2016, has now been replaced by the European MMAtwo project. Launched on 1 November 2018, the new project brings together 13 partners, including four French businesses representing all stages in the value chain. Their goal is to develop a chemical recycling process for PMMA that is validated on an industrial scale within three years. The European Union is providing €6.6 million of the project's funding, as part of its Horizon 2020 program.

Reusing by-products

Arkema markets by-products from the production of its leading products by finding suitable commercial applications linked to their inherent properties.

By-products from the conversion of castor oil into undecanoic acid 11 at the Marseille plant, which have been sold for many years through stable sales channels, are an example of how existing products are re-used.

Waste

RECYCLING

In addition, Arkema is seeking solutions to transform certain types of industrial waste, which otherwise would be discarded, into products that can be used in other industries. In 2015, the Group formed an inter-business working group to step up these efforts and increase coordination with partners.

In 2018, as in 2017, 15% of hazardous waste produced worldwide was recycled on- or off-site to recover useful materials.

For example, the Mont facility in France has long marketed the sodium-water produced as part of a monomer purification process to the paper industry for use in the kraft paper and cardboard production process. The basic, organic material-rich water helps to minimize sulfur loss in the process regeneration loops.

At the Hengshui site in China, the flow of residual sulfuric acid generated by the manufacturing process for sebacic acid is neutralized to obtain a sodium sulfate solution, which is then concentrated and crystallized. Instead of discharging the residual acid as waste, the plant is now able to sell 50,000 tonnes a year of solid sodium sulfate.

EMISSIONS

While inherent to its industrial operations, the Group ensures that its waste production is managed at every stage of its business activity and that resource recovery and/or recycling solutions are found whenever possible.

This commitment is reflected in a number of areas:

- reducing waste at source, by designing products and processes that generate as little waste as possible;
- recycling waste in the product value chain, in compliance with the REACH regulation; and
- recovering the energy potential of by-products and waste, wherever possible, by burning them as fuel.

In recent years, the Group has in particular:

- explored new ways to recover and reuse certain types of by-products, for example, to replace conventional fuels in boilers, notably at the La Chambre, Carling and Marseille sites in France;
- recycled cleaning solvents and optimized cleaning cycles; and
- installed filters to reduce sludge volumes.

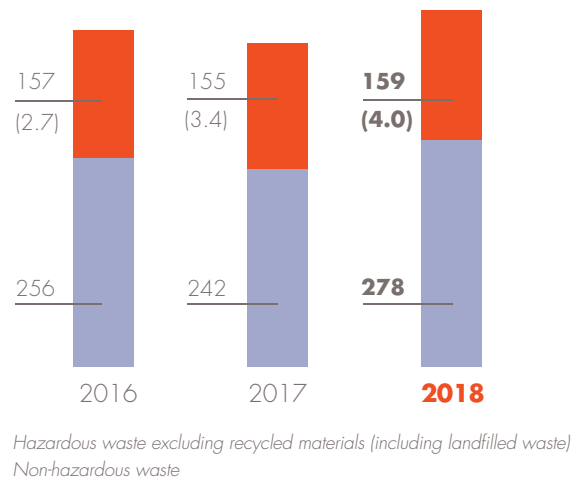
The following table shows the amounts of hazardous waste that were either recycled or burned as fuel in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

Hazardous waste (kt per year)	2018	2017	2016
Waste recycled into materials	28	27	28
Waste burned as fuel	90	90	92
Total waste (including recycled)	187	184	188

Waste recovery for reuse as fuel continues across the Group. In 2018, 15% of hazardous waste produced by the Group worldwide was recycled at the production site or off-site to recover useful materials and 48% was burned as fuel.

The following chart shows the amounts of hazardous and non-hazardous waste generated by the Group's operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

HAZARDOUS AND NON-HAZARDOUS WASTE (in kt per year)



In 2018 we saw a significant increase in non-hazardous waste, owing to sustained activity at the Clear Lake site (United States) and to soil and sludge treatment operations at certain sites in France and the United States.

The slight rise in hazardous waste came primarily from increasing activity at the Saint-Auban site (France).

The Group's objective is not only to reduce overall waste production, but also to recycle waste or recover its energy potential by burning it as fuel.

4.3.3.4 BIODIVERSITY

Arkema cares about preserving biodiversity and contributes to protecting the world's fauna and flora by reducing each site's emissions into air, water and soil.

The following paragraphs describe the Group's commitments in this area, its prevention and mitigation programs and the indicators for measuring their effectiveness, particularly in terms of the volatile organic compounds (VOCs) released into the air and the chemical oxygen demand (COD) of water discharges.

4.3.3.4.1 Measures to protect flora, fauna and biodiversity in general

Preserving biodiversity primarily means protecting all of the flora and fauna species liable to be impacted by emissions from the Group's operations.

The initiatives carried out are therefore designed to reduce releases into air and water and their impact on the surrounding soil and sub-soil.

Periodic environmental assessments enable the facilities to identify their environmental impact and the species liable to be affected, define priority objectives for their environmental protection action plans, and measure the improvements. Additionally, new manufacturing units are designed to incorporate environmental footprint considerations into the choice of processes and equipment.

In this way, the compliance and other initiatives being led by the Group have enabled:

- a reduction in chemical oxygen demand (COD) in the effluent discharged into rivers, thereby preserving the dissolved oxygen that is essential to all aquatic life, as described below;
- a reduction in the amount of volatile organic compounds (VOCs) released into the air, thereby limiting the formation of ground-level ozone, a super-oxidant harmful to flora and fauna, as described below;
- a reduction in greenhouse gas (GHG) emissions, thereby contributing to the fight against global warming, as described below;
- a reduction in SO₂ emissions, thereby helping to prevent the formation of acid rain which, in addition to its direct impact on plant life, can also alter soil and surface water characteristics, and a reduction in NO_x emissions; and
- Arkema to continue soil remediation projects at sites with long-standing industrial operations, as described in section 4.3.3.4.3 of this chapter, in order to protect the species that depend on the land, preserve the quality of local groundwater and control the impact of legacy pollution.

4.3.3.4.2 Emissions into air, water and soil

The Group pursues an active policy of managing and reducing the impact of its operations on emissions into air, water and soil.

As part of this process, emitted substances are identified and their amounts calculated by category, so that appropriate measures can be taken to manage each one, in compliance with applicable host country legislation.

In this way, the manufacturing plants are reducing their emissions by optimizing their use of raw materials, energy or natural resources, so that they result in fewer emissions and less waste. In line with the Group's strategic environmental objectives, as tracked by the EFPIs, production units are also being constantly improved with process upgrades and the installation of effluent treatment facilities.

Air emissions

The Group's objective is to minimize its emissions of the most harmful compounds, particularly greenhouse gases (GHG), as described above, volatile organic compounds (VOCs), acidifying substances (nitrogen oxides and sulfur dioxide) and dust.

VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS

Group production facilities are reducing their VOC emissions in several ways, including:

- collecting and treating effluents containing VOCs, particularly with thermal oxidizers or vent scrubbing; and
- carrying out regular campaigns to detect and eliminate VOC leaks.

The Group is also reducing its emissions of acidifying substances by:

- fueling boilers with low or ultra-low sulfur fuels, or replacing fuel oil with natural gas; and
- installing new low-NO_x burner technologies.

In 2018, substantial work was carried out on mapping VOC emissions at the Balan site (France) with a view to optimizing operating conditions. This was coupled with work on improving the reliability of VOC emission treatment. These actions resulted in a 40% reduction in the site's VOC emissions.

ABSOLUTE INDICATORS FOR AIR EMISSIONS

The indicators in the table below present air emissions from the Group’s operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

Air emissions	2018	2017	2016
Acidifying substances (t SO ₂ eq.)	3,040	3,380	3,570
SO _x (t)	1,960	2,254	2,332
NO _x (t)	1,230	1,350	1,467
Carbon monoxide (CO) (t)	940	860	690
Volatile organic compounds (VOCs) (t)	4,150	4,280	4,800
Dust (t)	235	230	300

The steady decline in acidifying substances since 2016 attests to the success of the initiatives undertaken by several production plants to significantly reduce their emissions. Several investments were made to upgrade the boilers, either to run on natural gas instead of fuel oil or to equip them with vented emission treatment systems, so that these emissions were significantly reduced. The 2018 fall in SO₂ emissions comes from maintenance shutdown of the Lacq units (France), progress on the change from coal to gas boilers at the Hengshui site (China) and reliability improvements at the Houston treatment units (United States).

The decrease in VOCs comes from the ongoing emissions reduction and recovery program at Hengshui (China) and from reliability improvements on the thermal oxidizer and optimization of operating conditions at the Balan site (France).

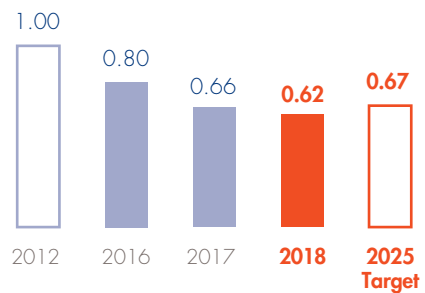
The reduction in carbon monoxide is primarily attributable to improved reporting for the Taixing site.

2025 TARGET

Reduce VOC emissions, expressed in EFPI terms, by 33% compared with 2012.



VOLATILE ORGANIC COMPOUND (VOC) EFPI



The significant improvement in this indicator in 2018 results from progress made at several plants as a result of investments undertaken in previous years.

Action plans are being deployed to sustain the improvement dynamic.

FOCUS

NO_x reduction at the Hengshui site (China)

The SCR (Selective Catalytic Reduction) project at the Hengshui site (China) resulted in a very significant reduction in NO_x emissions. Discharge from the site was reduced ten-fold.

INTENSIVE INDICATOR FOR AIR EMISSIONS

The chart below presents the volatile organic compound emissions EFPI from the Group’s operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter. Emissions are calculated using the Group’s biggest VOC emitters, which account for more than 80% of the consolidated total.

Effluent releases

Reducing effluent and other water discharge is one of the Group’s main environmental objectives, with particular attention paid to effluents with high chemical oxygen demand (COD) and/or suspended solids.

The Optim'O project, presented above in relation to its water consumption aspects, also aims to reduce the amount of effluent discharged by the Group. It is contributing to:

- continuously optimize water use and the efficiency of the water treatment process, from the initial design of the installations to their daily operation, through the use of advanced technologies and the development of innovative solutions, thanks in particular to the "Water management" innovation platform;
- ensure compliance with applicable legislation and regulatory developments, such as the European Union's Best Available Techniques reference document (BREF) for Common Waste Water (CWW), which sets out the best available techniques for wastewater treatment and the associated threshold emission levels; and

- implement the pretreatment of process effluent, where relevant, to reduce the COD content of effluent sent to wastewater treatment facilities.

Through detailed mapping of effluent treatment conditions at the Group's industrial sites carried out in 2017 under the Optim'O project, 39 priority sites were identified as having the greatest impact on the Group's COD EFPI. An action plan was deployed in 2018 and monitored under a dedicated audit program. Twenty sites were audited in 2018, and the program will be continued at a further 15 sites in 2019.

The VOC target for 2025 was reached early, in 2018, and the Group is considering setting a higher target.

ABSOLUTE INDICATORS FOR EFFLUENT RELEASES

The environmental indicators in the table below present effluent released from the Group's operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter.

Effluent releases	2018	2017	2016
Chemical oxygen demand (COD) (t O ₂)	2,170	2,440	2,600
Suspended solids (t)	535	920	770

In recent years, several initiatives have helped to reduce COD emissions from certain plants. Since 2016, the Optim'O project has helped to strengthen this process through better reporting, targeted investments and better facilities management.

FOCUS
Improved operational control for the effluent treatment plant brought a ten-fold reduction in COD discharge at the Rio Claro site (Brazil).

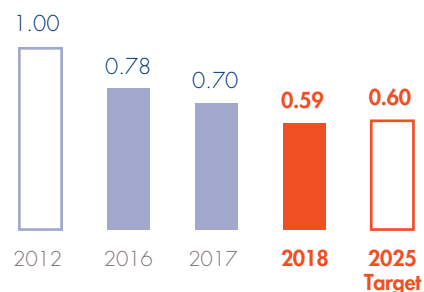
The significant reduction in suspended solids comes chiefly from improved operational control of the effluent treatment plant at the Pierre-Bénite site (France), with emissions reduced by more than 75%.

INTENSIVE INDICATOR FOR EFFLUENT RELEASES

The chart below presents the COD effluent EFPI from the Group's operations in 2018, 2017 and 2016, calculated according to the methodology described in section 4.5 of this chapter. Emissions are calculated using the Group's biggest COD effluent emitters, which account for more than 80% of the consolidated total.

2025 TARGET
Reduce COD emissions, expressed in EFPI terms, by 40% compared with 2012.

CHEMICAL OXYGEN DEMAND (COD) EFPI



In 2018, improved operation of wastewater treatment facilities at many sites resulted in a significant reduction in the COD EFPI.

Other emissions

Another major focus of the Group's environmental policies is to ease the impact of nuisances from its operations on people living in nearby communities. Every year, projects are undertaken to attenuate such nuisances as:

- odors, by upgrading incinerators to cut SO₂ emissions;
- noise, by improving air compressor soundproofing; and
- visual pollution (smoke), by firing boilers with natural gas rather than fuel oil.

The Group has put in place communication systems to alert stakeholders in real-time about any event likely to result in noise, odors, or visual pollution in and around a production site. In addition, most facilities now have a system for receiving and responding to complaints from local residents so that they can address the issues and minimize the nuisances to the extent possible. Complaints are investigated and action plans defined accordingly in liaison with local authorities.

Other measures to develop biodiversity

Despite occupying only a limited amount of land, the Group is leading a number of initiatives to help enhance biodiversity on sites where part of the land is not allocated to industrial operations. One of the purposes is to encourage revegetation and the development of local species on and around the sites.

The Group promotes certain initiatives to improve biodiversity around production units. In Italy, for example, some 150 olive trees are being tended on the grounds of the Gissi facility, helping to safeguard the surrounding plant and animal ecosystem.

4.3.3.4.3 Managing legacy pollution and protecting the soil

Arkema responsibly manages soil and groundwater contamination caused by legacy pollution, including the storage of waste from operating facilities that have been operated, sold or acquired. The Group manages its environmental responsibility in such a way as to ensure that the health impacts and risks of its operations are managed in compliance with the applicable

regulations, and that the environment is protected over the long term, with an appropriate allocation of funds.

In addition, Arkema implements prevention policies at all of the operating facilities, with mechanical integrity programs, dedicated incident reporting systems and experience sharing. When soil or groundwater contamination is suspected at a facility, an inquiry is conducted to determine the extent of the area concerned and ascertain the impact. The Group cooperates with the authorities to define the appropriate response, in line with applicable legislation.

The Group also implements a wide range of remediation initiatives using new techniques and looks for ways to reuse redundant industrial sites.

Site pollution risks are described in section 2.1.1 of this document.

Brownfield redevelopment

To redevelop certain brownfield sites, the Group is partnering with local players, academics and specialized companies. Some of these sites are used for the installation of photovoltaic panel projects, as was the case at Saint-Auban, in southeastern France, in 2018.

Provisions for the management of legacy pollution

The amount of provisions for environmental risk at 31 December 2018 may be found in note 19.3 to the consolidated financial statements, in section 5.3.3 of this document.

4.4 OPEN DIALOGUE AND CLOSE RELATIONS WITH STAKEHOLDERS

FOSTER INTERACTION AND PROXIMITY WITH STAKEHOLDERS THANKS TO OPEN AND CONSTRUCTIVE DIALOGUE

The Group's activities are part of a value chain and an ecosystem comprising numerous partners and stakeholders, as described in section 4.1.4 of this chapter. Open dialogue with its internal and external stakeholders is a cornerstone of Arkema's corporate social policy and a prerequisite for understanding their expectations, building relationships based on trust and cooperation, and ultimately minimizing social risks and creating value for all.

All of the international standards and principles that the Group upholds, and their transposition into Arkema's corporate reference documents, are presented in section 4.1 of this chapter.

In its dialogue with stakeholders, Arkema:

- respects human rights and fundamental freedoms and makes them central to its activities;
- places great importance on conducting its business in line with the principles and rules on ethics, integrity and compliance. Arkema therefore complies with prevailing laws and regulations and best business practices;
- fosters the individual and collective development of all its employees; Arkema's global human resources policy places a key focus on the development of skills and the promotion of diversity;

- establishes open dialogue with its customers, suppliers and partners with a view to building a responsible value chain that creates shared value. In its choice of industrial and business partners, Arkema favors those that respect its social commitments; and
- helps develop lasting relationships based on trust and openness through its Common Ground® initiative, which is aimed at its neighbors and local host communities.

4.4.1 Employee information

PROMOTING THE INDIVIDUAL AND COLLECTIVE DEVELOPMENT OF ALL ITS EMPLOYEES

4.4.1.1 HR MANAGEMENT

Given the highly technical nature of its businesses, Arkema considers each of its 20,010 employees as experts in their particular area. Since the Group's creation, its human resources principles, methods and management policies have been underpinned by the four core values of simplicity, solidarity, performance and accountability.

Developing its human capital and maintaining a high level of engagement among its employees are key objectives for Arkema, which must continuously evolve in order to meet business, technological, social and environmental expectations in a proactive manner.

Through its talent management policy, Arkema aims to offer employees a career path that enables them to continuously improve their skills and expertise. The Group's initiatives in this regard relate to recruitment, training and career management. With respect to career management, two types of career paths are open to employees: a management career path or a technical career path, which involves the implementation of technical streams in such areas of expertise as research and development, processes and legal affairs.

The introduction of skills matrices reflects the Group's desire to recognize the contribution made by employees with experience in a particular area of expertise, thereby enabling and encouraging all employees to strive for professional growth.

The Group's human resources development policy also addresses the critical issue of ensuring quality of work life. This is achieved through harmonious employee relations, as well as measures to continuously improve working conditions.

The Group ensures that it consistently complies with the constitutional texts, treaties, conventions, laws and regulations in force in the countries and regions in which it operates, as detailed in section 4.4.2 of this chapter.

4.4.1.2 EMPLOYMENT

The Group endeavors to offer its employees varied career paths and opportunities, in particular by encouraging transfers among subsidiaries and businesses and by developing their capabilities. In this way, the Group supports the personal development of every employee, provides opportunities for promotion and transfer and is actively broadening the diversity of its teams.

Total headcount and employees by region, gender and age

Data in this section concern all of the companies that are at least 50%-owned by the Group. They describe how the workforce breaks down by various criteria and how the Group manages its human capital.

Every reporting company considers as an employee, any person hired under an employment contract. The number of employees, which does not include interns or temporary workers, is calculated on a headcount basis, regardless of working hours.

For further details on the methods used to collect and calculate this data and their possible limitations, please see the methodological note in section 4.5 of this chapter.

TOTAL HEADCOUNT OVER THE PAST THREE YEARS BY REGION

	31 December 2018	31 December 2017	31 December 2016
GROUP TOTAL	20,010	19,779	19,637
France	7,193	7,144	7,145
Europe (excluding France)	3,904	3,936	3,838
North America	3,880	3,742	3,694
Asia	4,195	4,104	4,061
Rest of the world	838	853	899
Of which permanent ⁽¹⁾	19,301	18,701	18,607
Of which fixed-term	709	1,078	1,030



(1) See the methodological note in section 4.5 of this chapter.

There was no significant change in scope in 2018. That being said, the Group did acquire XL Brands in January 2018, the industrial adhesives business of Nitta Gelatin Inc. (Japan) in August and Afinitica in October. The Group's headcount

increased slightly (by 1.2%) on the 2017 level, and the proportion of employees on permanent employment contracts rose to 96.5% of the total workforce. The breakdown of Arkema employees by region was stable over the period.

HEADCOUNT BY REGION AND GENDER

Men accounted for 74.7% of the total workforce in 2018. The proportion of women was steady or slightly higher, across all regions.

(as a %)	 Male			 Female		
	2018	2017	2016	2018	2017	2016
France	73.1%	73.4%	74.0%	26.9%	26.6%	26.0%
Europe (excluding France)	74.8%	75.2%	75.5%	25.2%	24.8%	24.5%
North America	77.1%	77.7%	78.2%	22.9%	22.3%	21.8%
Asia	74.6%	74.6%	74.3%	25.4%	25.4%	25.7%
Rest of the world	78.2%	78.3%	79.0%	21.8%	21.7%	21.0%

The fact that the majority of employees are men reflects the high percentage of jobs traditionally held by men in non-managerial positions (supervisors and operators), who account for 72.7% of the workforce.

Headcount by category and gender

At 31 December 2018, executives accounted for 27.3% of Group employees (compared with 26.9% in 2017). The percentage of managers has risen slightly over the years.

Women accounted for 25.3% of the overall workforce and 29.6% of executives. The proportion of female executives continues to follow the slight upward trend observed in recent years.

HEADCOUNT BY AGE GROUP

Total headcount at 31 December	2018	2017	2016
GROUP TOTAL	20,010	19,779	19,637
Under 30 years	13.3%	13.8%	14.5%
30 to 39 years	26.3%	26.1%	26.0%
40 to 49 years	28.5%	28.7%	28.7%
50 to 59 years	25.9%	25.9%	25.9%
Over 60 years	6.0%	5.5%	4.9%

The proportion of employees aged 60 or over shows a slight rise, chiefly owing to the trend toward higher retirement ages in most countries. On the contrary, the proportion of employees aged under 30 shows a slight fall, reflecting a trend toward recruitment of experienced personnel.

HEADCOUNT BY AGE GROUP AND GENDER

(as a %)	 Male	 Female
Under 30 years	12.3%	16.1%
30 to 39 years	25.8%	28.1%
40 to 49 years	29.0%	26.8%
50 to 59 years	26.7%	23.8%
Over 60 years	6.2%	5.2%

The breakdown by age group is typical of the chemicals industry. The preponderance of employees over 30 reflects the fact that, compared to other industries, both managers and non-managers spend a longer time in professional education and training. This means that Arkema can build its growth on well-trained, experienced employees. Adapted to each Business Line and applied in all countries, the Group's human resources policies are also designed to ensure that, over time, this expertise is transferred to a new generation of employees. However, the high proportion of employees over 50 is prompting the Group to address the foreseeable departure of nearly a quarter of its current workforce over the next ten years, by leveraging its hiring and career management policies to gradually replace them.

Recruitments and departures

The Group's recruitment policies are designed to attract talented, highly skilled individuals to support its growth.

In keeping with its founding values of simplicity, solidarity, performance and accountability, Arkema attaches a great deal of importance to finding applicants with cultural awareness, teamwork skills, a solutions-driven approach and an entrepreneurial spirit.

To change preconceptions about chemicals industry professions and attract new profiles, Arkema developed a new employer brand in 2018. The new brand will gradually be rolled out in

2019 via various communication channels, including the website's Careers pages, social media, career fair stands and billboards.

Proactively attracting talented young graduates

In order to continuously improve the recruitment and hiring process, the Group nurtures special relationships with the best educational and training institutions for all its professions.

IN FRANCE

The Group takes an active approach to relations with academic institutions. In 2018, 80 initiatives were carried out to promote the Group among its target schools. They included Arkema's participation in more than 20 career fairs and the organization of two site tours for students and more than ten showroom visits to present the Group and its products to those responsible for relations with the business community.

These initiatives help promote the Group and its professions to the students of general engineering schools, chemical engineering schools, business schools, and technical schools in the fields of safety and maintenance.

New partnerships have also been forged with target institutions, including:

- a partnership with *Collège des Ingénieurs* for the hosting of students;
- a three-year partnership with *Chimie Paris Tech* students set to graduate in 2021, with more than a dozen initiatives planned each year;

- a “Discovery” partnership with *Central Supélec* that covers six initiatives scheduled for 2019; and
- a partnership with the Sciences Po School of Management and Innovation, signed in September 2018, which aims to strengthen students’ awareness of Arkema, notably through its participation in school events and projects.

In line with its policy of maintaining relations with academic institutions but also to further its research in the area of advanced materials, Arkema has forged a partnership with the *École polytechnique* engineering school and its foundation, in the form of a research and teaching chair on the design and modeling of innovative materials. This will enable Arkema to host doctoral students and develop targeted R&D programs with the school.

Each year, the Group offers numerous opportunities for internships, apprenticeships, doctoral research positions and jobs under France’s International Volunteers in Business (IVB) program. Arkema had a total of 21 IVB program participants in 2018, of which nine joined during the year. The Group aims to further broaden these international opportunities by offering students from partner schools the possibility to intern abroad. Final-year internships, IVB contracts and doctoral research projects are managed at the corporate level to monitor the future recruitment pool more effectively. In addition, Arkema invested in 2018 in talent programs that give young graduates the opportunity to take on business-related positions that offer international exposure.

Another major objective in France is to develop apprenticeship training, whose participants represent an important source of new hires. The identification of apprenticeship candidates has

been strengthened for both technician and engineering profiles. Participants are systematically assessed and the candidates who correspond to the Group’s expectations are invited for an interview, which may result in a short- or medium-term contract. Students on work-study programs accounted for 3.8% of the workforce in 2018.

The 2018 “Happy Trainees” satisfaction survey, which enables interns and apprenticeship participants to provide feedback on their experience within a company, showed a recommendation rate of 94% for Arkema and a response rate of 60%, with Arkema ranking among the Top 10 this year in the list of companies preferred by students.

IN THE UNITED STATES

Arkema Inc. nurtures close relations with universities whose students can meet the Group’s hiring needs. In 2018, for example, a series of meetings was organized between Arkema Inc. researchers/engineers and students from MIT, Pennsylvania State University, the University of Massachusetts and Cornell University. Two research positions were filled as a result of these meetings. Similar events were also organized with Drexel University, Georgia Tech, Ohio State University, University of Kentucky and the University of Minnesota.

IN ASIA

Under the Campus 2018 program developed in China, seven meetings were held during the year, reaching a total of 1,734 students and resulting in the collection of 1,189 resumes. A total of 55 job offers were sent to target schools during the year and 30 students won awards during the innovation and entrepreneurship ceremony organized by Arkema.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY REGION

In 2018, Arkema hired 1,833 people under permanent contracts, compared with 1,616 in 2017.



	2018	2017	2016*
GROUP TOTAL	1,833	1,616	1,694
France	393	364	295
Europe (excluding France)	252	254	186
North America	528	463	530
Asia	533	438	511
Rest of the world	127	97	172

* Excluding Den Braven.

The geographic distribution of recruitments shows that Asia and North America remain the most active regions, in line with the Group’s expansion in Asia and the higher employee turnover in both regions.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY REGION AND GENDER

Women accounted for 28.2% of new hires in 2018, steady year-on-year. As in 2017, this was higher than the proportion of women across the workforce as a whole (25.3%).

(as a %)	 Male			 Female		
	2018	2017	2016*	2018	2017	2016*
France	69.0%	65.1%	67.5%	31.0%	34.9%	32.5%
Europe (excluding France)	73.4%	66.5%	73.1%	26.6%	33.5%	26.9%
North America	70.1%	72.6%	76.0%	29.9%	27.4%	24.0%
Asia	75.4%	76.9%	78.3%	24.6%	23.1%	21.7%
Rest of the world	70.1%	79.4%	79.7%	29.9%	20.6%	20.3%

* Excluding Den Braven.

In 2018, 27.1% of recruitments concerned managerial positions, compared with 29.1% in 2017. This was slightly lower than the proportion of managers in the workforce as a whole (27.3%).

The percentage of women among managerial hires increased by 0.5 points in 2018, to 29.6% from 29.1% in 2017. These

proportions are in line with the percentage of women among the applicants for Group jobs. The Group remains attentive to this indicator as part of its determination to gradually hire more women across the organization, as described in section 4.4.1.5 of this chapter.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY AGE GROUP

Recruitment practices within the Group are designed to provide the skills and expertise that the technical, sales and administrative professions need. Recruitment of people under 40 represents 72.1% of the total, illustrating the initiatives in place to proactively respond to the wave of retirement departures projected over the next ten years.

Recruitments	2018	2017	2016*
GROUP TOTAL	1,833	1,616	1,694
Under 30 years	37.6%	38.5%	41.9%
30 to 39 years	34.5%	33.6%	33.8%
40 to 49 years	18.4%	18.5%	16.5%
50 to 59 years	8.7%	8.3%	7.4%
Over 60 years	0.8%	1.1%	0.4%

* Excluding Den Braven.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY AGE GROUP AND GENDER

(as a %)	 Male		 Female	
	2018	2017	2018	2017
Under 30 years	36.0%	38.5%	41.9%	41.9%
30 to 39 years	36.1%	33.6%	30.4%	30.4%
40 to 49 years	17.9%	18.5%	19.6%	19.6%
50 to 59 years	9.1%	8.3%	7.6%	7.6%
Over 60 years	0.9%	1.1%	0.5%	0.5%

DEPARTURES OF EMPLOYEES UNDER PERMANENT CONTRACTS

In 2018, the Group recorded 1,852 departures of permanent employees, versus 1,705 in 2017, which break down as follows:

	France	Europe (excluding France)	North America	Asia	Rest of the world	Total
TOTAL DEPARTURES OF PERMANENT EMPLOYEES	352	399	447	500	154	1,852
Of which resignations	82	218	262	400	42	1,004
Of which dismissals	35	98	53	39	97	322

RESIGNATIONS OF PERMANENT EMPLOYEES

The following table shows employee turnover, defined as resignations as a percentage of the total workforce, for 2018, 2017 and 2016.

	2018	2017	2016*
Resignations	1,004	862	866
Turnover	5.2%	4.6%	4.7%

* Excluding Den Braven.

Turnover by region and global turnover were both within the industry average. It has risen over the past few years as a result of Arkema consolidating specialty businesses in sectors and geographical regions (mainly Asia and the United States) where turnover is higher.

Organization of working time

In every country, working hours at Arkema comply with local legislation and business practices.

Work is organized within the Group so as to provide for full-time positions. Part-time employees accounted for 3.7% of the total workforce at 31 December 2018, as in 2017. In the majority of cases, these employees have chosen to work part time.

Given the specific features of the Group's industrial operations, some employee categories may work on continuous, discontinuous or semi-continuous shifts.

In response to a sudden demand increase or unusual difficulties, the Group may make use of fixed-term employment contracts, overtime, subcontractors or temporary employment agencies, in compliance with local legislation and depending on the local labor market.

Any overtime worked results in compensatory time off and/or pay, in compliance with the regulations applicable in each country.

Initially implemented at the Group's head offices in the United States and France, teleworking, which helps improve employees' quality of life, has now been extended to certain positions at industrial sites in France.

Absenteeism

Absenteeism, which includes sickness, accident and maternity leave, as well as strikes and unpaid leave, is presented in the following table:

	2018	2017	2016*
Percentage of hours of absence (excluding authorized leave)/ number of hours worked	3.9	3.9	3.7

* Excluding Den Braven.

The following table presents the percentage of hours of medical leave:

	2018	2017	2016*
Percentage of hours of medical leave/number of hours worked	2.7	2.8	2.6

* Excluding Den Braven.

The absenteeism rate is steady with respect to 2017, in line with the average 3.5% to 4.5% across the global manufacturing industry.

Compensation and changes in compensation

Total payroll costs for 2018 and previous years are presented in note 25 to the consolidated financial statements, in section 5.3.3 of this document.

A key component of the Group's human resources policies, total compensation is designed to recognize and equitably reward each employee's contribution to Arkema's success.

The compensation structure comprises a fixed base salary, an individual bonus and a collective bonus, which are applied differently depending on the position and the country. This structure fulfills a number of objectives:

- compensate individual and collective performance;
- enhance each employee's awareness of his or her responsibilities and involve everyone in meeting objectives;
- offer fair compensation consistently across the organization; and
- manage costs.

The compensation structure is regularly benchmarked.

35% of employees receive some form of individual bonus, the amount of which depends on their fulfillment of personal objectives and their contribution to the collective performance of a business, a country organization or the Group. A significant portion of their bonus depends on safety or other CSR objectives.

68% of employees are eligible for some form of collective bonus, which gives them a stake in the Group's expansion and financial performance. This is the case for the incentive and profit-sharing schemes in effect in France.

All employees benefit from minimum compensation guarantees. In addition, Group companies regularly perform benchmarking studies, keeping them in line with standard chemical industry practices.

Employees are paid on time, in full and without any deductions.

Employees may also receive various forms of long-term or deferred compensation, such as performance shares and employee share ownership plans.

Employee share ownership

Since its creation, Arkema has encouraged employee share ownership, with plans offered every two years in the Group's main host countries to enable employees to purchase Company shares on preferential terms.

The participation rate has increased over time to an average of 41% (close to 70% in France and 25% in other countries) and the average amount invested by employees reached €5,950 in 2018. These figures reflect the employees' engagement and their confidence in the Group's development.

As a result, 5.9% of outstanding shares were owned by employees at 31 December 2018, collectively making them one of the Company's leading shareholders.

For further details, see section 6.2.7 of this document.

Performance shares

Performance shares are granted, as decided each year by the Board of Directors, to executives and employees who have demonstrated remarkable performance or whom the Group wishes to incentivize and involve more closely in its long-term development. In 2018, performance shares were granted to some 1,500 beneficiaries, representing 7.3% of the total headcount.

For more information, please refer to section 3.5, section 6.2.6 and note 27 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Pension, health and welfare benefits

In most countries in which the Group operates, employees are covered by mandatory public schemes addressing risks related to death, disability, work incapacity, pensions and healthcare costs.

In addition to this statutory coverage, Group entities in France and abroad are responsible for implementing and updating health, welfare and employee benefit schemes, with a preference for defined contribution plans, in compliance with the approved annual budgets and in line with local requirements and practices. Nearly 92% of Group employees thus receive supplementary life cover and 90% supplementary disability cover.

4.4.1.3 TRAINING AND PERSONAL DEVELOPMENT

Arkema is committed to fostering a workplace environment that encourages the personal and professional development of its employees and to offering resources that help them to effectively meet this objective and improve their performance.

Around the world, annual performance reviews provide one-on-one opportunities for employees and managers to review the past year, set objectives for the coming year and discuss the employee's desired career path. They also review the training completed over the year and determine the further training needed to improve the employee's expertise and capabilities. Performance reviews are conducted for every employee, regardless of category.

In all, 98.7% of Group employees benefit from annual performance reviews.

In addition, meetings with career managers provide an opportunity to review the employee's career path, their expectations and how they could advance their career in other Group professions.

Training policy

Professional training concerns all employees regardless of their job, level of responsibility or age. It enables everyone to develop or acquire the skills needed to hold a position, move to a new position and fulfill the Company's expectations in terms of technical expertise or management practices. This is why the

Group has reaffirmed its desire to provide every employee with access to lifelong learning in the course of their career at Arkema.

Training hours are reported for companies at least 50%-owned by the Group and employing more than 60 people, corresponding to 92% of the total workforce.

NUMBER OF TRAINING HOURS (EXCLUDING E-LEARNING)

	2018	2017	2016*
Total number of training hours, Group-wide	456,798	484,578	464,706
Training hours per employee per year	25	25	27
Number of employees having attended at least one course	17,111	16,161	16,256
Percentage of employees having attended at least one course during the year	92.7	85.0	94.7

* Excluding Den Braven.

Employees continued to benefit from a significant level of training in 2018, with an average of 25 training hours per employee. The figures for 2017 and 2016 were particularly high due to the deployment of the global Safety Academy program.

Arkema seeks to offer training that meets the needs of the Company and its employees. It also strives to ensure the relevance and effectiveness of the training provided, in order to optimize the time and money invested.

In France, the quality of training modules is assessed via questionnaires that are completed by participants at the end of each session, which are then used to generate feed-back reports.

In addition to these quality assessments, certain training modules include checks to ensure that participants are able to put their new skills into practice on their own. For example, production line operator training is carried out in stages under a formal process that covers both the program content and subsequent validation of results. This ensures a real ramp-up of skills and performance,

allowing employees to access promotions and internal mobility opportunities, and enabling the Group to develop employee loyalty and heighten performance. This approach also meets the standards required by the Group's management system.

Training programs can culminate in job progression or rises in grade or coefficient that are conducive to career advancement.

NUMBER OF EMPLOYEES HAVING TAKEN AN E-LEARNING COURSE

Arkema's development of digital tools for use by employees resulted, very early on, in the expansion of its training offer to include easy-to-use e-learning modules, particularly for courses on safety and corporate subjects. The expanding curriculum currently consists of more than 25 modules in French and English and sometimes in Chinese, German or Italian, depending on the course. One reason for their growing popularity is the ease of enrollment, given that almost every employee has a log-in and access to a computer.

	2018	2017	2016*
Number of employees having taken an e-learning course	15,042	10,496	9,298
Percentage of employees having taken at least one e-learning course during the year	81	55	54

* Excluding Den Braven.

E-learning courses took a major step forward in 2018, driven by employees' rising familiarity with this training method, the arrival of new e-learning content, and more extensive communications on e-learning.

After the deployment of the "Code of Conduct and Business Ethics" module, a new "Anti-corruption" training module was

developed and rolled out worldwide, to enhance employee awareness of this issue.

Furthermore, the new e-learning module management system, Elearnings LMS, in use in Europe since 2017, has brought improved learner management and more precise statistics.

Special professional training programs for employees

The Group's training policies are especially designed to improve employee skills in the areas of health, safety, the environment, its businesses and management.

The following international programs have been set up:

- the Isafe program on cyber-security awareness has been deployed in all countries through a network of correspondents;
- the Arkema Executive program is run every two years with an internationally recognized management school, in the form of a ten-day training session for employees from different parts of the world, capable of taking on positions of responsibility within the Group. The aim is to provide participants with the resources necessary to develop their skills as future leaders. In 2018, 36 managers participated in the program;
- a leadership development program was created and rolled out in Asia and Europe in 2017. The two new programs, together with the existing Cornell Leadership Program in the United States, form the Arkema Leadership Academy. Five sessions have been run since 2017: three in Europe and two in Asia, reaching 126 managers in total;
- the SMART program dedicated to operational excellence, which is being rolled out at ten pilot sites in the United States and Europe. The program is part of a strategy to leverage input from employees in the field to resolve problems or improve team efficiency;
- the Sales Academy, which was set up in early 2018 to support sales teams worldwide through changes to the Group's sales strategy and the implementation of a Customer Relationship Management (CRM) tool;
- a Supply Chain Academy was founded in 2018, initially addressing managers. The syllabus, on development of the supply-chain function, helps managers to build new skills and identify good practices and the upgrades needed in their community. It fits in with Arkema's program addressing global supply-chain strategic objectives. The first training sessions were provided to teams in Europe and are scheduled for rollout in Asia and the United States in 2019; and
- a Top Executive Academy was formed in 2018 for executives, scheduled to be rolled out in 2019. This is based on internal and external master classes on negotiation, internal control, international business, talent management, innovation, legal affairs, digital technologies, CSR, leadership, and finance.

In France, a special initiative has been undertaken in recent years to expand the management training curriculum and to add the following courses to the "Managers' Passport" induction training program:

- managing psychosocial risks and quality of work life;

- working together internationally;
- communicating one-on-one: realignment meetings, annual performance reviews, job interviews;
- communicating interpersonally; and
- reviewing management practices in accordance with the Arkema Management Way.

To enhance diversity and more particularly increase the number of women in senior management positions, Arkema France has developed two training programs presented in detail in section 4.4.1.5 of this chapter.

Career management

Talent management, a cornerstone of the Group's human resources development policy, aims to diversify the experience that employees acquire along their career paths and thereby cultivate new skills, this being an essential factor in the Group's development.

This process therefore focuses on both:

- ensuring that the Group has the expertise it needs to secure its successful development, today and over the medium term; and
- helping employees build their careers, thereby enabling them to increase their skills and realize their career goals based on the potential and opportunities available within the Group.

The employee career management process is handled:

- at the corporate level for managers in France and grade 15 jobs and higher internationally; and
- by the career managers network in each country or facility for operational, administrative, technical and supervisory employees.

Talent management policies are based on the same principles regardless of employee category, country, age or gender, as follows:

- providing each employee with the resources and support he or she needs to manage every phase in his or her career;
- leading a proactive promotion-from-within policy;
- identifying and developing high-potential individuals to encourage them to take on greater responsibilities and support career development;
- encouraging mobility between subsidiaries and geographical areas; and
- enabling every employee to move up in the organization and enrich his or her experience and skills, while ensuring organizational flexibility.

A career development program has been rolled out Group-wide based on feedback to participants after their self-assessment has been compared with those of their manager and their manager's manager. This system provides input for preparing personalized action and improvement plans involving coaching, new experience and training.

International experience

Arkema, which mainly operates in Europe, North America and Asia, is actively pursuing an international job mobility policy designed to ensure that it has the skills and capabilities it needs at all its sites, and to broaden employee skills by offering them opportunities to work in different environments.

This policy is being applied through five programs aligned with the different international mobility objectives.

Expertise

This program enables employees who are contributing to implement strategic Group projects in a country where the requisite skills are not yet available to gradually transfer those capabilities to local employees.

Development

This program concerns employees who are going to take up a position in their area of expertise for a set period (on average three years) in a country where similar capabilities exist locally, with the goal of broadening their skills and returning home with their newly acquired experience.

International

This program is for employees whose career is exclusively international, with no further reference to their country of origin.

Expatriation in Europe

This program enables French employees to work on strategic projects or develop their careers in another European country.

Talent Program

Introduced in 2016, this new program offers an international experience to talented junior employees identified after being hired for an initial position or completing an IVB contract with the Group.

On average, only around 80 employees are working as expatriates, reflecting the Group's priority focus on hiring locally whenever possible, including for executive or high responsibility positions.

4.4.1.4 CONSULTATION AND DIALOGUE

The Group respects the fundamental freedoms of its employees, such as the freedom of association and expression, protects their personal data and respects their privacy, as defined in its Code of Conduct and Business Ethics.

The SuccessFactors tool, originally developed to meet the needs of Arkema Inc., was rolled out across the Group in 2018. It now includes the United States, Asia and Europe and covers close to 80% of the Group scope, providing access to a global database and enabling HR processes to be managed at Group level.

Among the fundamental principles and rights at work, the right to freedom of association and to collective bargaining is a vector of social progress that the Group encourages wherever it operates.

Accordingly, in addition to complying with host country legislation, the Group facilitates employee representation in order to support suitable collective bargaining processes. In countries where the law does not provide for employee representation, specific bodies can be set up locally. A consultation and dialogue structure has been implemented at the European level with the European Works Council.

Lastly, the Group strives to develop two-way feedback and consultation with employees, either directly in the form of surveys or via employee representatives.

The social dialogue organization

As part of its employee relations policy, the Group fosters ongoing dialogue with employee representatives in every entity, in accordance with local cultural norms and legislation.

At the European level

The social dialogue body is the 26-member European Works Council, which holds a one-day plenary meeting every six months to discuss issues within its remit, including:

- business issues: market trends, commercial situation, activity level, main strategic priorities, growth outlook and objectives;
- financial issues: review of the consolidated financial statements, annual report and investments;
- labor issues: human resources policy and the employment situation and outlook;
- environmental issues: Group policy and emerging European regulations; and
- organizational issues: significant changes in the Group's organization, developments in the businesses and the creation or termination of operations affecting at least two European Union countries.

In 2018, two plenary sessions were held on 30-31 March and 26-27 October at the Arkema head office.

In the United States

Employees at unionized facilities are covered by collective bargaining agreements negotiated with local and national trade unions for an average period of three years. They deal with such issues as compensation, the safety of people and processes, and quality of work life.

In China

The first Employee Representatives Congress of Arkema China Investment Co. Ltd, the Group's main local subsidiary, was elected in late 2007 and began operations in January 2008. It currently has 34 members. The ERC has a broad remit, ranging from

pay negotiations to safety and training. It complements the labor unions already in place at the Group's local production plants.

Around the world, a high percentage of employees were represented by elected bodies or unions in 2018, as shown in the following table.

PERCENTAGE OF EMPLOYEES REPRESENTED BY ELECTED BODIES AND/OR UNIONS, BY REGION

	2018*
GROUP TOTAL	90%
France	100%
Europe (excluding France)	90%
North America	77%
Asia	84%
Rest of the world	100%

* Data corresponding to companies employing more than 60 people in which the Group has at least a 50% interest, which accounts for 92% of the total workforce

Direct dialogue with employees

The Group is committed to developing two-way feedback and consultation with its employees, either directly in the form of internal surveys or via employee representatives.

Internal surveys are carried out in particular to assess employee satisfaction and engagement and to identify appropriate action plans.

In 2018, Arkema conducted an employee opinion survey among its teams in the main European countries, excluding Bostik. Covering 70% of the Group's workforce in Europe, the survey focused on three main themes: daily work life, support from Arkema, and relations between Arkema and the employee. The response rate was 60%, representing a very satisfactory level of coverage.

Results are very good, as seen with the Net Promoter Score (NPS) of 20, a very high score that reflects Arkema employees' attachment to the Company. The NPS is the most commonly used employee satisfaction indicator, measuring how likely employees are to recommend their Company to others.

The findings are analyzed in detail for each entity and shared with employees, and will be used to prepare action plans in 2019. The survey will be carried out periodically to provide a picture of how the situation evolves and improves over time.

Similar employee surveys are regularly conducted in the Group's other regions (United States, China, United Kingdom, France, Europe), with an average response rate of 70% in the last two years.

As a result, 80% of Group employees have been able to express their opinions over the past three years.

Survey findings are shared and analyzed to draw up site-specific and cross-cutting action plans. Following the European survey in 2018, the Human Resources department is stepping up internal communications on career advancement to better address employees' expectations on this.

Collective agreements

Since the Group was founded, its collective bargaining policy has led to the signing of a wide range of agreements in each facility or company.

In France, some agreements are Group-wide and therefore applicable to every Group company in the country, while others have been negotiated only for a given company or facility.

In other countries, collective bargaining procedures are aligned with national employee representation practices and legislation.

Negotiations are designed to raise the social status of employees in correlation with the Group's development and with the macroeconomic and legal environment. In 2018, negotiations notably related to the creation in 2019 of a Social and Economic Committee for the Group's companies in France.

Collective agreements have a positive impact on working conditions, as illustrated in France by the measures taken in favor of people with disabilities (see section 4.4.1.5 of this chapter), the agreement signed in 2017 on employees' right to disconnect, and the renewed teleworking agreement, which was extended in 2018 to include certain positions at industrial sites.

4.4.1.5 DIVERSITY, EQUAL OPPORTUNITY AND EQUAL TREATMENT

As part of its policy of non-discrimination, workplace equality and diversity, the Group commits to promote the elimination of all forms of discrimination in its operations, encourage diversity as a valuable asset in its global business and hire people solely on the basis of its needs and each applicant's personal qualities, as defined in its Code of Conduct and Business Ethics and its human resources policy memo.

Workplace equality is one of the major priorities of the Group's human resources policy, along with the prevention of discrimination in general. Special attention is given to ensure gender equality in the workplace, facilitate the integration of employees with a disability and prevent discrimination on the basis of age or nationality. Measures put in place to ensure equal opportunity and obtain quantifiable results include:

- a program that periodically revises job descriptions to ensure that they are non-discriminatory and consistent across each profession, with a particular focus on accurately describing the related tasks and responsibilities. In addition, the positions, job titles and requisite profiles are reviewed once a year, department by department; and
- recruitment policies based on the sole criterion of suitability for the job. In the United States, for example, Arkema Inc. gives training to people involved in the recruitment and hiring process, provides them with job descriptions and applicant profiles, and remedies any situation where there is a significant underrepresentation of minorities or women in the workforce. In France, human resources managers receive training on the prevention of discrimination during the recruitment process.

Diversity is an important issue for the Group and a powerful lever for driving team performance and attracting the finest talent. It is also a way for the Group to enhance its employer brand image. Arkema has therefore set two diversity objectives, to increase the percentage of women and of non-French nationals in senior management and executive positions. Details of these objectives are provided below.

Measures to foster international diversity

In every country and region where Arkema operates, it is committed to developing local skills and capabilities, with a preference for hiring local personnel at every level of the business, including top management. The Group also offers career opportunities abroad. Several expatriation programs have been designed, including the recent "Talent Program" for the most junior employees.

Encouraging the presence of non-French executives was also an important issue identified during the 2016 materiality assessment. The Group has therefore set the following target for 2025:

2025 TARGET

42% to 45% of senior management and executive positions to be held by non-French nationals.

In 2018, 39% of senior managers were non-French nationals, compared to 37% in 2017.

To help meet these objectives, international diversity is integrated into the recruitment process. Training is also offered to managers on "working in an intercultural environment" to foster healthy working relationships in a context of international diversity.

Measures to promote gender equality

Arkema ensures that women enjoy the same career development opportunities as their male counterparts. In recent years, a policy of gender equality and equal pay has been deployed, with initiatives in the following four areas:

- strengthening the principle of non-discrimination in the hiring process;
- ensuring equal pay for equal work;
- encouraging and facilitating career development; and
- taking parenthood into account in the career management process.

The second diversity objective set for the human capital aspects of the CSR process concerns promoting women to executive positions, where the proportion of women needs to increase. This issue was also identified during the materiality assessment performed in 2016. An action plan has been put in place to encourage female talent. Today, nearly 30% of middle managers are women, who therefore represent a promising source for meeting the 2025 target. The action plan involves:

- raising awareness among managers by introducing a "Managing in a Diverse Environment" training module and by integrating diversity into existing training modules. Rolled out from 2018, these training initiatives are initially aimed at mid-level managers but will ultimately be extended to the entire management chain;
- introducing career workshops designed in particular to encourage women to maintain their career goals. The workshops were introduced in 2018 and provide a forum for managers seeking to reflect on their career paths;
- identifying women in key positions in other businesses or organizations to create a pool of female talent for future recruitment needs; and
- carrying out communication and awareness campaigns within the Group.

2025 TARGET

23% to 25% of senior management and executive positions to be held by women.



In 2018, women accounted for 21% of all senior managers and executives across the Group, compared with 19% in 2017. The change is primarily the result of the support program introduced in 2016 to promote equal opportunity and gender diversity. This figure is consistent with the average 0.5% a year increase required to meet the 2025 target.

Senior managers and executives account for about 10% of managerial personnel. Women account for 21% of personnel in the top 10% of positions of responsibility.

In France

In 2018, Arkema France signed an agreement on gender equality and diversity, covering such issues as hiring and integration, compensation and promotions, access to training and work/life balance.

In 2018, the Group continued to strengthen its policy of hiring and promoting women. Practical initiatives have been deployed, in particular the expansion of a mentoring program run by senior Group executives to help women move into positions of responsibility. Over the past two years, around 40 women have benefited from the program, which is set to continue during 2019. Networks have also been set up in the regions to provide support for initiatives aimed at boosting women's careers.

To lead the entire process, a Diversity Steering Committee comprising business Managing Directors and corporate Vice-Presidents was formed in 2016, with the goal of approving and recommending initiatives to support gender diversity.

In the United States

Arkema Inc. has prepared an action plan supporting workplace equality and equal pay for all employees and job applicants, with similar qualifications, regardless of race, ethnicity, national origin, religion or gender. The plan, which is specific to each facility, is updated every year.

In addition, to support the objectives set by the Group, an action plan has been implemented involving:

- cross-disciplinary actions: the integration of diversity into existing management programs and the creation of a training offer dedicated to diversity management; initiatives to help employees work on their career goals; communication initiatives promoting access for women to industrial professions; and
- profession-specific actions: definition of targeted actions to support the hiring and promotion of women, based on the assessment carried out for each profession.

Measures to promote the recruitment of people with disabilities

One of the flagship commitments of the Group's disability policy is to hire and maintain the employability of people with disabilities, through dedicated training programs and workstation modifications. In addition, the Group's recruitment procedures make it possible to offer disabled talents various job opportunities.

The following sections describe the measures taken in France that illustrate the approach taken by the Group. For the other regions, similar measures have been implemented taking into account local conditions and legislation.

At the end of 2018, disabled employees accounted for 4.1% of the Group's workforce in France.

A new, four-year agreement was signed by Arkema France in 2017 reaffirming the Group's commitment to hiring, integrating, training and retaining disabled employees, raising awareness of the issue and increasing the use of social enterprises and work centers. The agreement includes the following objectives: hire the equivalent of 60 employees with a disability over four years and increase the amount spent on social enterprises and work centers by 21%. At end-2018, Arkema France had hired 73 people with a disability (all contract types combined) and increased the sales generated by working with social enterprises and work centers by 20%.

In addition, actions in favor of people with a disability have been pursued and strengthened in the following areas:

- retention: performing a wide variety of workstation ergonomic studies, installing appropriate upgrades, training nurses in ergonomics, developing a network of correspondents, organizing meetings for disabled employment coordinators, analyzing site practices in the area of retention;
- hiring and integration: maintaining relations with certain partners such as the Club House, which promotes the integration of people with a disability; forging a partnership with Salto to promote disabled access to internships and apprenticeships; carrying out a feasibility study of setting up an operator job certification program in southwestern France;
- increasing the use of social enterprises and work centers: integration into nation-wide tenders in such areas as translation and digitization;
- communication and awareness training: continuing to raise employee and manager awareness through local initiatives and corporate information.

In the United States, to encourage diversity in hiring, Arkema Inc. vacancies for outside applicants are posted on job search sites designed for people with a disability and emailed to local community organizations that help people with a disability find employment.

Measures to hire and retain seniors

In France, the issue of recruiting and retaining seniors is included in the strategic workforce planning (SWP) agreement. Under the agreement, which defined "seniors" as people over 50 years old, the Group pledged to undertake initiatives in the following areas:

- a recruitment target of 10% of permanent contracts for people aged 50 and over;

- retaining senior employees;
- supporting career-endings;
- transitioning to retirement; and
- knowledge transfer.

In 2018, people aged 50 or more accounted for close to 10% (37 out of 393) of those hired under permanent contracts in France.

4.4.2 Compliance and ethics

The Group places great importance on conducting its business in line with the principles and rules on ethics, integrity and compliance. Failure to respect this commitment would expose the Group to legal or reputational risks.

Arkema therefore complies with prevailing laws, regulations and best business practices. In its choice of industrial and business partners, Arkema favors those that respect its social commitments.

In addition to complying with international conventions and host country legislation, Arkema is committed to complying with competition rules and to rejecting all forms of corruption and fraud. It also condemns and works to prevent fraud and corruption in business transactions with its partners.

Arkema takes care to comply with the tax regulations in all the countries in which it operates, while minimizing its tax burden. It also condemns and works to prevent all forms of tax evasion. The Group's Tax department therefore calls on reputed external consultants whenever necessary and ensures that Arkema's transfer pricing policy is regularly updated. It also oversees the implementation of any corrective measures required in the event of a tax audit.

In 2018, the Group adopted an anti-corruption charter, implemented a whistleblowing system and updated its Code of Conduct and Business Ethics.

Arkema also makes sure it complies with all applicable national and international tax regulations, and adopts a transparent fiscal policy, especially as regards the need to counter tax evasion.

4.4.2.1 THE CODE OF CONDUCT AND BUSINESS ETHICS

The Group has a Code of Conduct and Business Ethics (also known simply as the "Code of Conduct") that sets out Arkema's four core values and describes the good business practices expected of all employees, based notably on the principles of the UN Global Compact.

It may be downloaded from the corporate website and covers the following main points:

- employees may not offer, provide or accept, directly or indirectly, any unfair advantage, be it pecuniary or otherwise, whose purpose is to secure business relations or any other business advantage. The counterparties concerned include people in positions of public authority, business intermediaries, customer employees and political parties;
- employees must scrupulously comply with all applicable rules relating to antitrust legislation in every country in which the Group operates; and
- employees must comply with import and export regulations.

4.4.2.2 PROCESSES FOR IDENTIFYING AND REDUCING THE RISKS OF ANTI-COMPETITIVE PRACTICES, CORRUPTION AND FRAUD

Arkema has put in place a compliance and business ethics program, whose cornerstone is the Code of Conduct. The compliance program mainly covers antitrust issues, export control and the fight against corruption. It defines and describes guidelines, procedures and risk management processes applicable throughout the Group.

To ensure that the program runs efficiently, the following resources have been implemented:

- training to build employee awareness of the need to comply with competition, export control and anti-corruption rules;
- a practical guide to competition covering rules and recommended behaviors issued to employees;
- the verification of business intermediaries prior to appointment, according to the business intermediary procedure, to minimize the risks of corruption-prone situations arising;

- systematic prior approval required for any export to countries subject to commercial or financial restrictions, according to the export control procedure;
- e-learning modules on the Code of Conduct, anti-corruption and antitrust legislation (module scheduled for roll-out in 2019); and
- a compliance statement signed by all employees potentially exposed to these risks, attesting that they will abide by the Code of Conduct and comply with the procedures associated with it.

Application of the compliance program is overseen by the Compliance Committee. This committee, whose members are appointed by the Chairman and Chief Executive Officer and which reports to the Executive Committee, is made up of representatives from the following departments: Internal Audit and Internal Control, Human Resources, Sustainability, Industry Environmental Safety, Legal Affairs, Finance & Treasury, Taxation. It also includes a member of the Executive Committee.

It is responsible for monitoring compliance Group-wide in the following areas: antitrust laws, business intermediaries, fraud, business practices and integrity, work environment integrity and environmental stewardship. The Compliance Committee met four times in 2018.

For all practical questions regarding an ethical issue in general, and any problem in applying the Code of Conduct in particular, the Compliance Committee can be consulted either by executive management or by an employee.

In the various regions where the Group operates, the regional Vice-Presidents are appointed as correspondents to the Compliance Committee.

Lastly, as part of the global risk management process, the Internal Audit and Internal Control department regularly performs audits in the subsidiaries. These include an analysis of the management processes to help detect possible risks of fraud and to define, where appropriate, the necessary corrective measures. For more information on the global risk management process, see section 2.2 of this document.

4.4.2.3 IMPLEMENTATION OF THE SAPIN II LAW

In application of French Law no. 2016-1691 of 9 December 2016 relating to transparency, the fight against corruption and the modernization of the economy, known as the "Sapin II Law", corruption risks have been mapped, as indicated in section 2.1.2 of this document, and are regularly updated so that the third-party verification process can be adapted if necessary.

In addition, an anti-corruption charter has been adopted and a whistleblowing system introduced as an extension of the Code of Conduct, which has itself been updated to take into account these new compliance tools. The Code of Conduct has gradually been integrated into the internal rules of the various entities

located in France. This integration process was completed in September 2018. The anti-corruption charter and information about the whistleblowing system have been annexed to the internal rules of the aforementioned entities and sent to all Group employees, together with the Code of Conduct, in an email from the Chairman and Chief Executive Officer in October 2018.

The Code of Conduct and the anti-corruption charter both provide for disciplinary action in the event of a breach, the details of which are described in the internal rules of each entity. In 2018, one incident resulted in disciplinary action.

Classroom training is organized throughout the year for those most exposed to the risks of corruption and influence peddling. An e-learning module was introduced in November 2018 to supplement classroom training. It focuses specifically on the fight against corruption and is targeted primarily at employees most exposed to these risks.

The whistleblowing system enables any Group employee (or equivalent) or anyone working with the Group on an external or occasional basis (subcontractor, intermediary, supplier, customer) to report any suspected wrongdoing that might involve Arkema. The reports are handled, in the strictest confidentiality, by the Whistleblower Committee, which has now replaced the ethics mediator. The Whistleblower Committee, whose members are appointed by the Chairman and Chief Executive Officer, comprises representatives from the following departments: Internal Audit and Internal Control, Sustainable Development, Legal Affairs and Institutional Affairs.

The whistleblowing system supplements the disclosure mechanisms already available at certain subsidiaries.

A total of 14 reports were received in 2018, relating to topics other than corruption.

A major communication campaign regarding these various measures has stimulated discussions and enhanced employee awareness at all levels of the organization.

4.4.2.4 IMPLEMENTATION OF THE GENERAL DATA PROTECTION REGULATION (GDPR)

The GDPR compliance project is under way, under supervision by a data protection officer (DPO). A general review has been carried out to identify any additional measures that need to be taken.

The DPO also ensures the proper application of data protection laws and regulations issued by countries both inside and outside the European Union. The roll-out of the SuccessFactors tool, for example, was followed closely by the DPO to ensure that the issue of personal data protection was adequately addressed.

Similarly, input from the DPO was also required during the development of digital marketing tools intended for use in various countries.

4.4.3 Human rights

Arkema respects human rights and fundamental freedoms, as defined in the Universal Declaration of Human Rights, and makes them central to its activities. The Group therefore makes every effort to prevent human rights violations against its employees, partners and other stakeholders and to remedy any violations that do occur.

A Human Rights Policy setting out the Group's commitment in this area was published in 2018 and deployed by all entities.

Arkema's commitment is reflected in: its compliance with international standards and the applicable laws in the countries in which the Group operates; regular assessment of the risks that may be generated by the Group's activities; access to a whistleblowing system for both internal and external stakeholders; the implementation of corrective action when necessary; a policy of continuous improvement of the Company's practices through on-going process improvements and training initiatives; an assessment and dialogue program with suppliers and subcontractors, aimed at promoting respect for human rights; and transparent communication on the Group's efforts in this area.

The Group opposes all forms of forced labor, child labor, discrimination and harassment and upholds the fundamental rights of a decent minimum wage, health and safety, equal opportunities, respect for private life, freedom of association, the right to strike and the right to collective bargaining.

As a result, when preparing its duty of care plan in compliance with article L. 225-102-4 of the French Commercial Code, Arkema did not identify any serious risks of human rights violations.

The Group's vigilance in the area of human rights also applies across its value chain and more particularly to its suppliers and subcontractors. Human rights compliance is an integral part of the commitments expected of the Group's partners, expressed through their adherence to the Supplier Code of Conduct, as well as one of the criteria for assessing and managing suppliers. For further details, see section 4.4.4 of this chapter.

Awareness-raising initiatives are undertaken to enable employees, and particularly those in management positions, to respect and protect human rights in the performance of their duties. These awareness-raising initiatives are designed to give all employees a better understanding of the concept of human rights and enable them to apply the associated principles both internally and in their relations with third parties.

To meet stakeholder expectations, keep risk analyses up-to-date and remedy any violations, the Group leverages a number of resources:

- the integration of human rights issues into internal control checklists and internal audit assignments;
- an annual inventory of risks carried out across the Group's main entities by the Internal Audit and Internal Control department;
- continuous dialogue with local communities via the Common Ground® initiative; and
- a whistleblowing system for both internal and external stakeholders.

Arkema's Executive Committee is responsible for drawing up and disseminating the Group's Human Rights Policy, while the regional entities are tasked with its implementation, in compliance with the applicable laws and regulations. The CSR Steering Committee regularly takes stock of the situation, and risks relating to human rights fall within the scope of the Group's Risk Review Committee. The two committees comprise Executive Committee members, the heads of certain corporate departments, as well as managers involved in the Group's CSR policy and risk management process. The Sustainable Development Vice-President is a member of both committees and reports on the Group's CSR activity at least once every year to the Executive Committee, the Audit and Accounts Committee and the Board of Directors.

The Human Rights Policy highlights four areas that are monitored particularly closely:

- health, safety and security: programs, initiatives and results are presented in section 4.3.2 of this chapter. The progress made in 2018 confirms the validity of the Group's approach in this area;
- health and safety of customers and end users: programs and initiatives on responsible product management are presented in section 4.2.4 of this document;
- suppliers and subcontractors: programs, initiatives and results are presented in section 4.4.4 of this document. In 2018, the scope of supplier assessments increased significantly, and initiatives were undertaken with regard to the suppliers most at risk; and
- promotion of diversity and equal opportunity: programs and achievements are described in section 4.4.1.5 of this chapter.

4.4.4 Suppliers and subcontractors

Arkema is primarily involved in the transformation of raw materials and works with a large number of subcontractors and service providers. Poor performances by its suppliers in any area, including those related to social and environmental issues, could therefore have an impact on the Group's performance and on its ability to serve its customers.

The Group has integrated employee, environmental and social issues into its procurement process and strives to build long-term, balanced and sustainable relationships that are based on trust with its suppliers and subcontractors. These relationships are managed transparently and in accordance with negotiated contractual terms, including those related to intellectual property.

In support, the following resources have been deployed.

4.4.4.1 THE SUPPLIER CODE OF CONDUCT

The Group's responsible procurement process is guided by the ethical principles expressed in the Code of Conduct described in section 4.4.2 of this chapter. The Group has also signed the national inter-company charter of the French purchasing managers' organization and the state-sponsored inter-company mediation initiative (*Médiation inter-entreprises*), which is based on ten responsible procurement commitments. As part of this process, a dedicated Code of Conduct for suppliers summarizing all of the related CSR aspects has been issued and disseminated to all Group entities.

The Supplier Code of Conduct's guidelines particularly cover environmental stewardship and the quality and safety of supplied products and services. As part of the focus on business integrity and transparency, suppliers must comply with laws governing competition, corruption, conflicts of interest, confidentiality and the transparency and accuracy of reported information. The Code can be accessed on the Group's website.

When selecting a new supplier, the Group looks for the bid that offers the best combination of performance, cost and quality, while also taking into account the supplier's CSR performance. New suppliers are systematically informed of the Code's provisions.

4.4.4.2 RESPONSIBLE PROCUREMENT TRAINING AND AWARENESS

Group buyers are all trained to apply the Supplier Code of Conduct and the CSR performance assessment process, with regular follow-up meetings to inform and maintain awareness. In 2018, sessions presenting the Group's corporate social responsibility approach were held with the procurement departments in each region. They were followed up with reminders and discussions about implementing the Together for Sustainability supplier assessment initiative.

4.4.4.3 ASSESSMENTS BY THE THREE PROCUREMENT DEPARTMENTS

The Goods and Services Procurement department has introduced a pre-approval questionnaire for suppliers that includes corporate social responsibility components. In addition, it regularly assesses the employee safety performance of the leading contractors working on Group sites. As explained in section 4.3.2 of this chapter, the safety of contractor employees is considered just as important as that of Group personnel, and their incidents are recorded in the consolidated indicator.

Logistics services contracts are awarded on the basis of the provider's safety, security and environmental performance, while highway hazardous materials transporters are selected based on third-party assessments, such as the Safety and Quality Assessment System (SQAS) in Europe and the Road Safety and Quality Assessment System (RSQAS) in China. Similarly, vessels chartered worldwide for the bulk transportation of Group products are first vetted by a third party.

To assess raw materials suppliers, pre-approval questionnaires are used to assess their management system, compliance with the principles of the Responsible Care® program and certification to ISO-type standards.

FOCUS

SOCIAL PERFORMANCE AS A FACTOR IN SUPPLIER SELECTION

As in 2017 for "electrical" and "instrumentation" services, in 2018 Arkema assessed all its suppliers to Together for Sustainability (see section 4.4.4.5) criteria in the categories "fire detection and firefighting" and "weighing", to ensure that CSR performance was factored in when selecting the best suppliers. In addition, a supplier audit plan will be produced in 2019.

As a producer of high performance materials made from renewable resources, Arkema is participating in the Pragati initiative, alongside industrial partners BASF and Jayant Agro-Organics Ltd. and NGO Solidaridad. Launched in Gujarat, India in 2016, the initiative aims to provide a framework for the sustainable production of castor beans by taking into account all of the related social, environmental and economic issues. To date, training has been provided to 2,700 farmers, of which 1,019 have been awarded official project certificates. The results so far have been very positive and notably include a better crop yield, improved health and safety conditions for farmers, and analyses of soil and water quality in 41 villages.

4.4.4.4 SUPPLIER AND PROCUREMENT PROCESS AUDITS

Under the Supplier Code of Conduct, suppliers agree to meet all of the Group's CSR expectations and to cooperate with its audits of their Code compliance.

Supply chain service providers, for example, are regularly audited through visits to transportation companies and outside warehouses and assessments of their performance. These audits are supported by third-party assessments, such as the Safety & Quality Assessment System (SQAS) for overland transportation, the Chemical Distribution Institute for maritime shipping, and the European Barge Inspection Scheme for river shipping.

In addition, every year, the Internal Audit and Internal Control department audits subsidiaries by conducting a range of tests on supplier approval and assessment processes and on the practices and risks associated with raw materials and goods and services procurement.

4.4.4.5 MEMBERSHIP OF THE TOGETHER FOR SUSTAINABILITY (TfS) INITIATIVE

To base its requirements on accepted standards and avoid the need for duplicate supplier assessment procedures, in 2014 the Group joined the Together for Sustainability (TfS) initiative, founded by six European chemical companies. This global program is designed to encourage social responsibility across the chemical industry service chain, and is based on the principles of the United Nations Global Compact and the Responsible Care® Global Charter. It enables member companies to share the findings of assessments or audits of the CSR performance of their suppliers or subcontractors conducted by Ecovadis or independent third parties. Ecovadis analyzes supplier documents and questionnaires on the basis of CSR criteria in line with international standards, and ensures a 360° watch on information reported by external stakeholders.

A procurement representative is specifically designated to lead the TfS drive within the Group. A TfS Steering Committee has been set up, bringing together representatives from the Procurement departments (Goods and Services/Logistics/Raw Materials) and

the Sustainable Development department. It meets at least once each quarter and the issues discussed during its meetings are reported to the CSR Steering Committee and the Risk Review Committee.

At the end of 2018, more than 1,400 of the Group's suppliers and subcontractors had been assessed according to CSR criteria, compared to around 1,000 in 2017. Thanks to these assessments, the Group has identified certain suppliers or subcontractors whose CSR performance is below standard and has requested that they improve their practices in this area. The resulting initiatives are tracked over time by the Group's procurement teams in liaison with the suppliers and subcontractors in question. The results of these assessments are also taken into account by procurement teams during the supplier selection process.

In 2018, CSR scores had risen for 60% of suppliers whose assessments had been updated.

At-risk suppliers

In 2018, the Group's three Procurement departments defined criteria for identifying at-risk suppliers and subcontractors, which are those most likely to present a risk in terms of human rights, personal health and safety, corruption, or compliance with international labor and environmental standards. The criteria relate to the supplier's area of activity and its country of origin. The three departments organize the supplier assessment and audit process so that recurrent at-risk suppliers are systematically assessed and then contacted and audited if their assessment reveals unsatisfactory practices.

4.4.4.6 THE IMPACT OF SUBCONTRACTING

The Group subcontracts for two main purposes: for maintenance operations, and, to a very limited extent, for the production of certain finished products. Subcontracting therefore accounts for part of the €270 million in capital expenditure dedicated to safety, the environment and the maintenance of industrial units.

Under the Group's procurement policy, contractors are bound by the Supplier Code of Conduct and its general purchasing conditions.

4.4.5 Institutional initiatives

As a responsible chemicals producer, the Group interacts with public authorities in every country where it operates, in particular to contribute to the development of legal and regulatory frameworks that are favorable to the growth of its businesses, in full accordance with its values and social responsibility commitments. As part of this process, it may take part in public debate on issues directly related to its businesses, while maintaining a position of strict political neutrality.

These public initiatives fully comply with the lobbying rules in each host country. For example, Arkema has been entered in the European Union Transparency Register and has pledged to comply with the related Code of Conduct. Similarly, in France, Arkema is registered as a lobbyist in the national digital registry of lobbyists set up in 2017, which is managed by France's High Authority for Transparency in Public Life (HATVP).

The Group is also active in several business federations or associations, such as the French Association of Private Enterprises (AFEP) and France Industrie in France, and chemical industry trade associations, such as France Chimie in France, CEFIC in Europe, the American Chemistry Council in the United States, as well as the Association of International Chemical Manufacturers and the China Petroleum & Chemical Industry Federation in China. In addition, the Group is a member of around 50 specialized industry associations worldwide whose objectives are closely related to the activities of its Business Lines.

Employees in charge of institutional relations are responsible for monitoring public initiatives at the local, national or international level that may impact the Group and are tasked with defending or promoting the interests of the Group in this context. The priority issues addressed concern business competitiveness, both globally (*i.e.*, at Group level, such issues as taxation, particularly on

output, payroll taxes, employment law, regulation in general, etc.) and locally (*i.e.*, at the plant level, such issues as health, safety and environmental legislation, and support for expansion projects and reorganizations), the energy and climate change transition, and the circular economy.

In the United States, Arkema Inc. files quarterly activity reports with both houses of Congress, as required under section 5 of the Lobbying Disclosure Act of 1995. Expenses reported for 2018, calculated according to the prescribed rules, amounted to around US\$860,000. Two Arkema Inc. employees have been registered as lobbyists to Congress, particularly on the issue of refrigeration gases.

Worldwide, the Group paid €4.1 million in membership fees to general or specialized industry associations and €370,000 in consultants' fees for similar reasons, and recorded €1.2 million in related in-house expenses in 2018.

4.4.6 Corporate citizenship and philanthropy

In the 55 countries where it operates, the Group's business operations contribute to developing the local economy, by creating and maintaining direct and indirect jobs, developing local skills and expertise, purchasing local goods and services, forming business partnerships and paying taxes.

In particular, the Group focuses on hiring locally at every level of the business, including the senior management teams of its non-French subsidiaries. In this way, more than 80% of the executives at the main operating facilities outside France were hired locally.

As seen in this document, and particularly in chapter 5, the Group's economic contribution to surrounding communities covers many items (sales, capital expenditure, operating expenses, wages and salaries and payroll taxes, income and other business taxes, dividends, etc.), which go together to shape the Group's economic and social footprint.

In addition to contributing to the local economy, the Group deploys a policy of revitalizing regional labor markets and supporting scientific research upstream from industrial innovation.

Lastly, as a responsible company in an increasingly interconnected world, the Group is particularly attentive to the need to nurture close ties with all its stakeholders. Around the world, the Group is deploying local communication initiatives to foster high-quality relationships with host communities that are based on trust. This open dialogue also helps the Group to better understand the expectations of people living in nearby communities and ensure that they are properly addressed in its CSR strategy.

4.4.6.1 SUPPORTING LOCAL COMMUNITIES THROUGH INNOVATION

The Group has a policy of supporting innovative small and medium-sized enterprises (SMEs) in related business areas through joint projects and equity investments. Each research center, for example, works closely with neighboring schools or laboratories as part of clusters while creating possibilities for partnerships with local SMEs. The Group is a founding member of Axelera, a world-class competitiveness cluster in the field of chemistry and the environment that brings together and coordinates players from industry, research and education in the Auvergne Rhône-Alpes region in France.

These kinds of local partnerships contribute to stimulating innovation, while deepening the Group's local roots. For example, at the Lacq site in France, the Group provides technical and infrastructure support to innovative young businesses setting up in the Chemstart'up business incubator.

It is also positioned as a key early-stage player in strategically crucial industries such as thermoplastic composite materials, renewable raw materials and new energies.

Under its ambitious innovation policy, the Group maintains close ties with the scientific and educational ecosystems in its host regions worldwide, in particular through a wide variety of partnerships with universities and public and private research laboratories, such as the CNRS and the CEA in France. These partnerships, such as the ones in France with Compiègne

Technology University for the Smart House by Arkema and with Hydro Québec in Lacq, are described in section 1.1.5 of this document.

In 2016, Arkema opened an innovation center in South Korea within the Hanyang University in Seoul. The center is specialized in high performance polymers and renewable energies, areas in which the university excels. More recently, Arkema forged a partnership in 2018 with Monash University Malaysia, which is located just outside Kuala Lumpur. The aim is to enhance understanding of biocatalysis, a discipline that could lead to more efficient reaction processes than those achieved with traditional chemistry or the identification of alternatives to certain raw materials used in the production of sulfur products. The creation of this center for research into biocatalysis is in line with the Group's commitment to develop increasingly sustainable solutions.

The decision to join forces with a university in Asia reflects the Group's vision of partner-based research as a bridge between industry and academia.

4.4.6.2 CORPORATE CITIZENSHIP

As part of its commitment to societal issues, Arkema undertakes corporate sponsorship and philanthropy initiatives that are aligned with its CSR policy and values, particularly the value of solidarity, and focus primarily on education, integrating young people into active life, gender diversity and access to water. These initiatives are overseen at Group level by the Human Resources and Communication Executive Vice-President, who is a member of the Executive Committee. They are deployed worldwide and are supported at the local level by the Common Ground® initiative.

NUMBER OF COMMON GROUND® INITIATIVES BY REGION

	2018	2017	2016*
GROUP TOTAL	1,064	1,011	866
Europe	421	359	328
North America	486	409	376
Asia	126	204	124
Rest of the world	31	39	38

* Excluding Den Braven.

In all, 73% of production plants took part in these initiatives in the United States, 73% in Europe, and 69% in Asia.

The Common Ground® initiative

Formalized and introduced over 15 years ago, the pioneering Common Ground® initiative takes community relations beyond the legal minimum requirements by actively encouraging local dialogue and exchange in every host country.

It is based on three key principles, designed to improve the social acceptability of chemical plants:

- **listening to understand expectations:** understanding the concerns of people living in nearby communities is key to effectively addressing their concerns about industrial and chemical risks;
- **engaging in dialogue and informing communities about the Group's activities:** at the core of the initiatives are workshops that enable neighbors to discover what the plant does, the products it makes and the processes it uses, and get a first-hand view of how the site runs and what its projects are; and
- **risk prevention and progressing:** in addition to continuously improving the health, safety and environmental performance of its production facilities, the Group is deploying a risk prevention culture in every host country. As part of this proactive approach, incident or accident drills are regularly organized to test emergency response resources and procedures, along with the systems for alerting, informing and protecting employees and the local community.

Operational implementation of the Common Ground® initiative is overseen by the Group's site managers.

Building better relations around the world

In 2018, 1,064 Common Ground® initiatives were carried out worldwide, with 84% of production plants actively participating. These initiatives break down by region as follows over the past three years:

These initiatives are primarily aimed at local communities, academia and associations, as shown in the following breakdown over the past three years:

NUMBER OF COMMON GROUND® INITIATIVES BY STAKEHOLDER CATEGORY

	2018	2017	2016*
Local communities	252	379	334
Education	294	293	240
Associations	376	339	292

* Excluding Den Braven.

The number of Common Ground® initiatives rose from 1,011 in 2017 to 1,064 in 2018, primarily reflecting increased involvement by the Group's sites. Progress was made across all three stakeholder categories. In France, for example, the increase in educational initiatives stems from a partnership with the CGénial Foundation. The percentage of production plants taking part in the Common Ground® initiative decreased in 2018 owing to the recent integration of the Den Braven sites and other sites acquired in 2018. However, the program should be phased in across these new sites over time.

Initiatives involving local communities and the public

In 2018, around 68% of Group facilities conducted public tours, in particular to explain how chemistry offers solutions that can benefit everyone in their daily lives.

In the United States and Asia, many plants also take part in information meetings organized by local resident associations.

In recent years, the Group has partnered two important science and industry events in France:

- the *Fête de la Science*, an initiative of the French Ministry of Higher Education and Research to encourage interaction between research scientists and the general public; and
- the *Semaine de l'Industrie*, a week-long event that gives young people and career seekers insights into the world of industry and its job opportunities.

The Group also supports environmental initiatives. In 2018, more than 1,000 trees of various species were planted by some one hundred employees of the Bostik site in Tanay (Philippines) and their families.

Initiatives involving associations

The Group's values of solidarity and responsibility show through in the initiatives undertaken in partnership with non-profit associations in its host regions. Many examples around the world attest to the dedication of Group employees to helping the neediest and to being actively involved in their local communities.

The Group regularly leads or partners a broad range of community outreach initiatives in such areas as:

- jobs for people with a disability, with support for several associations that help people with a disability enter the workforce;
- health and community, with corporate and employee participation in a large number of charitable campaigns; and
- the environment, with programs to improve biodiversity (see section 4.3.3.4 of this chapter).

Lastly, in early 2018, Arkema introduced a "salary rounding" system, initially in France. The system allows employees to donate the cents from their monthly salary to a non-profit organization with Arkema donating the same amount as its employees. The non-profit organizations that benefit from this initiative are active in areas that relate to the Group's CSR policy, such as the issue of access to water. Under this initiative, close to 600 employees made donations to six associations.

Educational initiatives

Around the world, the Group gives priority attention to strengthening its ties with schools and universities.

Programs and events are regularly organized in cooperation with schools, to provide young people with information on careers in the chemicals industry and to promote the development of a scientific culture. Locally, the production facilities periodically organize tours for school groups, take part in educational initiatives, and speak at conferences at higher education venues.

In the United States, the Arkema Inc. Foundation, set up in 1996, runs a number of selfless initiatives focused on science and education at all levels. Since its creation, its yearly Science Teacher Program has reached hundreds of researchers and teachers.

In 2016, the Group began working with France's CGénial Foundation to support its programs designed to promote science and its different careers among college students in France. With the partnership, Arkema reaffirmed its commitment to attracting young people to science and developing bridges between business and academia by taking part in the Foundation's flagship programs. As a result, more than 130 teachers visited the Group's plants and research center in France in 2018.

Driven by its commitment to corporate social responsibility, Arkema created a fund for education on its 10th anniversary. The aim is to finance projects submitted by employees who volunteer on education-related initiatives. The fund is a way for the Group to support the volunteer work carried out by its employees, as well as their engagement and commitment to non-profit organizations. Since the fund's creation, 32 education-related non-profit organizations have been selected in nine countries.

Youth inclusion

The Group also offers opportunities for socially disadvantaged young people, and helps them to earn academic qualifications. To promote access to the prestigious ENSIC chemical engineering school, *Fondation de France* and the Group founded *Fondation ENSIC* to grant scholarships to students experiencing financial hardship. Since it opened, the foundation has provided support for around a hundred students.

In France, Arkema has been a patron of the *Théâtre des Champs-Élysées* in Paris since the 2017/2018 season and started supporting the theater's youth program during 2018. Helping to provide disadvantaged young people with greater access to music and opera is aligned with Arkema's focus on youth inclusion and with the values of solidarity and accountability championed by the Group.

Gender diversity

In keeping with its internal policy of promoting gender diversity and making all positions accessible to women, including at its plants, Arkema has signed a partnership with FIFA in relation to the Women's World Cup France 2019™. Spanning 2018 and 2019, the partnership offers an invaluable opportunity to showcase the role of women in sport and business. The aim is to

illustrate that women have an important role to play in industry – including in the chemicals sector – just as they do in football, despite the fact that both are still viewed as male domains. The partnership also gives the Group an opportunity to highlight that some of its products, such as Pebax®, are used in the production of soles for soccer shoes.

Arkema also supports women's soccer in the United States by sponsoring a team of young women in New York.

Water

After supporting the Sail for Water association from 2015 to 2017, Arkema continued its efforts to promote universal access to drinking water through the distribution of filtration kits in 2018. During the year, non-profit organization No Thirst Initiative provided 300 filtration kits to villages, schools, hospitals and clinics in Nepal, thereby providing access to drinking water to more than 3,000 people in isolated areas.

Innovation

A partnership with the world of sailing enables the Group to demonstrate and explain its performance-oriented innovation approach to the general public. Arkema has been supporting the construction of highly innovative sailing boats and their race programs since 2013. Its innovative materials are used to manufacture and improve the performance of a "Multi50" trimaran and a "Mini 6.50" monohull. At the start or finish of a race, in France and the United States, the Group invites its stakeholders to tour the boats and meet the skippers. In this way, customers, partners, students from partner schools, and employees and their families have all had the opportunity to discover and discuss the direct ties between innovation and performance that exist thanks to Arkema's high performance materials.

4.5 REPORTING METHODOLOGY

4.5.1 Reporting organization

The CSR reporting organization is designed to enable the Group to manage and measure the effectiveness of its sustainable development program.

Reporting scope and period

The reporting scopes for safety, employee, environmental and social data is presented below. To optimize the organization, coordination and integration of the financial and CSR reports, these data are reported on a calendar year basis.

Reporting organization and protocol

The Group has defined directives governing the reporting of safety, environmental, employee and social data for all facilities. Data are generally reported once a year, but for certain specific issues, interim data are reported quarterly so as to identify trends and implement required corrective measures on a timely basis. The interim data are not published.

Compliance and standards

The Group publishes employee, environmental and social information in compliance with article L. 225-102-1 of the French Commercial Code, as amended most recently by French Law no. 2018-938 of 30 October 2018, and with articles R. 225-105 and R. 225-105-1 of said Code, as amended by French Decree no. 2017-1265 of 9 August 2017. Arkema also follows the recommendations of ISO 26000. In compliance with the

abovementioned article L. 225-102-1, this information is reviewed by an independent third-party auditor, who issues a report attesting to the consistency and fairness of the CSR information. The report is presented in section 4.5.6 of this chapter.

The reporting process follows the Global Reporting Initiative guidelines (GRI Standards). The concordance table can be found in section 4.5.5 of this chapter.

4.5.2 Methodological note on environmental and safety indicators

4.5.2.1 ENVIRONMENTAL REPORTING TOOLS AND SCOPE

Absolute data

The Group's absolute environmental data are compiled by its Reporting of Environmental and Energy Data (REED) system, which is accessible worldwide via the web platform of a service provider.

The values of the absolute indicators, once published after review by the independent third-party auditor, are not amended in the REED system. Any subsequent retroactive modifications made due to a change in the estimation method or a correction are addressed in section 4.3.3 of this chapter.

The data are entered by the plant Health, Safety and Environment (HSE) departments and validated at two levels, geographic and corporate.

The scope of consolidation for environmental reporting covers all Group industrial sites for which operating and emissions permits were held in the name of the Group or a majority-owned subsidiary at 31 December 2018. On this basis, the scope covered 99% of the Group's industrial operations in 2018.

The scope of consolidation for energy reporting covers all of the industrial sites operated by the Group or by majority-owned subsidiaries, head offices and research and development centers, corresponding to around 91% of the total scope. It should be noted that this scope covers more specifically 98% of the industrial sites operated by the Group or by majority-owned subsidiaries.

Operations sold or discontinued in 2018 were removed from the scope of reporting for the year but remain in prior-year data.

For activities that were acquired in 2018, all operations for the year are included in the scope of reporting.

Operations that started up in 2018 reported data from their start-up date.

Intensive data (EFPIs)

To manage its environmental performance more efficiently and report consolidated data that more accurately track this performance year by year, Arkema uses a methodology that enables production facilities to report relative indicators, known as Environmental Footprint Performance Indicators (EFPIs). This method of calculating the intensity of emissions or resource consumption relative to production volumes, compared with 2012 as a baseline year, minimizes the impact of any changes in the business base and plant output, as well as any changes to the method used to estimate or calculate environmental footprint variables.

These relative environmental data are compiled by the same REED environmental reporting system, which is accessible worldwide via the web platform of a service provider.

EFPI data are entered by facility HSE departments and validated first by the factory manager then at Group level. They are subject to a large number of consistency tests.

The scope of consolidation for EFPI reporting covers Group sites for which operations (and emissions) permits were held in the name of the Group or a majority-owned subsidiary at 31 December 2018 and which are among the biggest contributors of the Group's sites. In all, these sites account for at least 80% of the Group's prior-year emissions or consumption.

Any activities sold or terminated in 2018 are not included in the scope of EFPI reporting for 2018, but are still included for previous years.

Operations started up in 2017 will be included in the EFPI reporting in 2019 compared with their 2018 performance.

Operations acquired in 2018 will be included in the 2020 scope of EFPI reporting for all of their 2020 activities, compared with their 2019 performance.

The EFPI methodology allows new reporting units to be included in prior-year performance data. Should the inclusion of a large number of new units result in a significant change to the confidence interval in the calculation of the Group's EFPIs, consideration will be given to whether an adjustment factor should be applied or whether the use of a new baseline year should be used.

4.5.2.2 SAFETY DATA REPORTING TOOLS AND SCOPE

Safety data:

- are recorded in the SafetyLog application accessible on the employee intranet;
- are entered by the reporting units and validated at corporate level; and
- cover all of the industrial sites operated by the Group or by majority-owned subsidiaries, head offices and research and development centers, corresponding to around 99% of the scope. Den Braven's sites are not included in accident safety reporting (see section 4.5.2.4 of this chapter), nor are they subject to peer observation.

4.5.2.3 CHOICE OF INDICATORS, MEASUREMENT METHODS AND USER INFORMATION

The Group has designed indicators to track the emissions and consumption levels that concern its operations, in accordance with the information required by articles R. 225-105 and R. 225-105-1 of the French Commercial Code. These indicators enable the Group to assess the impact of its policies and monitor changes over time for certain types of emissions and uses that have been identified as risks.

They were introduced at the time of the Group's creation in 2006 and have been tracked ever since, in compliance with the social and environmental reporting requirements set out in the French New Economic Regulations Act (the so-called NRE Act) of 15 May 2001.

The environmental reporting system is governed by an Environmental Reporting directive, an EFPI Reporting directive and an Energy Reporting directive issued by the Group Safety and Environment (DSEG), Sustainable Development (DDD) and Raw Materials and Energy Procurement (DAMPE) departments and accessible to all employees on the corporate intranet.

Calculation and estimation methods are subject to change, for example due to changes in national or international legislation, measures to improve consistency among regions, or problems with their application.

The directives may then be expressed in guidelines and handbooks, which are supported by training sessions in each region as required.

The safety reporting process is covered by a Monthly Safety Reporting directive issued by the Group Safety and Environment department and accessible to all employees on the intranet.

4.5.2.4 CLARIFICATIONS CONCERNING THE ENVIRONMENTAL AND SAFETY INDICATORS

The following information is provided to clarify the definition of the indicators applied by the Group.

Total acidifying substances

This indicator is calculated using sulfur oxide (SO_x), ammonia (NH₃) and nitrogen oxide (NO_x) emissions converted into tonnes of sulfur dioxide (SO₂) equivalent.

Volatile organic compounds (VOCs)

The list of products regarded as VOCs may vary from country to country, in particular between Europe and North America.

The VOC definitions used by the Group are those recommended in Europe by directive 2010/75/EU on industrial emissions, known as the Industrial Emissions Directive (IED).

Emission figures for US sites are therefore obtained by adding figures for products such as fluorinated organic compounds to national reported data.

Chemical oxygen demand (COD)

For reporting purposes, COD is measured in effluent released into the natural environment.

In cases where wastewater from a Group facility is treated in an external plant, the reported data takes into account the effectiveness of the treatment process.

In cases where a Group facility takes in COD-laden water, the reported data concerns the net COD load effectively produced in the ecosystem by the Group (outgoing less incoming).

Waste

The distinction between hazardous and non-hazardous waste may vary from one region to another. The definitions used by the Group are those of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

By-products that are sold to third parties for reuse without processing at a Group site are not counted as waste.

Water use

All sources of water are included in the reported data, including groundwater/wells, rivers, the sea, public or private networks and drinking water, excluding rainwater collected in separate networks.

Energy use

Reported use corresponds to net energy purchases.

It does not include self-generated energy, which corresponds to the energy produced by exothermic chemical reactions and therefore does not draw down the planet's energy resources.

Sales of energy are deducted from purchases of energy. This is the case, for example, for facilities fitted with combined heat and power plants that generate steam and electricity from purchased gas (reported), then sell the electricity (deducted).

In cases where sites do not have any December data due to late reporting by energy providers, the values for the year are extrapolated from the data at end-November.

Direct greenhouse gas (GHG) emissions

For reporting purposes, direct GHG emissions correspond to those defined in the Kyoto Protocol.

Their impact is calculated in equivalent tonnes of carbon dioxide (t CO₂ eq.).

In this report, 2018 emissions have been calculated using the Global Warming Potential values published in 2007 by the Intergovernmental Panel on Climate Change (IPCC).

For relative data, EFPI calculations include fluorinated greenhouse gases that are not listed in the Kyoto Protocol but are listed in the Montreal Protocol.

Indirect greenhouse gas (GHG) emissions

For the purposes of this report, indirect Scope 2 CO₂ emissions were calculated using electricity and steam consumption and emission factors in tonnes of CO₂ equivalent per input unit (KWh tonnes of oil equivalent) reported by suppliers. Where this was not possible, they were calculated using figures provided by local authorities, such as those available in the EPA-2012 database in the United States, the 2013 Baseline Emission Factors for Regional Power Grids issued by China's National Development & Reform Council (NDRC) for China, and SEMARNAT data issued by Mexico's Federal Environmental Agency for Mexico. In the absence of specific regional values, calculations were made using national energy-mix emission factors published by the International Energy Agency in 2017.

For the purposes of this report, indirect Scope 3 CO₂ emissions were calculated using the default scenarios in the GHG Protocol guidance for the chemical sector, issued by the World Business Council for Sustainable Development (WBCSD). Indirect Scope 3 emissions relate to the Group's value chain, including both upstream and downstream emissions, and have been calculated for seven categories. A detailed explanation of the calculation methodology is available to stakeholders upon request.

- Category 1 – Purchased goods and services: emission estimates comprise figures for raw materials and packaging. For raw materials, a CO₂ equivalent emissions coefficient per tonne is applied to the purchased tonnage. For packaging, the quantities purchased in 2017 are extrapolated for 2018 on the basis of product volumes sold, and a CO₂ equivalent emissions coefficient is applied for each category of material (metal, wood, polymer, paper, etc.) and end-of-life scenario (e.g. metals recycling). The emission coefficients used are those in the Ecolnvent base (version 3.4).
- Category 2 – Capital goods: emissions are estimated based on the amount of capital expenditure and by applying the default rule described in the WBCSD guide when the composition of capital goods and their emission factors are not available. Capital expenditure is therefore split between 25% concrete and 75% steel.
- Category 3 – Fossil fuels and energy in relation to Group activities: emissions are estimated applying the default methodology set out in the WBCSD guide. These emissions

include (i) losses expressed in CO₂ equivalent in relation to electricity and steam transmission and distribution networks in each of the countries in which Arkema has industrial operations, (ii) upstream emissions for fossil fuel, steam and electricity consumed in each country by Arkema industrial sites, and (iii) upstream emissions for fossil fuels, steam and electricity sold by certain Arkema industrial sites. Emission coefficients for losses on the electricity and steam transmission and distribution networks in each country, and upstream of fossil fuel, steam and electricity are as given in the 2017 version of the DEFRA database ⁽¹⁾.

- Category 5 – Waste generated: the emissions calculated are those related to the waste generated during the Group's operations. The WBCSD rule is applied, with emission estimates based on the Group's waste treatment breakdown and the emission factors given in the Ecolnvent base (version 3.4) for incinerated, landfilled and recycled waste. Calculations are based on the actual quantities of waste from each site that is treated in the various ways. As a first step, all of the landfilled waste was considered as organic waste and therefore totally decomposed.
- Category 6 – Business travel: the emissions calculated correspond to travel by plane (the type of transportation that emits the most GHGs) by Group employees representing 90% of the global scope. Total air travel distances come from travel agency data, and emissions are calculated applying emission factors given in the 2017 version of the DEFRA database.
- Category 7 – Employee commuting: emissions were estimated using the least favorable scenario, assuming that all 20,000 employees use their own cars to get to work, traveling an average distance of 33km per day in France ⁽²⁾, 26km in the United States ⁽³⁾, and 50km in other countries. The emission factors applied correspond to the average CO₂ emissions per kilometer by vehicle type and fuel type given in DEFRA database (2017 version).
- Category 8 – Upstream leased assets: emission figures in this category are for energy consumption at leased real-estate assets (head offices, sales offices and research centers), except for those already included in Scope 2 reporting. Where site energy consumption data was not directly available, estimates were made working from the energy consumption ratio (all usages) given by ADEME ⁽⁴⁾ (243kWh/m² per year) and the rented surface in square meters. Where site surface area data was not available, calculations applied the average surface area per employee at the type of site in question, as determined by Arkema. Emissions were then calculated by applying the emission factor for the national electricity mix in the country where each site is located.
- Category 9 – Downstream transportation and distribution: the emissions were estimated using Group company logistics data, which account for 99% of consolidated shipments. The

(1) UK Department for Business, Energy and Industrial Strategy.

(2) Source: National Transportation and Travel Global Survey (2008) by the Observation and Statistics department (SOeS) of the French Ministry of Ecology, Energy, Sustainability and the Sea (MEEDDM).

(3) Bureau of Transportation Statistics.

(4) French Energy and Environment Agency.

Group defines a shipment as the transportation of products to customers, as well as any post-production logistics. Emissions are calculated by taking such logistics data as tonnes transported, number of shipments, and average kilometers for each type of transportation (road, rail, air, etc.) and applying the emission factors defined in the Guidelines for Measuring and Managing CO₂ Emissions from Freight Transport Operations published by the European Chemical Transport Association (ECTA) and the European Chemical Industry Council (CEFIC) in March 2011, based on the work of Professor Alan McKinnon of Heriot-Watt University in Edinburgh, UK. The reporting period runs from 1 October to 30 September of the following year. To broaden the reporting scope and enhance the reliability of data, the methodology applied by the Group was significantly improved in 2017, particularly in the United States. Current reporting practices are showing their limits, particularly as concerns operations outside Europe and outside Arkema Inc. These limits mainly relate to reported distances, with average distances used in the absence of actual data, and emission factors, with standard factors used in the absence of transporter data. These methodological limits mean that 2017 data are accurate to within plus or minus 10%.

- Category 12 – End-of-life treatment of products sold: the products sold by the Group have been classified into 23 different categories based on their chemical composition and, by extension, the GHG emissions that they may generate. A scenario was applied to define the end-of-life treatment method for each product category: incineration, landfilling or recycling. Emission factors were then applied in accordance with the WBCSD guide. For this estimate of Category 12 emissions, all of the Group’s products were taken into account except fluorogases and Bostik products, which are still under review.

Accidents

Total recordable injury rates (TRIR) and lost-time injury rates (LTIR) are calculated for both Group and on-site subcontractor employees on the basis of US standard 29 CFR 1904.

The operations of Den Braven, acquired recently on 1 December 2016, were not included in the 2018 scope. The TRIR and LTIR data presented above do not include Group employees or subcontractor employees working on Den Braven sites for 2018.

Process safety

The safety performance of a plant’s production processes is assessed by means of performance indicators that measure and analyze process safety incidents. The Group reports and classifies process safety indicators in accordance with European Chemical Industry Council (CEFIC) guidelines. Until the end of 2016, the definition used for process safety events was the one proposed by CEFIC. During 2016, the International Council of Chemical Associations (ICCA) proposed new criteria to be used globally. Like CEFIC, Arkema decided to use these new criteria to measure its process safety event rate (PSER), starting in 2017.

AIMS-audited sites

The Group tracks the increase in the percentage of facilities that have been audited in accordance with the AIMS standard. Depending on their specific features and size, some sites have had the option since 2016 of performing simplified self-assessments. This is the case for Bostik in particular.

4.5.3 Methodological note on employee, social and R&D information/indicators

4.5.3.1 SCOPE AND REPORTING TOOLS

Employee data are taken from several different reporting processes.

The employee data presented in section 4.4 of this chapter:

- are recorded in the AREA 1 application, accessible via the corporate intranet;
- are entered by the human resources managers or company Managing Directors (depending on their size);
- are validated at the Arkema, Altuglas International, Bostik, CECA, Coatex, Den Braven and MLPC group levels; and
- cover all companies in which the Group has at least a 50% interest.

The quantitative and qualitative data concerning other employee and social information:

- are recorded in the AREA 2 application, accessible via the corporate intranet;
- are entered by human resources employees of the companies or regional organizations;
- are validated by the regional Human Resources directors or subsidiary managers; and
- cover all companies of 60 or more employees in which the Group has at least a 50% interest at 30 June of the reporting year, which accounts for 92.2% of the Group’s total headcount.

Any changes or corrections to prior-year data are noted in section 4.4.1 of this chapter.

4.5.3.2 CHOICE OF INDICATORS, MEASUREMENT METHODS AND USER INFORMATION

The Group has defined and tracks indicators relevant to its activities and its main risk and opportunity challenges.

The indicators relating to employee numbers and safety performance have been tracked since the Group's creation in 2006.

Additional employee information and indicators and social data have been reported since 2012 via the AREA 2 compilation system, in particular the number of training hours.

Employee data reporting is covered by different procedural documents in the form of AREA 1 and AREA 2 guidelines, which have been provided to all of the contributors and validators.

The calculation methods may have limitations and be subject to change, for example due to varying national labor legislation and practices, difficulties in reporting certain information in some regions, or the unavailability of certain data in some countries.

Food waste, food security and the responsible, equitable and sustainable production of food are not considered as risks for Arkema. As a result, this reference document does not include any information about combating food waste, ensuring food security or promoting the responsible, equitable and sustainable production of food.

4.5.3.3 DETAILS ON EMPLOYEE INFORMATION AND INDICATORS

Headcount

For the purposes of reporting, the headcount includes employees on payroll (employees present and employees whose employment contract, of any type, has been suspended) at 31 December of the reporting year.

Permanent employees are defined as employees that have signed an employment contract for an indefinite period of time. Outside France, employees hired on fixed-term contracts for periods of more than 12 months and renewed more than once are also included among permanent employees.

Employee categories

Data are presented by professional category. In France, manager status (*cadre*) is determined by the collective bargaining agreements governing the company concerned. Outside France, employees with a Hay job level of 10 or more are considered managers.

New hires

These data cover only the hiring of employees under permanent contracts, including the transformation of contracts (fixed-term into permanent contracts in France, for example).

Compensation

Collective bonus components are defined as components that vary depending on overall business criteria and the business and financial results of the employee's company. In France, these take the form of incentive and profit-sharing schemes.

Health and welfare

Health and welfare cover refers to benefits from a collective or mutual insurance plan providing cover for incapacity/disability/death risks.

Training

The data relate to training hours recorded for Group employees excluding e-learning courses.

Absenteeism

The absenteeism rate corresponds to the total number of hours of absence in the year (due to sickness, injuries, maternity leave, strikes and unpaid leave but excluding paid leave) divided by the total number of hours worked in the year.

Departures

Since 2016, departures are recorded only when the person leaves the Group, so that reported data no longer include inter-subsidiary transfers.

4.5.3.4 DETAILS ON R&D INFORMATION AND INDICATORS

Sustainable development patents

Number of original patent applications filed in the reporting year by the Group in response to sustainable development issues related to the UN Sustainable Development Goals, as described in section 4.2 of this chapter.

R&D expenditure

R&D expenditure is expressed as a percentage of consolidated revenue for the year.

Number of non-disclosure, cooperation and intellectual property agreements

The number of contracts corresponds to the non-disclosure, cooperation and intellectual property agreements signed by Arkema France during the year and recorded by the R&D department in its Athena database.

4.5.4 Indicators

		2018	2017	2016
SAFETY ⁽¹⁾				
Total recordable injury rate (TRIR)	per million hours worked	1.3	1.6	1.5
Lost-time injury rate (LTIR)	per million hours worked	0.8	0.6	0.9
Percentage of sites audited according to Arkema Integrated Management System (AIMS) standards	%	74	69	63
Percentage of sites practicing peer observation	%	64	59	56
Safety, environment and maintenance expenditure	€m	270	242	240
Percentage of OHSAS 18001-certified sites	%	47	46	47
Percentage of OHSAS 18001-certified sites in Europe	%	53	45	54
Percentage of OHSAS 18001-certified sites in the Americas	%	48	43	45
Percentage of OHSAS 18001-certified sites in Asia	%	58	49	34
ENVIRONMENT ⁽¹⁾				
Percentage of ISO 14001/RCMS-certified sites	%	54	52	52
Percentage of ISO 14001-certified sites in Europe	%	60	53	56
Percentage of RCMS-certified sites in the Americas	%	36	48	57
Percentage of ISO 14001-certified sites in Asia	%	60	54	34
AIR EMISSIONS				
Acidifying substances	t SO ₂ eq.	3,040	3,380	3,570
Carbon monoxide	t	940	860	690
Volatile organic compounds (VOCs)	t	4,150	4,280	4,800
Volatile organic compound (VOCs) EFPI		0.62	0.66	0.80
Dust	t	235	230	300
EFFLUENT RELEASES				
Chemical oxygen demand (COD)	t O ₂	2,170	2,440	2,600
Suspended solids	t	535	920	770
Chemical oxygen demand (COD) EFPI		0.59	0.70	0.78
WASTE				
Hazardous waste (excluding material recovery)	kt	159	155	157
• of which landfilled	kt	4	3.4	2.7
Hazardous waste recycled into materials	%	15	15	15
Hazardous waste burned as fuel	%	48	49	49
Non-hazardous waste	kt	278	242	256

		2018	2017	2016
RESOURCES				
Total water withdrawn	millions of cu.m	119	118	126
Net energy purchases	TWh	8.07	8.12	8.25
• of which in Europe	TWh	4.33	4.37	4.37
• of which in America	TWh	2.53	2.47	2.64
• of which in the Rest of the world	TWh	1.21	1.28	1.24
Energy EFPI		0.88	0.89	0.92
Net energy purchases by type				
• fuel	TWh	4.06	4.11	4.42
• electricity	TWh	2.72	2.76	2.71
• steam	TWh	1.29	1.25	1.12
Natural gas in net purchases of fuels	%	97	93	91
Low-carbon electricity in net energy purchases	%	22	18	17
Number of Arkenergy investments		50	60	51
• of which in Europe		26	41	31
• of which in the Americas		14	11	9
• of which in the Rest of the world		10	8	11
Number of ISO 50001-certified sites		30	29	22
GREENHOUSE GAS EMISSIONS				
Direct greenhouse gas emissions corresponding to the Kyoto Protocol	kt CO ₂ eq.	2,720	3,000	3,110
• of which CO ₂	kt CO ₂ eq.	1,480	1,430	1,540
• of which HFC	kt CO ₂ eq.	1,210	1,530	1,530
Direct greenhouse gas emissions corresponding to the Kyoto Protocol, by region				
• Europe	%	31	33	32
• Americas	%	55	54	56
• Rest of the world	%	14	13	12
Scope 2 indirect greenhouse gas emissions of CO ₂	kt	1,155	1,080	1,080
• of which in Europe	kt	291	302	255
• of which in the Americas	kt	373	378	425
• of which in the Rest of the world	kt	491	400	400
Scope 3 indirect greenhouse gas emissions of CO ₂ (to within 10%) ⁽²⁾	Mt	9.56	3.56	0.26
Direct GHG emissions EFPI		0.46	0.52	0.60
ADAPTING TO THE CONSEQUENCES OF CLIMATE CHANGE				
Number of sites exposed to a severe risk of storms and/or flooding		22	22	22
Sales from products made in full or in part from renewable raw materials	%	9	9	10

		2018	2017	2016
EMPLOYMENT ⁽¹⁾				
HEADCOUNT				
Total headcount at 31 December		20,010	19,779	19,637
• of which permanent employees		19,301	18,701	18,607
• of which fixed-term employees		709	1,078	1,030
Managers	%	27.3	26.9	26.2
Women	%	25.3	25.0	24.6
Women in senior management and executive positions (Hay grade 15 or higher)	%	21	19	18
Non-French nationals in senior management and executive positions (Hay grade 15 or higher)	%	39	37	39
Recruitments		1,833	1,616	1,694
Women recruitments	%	28.2	28.5	24.7
New hires aged 50 and over	%	9.5	9.4	7.9
New hires aged under 30	%	37.6	38.5	42.0
Departures		1,852	1,705	2,023
• of which resignations		1,004	862	866
• of which dismissals		322	332	428
• of which following a divestment/merger		0	0	324
Part-time employees	%	3.7	3.7	3.8
TRAINING				
Number of training hours	thousands	456	484	465
Number of training hours per employee		25	25	26
Number of employees who received training, excluding e-learning		17,111	16,161	16,256
Number of employees who took an e-learning course		15,042	10,496	9,298
Number of safety training hours	thousands	193	207	181
Number of safety training hours per employee trained		14	15	14
Number of employees who received safety training (excluding e-learning)		13,588	13,556	12,862
Number of employees who took safety-related e-learning courses		8,539	6,276	4,479
Number of environment-related training hours		15,795	22,665	19,029
Number of environment-related training hours per employee trained		4	6.6	6.3
Number of employees who received environment-related training (excluding e-learning)		3,919	3,398	3,012
Percentage of apprenticeships (Arkema France)	%		3.5	3.9
Proportion of Group employees benefiting from annual performance reviews	%	99	99	99
HEALTH AND WELFARE				
Absenteeism	%	3.9	3.9	3.7
Hours off work on medical grounds as a % of hours worked	%	2.7	2.8	2.6
Employees benefiting from medical care	%	93	94	92
Employees benefiting from supplementary disability cover	%	90	90	89
Employees benefiting from supplementary life cover	%	92	93	94
Employees covered by death benefits representing at least 18 months' salary	%	82	81	74

		2018	2017	2016
COMPENSATION				
Employees benefiting from minimum compensation guarantees	%	100	99.6	99.2
Employees benefiting from collective variable compensation components	%	68	67	68
Employees benefiting from individual variable compensation components	%	35	32	31
REPRESENTATION				
Percentage of employees benefiting from personnel representation and/or trade union representation	%	90	89	90
SOCIETAL ⁽¹⁾				
Number of Common Ground® initiatives		1,064	1,011	866
Group industrial sites taking part in Common Ground®	%	84	78	86
European industrial sites taking part in Common Ground®	%	73	73	84
North American industrial sites taking part in Common Ground®	%	73	85	92
Asian industrial sites taking part in Common Ground®	%	69	64	93
INNOVATION ⁽¹⁾				
Sustainable development patents addressing SDGs		154	150	116
R&D expenditure as a percentage of consolidated revenues	%	2.7	2.8	2.9
Number of non-disclosure, cooperation and intellectual property agreements signed by Arkema France		476	415	276
PRODUCT STEWARDSHIP				
Number of substances with REACH registration		425	406	317
Number of GPS sheets voluntarily published		145	145	145

(1) Indicators are defined in detail in the methodological notes in sections 4.5.1 and 4.5.2 of this chapter.

(2) The Scope 3 categories covered by this estimate are detailed in section 4.3.3.2.3 of this chapter.

4.5.5 Index of Global Reporting Initiative (GRI) content

The in accordance option chosen for GRI standards is "Essential Criteria".

Declaration of GRI compliance

Arkema applies the reporting principles and prepared its reporting in compliance with GRI : ESSENTIAL COMPLIANCE.

GRI reporting standards are essential to obtain a good quality CSR report.

Each reporting principle includes one requirement and guidelines relative to the principle's application procedures. In order to ensure a good quality approach, in line with GRI standards expectations, Arkema ensured the implementation of the tests indicated for each principle by MATERIALITY-Reporting, GRI DATA PARTNER for France. The index of contents is presented below.

GRI Standard	Item	Description	Location in reference document
GRI 101: GENERAL PRINCIPLES - 2016			
GRI 102: GENERAL STANDARD DISCLOSURES - 2016			
ORGANIZATIONAL PROFILE			
	102-1	Name of the organization	6.1.1 - Information about the Company
	102-2	Activities, brands, products and services	1.2 - Business overview
	102-3	Location of the organization's headquarters	6.1.1 - Information about the Company
	102-4	Location of operations	6.1.2 - Subsidiaries and shareholdings of the Company
	102-5	Capital and legal form	6.1.1 - Information about the Company
	102-6	Markets served	1.2 - Business overview
	102-7	Scale of the organization	1.2 - Business overview
	102-8	Information on employees and other workers	6.1.1 - Information about the Company
	102-9	Supply chain	4.4.1.2 - Employment/Total headcount and employees by region, gender and age
	102-10	Significant changes to the organization and its supply chain	1.4 - Raw materials and energy supply contracts 4.1.5 - Stakeholders and materiality analysis 4.2.1 - Management of the sustainable solutions portfolio 4.2.3 - Management of the solutions portfolio
	102-11	Precautionary principle or approach	2.2 - Comprehensive internal control and risk management procedures
	102-12	External initiatives	2.1.1 and 2.1.3 - Industrial safety, environmental and climate change risks
	102-13	Membership of associations	4.1 - Introduction 4.4.4.5 - Membership of the Together for Sustainability (TfS) initiative 4.4.6 - Corporate citizenship and philanthropy
STRATEGY			
	102-14	Statement from senior decision-maker	Message from the Chairman and CEO in the introduction of this document INNOVATIVE - Annual and sustainable development report 2017: OPINION section
	102-15	Key impacts, risks, and opportunities	4.4.1 - Main impacts, risks and opportunities 4.1.5 - Stakeholders and materiality assessment - Materiality analysis
ETHICS AND INTEGRITY			
	102-16	Values, principles, standards and norms of behavior	4.4.2 - Compliance and ethics
GOVERNANCE			

GRI Standard	Item	Description	Location in reference document
	102-18	Governance structure	4.1.4 - Participants in the CSR process 3.2 - Composition of administrative and management bodies
APPROACH TO STAKEHOLDER ENGAGEMENT			
	102-40	List of stakeholder groups	4.1.5 - Stakeholders and materiality assessment - Open dialogue
	102-41	Collective bargaining agreements	4.4.1.4 - Consultation and dialogue
	102-42	Identification and selection of stakeholders	4.1.5 - Stakeholders and materiality assessment - Open dialogue
	102-43	Approach to stakeholder engagement	4.1.5 - Stakeholders and materiality assessment - Open dialogue
	102-44	Key topics and concerns raised	4.1.5 - Stakeholders and materiality assessment - Open dialogue
REPORTING PRACTICE			
	102-45	Entities included in the consolidated financial statements	4.5.2.1 - Environmental reporting tools and scope 4.5.2.2 - Safety reporting tools and scope 4.5.3.1 - Social, employee and R&D reporting tools and scope
	102-46	Defining report content and topic boundaries	4.1.5 - Stakeholders and materiality assessment - Materiality analysis
	102-47	List of material topics	4.1.5 - Stakeholders and materiality assessment - Materiality analysis
	102-48	Restatements of information	1.2.1.3 - Overview of the High Performance Materials division - Highlights 1.2.2.3 - Overview of the Industrial Specialties division - Highlights 1.2.3.3 - Overview of the Coating Solutions division - Highlights
	102-49	Changes in reporting	4.5 - Reporting methodology
	102-50	Reporting period	4.5.1 - Reporting organization
	102-51	Date of most recent report	Page 1 footnote
	102-52	Reporting cycle	4.5.1 - Reporting organization
	102-53	Contact point for questions regarding the report	8.2 - Person responsible for the information
	102-54	Claims of reporting in accordance with the GRI Standards	4.5.1 - Reporting organization 4.5.5 - Index of GRI content
	102-55	GRI content index	4.5.5 - Index of GRI content
	102-56	External assurance	4.5.6 - Independent third-party opinion pursuant to the provisions of article L. 225-102-1 of the French Commercial Code

GRI 200-300-400: SPECIFIC STANDARD DISCLOSURES - 2016

ECONOMIC PERFORMANCE

GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy
	103-2	Description of managerial approach	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy
	103-3	Evaluation of the managerial approach	4.2.3 - Management of the solutions portfolio
GRI 201: Economic performance - 2016	201-1	Direct economic value generated and distributed	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy 5.3.2 - Consolidated financial statements at 31 December 2018

INDIRECT ECONOMIC IMPACTS

GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy
	103-2	Description of managerial approach	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy
	103-3	Evaluation of the managerial approach	4.4.5 - Institutional initiatives



GRI Standard	Item	Description	Location in reference document
GRI 203: Indirect economic impacts - 2016	203-1	Infrastructure investments and philanthropy	4.2.3 - Management of the solutions portfolio 4.4.6 - Corporate citizenship and philanthropy
PROCUREMENT PRACTICES			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.4 - Suppliers and subcontractors
	103-2	Description of managerial approach	4.4.4 - Suppliers and subcontractors
	103-3	Evaluation of the managerial approach	4.4.4 - Suppliers and subcontractors
GRI 204: Procurement practices - 2016	204-1	Proportion of spending on local suppliers	4.4.4 - Suppliers and subcontractors
ANTI-CORRUPTION			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.2 - Compliance and ethics
	103-2	Description of managerial approach	4.4.2 - Compliance and ethics
	103-3	Evaluation of the managerial approach	4.4.2 - Compliance and ethics
GRI 205: Anti-corruption - 2016	205-1	Operations assessed for risks related to corruption	4.4.2 - Compliance and ethics
	205-2	Communication and training on anti-corruption policies and procedures	4.4.2 - Compliance and ethics
MATERIALS			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-2	Description of managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
GRI 301: Materials - 2016	301-1	Materials used by weight or volume	4.3.3.3.3 - Raw materials consumption
	301-2	Recycled materials used	4.3.3.3.4 - Circular economy
ENERGY			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-2	Description of managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
GRI 302: Energy - 2016	302-1	Energy consumption within the organization	4.3.3.2.2 - Energy
	302-4	Reduction of energy consumption	4.3.3.2.2 - Energy
	302-5	Reduction in energy requirements of products and services	4.3.3.2.2 - Energy
WATER			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-2	Description of managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
GRI 303: Water - 2016	303-1	Water withdrawal by source	4.3.3.3.2 - Water use
	303-2	Management of water discharge related impacts	4.3.3.3.2 - Water use
BIODIVERSITY			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.3.4 - Biodiversity
	103-2	Description of managerial approach	4.3.3.4 - Biodiversity
	103-3	Evaluation of the managerial approach	4.3.3.4 - Biodiversity

GRI Standard	Item	Description	Location in reference document
GRI 304: Biodiversity - 2016	304-2	Significant impacts of activities, products and services on biodiversity	4.3.3.4 - Biodiversity
EMISSIONS			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management 4.3.3.2 - Climate change
	103-2	Description of managerial approach	4.3.1 - Health, safety and environment management 4.3.3.1 - Environmental management 4.3.3.2 - Climate change
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and environment management 4.3.3.1 - Environmental management 4.3.3.2 - Climate change
GRI 305: Emissions - 2016	305-1	Direct GHG emissions (Scope 1)	4.3.3.2.1 - Scope 1 and 2 greenhouse gas emissions
	305-2	Indirect GHG emissions (Scope 2)	4.3.3.2.1 - Scope 1 and Scope 2 greenhouse gas emissions
	305-3	Other indirect GHG emissions (Scope 3)	4.3.3.2.3 - Scope 3 emissions inventory
	305-4	GHG emissions intensity	4.3.3.2.1 - Scope 1 and Scope 2 greenhouse gas emissions/Intensive indicator for direct greenhouse gas emissions
	305-5	Reduction of GHG emissions	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management 4.3.3.2 - Climate change
	305-7	Emissions of nitrogen oxides (NOx), sulfur oxides (SOx) and other significant atmospheric emissions	4.3.3.4.2 - Emissions into air, water and soil/Absolute indicators for air emissions
EFFLUENTS AND WASTE			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.3.3.4 - Circular economy - Waste 4.3.3.4.2 - Emissions into air, water and soil - discharge into water 4.3.3.4.3 - Management of legacy pollution and soil protection
	103-2	Description of managerial approach	4.3.3.3.4 - Circular economy - Waste 4.3.3.4.2 - Emissions into air, water and soil - discharge into water 4.3.3.4.3 - Management of legacy pollution and soil protection
	103-3	Evaluation of the managerial approach	4.3.3.3.4 - Circular economy - Waste 4.3.3.4.2 - Emissions into air, water and soil - Discharge into water 4.3.3.4.3 - Managing legacy pollution and protecting the soil
GRI 306: Effluents and waste - 2016	306-1	Water discharge by quality and destination	4.3.3.4.2 - Emissions into air, water and soil - Discharge into water
	306-2	Waste by type and disposal method	4.3.3.3.4 - Circular economy - Waste
	306-3	Significant spills	4.3.3.3.4 - Circular economy - Waste
	306-4	Transportation of hazardous waste	4.3.3.3.4 - Circular economy - Waste
ENVIRONMENTAL COMPLIANCE			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-2	Description of managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and the environment 4.3.3.1 - Environmental management

GRI Standard	Item	Description	Location in reference document
GRI 307: Non-compliance with environmental laws and regulations - 2016	307-1	Non-compliance with environmental laws and regulations	4.3.1.2 - Management systems and audits
SUPPLIER ENVIRONMENTAL ASSESSMENT			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.4 - Suppliers and subcontractors
	103-2	Description of managerial approach	4.4.4 - Suppliers and subcontractors
	103-3	Evaluation of the managerial approach	4.4.4 - Suppliers and subcontractors
GRI 308: Supplier environmental assessment - 2016	308-1	New suppliers that were screened using environmental criteria	4.4.4 - Suppliers and subcontractors
	308-2	Negative environmental impacts in the supply chain and actions taken	4.4.4 - Suppliers and subcontractors
EMPLOYMENT			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.1.1 - Social management 4.4.1.2 - Employment
	103-2	Description of managerial approach	4.4.1.1 - Social management 4.4.1.2 - Employment
	103-3	Evaluation of the managerial approach	4.4.1.1 - Social management 4.4.1.2 - Employment
GRI 401: Employment - 2016	401-1	New employee hires and employee turnover	4.4.1.2 - Employment - Total headcount and employees by region, gender and age 4.4.1.2 - Employment - Recruitments and departures
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	4.4.1.2 - Employment - Organization of working time 4.4.1.2 - Employment - Compensation and changes in compensation 4.4.1.2 - Employment - Pension, health and welfare benefits 5.3.3 - Notes to consolidated financial statements - Note 25: Employer's welfare contributions 6.2.7 Share capital increase reserved for employees
OCCUPATIONAL HEALTH AND SAFETY			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.1 - Health, safety and the environment 4.3.2.2 - Employee health and safety
	103-2	Description of managerial approach	4.3.1 - Health, safety and the environment 4.3.2.2 - Employee health and safety
	103-3	Evaluation of the managerial approach	4.3.1 - Health, safety and the environment 4.3.2.2 - Employee health and safety
GRI 403: Occupational health and safety - 2016	403-2	Hazard identification, risk assessment, and incident investigation	4.3.2.2 - Employee health and safety 4.4.1.2 - Employment - Absenteeism
	403-3	Workers with high incidence or high risk of diseases related to their occupation	4.3.2.2 - Employee safety and health 4.3.2.2.1.4 - Occupational illnesses
	403-4	Health and safety topics covered in formal agreements with trade unions	4.3.2.2.2 - Health at work
TRAINING AND EDUCATION			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.1.3 - Training and personal development
	103-2	Description of managerial approach	4.4.1.3 - Training and personal development
	103-3	Evaluation of the managerial approach	4.4.1.3 - Training and personal development
GRI 404: Training and education - 2016	404-1	Average hours of training per year per employee	4.4.1.3 - Training and personal development - Training policy

GRI Standard	Item	Description	Location in reference document
	404-2	Programs for upgrading employee skills and transition assistance programs	4.4.1.3 - Training and personal development - Special professional training programs for employees 4.4.1.3 - Training and personal development - Career management
	404-3	Percentage of employees receiving regular performance and career development reviews	4.4.1.3 - Training and personal development - Career management
DIVERSITY AND EQUAL OPPORTUNITIES			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.1.5 - Diversity, equal opportunity and equal treatment
	103-2	Description of managerial approach	4.4.1.5 - Diversity, equal opportunity and equal treatment
	103-3	Evaluation of the managerial approach	4.4.1.5 - Diversity, equal opportunity and equal treatment
GRI 405: Diversity and equal opportunity - 2016	405-1	Diversity of governance bodies and employees	4.4.1.5 - Diversity and equal opportunity, equal treatment 4.4.1.2 - Employment - Total headcount and employees by region, gender and age
	405-2	Ratio of basic salary and remuneration of women to men	4.4.1.5 - Diversity and equal opportunity, equal treatment - Measures to promote gender equality
FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.1.4 - Consultation and dialogue
	103-2	Description of managerial approach	4.4.1.4 - Consultation and dialogue
	103-3	Evaluation of the managerial approach	4.4.1.4 - Consultation and dialogue
GRI 407: Freedom of association and collective bargaining - 2016	407-1	Operations and suppliers with the right to freedom of association	4.4.1.4 - Consultation and dialogue
CHILD LABOR			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.3 - Human rights
	103-2	Description of managerial approach	4.4.3 - Human rights
	103-3	Evaluation of the managerial approach	4.4.3 - Human rights
GRI 408: Child labor - 2016	408-1	Operations and suppliers at significant risk for incidents of child labor	4.4.3 - Human rights
FORCED OR COMPULSORY LABOR			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topic and its boundary	4.4.3 - Human rights
	103-2	The management approach and its components	4.4.3 - Human rights
	103-3	Evaluation of the managerial approach	4.4.3 - Human rights
GRI 409: Forced or compulsory labor - 2016	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	4.4.3 - Human rights
SECURITY PRACTICES			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.3.2.2 - Employee health and safety
	103-2	Description of managerial approach	4.3.2.2 - Employee health and safety
	103-3	Evaluation of the managerial approach	4.3.2.2 - Employee health and safety
GRI 410: Security practices - 2016	410-1	Security personnel trained in human rights policies or procedures	4.3.2.2 - Employee health and safety

GRI Standard	Item	Description	Location in reference document
HUMAN RIGHTS ASSESSMENT			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.2 - Compliance and ethics 4.4.3 - Human rights
	103-2	Description of managerial approach	4.4.2 - Compliance and ethics 4.4.3 - Human rights
	103-3	Evaluation of the managerial approach	4.4.2 - Compliance and ethics 4.4.3 - Human rights
GRI 412: Human rights assessment - 2016	412-2	Employee training on human rights policies or procedures	4.4.2 - Compliance and ethics 4.4.3 - Human rights
	412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	4.4.2 - Compliance and ethics 4.4.3 - Human rights
LOCAL COMMUNITIES			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.6 - Corporate citizenship and philanthropy
	103-2	Description of managerial approach	4.4.6 - Corporate citizenship and philanthropy
	103-3	Evaluation of the managerial approach	4.4.6 - Corporate citizenship and philanthropy
GRI 413: Local communities - 2016	413-1	Operations with local community engagement, impact assessments, and development program	4.4.6 - Corporate citizenship and philanthropy
SUPPLIER SOCIAL ASSESSMENT			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.4 - Suppliers and subcontractors
	103-2	Description of managerial approach	4.4.4 - Suppliers and subcontractors
	103-3	Evaluation of the managerial approach	4.4.4 - Suppliers and subcontractors
GRI 414: Supplier social assessment - 2016	414-1	New suppliers screened to environmental criteria	4.4.4 - Suppliers and subcontractors
	414-2	Negative social impacts in the supply chain and actions taken	4.4.4 - Suppliers and subcontractors
CUSTOMER HEALTH AND SAFETY			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.2.4 - Responsible product stewardship
	103-2	Description of managerial approach	4.2.4 - Responsible product stewardship
	103-3	Evaluation of the managerial approach	4.2.4 - Responsible product stewardship
GRI 416: Customer health and safety - 2016	416-1	Assessment of the health and safety impacts of product and service categories	4.2.4 - Responsible product stewardship
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	4.2.4 - Responsible product stewardship
MARKETING AND LABELING			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.2.4 - Responsible product stewardship
	103-2	Description of managerial approach	4.2.4 - Responsible product stewardship
	103-3	Evaluation of the managerial approach	4.2.4 - Responsible product stewardship
GRI 417: Marketing and labeling - 2016	417-1	Requirements for product and service information and labeling	4.2.4.1 - Regulatory compliance
	417-2	Incidents of non-compliance concerning product and service information and labeling	4.2.4.1 - Regulatory compliance
	417-3	Incidents of non-compliance concerning marketing communications	4.2.4.1 - Regulatory compliance
SOCIOECONOMIC COMPLIANCE			
GRI 103: Managerial approach - 2016	103-1	Explanation of the material topics and their scope	4.4.2 - Compliance and ethics
	103-2	Description of managerial approach	4.4.2 - Compliance and ethics
	103-3	Evaluation of the managerial approach	4.4.2 - Compliance and ethics
GRI 419: Socioeconomic compliance - 2016	419-1	Non-compliance with social and economic laws and regulations	4.4.2 - Compliance and ethics

4.5.6 Independent third-party opinion pursuant to article L. 225-102-1 of the French Commercial Code

REPORT BY OF THE STATUTORY AUDITORS, APPOINTED AS AN INDEPENDENT THIRD PARTY, ON THE CONSOLIDATED NON-FINANCIAL PERFORMANCE STATEMENT IN THE MANAGEMENT REPORT

For the year ended 31 December 2018

This is a free translation into English of the statutory auditor's report issued in French and is provided solely for the convenience of English speaking readers. This report should be read in conjunction with, and construed in accordance with, French law and professional standards applicable in France.

To the Shareholders,

In our capacity as Statutory Auditor, appointed as an independent third party, of Arkema S.A., certified by the French Accreditation Committee (*Comité Français d'Accréditation* or COFRAC) under number 3-1049 ⁽¹⁾, we hereby report to you on the consolidated non-financial performance statement for the year ended 31 December 2018 (hereinafter the "Statement"), included in the Group Management Report, in accordance with the legal and regulatory provisions of Articles L.225-102-1, R. 225-105 and R.225-105-1 of the French Commercial Code (*Code de commerce*).

Responsibility of the company

It is the Management Board's responsibility to prepare a Statement in accordance with legal and regulatory provisions, including a presentation of the business model, a description of the main non-financial risks, a presentation of policies applied to mitigate these risks and the outcomes of those policies, including key performance indicators.

The Statement has been prepared applying the procedures of the Company, (hereinafter the "Procedures"), the most significant aspects of which are presented in the Statement and available upon request at the company's headquarters.

Independence and quality control

Our independence is defined by the provisions of Article L.822-11-3 of the French Commercial Code (*Code de commerce*) and the French Code of Ethics (*Code de déontologie*) for statutory auditors. Moreover, we have implemented a quality control system that includes documented policies and procedures to ensure compliance with applicable ethical rules, professional standards, laws and regulations.

Statutory Auditor's responsibility

On the basis of our work, it is our responsibility to express a limited assurance opinion about whether:

- the Statement complies with the provisions of Article R. 225-105 of the French Commercial Code (*Code de Commerce*);
- the information provided (hereinafter the "Information") is fairly presented in accordance with Article R.225-105-I(3) and II of the French Commercial Code (*Code de commerce*) concerning policy outcomes, including key performance indicators and actions relating to the main risks;

However, it is not our responsibility to express an opinion on:

- the company's compliance with any other applicable legal and regulatory provisions, relating, in particular, to the duty of care requirement and the fight against corruption and tax evasion;
- the compliance of products and services with applicable regulatory provisions.

(1) Scope available at www.cofrac.fr

Nature and scope of our work

We performed our work described below in compliance with Article A.225-1 et seq. of the French Commercial Code (*Code de commerce*), defining the conditions under which the independent third party performs its engagement, and with the professional guidance issued by the French Institute of Statutory Auditors (*Compagnie nationale des commissaires aux comptes* or CNCC) relating to this engagement, and with ISAE 3000 (International standard on assurance engagements other than audits or reviews of historical financial information).

We conducted work to form an opinion on the Statement's compliance with legal and regulatory provisions and the fair presentation of the Information therein:

- We gained an understanding of the activity of all companies in the consolidation scope, of the Entity's exposure to the main social and environmental risks relating to the business activity and, if applicable, of its effects on respect for human rights and the fight against corruption and tax evasion, including any related policies and their outcomes;
- We assessed the appropriateness of the Procedures in terms of their relevance, completeness, reliability, neutrality and clarity, by taking into consideration, where relevant, the sector's best practices;
- We verified that the Statement covers every category of information required under Article L.225-102-1, Paragraph III concerning social and environmental matters as well as respect for human rights and the fight against corruption and tax evasion;
- We verified that the Statement presents the business model and the main risks relating to the activity of all companies in the consolidation scope, including – if relevant and proportionate – risks due to its business relationships, products or services, in accordance with the disclosures required under Article R. 225-105-I, and policies, due diligence procedures and outcomes, including key performance indicators;
- We verified that the Statement presents the disclosures required under article R. 225-105-II if they are relevant given the main risks or policies presented;
- We obtained an understanding of the process for identifying, prioritizing and validating the main risks;
- We enquired about the existence of internal control and risk management procedures implemented by the company;
- We verified that the Statement covers all companies in the consolidation scope in accordance with Article L. 233-16 within the limits specified in the Statement;
- We assessed the data collection process implemented by the Company to ensure the completeness and fair presentation of the policy outcomes and key performance indicators that must be mentioned in the Statement;
- For key performance indicators and the other quantitative outcomes⁽²⁾ that we considered the most important, we set up:
 - analytical procedures to verify that data collected are correctly consolidated and that any changes to the data are consistent;
 - tests of details based on sampling to verify that definitions and procedures are correctly applied and to reconcile data with supporting documents. The work was carried out with a selection of entities contributing⁽³⁾ to the reported data and represents between 12% and 87% of consolidated data of key performance indicators and outcomes selected for these tests;
- We referred to documentary sources and conducted interviews to corroborate the due diligence procedures that we deemed the most important⁽⁴⁾ (organization, policies, actions, qualitative outcomes);
- We assessed the overall consistency of the Statement based on our understanding of the company.

(2) Total headcount as at 31/12 and breakdown by age, gender and geographical area; Total recruits and leavers on permanent position; Number of training hours; Number of absenteeism hours; Percentage of women in management position; Percentage of employees benefiting from personnel representation and/or trade union representation; Percentage of employees benefiting from regular medical check-ups; TRIR (Total Recordable Injury Rate); LTIR (Lost Time Injury Rate); PSER (Process Safety Event Rate); Percentage of sites implementing peer observation; Percentage of AIMS (Arkema Integrated Management System) audited sites; Net purchases of energy; Direct greenhouse gas emissions (Scope 1); Indirect greenhouse gas emissions (Scope 2); Indirect greenhouse gas emissions (Scope 3 – Category 9); HFC emissions (hydrofluorocarbons); VOC emissions (Volatile Organic Compounds); Total substances contributing to acidification; Water withdrawn; COD (Chemical Oxygen Demand); Hazardous waste; Number of first patent applications filed by the Group in response to sustainable development issues; Number of "Common Ground[®]" initiatives.

(3) Arkema France S.A. of which plants in Villers-Saint-Paul, Lacq and Lannemezan; Arkema Inc. of which plant in Calvert City (USA); Bostik Inc. (USA); Arkema S.r.l.: plants in Rho and Spinetta Marengo (Italy); Arkema Investment Co., Ltd., Arkema Fluorochemical Co., Ltd., Arkema Daikin Advanced Fluorochemicals Co., Ltd., Arkema Chemicals Co., Ltd., Arkema Polyimides Co., Ltd., Changshu Haiké Chemical Co., Ltd.: plant in Changshu (China).

(4) Social dialogue; Occupational health and safety conditions; Policies implemented in training; Measures taken to promote equal treatment; Company organisation to take environmental issues into account; Measures to prevent, reduce or repair releases to air, water and soil seriously affecting the environment; Water consumption and water supply adapted to local constraints; Energy consumption and measures implemented to improve energy efficiency; Significant greenhouse gas emissions items generated as a result of the Group's activity, particularly by the use of goods and services they provide; Relationships with individuals or organisations affected by the group's operations; Importance of subcontracting and consideration, in the relationship with subcontractors and suppliers of their social and environmental responsibility; Consideration of social and environmental issues in the company's purchasing policy; Actions taken to prevent corruption; Actions in favor of human rights.

We believe that the sampling methods and sample sizes we have used, based on our professional judgment, are sufficient to provide a basis for our limited assurance opinion. A higher level of assurance would have required us to carry out more extensive procedures. Due to the use of sampling techniques and other limitations inherent to information and internal control systems, the risk of not detecting a material misstatement in the Statement cannot be totally eliminated.

Means and resources

Our work drew on the skills of seven individuals. To assist us in conducting our work, we called on our firm's sustainable development and corporate social responsibility specialists. We conducted around twenty interviews with the individuals responsible for preparing the Statement.

Conclusion

Based on our work, and given the scope of our responsibilities, we have no material misstatements to report that would call into question the Statement's compliance with the applicable regulatory provisions, or the fair presentation of the information, taken as a whole, in accordance with the Procedures.

Comments

Without qualifying our opinion, in accordance with article A. 225-3 of the French Commercial Code (*Code de commerce*), we draw your attention to the following matter:

- We draw your attention to the methodological limitations noted on the indicator "Greenhouse gas emissions related to the transport and distribution of products", as mentioned in paragraph 4.5.2 of the reference document including the management report. An improvement approach is ongoing to reduce the uncertainty associated with the reporting process of this data.

Paris-La Défense, 26 February 2019

KPMG S.A.

Anne Garans
Partner
Sustainability Services

François Quédiniac
Partner

4.5.7 Contacts

See section 8.2 of this document.

APPENDIX 1 : INNOVATION STRATEGY



1.1 INNOVATION STRATEGY

Clearly defined in a Group policy in 2018, innovation is a strategic pillar in Arkema's targeted growth strategy and a key component in its contribution to sustainable development. Innovation enables Arkema to:

- design and develop products and solutions while continually improving their performance;
- anticipate market trends, by capitalizing on the Group's commercial excellence, and develop today the products its customers will need in the years ahead; and
- enhance the Group's operational excellence by providing production facilities with new technologies and processes, thereby enabling the Group to produce safely and competitively while limiting its environmental footprint, in line with its commitment to being a responsible chemicals producer.

Whether aimed at manufacturing technologies, products or their applications, innovation makes it possible to create sustainable solutions.

This strategy of growth through innovation is supported by:

- a dedicated organization;
- a portfolio of research and development (R&D) projects;
- patent and trademark management;
- a research incubator;
- a collaborative innovation ecosystem; and
- development of digital.

1.1.1 A dedicated organization

The Group's innovation structure is organized in a way that allows all stakeholders to contribute. It is based on:

- a Research and Development department that reports directly to the Chairman and Chief Executive Officer. The R&D department coordinates all of Arkema's research programs worldwide, the development of long-term research platforms and the implementation of partnerships. It also ensures that all innovation projects funded by Arkema's various Business Lines and businesses are scientifically and technologically relevant and in line with the Group's overall strategy. Lastly, it creates and steers corporate R&D programs and identifies disruptive development opportunities and new research areas;
- a Scientific Committee comprising representatives from the Sustainable Development department, the Process department, the Intellectual Property department, the Business Lines' global R&D departments, the scientific departments and the Group's main R&D centers; and
- research centers spread across the three regional hubs (Europe, North America and Asia).

The scientific and technological knowledge of Arkema's R&D teams is further strengthened by world-renowned scientific advisors from the academic world, as well as numerous academic and industrial partnerships.

In 2018, R&D expenditure totalled €237 million, representing 2.7% of Group sales. R&D expenditure as a percentage of sales varies between businesses. It is notably higher in specialty areas and particularly in the High Performance Materials division, where R&D helps find solutions for customers and respond to the

major sustainable development trends. In 2018, Arkema's R&D teams comprised more than 1,600 researchers, spread across three regional research and innovation hubs.

R&D efforts break down among Arkema's three divisions and its corporate research program as follows:

- the corporate research program represents 10% of Arkema's R&D expenses.
Defined by the R&D department and subject to the approval of Arkema's Executive Committee, the program aims to prepare the breakthrough innovations that are driven by megatrends and will be developed commercially by the Group's divisions at a later stage;
- the High Performance Materials division accounts for 51% of Arkema's R&D expenses.

Its R&D efforts focus in particular on the materials of tomorrow and the techniques for assembling them. Innovations combining performance with sustainable development include materials made from renewable feedstocks, materials and adhesives with a low environmental impact, lightweight materials for transportation as well as structural adhesives used to join these materials, and functional adhesives for construction and industry. The High Performance Materials division fuels its growth by expanding its product range and by adapting the performance and functions of its products to new market demands. The division's technical excellence is reflected in the strength of brands such as Rilsan[®], Pebax[®], Luperox[®], Kynar[®], Sartomer[®] and Bostik[®], and in the widespread consumer awareness of retail brands like Sader[®] and Quelyd[®];

- the Industrial Specialties division represents 22% of Arkema's R&D expenses.

Its R&D objectives focus on ensuring that the division's processes are competitive and finding new applications and end markets for its products. One of its primary objectives is to continuously improve its main processes, such as those used for fluorochemicals, thiochemicals and hydrogen peroxide, in order to make them safer, more reliable, more productive and therefore more competitive, while minimizing their environmental impact. To this end, R&D teams study the benefits of new raw materials, test new catalysts and reactor types and develop new synthesis pathways. They also contribute to the

development of new products such as the new HFO low global warming potential (GWP) refrigerants; and

- the Coating Solutions division accounts for 17% of Arkema's R&D expenses.

Its R&D teams develop innovative solutions for the coatings market while combining technical performance with sustainable development. In addition to working closely with customers to provide responsive technical support, the division's R&D teams also carry out process research, which enables them to optimize production costs and produce new formulas on an industrial scale.

1.1.2 A portfolio of research and development projects

Global population growth is already driving up demand for drinking water and energy, as well as in the areas of health and well-being or transportation. It is also having an impact on climate change, biodiversity and the availability of resources. Against this backdrop, and based on a forward-looking analysis of global megatrends, the Group is driving growth through innovation via a portfolio of R&D projects that provide solutions to economic and social challenges and contribute to the United Nation's 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). For further details, see section 4.1.1 of this document.

The Group's analysis led to the definition of the following six cross-business platforms, which target areas with strong development potential and form the base of its portfolio of R&D projects:

- bio-based products;
- lightweight materials and design;
- new energies;
- water management;
- electronics solutions; and
- home efficiency and insulation.

In addition to these six market-oriented innovation platforms, the Group also has a number of technology platforms focused on generating innovative production methods that promote the principles of eco-design. These platforms are described in section 1.1.2.7 of this chapter.

The innovation work carried out within these platforms is supplemented by the Business Lines' ongoing efforts to improve their product ranges, in order to meet market and customer expectations.

Arkema's corporate social responsibility dimensions are integrated into the management of all its R&D projects. When identifying the risks and opportunities of each project, Arkema takes into account the entire value chain, from raw materials to end products, as well as the UN Sustainable Development Goals. For further details, see section 4.2.3 of this document.

1.1.2.1 BIO-BASED PRODUCTS PLATFORM



Global population growth, rising living standards and industrial intensification are all driving an increase in the use of fossil fuels and therefore contribute to global warming. Mindful of the need to reduce the use of non-renewable fossil resources, Arkema has long been involved in the development of bio-based products, thereby supporting the United Nations' SDG 12: "Ensure sustainable consumption and production patterns".

Arkema has developed a wide range of bio-based polyamides derived from the castor oil plant, which is mainly cultivated in water-scarce regions of India. These unique products are used in a wide variety of markets, including the automotive, energy, optics and electronics markets.

Arkema's portfolio of bio-based polyamides has expanded considerably since production began over 70 years ago. With the Pebax® Rnew range, for example, Arkema has developed thermoplastic elastomers that deliver outstanding energy return, lightness, shock resistance and durability. Offering a very broad spectrum of flexibility, this range of polymers has become the standard for ski boots and sport shoe soles.

FOCUS

The Pebax® elastomer stays ahead of the game

70% of the soccer players involved in the 2018 World Cup in Russia had Pebax® in the soles of their shoes. Pebax® foam helps to make shoes lighter and outer soles thinner, without compromising on rigidity and robustness. Pebax® Powered shoes are also favored by the world's top soccer players because they offer exceptional resistance to repeated deformation and bending; their soles can be bent a million times without deterioration. The other key advantage of elastomers is their ability to deliver maximum energy return.

The Group's expertise and innovation in renewable polyamides enables it to offer:

- products that are both flexible and heat-resistant, such as the Rilsan® HT range for the transportation market. These polyamides offer outstanding performance, enabling them to replace metal parts to help lighten vehicles and, by extension, reduce vehicle emissions;
- highly transparent materials such as Rilsan® Clear Rnew, for applications in the eyewear industry;
- rigid materials designed to serve as reinforcements in composites, such as Platamid® or the Rilsan® XD range designed for the numerous structural parts found in telephones, tablets and other mobile devices; and
- Orgasol® ultrafine polyamide powders, which are primarily used in cosmetics for their sensorial properties.

Arkema has also developed a special sulfur-based intermediate for the production – by its partner, South Korea-based CJ CheilJedang – of L-methionine, a methionine from renewable sources produced by replacing the use of propylene with a unique bio-fermentation process. These innovations have been implemented at the Kerteh production facility in Malaysia. The remarkable results obtained have led Arkema to study enzyme catalysis as a synthesis process for other products in its portfolio (see section 1.1.5 of this chapter).

The Group's ongoing commitment to bio-based products is demonstrated by the fact that products at least 20% made from renewable raw materials account for around 9% of Group sales.

1.1.2.2 LIGHTWEIGHT MATERIALS AND DESIGN PLATFORM



Global population growth, rising living standards, increased transportation and urbanization, as well as the faster pace of industrialization in emerging markets are all factors that contribute to global warming. By developing solutions that

can be used to reduce the weight of land and air vehicles and thereby lower fuel consumption, Arkema contributes to the United Nations' SDG 13: "Take urgent action to combat climate change and its impacts".

The polymers developed by Arkema are ideally positioned to support this trend, be they high-temperature polyamides designed to replace certain metal components in car engines (Rilsan® HT), structural adhesives that substitute for metal attachment systems, or composite materials.

3D printing also helps to meet this goal. By enabling the design of complex parts, 3D printing technology simplifies assembly and makes it possible to replace the metal parts traditionally derived from smelting or tooling, with a subsequent reduction in weight. Additive manufacturing optimizes design, driving a reduction in the raw materials used and in the losses incurred during the prototyping phase.

Composite materials

The development of thermoplastic composite materials, and their assembly with adhesives, is a good illustration of the research platform's work. Current carbon- or glass-fiber-based composites make heavy use of thermoset polymers, for which the cross-linking process is irreversible. These resins present two limitations: they cannot be recycled and their production cycle time makes them difficult to use in high throughput industries such as automotive.

To address this challenge, Arkema has developed thermoplastic-polymer-based composites with innovative resins (Elium®, Kepstan® and Rilsan®), which are adapted to the specific needs of various markets. The recyclable Elium® resin, for example, is used in applications in the automotive and wind turbine industries, while Kepstan® PEKK makes it possible to obtain particularly hard-wearing and flame-retardant parts that meet the stringent specifications of the aerospace industry. In terms of performance, replacing steel parts with Elium® substitutes is expected to deliver weight savings of between 30% and 50%.

FOCUS

Hexcel and Arkema signed a strategic alliance in 2018 to develop thermoplastic composite solutions for the aerospace sector combining the expertise of Hexcel in carbon fibers and that of Arkema in polyetherketoneketone (PEKK). The partnership aims to develop carbon fiber-reinforced thermoplastic tapes to produce lightweight parts for future generations of aircraft. In addition to lightweighting, these new composites will provide lower cost and faster production speeds for customers in the aerospace and defense sectors. As part of this partnership, a joint research and development laboratory has been set up in France.

In addition, Arkema's R&D teams are assessing the processes for recycling the polymers used in thermoplastic composites, which will enable users to recycle their waste via dedicated channels.

3D printing

The Lightweight materials and design platform places particular emphasis on additive manufacturing (3D printing) technologies, which are enjoying fast growth in the aerospace, electronics, automotive and healthcare industries. The Group's product range has grown significantly more diversified in recent years and now includes Rilsan® polyamide 11 powders, Kepstan® PEKK powders and UV curable N3xtDimension® resins. In this way, Arkema has stepped up development to occupy a unique position, with a range that now covers all additive manufacturing technologies: powder bed fusion, filament extrusion and UV curing.

In 2018, the Group opened a center of excellence dedicated to 3D printing at its US Sartomer facility in Exton, Pennsylvania (PA). Arkema has two other R&D centers of excellence dedicated to the development of advanced materials for additive manufacturing: one in King of Prussia, PA in the United States for filament extrusion technologies and one in Serquigny, France for powder bed fusion technologies. In addition, Arkema launched a commercial platform dedicated to 3D printing. Named "3D Printing Solutions by Arkema", the new platform aims to meet the needs of end customers by offering them development partnerships, a unique range of materials and services and Arkema's application-oriented expertise.

1.1.2.3 NEW ENERGIES PLATFORM



The development of new energies is a megatrend driven by the world transition to a less fossil-fuel-dependent economy. Through its platform and the innovative solutions it generates, the Group is contributing to the fight against climate change and to the United Nations' SDG 7: "Ensure access to affordable, reliable, sustainable and modern energy" and SDG 13: "Take urgent action to combat climate change and its impacts".

Innovative polymer materials and chemicals are used to varying degrees in the new energy solutions currently available, including rechargeable batteries, photovoltaic panels, heat-transfer fluids which transport the heat generated by solar energy, wind turbines and solar thermal power plants.

Thanks to its technological expertise, Arkema offers these various markets a number of innovative solutions.

Solutions for batteries

Thanks to innovation in materials, binders and electrolytes, Arkema has a range of solutions designed for use in the development of batteries.

The Kynar® fluoropolymer, for example, is used in lithium-ion batteries for several applications – in electrodes as the binder for the active phase and as a protective coating for the separator. These

products play a very important role in the battery's lifespan and performance. They are therefore the focus of continuous innovation.

Lithium salts, synthesized from the Group's various chemistries are also used inside batteries, to move lithium ions from one electrode to the other. Battery manufacturers need lithium salts, like the Foranext® electrolyte, that can withstand the increasingly demanding conditions of use, including high temperatures and rising electrochemical potential.

Materials for photovoltaic cells

Photovoltaic cells are made up of a number of highly technical organic materials that protect the silicium layer from outside elements. Arkema harnesses its performance materials expertise to bring this market a large number of innovations, such as:

- Apolhya® grafted polyolefins, which are used for the encapsulation or protection of photovoltaic cells;
- Kynar® fluoropolymers, for backsheet protection; and
- Bostik ViteI® polyester adhesives, which are used for binding photovoltaic backsheets.

Heat-transfer fluids for solar energy applications

The Jarysol® fluids developed by the Group are particularly well adapted to the transfer of heat from concentrated solar power plants.

Materials and products for the wind turbine industry

The Elium® resin developed by Arkema is a lightweight thermoplastic composite that notably enables the fabrication of 25-meter-long wind turbine rotor blades. The resin's recyclability represents a major advantage for wind turbine manufacturers. The technology has won an award at JEC Asia.

1.1.2.4 WATER MANAGEMENT PLATFORM



Population growth and increased urbanization are having a major impact on the availability of water resources and limiting access to drinking water, the focus of the United Nations' SDG 6: "Ensure access to water and sanitation for all". Through its research, Arkema contributes to this goal by developing (i) a product range specifically aimed at water treatment, transportation and filtration and (ii) technologies and processes for more effective management of the water use and discharges associated with its industrial processes. To the latter end, a global project to improve water management, known as Optim'O, was launched at Arkema several years ago (for further details, see section 4.3.3 of this document).

In terms of product range, acrylic acid serves to manufacture polyacrylates that are used in water treatment plants to ensure the flocculation of suspended solids. Arkema is also pursuing its developments to use more Albione® hydrogen peroxide to disinfect cooling systems or as a water treatment product for

drinking water and swimming pools. Unlike the chlorinated products traditionally used in water treatment, this solution avoids chlorinated water discharges.

Kynar® resins are used in filtration applications to treat wastewater or to make water suitable for drinking. They offer much finer filtration of suspended solids, bacteria and viruses, and a higher (+20%) volume of water filtered for constant energy consumption. They also double the lifespan of certain filtration systems, from five to ten years.

1.1.2.5 ELECTRONICS SOLUTIONS PLATFORM



The numerous innovations for electronics, and particularly mobile devices, contribute to the United Nations' SDG 9: "Build resilient infrastructure, promote sustainable industrialization and foster innovation".

Through its technical polymers range (specialty polyamides and fluoropolymers), Arkema offers innovative solutions for the mobile device market, which includes smartphones and tablets. These solutions relate to the internal structural parts of these devices, which are required to be increasingly thin and made using the same simple injection molding process, as well as offering ultra-high rigidity, and to the external parts, which need to be stain and shock resistant. Arkema proposes materials that meet these increasingly demanding requirements.

Arkema's Piezotech® piezoelectric polymers, which are described in section 1.1.4 of this chapter, make it possible to meet the needs associated with the fast-growing Internet of Things (in consumer electronics, such as smartphones and virtual reality devices) and with increased industrial digitization (connected industrial sensors).

One of this platform's most ambitious projects concerns directed self-assembly (DSA), where block copolymers derived from the Group's extensive know-how are used for nanoscale semiconductor etching. Nanolithography enables these copolymers to self-assemble at the scale of several dozen nanometers to form a variety of customizable geometric patterns. It is therefore possible to create a desired nanostructure and thereby obtain extremely thin electronic nanocomponents.

The Group produces these copolymers, meeting the quality standards required by the electronics industry, on a pilot production line at its Lacq site in France.

Thanks to these positive results, Arkema has signed a special R&D and marketing partnership with Brewer Science, a world leader in materials for the microprocessor industry. In 2018, Brewer Science unveiled its OptiLign™ DSA materials range developed in collaboration with Arkema. Numerous partnerships have since been developed with major semiconductor players, and the final phases of certification are under way.

1.1.2.6 HOME EFFICIENCY AND INSULATION PLATFORM



Energy efficiency, health, comfort and environmental footprint are key concerns in developing the building of the future, with consumer demand in the field regularly becoming greater and more complex. The responses provided to these needs contribute to the construction of sustainable cities and communities, the focus of UN SDG 11. Mindful that this trend is likely to continue over the long term, Arkema has made home efficiency and insulation a key focus of its R&D strategy.

Arkema offers solutions for the thermal insulation of buildings, which is achieved by combining vacuums or air, which have low thermal conductivity, with materials that provide mechanical strength, such as glass, metal and wood. In particular, Arkema markets a range of high-performance adhesives and sealants, such as adhesives for making double-glazed windows and adhesives for the manufacturing of doors and insulation panels.

This expertise continues to be actively developed within Bostik, where it forms a significant R&D focus. Particular attention is paid to formulations where the Company proactively limits the use of additives with unfavorable toxicity profiles. For example, the most recent floor covering adhesives, Mipaflix®, are phthalate- and solvent-free and have sufficiently low volatile organic compound (VOC) emissions to obtain an A+ rating, as well as EC 1 Plus, LEED and BREEAM certification.

The coating resins business also contributes to the development of healthier, more environmentally friendly homes. Most new grades of acrylic and alkyd emulsions, which are developed by this business, can be used without the addition of a coalescing agent, enabling customers to prepare very low VOC coatings. Some grades also capture formaldehyde. In addition, the new binders for exterior paints offered by Arkema have enhanced dust and water resistance and excellent stability with regard to environmental conditions. Thanks to these improvements, consumers can use the coatings for a number of years, thereby reducing the environmental impact of maintenance and replacement works.

The innovation platform also benefits from the development of the Smart House by Arkema, which is located at the Venette R&D site in France. This one-of-a-kind laboratory-house was designed to bring together players in construction to cooperate on innovation and sustainable development. The purpose of the concept house is to test, develop and approve new solutions to major challenges facing the construction industry, particularly energy efficiency, environmental footprint and the health and comfort of building occupants. Since its creation, the project has offered a real-scale illustration of several innovative solutions, including solutions that improve occupants' acoustic comfort and new adhesive concepts that make it possible to recycle plastic flooring by simplifying

the replacement process and reducing the associated costs. The improved functionality of construction components such as walls and floors is also under review. The approach developed at the Smart House is part of the Group's open innovation ecosystem, where input from such diverse participants as economists, rental companies, architects, customers, universities and suppliers provides a better understanding of future needs.

1.1.2.7 TECHNOLOGY PLATFORMS



Innovation in the area of manufacturing technologies helps to improve reaction yield and reduce the environmental footprint of manufacturing processes by reducing energy and water use, limiting air emissions and effluent discharges, and minimizing

waste generation. Arkema has thus deployed several technology platforms that enable it to contribute to the United Nations' SDG 12: "Ensure sustainable consumption and production patterns". These platforms focus primarily on:

- the use of the latest innovations derived from molecular modeling to more accurately predict chemical reactions;
- new solutions that intensify the separation of the primary product from the reaction by-products;
- the development of online analyses that monitor changes in the reaction process and the purity of products without the need for human intervention to obtain samples, thereby avoiding drifts in the production and ensuring consistent product quality; and
- the use of innovative technologies to recycle effluents and/or recover the chemical components present.

1.1.3 Patent and trademark management

Arkema uses patents to protect the innovations generated by its research and development efforts, whether in relation to its manufacturing technologies or its products. Intellectual property rights also enhance the value of the Group's products and brands in the eyes of its customers and enable it to be recognized as one of the most innovative companies in its industry. As a result, the Group's portfolio of patents and trademarks represents a key asset for its business.

1.1.3.1 PATENTS

Protecting the Group's technologies, products and processes with patents is key in optimally managing its business.

Consequently, Arkema files patent applications in its main markets in order to protect new chemical compounds, new high technical performance materials, new synthesis processes for major industrial products and new product applications.

The number of patents granted and the number of patent applications filed annually are good indicators of R&D investment and performance. In 2018, Arkema filed 244 priority patent applications. At 31 December 2018, it held 8,963 patents and had 5,760 patent applications pending ⁽¹⁾. The high ratio of pending patent applications to patents filed per year is due to the lengthy examination process.

Patent protection in countries where Arkema seeks it is typically granted for the maximum legal duration of twenty years, calculated from the application date. The level of protection varies from one country to another, depending on the patent type and

scope. Arkema seeks patent protection in many countries and regions, primarily in Europe, China, Japan, South Korea, India, North America and South America.

Arkema actively protects its markets. To this end, it monitors competitors and takes action against any third-party infringements of its patents. The Group also challenges third-party patents that are granted without justification and takes legal action to have them declared null and void.

The expiration of a basic patent for a product or process can lead to increased competition as other companies bring new products to market. In some cases, however, the Group may continue to benefit commercially from a patent after its expiration by leveraging expertise related to a product or process or by filing for application or improvement patents.

Arkema also has a policy of obtaining and granting patent licenses to meet operating requirements. For inventions by employees, the Group continues to use the system that it implemented in 1989, whereby it grants additional compensation to employees whose inventions have given rise to a commercially exploited patent.

1.1.3.2 TRADEMARKS

Trademark protection varies from country to country. While in most countries, trademark rights are the result of registration, in some, they may be based on usage regardless of registration. Trademark rights are obtained by registering the trademark nationally, internationally or even supra-nationally in the case of

(1) All patent applications filed as part of a centralized process – with the World Intellectual Property Organization (WIPO), for example – are counted as a single application, even though the application may result in several patents being granted depending on the number of countries subsequently selected.

EU trademarks. Registrations are usually granted for a ten-year term and can be renewed indefinitely.

Arkema implements a centralized, dynamic trademark registration policy that draws on a worldwide network of intellectual property advisors.

In particular, Arkema holds the trademark rights to its main products. Examples from Arkema's flagship brands include Pebax®, Rilsan®, Forane®, Careflex®, Evolution®, Altuglas®,

Plexiglas® (which is used exclusively on the American continent), Bostik®, Sader® and Quelyd®. Arkema has also trademark protected the names of its latest innovations, such as Kepstan®, Elium® and N3xtDimension®.

Mindful of the importance of its brand portfolio, Arkema monitors trademark registrations by competitors in similar business sectors and has a policy of taking legal action against infringements.

1.1.4 Research incubator

The aim of the research incubator is to bring new products to market by carrying out disruptive innovation projects.

These projects are characterized by:

- their anticipation of changes in technologies or markets;
- significant project risks but high value added if successful;
- a market approach closely coordinated with that of the relevant Business Lines (one project may involve several Group Business Lines); and
- a portfolio that is balanced between projects that are expected to be brought to market within five years and projects with longer timelines.

Since its creation, it has notably developed nanostructured PMMA for automotive glazing under the Altuglas® ShieldUp brand and piezoelectric polymers via the Piezotech subsidiary. Working closely with academic and industrial partners, Piezotech is developing applications for electroactive polymers, notably in

the area of haptics for virtual reality devices and sensors for consumer electronics.

The incubator was also behind the 2016 launch of Arkema's thermoplastic composites range, which includes:

- the Elium® range of solutions for infusion molding or resin transfer molding (RTM) technologies; and
- the Polystrand® range of continuous glass-fiber-reinforced thermoplastic solutions in tape or sheet form, for thermo-compression, thermo-stamping and lamination technologies.

The incubator also developed PEKK, a new polymer withstanding ultra-high temperatures, under the Kepstan® brand, for which production began in 2010. Production capacities were doubled in France in 2017 and a world-scale PEKK plant at the Mobile, Alabama site in the United States, started production early 2019. These investments will help to meet growing demand in the carbon fiber reinforced composites and additive manufacturing (3D printing) markets (for further details, see section 1.1.2.2 of this chapter).

1.1.5 A collaborative innovation ecosystem

The aim of collaborative innovation is to jointly develop innovative solutions with both academic research teams and industrial partners (customers, suppliers and even competitors). This open innovation approach takes the form of participation in industrial research chairs, sharing of laboratories with recognized research institutions, public-private research partnerships and industrial partnerships. The ecosystem also includes collaboration with start-ups or innovative companies, equity investments in such companies or the acquisition of specific technologies.

RESEARCH CHAIRS, SHARED LABORATORIES AND PARTNERSHIPS WITH UNIVERSITIES

The R&D department has forged numerous upstream partnerships with academic and scientific institutions, in the form of research chairs, shared laboratories, collaborative projects and doctoral and post-doctoral research contracts. The contribution made by these external experts enables the Group to advance its research in scientific areas related to its R&D projects.

In 2018, Arkema joined forces with France's *École polytechnique* and its Foundation to create an international research and teaching chair dedicated to innovative materials named "Design and modeling of innovative materials". Theoretical and experimental modeling of materials and processes is a key topic for the chemicals industry. This multidisciplinary technique goes beyond materials chemistry to look at the physical and mechanical factors at play during product manufacturing and use. Arkema together with *École polytechnique* and its Foundation all aim to leverage innovation in order to meet the energy, technological, industrial and environmental challenges facing the world today and in the future. The research and development topics to be explored by the chair include polymer materials, thermoplastic composites and adhesives, with a particular focus on the relationship between process, structure and properties and on the optimization of mechanical properties and processes.

In Asia, Arkema forged a partnership with Monash University in Kuala Lumpur, Malaysia. The aim is to enhance understanding of biocatalysis, a discipline that could lead to more efficient reaction processes than those achieved with traditional chemistry or the identification of alternatives to certain raw materials used in the production of sulfur products. The creation of this center for research into biocatalysis is in line with the Group's commitment to develop increasingly sustainable solutions.

INDUSTRIAL PARTNERSHIPS AND TECHNOLOGY ACQUISITIONS

Arkema also forms downstream partnerships with industrial partners as part of joint research programs with customers, suppliers and even competitors to develop new products and technologies. As part of this, Arkema establishes many research partnerships with customers in order to better understand market demand and to accelerate the development and time-to-market of innovative technical solutions.

The R&D department has a technology acquisition policy that targets high value-added SMEs and start-ups and supports them in their development process, allowing them to grow in an application-oriented environment thanks to Arkema's resources and expert staff. These equity interests enable the Group to position itself in the highly-innovative product and high-tech markets.

FOCUS

In September 2018, Arkema and Barrday Inc. announced the creation of a joint venture, Barrflex® TU, to manufacture and market carbon fiber and specialty polymer tapes for the growing oil and gas market. These high performance thermoplastic composite solutions will deliver substantial improvements in terms of weight reduction (replacement of metal) and corrosion resistance for the flexible pipes used in the deep offshore and in next-generation onshore operations.

1.1.6 Development of digital

A Digital Transformation department was created in 2018 to set the Group's strategy in this field and drive more widespread use of the innovations associated with digital technology. This digital transformation concerns many of the Group's activities.

In relation to the initiatives launched as part of the digital transformation, the R&D department contributes its expertise in

data management and digitization, modeling, software, and the associated computing power, algorithms and their interpretation. These tools enhance the effectiveness of innovation in the Group's operating and industrial processes and in the development of new processes, products and materials.

APPENDIX 2 :

RISKS AND INTERNAL CONTROL



2.1 MAIN RISKS

Arkema carries out its business activities in a rapidly changing environment, which creates various risks that may be beyond its control. The items described below constitute the main risks and uncertainties to which Arkema considers itself to be exposed at the date of this document. The occurrence of one or more of these risks could have a material adverse impact on the Group's business activities, financial position, results or future prospects, as well as on its image and reputation.

At the date of this document, the main risks identified have been categorized as follows, after taking into account the probability of their occurrence and the estimated severity of their unfavorable impact:

- industrial risks;
- risks relating to compliance, societal expectations and internal control;
- operational risks;
- project and innovation risks;
- economic and business risks;
- IT risks;
- financial risks;
- talent and skills risks; and
- insurance cover default risks.

However, this list is not exhaustive and other risks of which Arkema is currently unaware or that it deems not to be significant at the date of this document could also occur and adversely affect its business activities, financial position, results or future prospects, as well as its image and reputation.

The means implemented by Arkema to identify, assess and manage risks, particularly the set-up and regular update of its risk map, are outlined in section 2.2 of this chapter. The means implemented by Arkema to understand and manage each of the main risks that it faces and to reduce the probability of their

occurrence are described in this section. However, Arkema cannot provide any absolute certainty or fully protect the Group, in any manner, against the risks described in this chapter or the losses that could be incurred should such risks materialize.

Furthermore, in the normal course of its business, Arkema is or may become a party to a number of administrative, legal or arbitration actions, suits and proceedings, as a result of which it and/or its employees may be found liable on various grounds, such as violating the various laws applicable to the Group, full or partial failure to fulfill contractual obligations, termination of established business relationships, pollution, non-conformity of products, non-compliance with export control regulations, or violating anti-corruption laws.

A description of the most significant current or potential litigation is given in note 20 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

To the best of the Company's and the Group's knowledge, there are no other administrative, legal or arbitration proceedings currently underway, or with which the Company or the Group are threatened, that are likely to have or have had over the course of the past twelve months a material adverse impact on the results or financial position of the Company or the Group. However, it cannot be ruled out that, in the future, new proceedings, related or unrelated to existing proceedings, could be initiated against an Arkema entity. Should such proceedings have an unfavorable outcome, they could adversely impact Arkema's business activities, financial position or results.

Lastly, in 2018, as part of the review and update (as the case may be) of its risk map and in order to take into account certain regulatory changes and to better anticipate them, Arkema focused on the specific nature of the risks to which it considers itself to be exposed as well as on factoring in the non-financial issues outlined in chapter 4 of this document.

Specific risks are highlighted. Risks related to non-financial issues are identified by the CSR icon.

2.1.1 Industrial risks

Arkema's business activities are subject to frequently changing international and national laws and regulations in the areas of environmental protection and health and safety. These laws and regulations impose increasingly strict obligations, particularly concerning industrial safety, emissions and discharges to air, water and land of toxic or hazardous substances (including waste), use of resources, labeling, traceability, handling,

transportation, storage and disposal of toxic or hazardous substances and exposure thereto, the clean-up of past industrial sites, and soil and groundwater remediation.

The industrial risks described below are considered in view of the potential impact they could have both on Arkema and on the environment and stakeholders.

Accidents at sites, external storage or warehouse facilities or during transportation **CSR**

Because of the very nature of the Group's operations and the level of hazard, toxicity or flammability of certain raw materials, finished products and production or supply processes, different kinds of accidents (such as explosions, fires and pollution) may occur at Arkema's facilities, at storage and warehouse facilities used by Arkema or during the transportation of various products and raw materials by road, rail, sea or air.

In particular, Arkema operates many industrial facilities, including 35 "Seveso" classified sites in Europe (as defined by the 2012/18/EU directive of the European Parliament and Council dated 4 July 2012 on the control of hazards linked to major accidents involving dangerous substances) and facilities outside Europe that have been given a similar classification, in which hazardous substances that may present significant risks to the health or safety of neighboring communities and to the environment are used, produced or stored.

Arkema also owns or uses a small number of pipelines to transport hazardous chemical products. Despite the safety measures it has put in place for the operation of these pipelines, the possibility of an accident cannot be ruled out.

Arkema may suffer the consequences of possible malicious acts against its facilities or equipment.

Any accident, regardless of whether it occurs at one of the Group's production sites or during the transportation or use of products manufactured by Arkema, may adversely affect the operation of certain units at its industrial sites and cause delays in production. Arkema could also be held liable (i) following injury or damage to property or people, notably due to exposure to hazardous substances being used, produced or destroyed by Arkema or present on its sites, or (ii) for having caused damage to natural resources. In addition, any accident may give rise to compensation claims on grounds of contractual liability (in particular in its role as the shipper, in the case of transportation), tort liability or, as appropriate, product liability.

Lastly, accidents to persons constitute a general risk for Arkema. Among the accidents reported, those related to exposure to chemicals account for less than 10% of all accidents to persons.

Risk management

In order to prevent and limit the risk of accidents, the Group defines scenarios that enable it to assess and anticipate the consequences of various events such as the potential consequences of climate change, which could increase the frequency and intensity of certain weather events (storms, flooding, droughts).

As part of its preventive measures, all Arkema facilities and activities worldwide are covered by a Group-wide safety management program adapted to the risks that each may face. In the particular case of France, Technological Risk Prevention

Plans (PPRTs) (created by French law no. 2003-699 of 30 July 2003 on the prevention of technological and natural risks and compensation for damage) form part of the Group's risk management policy for areas in which high-risk "upper-tier Seveso" industrial sites are located. Arkema has completed the necessary studies for the 16 relevant French sites and is implementing the appropriate additional resources, working alongside the local authorities to further secure the facilities in compliance with the regulatory processes.

The continuous improvement process, which concerns both Group and subcontractor employees and has been developed in line with the Group's health, safety, environment and quality policy, is based on taking action at three priority levels:

- at the technical level, for example when designing or improving production units, or drawing up specifications for hazardous material transportation equipment;
- at the organizational level, by ensuring that each entity's management system complies with Arkema's safety requirements; and
- at the human level, by strengthening social dialogue and developing a safety culture that raises awareness of each person's individual responsibility and of the importance of behavior.

These points are detailed in section 4.3 of this document.

In addition, in order to prevent or minimize the risk of accidents related to transportation and storage, Arkema endeavors to:

- use transportation means that are deemed less dangerous (barge, pipeline, road-rail or rail), when technical and financial conditions allow it;
- strictly select suppliers based on the Warehouse Safety and Quality Assessment System (SQAS) which was established under the aegis of the European Chemical Industry Council (CEFIC) by a consortium of European chemical manufacturers and which also covers the Middle East and Asia, and the Chemical Distribution Institute – Terminals (CDI-T) scheme at the global level;
- assess the quality and safety performance of the carriers used;
- ensure regular maintenance of the transportation equipment that it owns, hires or leases (freight cars, ISO containers, tankers and pipelines);
- carry out systemic risk assessment studies when a modal shift is required;
- implement a variety of operational risk assessment measures, including vetting bulk charter vessels and having the transportation safety management system maintained by the Transportation Safety team, which reports to the Group Safety and Environment department; and

- conduct storage audits prior to signing contracts – repeated every three years for warehouse facilities housing hazardous materials – under the responsibility of the relevant business management.

For pipelines, Arkema notably carries out hazard studies and develops compensatory measures to minimize risks where necessary, defines monitoring and response plans, and carries out drills with the emergency services.

Security directives are regularly updated in line with recommendations from the public authorities in order to strengthen the security of the Group's industrial facilities. In France, the Group's upper-tier Seveso sites have undergone and are regularly subject to security audits by the authorities, with no evidence found of significant deviations from required standards. The audits led to minor adjustments being made where necessary. In addition, Arkema has raised security levels at its industrial facilities and R&D centers since 2015 in response to terrorist attacks in France, Germany, the United Kingdom and elsewhere. In particular, additional security measures have also been taken in response to malicious acts at other industrial companies in France.

Furthermore, in order to effectively manage potentially critical situations on Group sites and during transportation, Arkema has defined crisis management procedures for its various plants based on the Group Crisis Management directive. A year-round on-call system enables the Group to supervise any crisis that may occur by setting up a dedicated crisis management team. The Group also regularly offers training courses in "Crisis management and communication" and conducts simulations of crises and of setting-up of crisis management teams. These procedures were notably implemented in response to the industrial accident that occurred at the Crosby site in the United States in 2017.

Lastly, Arkema has taken out insurance policies for civil liability and property damage with leading insurance companies (for further details, see section 2.2.6 of this chapter).

Pollution at sites, warehouse facilities or during transportation CSR

Arkema has activities in business areas that entail significant environmental liability risks, with respect to both the operation of its industrial units and to accidents at one of Arkema's production sites, at a warehouse or during the transportation of products manufactured by Arkema.

While the Group has secured insurance policies from leading insurance companies to cover environmental risks, described in section 2.2.6 of this chapter, it cannot rule out the possibility that claims will be made in connection with its operations or products, seeking to hold it liable for uninsured events or for amounts exceeding the cover limits.

Should Arkema be held liable for environmental claims, the amounts covered by provisions or included in its investment plans

could prove to be insufficient due to the intrinsic uncertainties involved in projecting expenditure and liabilities relating to the environment. The assumptions used to determine these provisions and investments may need to be adjusted, mainly due to changes in regulations, changes in the interpretation or application of regulations by the relevant authorities, the technical, hydrological or geological constraints of environmental remediation or the identification of as yet unknown pollutants. Achieving compliance with environmental protection regulations for Arkema sites that are still in operation or were previously operated, or for sites where operations have ceased, is likely to generate substantial financial costs for Arkema.

Contingent environmental liabilities are detailed in note 20 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Risk management

Environmental risk is managed by the implementation of a policy defined and monitored by the Environmental Remediation team within Arkema's Safety and Environment department and rolled out within its various businesses under the responsibility of the industrial Vice-Presidents. The components of this policy are detailed in section 4.3.3 of this document.

Arkema also benefits from guarantees from subsidiaries of Total S.A. with respect to former industrial sites, which were granted prior to Arkema's stock market listing. A description of these guarantees can be found in note 29 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Exposure to chemicals CSR

Arkema has used toxic or hazardous substances to manufacture its products in the past, and continues to do so. Employees and former employees of Arkema and, in some cases, employees of external companies and service providers, Arkema customers and people living near Arkema's industrial sites may have been exposed or may still be exposed to these substances (ingestion, inhalation, skin contact, etc.) and, as a result, may have developed or may develop specific illnesses from such exposure. In addition, for certain substances currently regarded as risk-free, chronic toxicity, even at very low concentrations or exposures, could be discovered in the future.

Furthermore, certain Arkema Group products may also be used directly or indirectly in sensitive applications, such as medical and food applications.

Risk management

Through product stewardship, Arkema takes care to ensure that its products do not impact people's health or safety. These aspects are taken into account during the product design stage. Regulatory compliance plays a key role in ensuring product safety for customers, the entire value chain and stakeholders.

Arkema has put in place safety and monitoring procedures for its products and the products it uses in its manufacturing processes. It also regularly conducts research on the toxicity of its products and the products it uses, and in addition has developed a tool for monitoring individual exposure to toxic products. For this purpose, Arkema employs regulatory experts supported by a global network of correspondents based in the industrial sites, within the businesses and subsidiaries, and experts in physicochemistry, toxicology and ecotoxicology who work to improve knowledge and understanding of the hazard characteristics of the substances and products used, manufactured, imported and marketed by Arkema. The various procedures in place are described in section 4.2.4 of this document.

In the particular case of medical applications, Arkema has put in place strict rules governing the applications for which Arkema markets its products. In addition, two committees – the Europe/Asia Medical Device Risks Committee and its equivalent for the Americas – are responsible for giving their preliminary opinion regarding all decisions in this area. Arkema, as the case may be, may also be forced to withdraw certain products from the market or to cease using certain substances or find substitutes for them in its manufacturing processes, particularly in certain sensitive markets.

Group employees who may potentially be exposed to toxic or hazardous substances in the workplace benefit from medical monitoring adapted to the specific risks related to their activities. When they leave the Group, particularly for retirement, they may benefit, in accordance with applicable legislation, from specific post-occupational medical monitoring established on the basis of information provided by Arkema on the hazardous chemicals they handled over the course of their professional career.

Industrial relocation

Arkema owns most of the land on which its industrial sites are built, but some of the Group's industrial facilities around the world are located on land that belongs to third parties, either due to local regulations or for technical or strategic reasons. In such cases, Arkema occupies the land under the terms of leases or similar agreements. If these agreements were to be terminated or not renewed, or if a site were to be expropriated, it could adversely impact Arkema's business activities, results or financial position.

In addition, Arkema's external growth transactions could expose it to unforeseen legal obligations towards public authorities or other parties in relation to real property acquired, held or rented by the companies acquired. This could have a material adverse affect on the Group's business activities, results or financial position (for further details, see section 2.1.4 of this chapter).

Risk management

When negotiating contracts, Arkema secures its right to occupy land by implementing sufficiently long terms and lengthy notice periods. Contractual expiration dates are monitored regularly to anticipate any problems regarding renewals. Where applicable, in the event of an expropriation, the Group endeavors to negotiate compensation with a view to reducing future costs related to rebuilding or relocating the units concerned.

2.1.2 Compliance, societal expectations and internal control

Non-compliance with business practices CSR

The Group operates in many countries and, for this reason, is subject to a range of antitrust and anti-corruption laws as well as export control regulations in certain countries. Non-compliance with any of these laws or regulations may result in significant fines being levied on the Group or civil or criminal charges being brought against it and/or its employees.

Risk management

Arkema has put in place a business compliance and ethics program, which notably covers antitrust, export control and anti-corruption laws. Procedures and/or guides have been issued on each of these topics. Training is also given within the Group to prevent risky behavior and maintain a suitable level of awareness in these areas. For further details on this program and related procedures see section 4.4 of this document. Consequently, Arkema is particularly careful with regard to:

- planned export sales to countries subject to economic sanctions or other restrictive measures. In such situations, in-depth reviews

are carried out to avoid any risk of violating the export control regulations; and

- the third parties with which it enters into contracts, notably the choice of commercial intermediaries used in order to minimize the risk of corruption or fraud.

A specific map of corruption-related risks has been drawn up, as part of the general risk map exercise performed by the Group (see section 2.2.4 of this chapter). It is intended to serve as a guide for implementing procedures to assess customers, suppliers and intermediaries.

Regulatory requirements and CSR expectations CSR

Arkema is subject to complex and constantly changing local, national and international laws and regulations that differ depending on the countries in which it operates. These laws and regulations encompass a large number of fields, including safety, environmental protection, company law, commercial law, patent protection, labor law, personal data protection, tax law, customs regulations, and product listing. Non-compliance with any of these laws or regulations could result in significant fines being levied on Arkema or civil or criminal charges being brought against it and/or its employees.

If existing product regulations were to be amended to become more restrictive for Arkema or if new regulations were issued, it could (i) compel Arkema to significantly scale back on or even discontinue the production and marketing of certain products, (ii) restrict Arkema's ability to alter or expand its facilities, and (iii) possibly compel it to abandon certain markets, incur significant expenditure to produce substitute substances, institute costly emissions control or reduction systems or (iv) exclude Arkema from certain markets if it could not develop substitute products. Changes in tax and customs duty regulations could jeopardize certain schemes which Arkema currently benefits from.

In addition, societal expectations of civil society, non-governmental organizations and associations are gathering momentum and may, in certain cases, lead to more stringent requirements in various areas of the business, such as product stewardship, environmental management and increased consideration of impacts related to climate change and human resources management.

Risk management

All of the Group's operational and corporate departments, both at the corporate and local levels, assisted by the Group's Legal department and, where necessary, specialist law firms or the relevant government authorities, work continuously to ensure that a high level of knowledge is maintained and to anticipate any future developments in order to comply with the applicable laws and regulations at all times.

The Group is supported by a global network of regulatory experts based in the industrial sites, within the businesses and subsidiaries. These experts are more specifically responsible for monitoring regulatory changes and producing the documents required to comply with the regulations within the prescribed time. These experts are involved in professional associations that monitor proposed legislative or regulatory changes at the state or agency level, thus helping the Group to anticipate regulatory changes and prepare accordingly.

Regarding product regulations, particularly the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulation, Arkema has put in place a specific organization to optimize the implementation of these regulations and monitor any changes. For further details, see section 4.2.4 of this document.

In cases where product regulation changes lead to restrictions on the use of raw materials or the marketing of finished products, Arkema relies on its R&D to develop alternative solutions. Concerning fluorogases, for example, which have been identified as the most exposed to regulatory developments for many years now, Arkema proactively works to develop new blends or substitutes. For further details on this matter, see section 1.2.2.3 of this document.

Internal control failure

Arkema has put in place an internal control system whose primary purpose is to reduce the occurrence of incidents and limit their potential impact. However, as for any control system, it cannot provide absolute assurance that the goals mentioned in section 2.2.1 of this chapter will be met and that risks will be eliminated.

In particular, a failure in the system cannot be ruled out, especially at small or geographically isolated subsidiaries.

Risk management

The Group's internal control and risk management system and in particular its organization, main stakeholders and framework, are detailed in section 2.2 of this chapter.

2.1.3 Operational risks**Supply chain disruption**

Arkema's customer supply chain may be interrupted due to supplier default, the unexpected shutdown of a production site, or a disruption affecting transportation, logistics or storage and warehousing facilities. Disruptions or extended shutdowns impacting a production site may result from problems with raw material or energy resource supplies, industrial action or even natural disasters as well as serious government-declared health crises.

Regarding transportation, due to stricter regulations on the transportation of hazardous materials, the temporary or permanent lack of transportation means for certain toxic or hazardous

products to certain destinations, the market dominance of a single supplier, and industrial action affecting transportation, Arkema may face delays in delivery or even refusal by its carriers to collect shipments, difficulties in meeting certain customer demands, increases in certain shipping costs or shipping equipment rental costs and reductions in certain shipments.

Arkema uses many storage and warehousing facilities located on its industrial sites and elsewhere. The temporary unavailability of these storage facilities may lead to a production disruption or suspension at certain Group sites or to delays in delivery for certain customers.

Risk management

In order to prevent or minimize the risks related to the transportation and storage of its raw materials and own products, Arkema endeavors to strictly select suppliers based on the Warehouse Safety and Quality Assessment System (SQAS) which was established under the aegis of the European Chemical Industry Council (CEFIC) by a consortium of European chemical manufacturers and which also covers the Middle East and Asia, and the Chemical Distribution Institute – Terminals (CDI-T) scheme at the global level. Arkema also endeavors to diversify its service providers and, in particular, split its product shipments between several carriers where possible. Lastly, the Group develops alternative solutions that combine transportation plans and distribution schemes, with a lag time for implementation, and can set up geographical swaps with other manufacturers.

Dependency on suppliers and customers

Suppliers CSR

In the case of certain raw materials, equipment and services (storage in particular) that are essential to its business, Arkema is to a significant extent dependent on a limited number of suppliers and, in some cases, a single supplier. Default by a major supplier, the non-renewal of supply contracts for certain raw materials or their renewal on less favorable terms, and significant price increases could therefore have an adverse impact on Arkema's industrial and financial performance.

In particular, the Group entered into certain multi-year supply contracts, including those governing Arkema's supply of propylene and oxo alcohols, hydrofluoric acid (HF) and cyclododecane (CDAN), which are used as a main raw material for acrylic monomers, fluorogases and polyamide 12, respectively. In addition, Arkema France signed an electricity supply agreement with EDF covering some of its industrial sites for a 25-year period (1996-2020) in return for payment to EDF of a sum corresponding to a drawing right. Beyond 2020, Arkema France will have to negotiate new supply conditions with electricity providers for its industrial sites. There is a possibility that these conditions will be significantly less favorable than the current ones.

Furthermore, long-term agreements entered into with a certain number of its raw materials suppliers contain minimum supply commitments. In the event of failure to fulfill these contractual commitments or of early termination of the agreements by Arkema, these suppliers could claim compensation or penalties.

Some of Arkema's operational units in France were built downstream of steam crackers. In certain cases these units present a particularly high level of physical integration with the production capacities supplying the raw materials.

Risk management

Arkema has implemented a policy of spreading supplier risk at product-line level and at geographic exposure level for its

supplies of raw materials, energy resources, services and for some equipment.

The Group's centralized procurement policy for raw materials and goods and services aims in particular to analyze and comprehensively address its exposure to the risk of significant dependence on supplies and suppliers.

This policy is based on the following principles:

- diversification of sources of supply when technical conditions allow it;
- the development of long-term partnerships or contracts for supply situations that are subject to severe structural constraints due to the supply and demand balance or the limited number of suppliers;
- careful management of the duration of contractual commitments;
- supply chain and inventory management adapted to both business and industrial requirements, particularly for strategic products;
- a thorough assessment of suppliers based on the following criteria: position in the relevant market, industrial and CSR performance, financial strength and development; and
- participation in certain investments or development projects.

With regard to the supply of propylene for the Acrylics business at the Carling site in France following the shutdown by Total Petrochemicals France of its steam cracker in Carling, a new agreement was signed on 3 September 2015 with Total, covering the period to 30 April 2021. Arkema is working with the Total group on the supply of propylene to the site beyond the end of the current agreement.

Arkema has also included the risk of supplier default in its insurance policies.

Customers

Arkema has entered into agreements representing significant financial income with certain customers, the most significant of which are described in section 1.2 of this document for each business concerned. It cannot be ruled out that these contracts may not be renewed, may be renewed under less favorable terms than initially agreed, or may be terminated.

More generally, the Group has relationships with a large number of clients, thereby exposing it to credit risk. At 31 December 2018, accounts receivable net of provisions amounted to €1,246 million. These accounts receivable are detailed by due date in note 22.4 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document. Arkema's exposure to credit risk is linked to the individual characteristics of its customers. Default by one of these customers is likely to lead to a financial loss limited to the uninsured share of the customer's debt to Arkema.

Risk management

Arkema has a highly diversified customer base and makes less than 25% of its sales with its top forty customers. No customer represented more than 3% of its sales in 2018. Furthermore, as the Group's sales are evenly balanced across the different regions in which it operates, there is no geographical concentration of credit risk.

In addition, the Group's business policy is based on developing alliances or partnerships with certain customers in order to establish solid, long-term relationships. However, in some exceptional cases, when the customer breaches its contractual commitments, Arkema may initiate legal proceedings or arbitration to enforce its rights. For more information on disputes, please refer to note 20 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Lastly, regarding customer credit risk, Arkema covers its risk with a global credit insurance program that, given the quality of its customer portfolio and low claim rate, allows it to cover a significant proportion of its accounts receivable. Arkema is striving to further minimize this risk through a specific credit risk management policy that consists in regularly assessing the solvency of each of its uninsured customers. Uninsured customers whose financial situation does not meet Arkema's solvency requirements are only supplied after payment. For more information, please refer to note 22.4 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document. The policy concerning provisions for doubtful accounts on fully or partially uninsured accounts receivable is also detailed in this note.

Contractual commitments

In the normal course of its business, Arkema may make commitments to its customers concerning the quality of its products and services, the quantities delivered and delivery times. Operational uncertainties may prevent Arkema from meeting its commitments, which could adversely affect its business and results, or even its reputation with its customers. The non-fulfillment of these commitments could also result in significant penalties being levied on Arkema as well as claims or even lawsuits being brought against it.

Risk management

Each Group business puts in place an industrial and commercial organization as well as a quality control system to help it fulfill its commitments. Furthermore, the Legal department supports the relevant businesses during the negotiation process for the various agreements.

After being reviewed by the Group's Legal department, material contractual commitments must be approved by the Executive Committee, which, depending on the situation, may request that a specific organizational structure be put in place.

Natural disasters and climate change

Due to their geographic location, 35 of Arkema's industrial sites are exposed to seismic and/or climate risks such as floods, droughts and storms, the severity and frequency of which may evolve as a result of climate change. In 2018, 22 sites (unchanged from 2017) were identified as being specifically exposed to climate risks.

In addition, in light of increasingly high expectations in the area of climate change response, the tightening of international, European and national regulations, notably those aimed at reducing greenhouse gas emissions (CO₂ quota systems), could have a negative impact on Arkema's business activities, operating costs or profitability.

Risk management

Scientists expect an overall increase in the intensity and frequency of extreme weather events. However, current knowledge does not allow Arkema to accurately describe future changes regarding its sites' exposure to the aforementioned risks. In order to prevent and limit the potential impact of natural disasters and climate change at the 35 exposed sites, the Group has defined scenarios that notably take into account the evolution and potential consequences of climate change, including the increased frequency and intensity of certain weather events, such as storms, flooding and droughts.

Following the industrial accident that took place at the Crosby site in Texas in September 2017 as a result of Hurricane Harvey, a category 4 storm, the US Chemical Safety and Hazard Investigation Board (CSB) published a report on the accident on its website on 24 May 2018, as well as a press release entitled "CSB Releases Arkema Final report". Consequently, Arkema is going to strengthen its existing risk and hazard analysis procedures to ensure periodic assessment of the potential impact of a natural disaster or extreme weather event at its sites, within the deadline imposed by the CSB. At the same time, Arkema is developing an extreme weather planning and response toolbox to ensure that critical safeguards, such as backup power, function as intended during extreme weather events, including hurricanes or floods.

In addition, Arkema endeavors to reduce the greenhouse gas emissions generated by its operations and energy use, and also strives, through its innovation, to adapt its product range in order to reduce emissions across its value chain. Fluorogases, for example, have been identified as the products that have been most exposed to regulatory developments for many years. Accordingly, Arkema is already anticipating the applicable regulatory changes by developing new blends or substitutes. The various initiatives taken and the results achieved as part of the fight against global warming are presented in section 4.3.3.2 of this document.

2.1.4 Project and innovation risks

Strategic projects

In order to implement its strategy and develop its business, Arkema carries out a number of investment projects. The completion of these projects may be delayed and/or result in expenses in excess of those budgeted by the Group.

Arkema also carries out acquisitions that may expose the Group to various risks, including in particular the risk of bearing potential liabilities or responsibilities related to the businesses acquired (notably relating to real estate owned or leased by companies acquired by Arkema). In addition, should the assumptions on which the acquisitions were made fail to materialize or if the development prospects of these activities cannot be achieved, this could consequently impact the valuation of goodwill.

Furthermore, Arkema holds non-controlling interests in certain companies, which could lead to disagreements or deadlocks, and in certain cases that are beyond Arkema's control, to decisions that go against Arkema's interests. In addition, despite all the precautions taken when choosing partners, the Group cannot rule out the possibility that one of its partners could file for bankruptcy. The interests included in the Group's scope of consolidation are described in the notes to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Any delay, expense and/or additional investment or even any revaluation of goodwill could adversely impact Arkema's business activities, results or financial position.

Lastly, when Arkema disposes of businesses, it may provide a number of guarantees to third parties. It cannot be ruled out that when some of these guarantees are invoked, the compensation claims could exceed the provisions made by Arkema.

Risk management

Arkema has demonstrated its ability to carry out significant projects and has acquired solid experience in this area over the years. For each of its investments, the Group solicits the necessary internal and external resources and expertise to ensure its projects are implemented under the best possible conditions.

Before entering into any external growth transaction, Arkema takes the necessary precautions when identifying targets, in particular by conducting in-depth evaluations of the activities and companies concerned and the various liabilities related to the business being sold, and by negotiating appropriate guarantees from the sellers or putting in place insurance cover for the same purpose with the advice of external consultants with expert knowledge in this area. Furthermore, acquisitions are carried out by teams of qualified experts under the responsibility of the Strategy department.

Arkema has a small number of non-controlling or joint-controlling interests in joint ventures, and accordingly protects its interests by introducing, where possible, contractual provisions designed to resolve deadlocks and maintain the Group's decision-making powers.

Lastly, Arkema's policy in terms of business disposals is to limit its liability with respect to guarantees to the buyers.

Innovation and technologies CSR

Innovation is a key part of Arkema's strategy. Its business activities, results and future prospects are heavily reliant on its ability to produce new products and new applications and to develop new production processes and protect the innovations derived from its research.

In the course of its business, Arkema also uses technologies that it owns or technologies under license from third parties. If Arkema were no longer able to use these technologies, it could have an adverse impact on its business activities or results.

Risk management

Each year, Arkema invests heavily in R&D to develop new products and processes that answer to both market demands and social challenges. This major focus on innovation also enables the Group to adapt to regulatory changes. The organization and policy priorities of the Group's R&D, as well as the resources dedicated to R&D are detailed in section 1.1 of this document.

Furthermore, Arkema has a technological development policy for its processes, in particular as part of its R&D programs, to give it ownership and control over the technologies that it uses in its major activities, and to help reduce its level of exposure to third parties in this regard.

Protecting data and know-how

The patents and trademarks that protect the innovations derived from Arkema's research represent a key asset for its business. Aside from having an instantly negative impact on Arkema's results, patent or trademark infringements committed by a third party and any other types of intellectual or industrial property rights infringements could also harm the reputation and the perceived quality of the products concerned as well as the image of the Group. Arkema could also infringe a patent involuntarily, given the time during which patent applications are not made public. Patent applications filed by third parties and made public only on publication could therefore have an impact on ongoing developments or even products recently brought to market and could oblige Arkema to modify its product, thereby increasing the related R&D costs, or to negotiate a license to use the patented component.

Furthermore, the disclosure of confidential documents or the copying of processes or technologies that are critical to its production and to maintaining its international competitiveness could also adversely affect its business activities or results.

Risk management

Arkema has developed an assertive policy to protect its innovations and know-how through the registration of patents and trademarks, particularly with the support of a global network of industrial property consultants. The Group's intellectual and industrial property rights are managed by the Intellectual Property department, which reports to the R&D department for patent matters and to the Group's Legal department for trademark and design matters. These departments are mindful of any infringements that may be committed against the Group's intellectual and industrial property rights and can, where required, take whatever action

they deem necessary to prevent those infringements, halt them and obtain redress for said infringements. When new products, applications and processes are being developed, the departments also verify whether a given technology can be freely used in order to prevent any patent infringement due to such use. More information on the role of these departments can be found in section 1.1.3 of this document.

When it comes to protecting sensitive data and their confidentiality, particularly in the area of technology, the Group has strengthened its security policy by updating its procedures and application guides, which are applicable at all of the Group's sites, and has introduced an awareness-raising and training program for its employees. Lastly, Arkema subcontracts equipment essential to its critical processes to specific companies bound by confidentiality agreements. Files and technical manuals are managed by a restricted number of individuals.

2.1.5 Economic and business risks

Fluctuations in supply and demand

As part of its operations, Arkema is exposed directly or indirectly to changes in supply and demand of the products it manufactures, the raw materials it purchases and the markets it serves.

Upstream of its activities, the Group uses raw materials and energy resources to manufacture its products, some of which are indirectly linked to the price of crude oil like propylene or butadiene, while others, such as sulfur, castor oil and fluorspar, are only minimally connected or not at all. The prices of these raw materials and energy resources can be highly volatile and therefore lead to significant variations in the cost price of the Group's products.

Downstream, external factors such as economic conditions, the Group's competitors' activities or even international situations and events, can lead to volatility in supply and demand and consequently changes in the sales volumes and prices of products manufactured and marketed by the Group.

Furthermore, Arkema faces strong competition in each of its businesses, the strengthening of some of its competitors and the emergence of new players that could impact its competitive position. Regarding the Group's intermediate product lines, some competitors are larger and more vertically integrated, which could enable them to benefit from lower production costs for certain products that are also manufactured by the Group. The economic emergence of certain countries like China, has been accompanied by the rise of local competitors, leading to growing competition on certain product lines, such as Fluorogases and Acrylics. This could result in lasting downward pressure on the selling prices of these products.

Risk management

Upstream of its activities, Arkema seeks to secure its raw material and energy supplies and to optimize their cost by diversifying its sources of supply. In some cases, the Group may therefore use derivatives such as futures, forwards, swaps and options, on both exchange and over-the-counter markets. These derivatives are matched with existing contracts (see notes 22.5 and 23.2 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document). Arkema also seeks to pass on to its sales prices any increases in the cost of the raw materials used to manufacture its products.

To minimize its exposure to fluctuations in demand in its end markets, the Group has worked to reposition its business in order to diversify its product portfolio and application markets, and re-balance its geographical presence. Arkema is also continuing to consolidate its positioning in higher value-added niche markets, a strategy that notably allows it to offset potential slowdowns in its main end markets. Taken together, these strategies enable the Group to mitigate the risk related to worsening economic conditions in any one of its end markets. Lastly, the Group's integration in certain product lines such as acrylics, fluorochemicals and specialty polyamides also reduces its exposure to market cycles.

In addition, the Group is forging partnerships with customers and suppliers who are leaders in their respective fields in order to build strong, long-term business relationships with its main partners.

Lastly, with a view to consolidating its competitive position, Arkema has since its creation implemented a policy of operational

excellence and cost optimization to enhance the competitive advantages that it enjoys in its various product lines and to guarantee the quality and performance of the products offered to its customers.

Country-related risks

Arkema's worldwide operations expose it to a multitude of local business risks. Its global success depends in particular on its ability to adapt to economic, social and political changes in each of its host countries.

In particular, the direct and indirect consequences of conflicts, embargoes, sudden changes in customs duties, terrorist activities, political instability or the emergence of health risks in countries where the Group is active or markets its products could notably cause delays in product delivery or the supply of raw materials, as well as losses. In addition, they could lead to increased costs for products manufactured by the Group as well as higher safety costs, insurance premiums or other expenses needed to ensure the continuity of the concerned operations.

2.1.6 IT risks

In an increasingly digital world, industrial and management processes and communication between employees and third parties are highly dependent on information technology systems based on complex and ever-changing technical environments. The failure of these systems could have a material impact on the Group's business activities, results or financial position.

The main cyber and other risks related to IT systems are as follow:

- technical risk of an interruption in the operation of critical applications or the loss of sensitive data, resulting in the shutdown or serious disruption of the operation of all or part of one or more industrial units or departments; and
- risk of intrusion or malicious use of the IT systems, particularly to steal information, misappropriate funds, disrupt the operation of industrial facilities or impede the Group's business activities.

Risk management

The Group's IT department aims to provide systems access to authorized users while ensuring the integrity and confidentiality of sensitive data.

Accordingly, the Group has adopted an IT Systems Security Policy that sets out the objectives and rules to be applied to guarantee the reliability of its IT systems based on the three criteria of availability, integrity and confidentiality. The policy is regularly reviewed and updated. The Group has also defined and implemented an internal directive to bolster the security of its industrial networks, as well as a regular compliance audit plan at its production sites.

Risk management

With its balanced geographic presence in Europe, North America and Asia, the Group is able to spread its risk between the different geographic regions in which it operates.

To develop and implement effective policies and strategies in each of its foreign operations, Arkema relies on subsidiaries, which are placed under the supervision of a regional Vice-President, in most countries in which it has industrial and commercial operations. This organization helps the Group maintain relations with local authorities and economic players, defend its interests, and better anticipate changes in the local political and economic environment.

As part of its compliance and business ethics program, Arkema has put in place procedures that cover export control and other restrictive regulations applicable in some countries. For further details, see section 2.1.2 of this chapter.

Pursuant to this policy, the IT department implements a variety of initiatives, including technical measures (network protection, high-availability architectures with data replication, redundant data centers, standard workstation architecture with up-to-date antivirus software, segregation of industrial networks, etc.) and organizational measures (remote access for key employees, IT systems monitoring, enhanced ID and access-right security management, regularly tested business recovery plans, formal classification of information, user awareness-raising, annual reviews of IT risks, security patch management policy, etc.). In order to minimize any incidents brought about by the rollout of new versions of software or hardware, strict management procedures are in place, including non-regression testing.

The Security Operations Center, which has been partly operational since April 2018 and is set to be fully operational as of April 2019, also boosts the overall level of the Group's IT security by increasing its surveillance and response capacity in the event of a security breach of its IT systems.

To ensure the reliability of the Group's critical processes and compliance with security rules, the Group has set up an internal control system consisting of a number of general IT controls. The effectiveness of these measures, particularly in terms of cybersecurity, is assessed every year and action plans are put in place to address any identified weaknesses.

As part of its cyber risk prevention policy, the Group has implemented a set of ten directives to be followed by each site to strengthen cybersecurity at the local level. Accordingly, the

technical requirements of the Group's IT systems security policy comprise a behavioral component with the implementation of the iSafe program to raise employee awareness in the areas of data

protection and cybersecurity. Lastly, the Group has taken out an insurance policy for cybersecurity risks with leading insurance companies (see section 2.2.6 of this chapter).

2.1.7 Financial risks

Arkema is exposed to various types of financial risks, such as foreign currency risk, liquidity risk, interest rate risk and counterparty risk.

The information provided below is based on certain assumptions and expectations that, by nature, may prove to be inaccurate, particularly with respect to changes in exchange rates and interest rates, and Arkema's exposure to the associated risks.

Foreign currency

Given its international operations, Arkema is exposed to various types of currency risks:

- transaction risks related to Arkema's day-to-day operations and development projects;
- translation risks related to the consolidation in euros of Arkema's subsidiaries' accounts in currencies other than the euro. Fluctuations in the exchange rates of these currencies, particularly the US dollar-to-euro exchange rate, have had in the past and may have in the future a material impact on Arkema's financial position and operating income. The translation effect of a 10% change in the euro/US dollar exchange rate, for example, would have an estimated impact on consolidated EBITDA of €50 million. For further details about the impact of the translation effect on Arkema's income statement and balance sheet, see sections 5.1.5 and 5.1.9 of this document; and
- risk of competitiveness related to the fact that, proportionately, in the euro zone, the Group incurs more operating expenses in euros than it generates sales in the currency owing to the fact that it is an export-focused company. As a result, Arkema's competitive position may be affected by the weakness of certain currencies, and in particular the US dollar against the euro, compared with its competitors positioned in countries with a weak currency. Furthermore, the weakness of certain currencies in countries with major imports from Arkema may affect its results.

Risk management

Arkema's objective is to minimize the impact of exchange rate fluctuations on its results and financial position.

Transactional risks are systematically hedged when recorded in the accounts: Arkema companies hedge their foreign currency assets and liabilities against their respective functional currencies. Revenues and costs in foreign currencies are hedged essentially by spot foreign exchange transactions and sometimes by forward transactions.

Foreign currency risk linked to future flows, such as capital expenditure or sales flows, particularly export sales, may also

be hedged. The Executive Committee is responsible for deciding whether such hedging is necessary, while implementation is carried out by the Financing and Treasury department using simple derivatives. For further details, see notes 22 and 23 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Translation risk is not hedged as Arkema considers that it is inherent to its worldwide operations. However, Arkema reduces its balance sheet risk through a policy of allowing its companies to contract debt only in their functional currencies, except when a foreign-currency loan is backed by a commercial risk in the same currency.

The risk of lower competitiveness has gradually decreased thanks to Arkema's strategy to achieve a greater balance in its geographic exposure.

Liquidity

Arkema has conducted a specific review of its liquidity risk and deems it is in a position to meet its future commitments.

Arkema uses bond issues and loans from banking institutions to finance its day-to-day operating requirements and development. However, unforeseen needs may also arise, resulting in particular from an increase in working capital or unfavorable market conditions. Additionally, market conditions may make it difficult to refinance bonds at maturity, or one or more banks may be unable to meet their obligations to Arkema with respect to one of its main credit lines, which would significantly reduce its access to financing under equivalent terms. For further details on borrowing terms and in particular on early repayment clauses, see notes 21 and 22 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Risk management

Arkema's financing policy, implemented by the Financing and Treasury department, aims to provide the Group with the necessary financial resources to fund its operations over periods of time adapted to its repayment ability. This policy is based on the following principles:

- having Arkema's long-term credit rated by two rating agencies and maintaining a solid investment grade rating;
- having a net debt to EBITDA ratio of less than 2;
- maintaining cash reserves in excess of €500 million;
- maintaining average maturity at over three years; and
- diversifying its sources of financing.

At 31 December 2018, Arkema had a strong financial profile, with:

- a net debt to EBITDA ratio of 0.7;
- cash reserves of around €2.1 billion; and
- a Euro Medium Term Note (EMTN) program, representing a maximum amount of €3 billion, to facilitate access to bond markets.

At the date of this document:

- without taking into account the issue of perpetual hybrid bonds classified as equity, completed on 29 October 2014, the average maturity of Arkema's financial resources is greater than four and a half years; and
- Arkema's long-term credit ratings are BBB+ (stable outlook) according to Standard & Poor's and Baa2 (positive outlook) according to Moody's.

Interest rate and counterparty

Due to its borrowing and cash investments, Arkema is exposed to the risk of fluctuations in the interest rates on its variable-rate financing and investments, and on the arrangement of new fixed-rate financing.

At 31 December 2018, the amount of cash invested with banking institutions or money market funds amounted to €1,441 million. Default by any one of these counterparties is likely to lead to a financial loss limited to the amount invested with the defaulting counterparty and therefore to an adverse impact on Arkema's results.

Risk management

Arkema's policy is to minimize the impact of interest rate fluctuations on its financing costs while simultaneously optimizing such costs. Interest rate risk exposure is managed by the Group's Financing and Treasury department and is hedged using simple derivatives.

Arkema gives priority to fixed-rate borrowing, whereas its investments are made at variable rates. At the date of this document, a 1% increase in interest rates would reduce the cost of net debt by around €7 million. In addition, part of its debt is hedged using currency swaps and is therefore exposed to changes in the difference between short-term interest rates in euros and those in the foreign currencies concerned. For further details, see notes 21 and 22 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

Furthermore, as part of its liquidity management strategy, Arkema centralizes the management of its financing resources and requirements and applies the following principles:

- Arkema recycles the financial surplus of its subsidiaries through intra-Group current accounts wherever local regulations permit;
- any new relationship between an Arkema subsidiary and a banking or financial institution is first approved by the Financing and Treasury department; and
- Arkema minimizes its exposure to counterparty risk by investing only in highly secure assets with leading diversified counterparties.

For further details, see note 22 to the consolidated financial statements at 31 December 2018 in section 5.3.3 of this document.

2.1.8 Talent and skills risks CSR

Arkema's success is deeply linked to the quality and commitment of its employees and, as a result, to its ability to attract, integrate, motivate, promote and retain skilled employees across all regions.

Difficulties in hiring or retaining skilled employees or even the departure of experienced employees (via resignation or retirement) could hamper the implementation of the Group's strategy and have a negative impact on its business activities and financial position. Given that 32% of Arkema's employees are over 50 years old at the date of this document, the Group needs to organize an effective skills transfer process from that generation to a new generation of employees in the coming years.

Furthermore, in some cases, Arkema's activities rely on technologies that require specific skills from its employees.

Risk management

Arkema has implemented numerous initiatives aimed at attracting quality candidates, retaining top employees and reinforcing, notably thanks to targeted training, their skills and, as a result, the Group's overall expertise. For further details on the human resources development and talent management policy, see section 4.4.1 of this document.

Arkema's compensation policies value and reward fairly each employee's contribution to the Group's success. Arkema has also rolled out long-term incentives to motivate and retain employees (incentive schemes, profit-sharing plans, employee shareholding

and performance shares). For further details, see sections 3.5 and 4.4.1.3 of this document.

Lastly, Arkema ensures that skills in certain sensitive technologies are shared by a sufficient number of employees in order to safeguard know-how within the Group.

2.1.9 Insurance cover default risks

Arkema's insurance policy is part of the overall risk management framework and, as such, is described in detail in section 2.2.6 of this chapter.

At the date of this document, Arkema believes that the limits of insurance cover described in said section take into account the type of risks it incurs. However, in some cases, the possibility that Arkema could be required to pay substantial compensation for claims that are not covered by the existing insurance program, or that it will incur very large expenses that will not be reimbursed or only partially reimbursed under its insurance policies, cannot be excluded.

Arkema selects its insurers from the best and most financially sound companies when taking out policies. However, the possibility cannot be ruled out that, at the time of settling a claim, one or more of these insurers could be in a difficult, even compromised, financial situation that puts payment of the compensation in doubt. Furthermore, developments in the insurance market could result in unfavorable changes to the Group's insurance policies and an increase in policy premiums.

The Group's insurers, under certain conditions deemed customary in the insurance industry for those types of contracts, can prematurely terminate insurance policies in the event of a major claim. In such an event, the Group nevertheless remains covered throughout the notice period, which may vary depending on the policy.

Risk management

Since its creation, Arkema has maintained a department dedicated to the investment and management of the Group's insurance cover, backed by international insurance brokers to optimize and bolster its cover.

The Group issues regular calls for tenders to insurance brokers and insurers in order to ensure that it is always informed of the best offers available on the market. Insurance cover and insurers are selected based on objective criteria including price, the extent of coverage and the strength, experience and quality of the insurers.

2.2 GLOBAL INTERNAL CONTROL AND RISK MANAGEMENT PROCEDURES

2.2.1 General organization: objectives and scope of internal control and risk management

OBJECTIVES

Arkema applies the Reference Framework of the French financial markets authority (*Autorité des marchés financiers – AMF*), published in 2007 and subsequently reviewed and expanded in 2010, which it has adapted to its business activities, size and organization.

Internal control is a Group-wide process defined and implemented by executive management, management and employees. Its objective is to ensure:

- compliance with current laws and regulations;
- compliance with the instructions and guidelines issued by executive management;
- the smooth operation of internal processes, notably those serving to protect assets; and
- the reliability of financial information.

Generally, internal control contributes to the management of Arkema's activities, the effectiveness of its operations, and the efficient use of resources.

However, no internal control process can provide absolute assurance that these goals are met. Despite the processes and controls in place, it cannot guarantee that all Arkema employees will constantly comply with the internal control guidelines and apply all the defined procedures.

Arkema has also implemented a risk management system that enables the Executive Committee to ensure that risks are at a level that it deems acceptable. This system contributes to:

- creating and protecting Arkema's value, assets and reputation;
- securing Arkema's decision-making and other processes so that objectives may be achieved more easily;
- ensuring consistency between Arkema values and actions; and
- rallying Arkema employees around a common vision of the main risks.

SCOPE

The internal control and risk management procedures are adapted to Arkema's organization, which is structured around three components:

- the three divisions, each comprising Business Lines, which are responsible for their respective performance and the implementation of internal control procedures (see section 1.2 of this document);
- the corporate departments (or support functions), which assist the divisions and businesses in their area of competence, such as accounting, human resources, legal affairs, IT and procurement, and ensure the coherence and optimization at the Group level (see section 1.3 of this document); and
- the subsidiaries, in which Arkema performs its business activities (see section 6.1.2 of this document).

These internal control and risk management procedures apply to all fully consolidated Arkema Group companies. Internal control is not limited to procedures that improve the reliability of financial and accounting information.

2.2.2 Persons involved in internal control and risk management

BOARD OF DIRECTORS AND COMMITTEES

The Board of Directors, the two committees in place (the Audit and Accounts Committee and the Nomination, Compensation and Corporate Governance Committee) and their members through their experience and expertise, contribute to the promotion of an internal control and risk management culture adapted to Arkema's activities.

In particular, it is the responsibility of the Audit and Accounts Committee to oversee the effectiveness of internal control and risk management systems, and assess the schedule of the internal auditors and the results of their work.

EXECUTIVE COMMITTEE

The Executive Committee implements the internal control process and ensures compliance by:

- defining the internal control framework and the rules for delegating responsibility;
- setting targets for each business, corporate department and subsidiary, and ensuring they have the resources for meeting these targets;
- supervising the implementation of the control procedures that help achieve the targets it has set;
- assessing the risks specific to each project submitted to the Executive Committee; and
- carrying out a review (annually and as deemed necessary) of Arkema's major risks, based on the work of the Risk Review Committee and its risk mapping presentation. In order to carry this out effectively, the Executive Committee relies on the Internal Audit and Internal Control department and the expertise of all its own members.

Each member of the Executive Committee is responsible for ensuring that the Internal Control Framework's Group-wide rules and principles (as described in section 2.2.3 of this chapter) are observed in the entities and, in particular, the businesses that he or she supervises.

RISK REVIEW COMMITTEE

A Risk Review Committee was set up in October 2007 to strengthen the formal framework of risk identification, analysis and management, and to regularly monitor the development of risk factors. It is made up of the Strategy Executive Vice-President (committee Chairman), the Industry Executive Vice-President, the Chief Financial Officer, the Legal Affairs Vice-President, the Sustainable Development Vice-President, the Group Safety and Environment Vice-President, the Insurance Vice-President and the Internal Audit and Internal Control Vice-President (committee secretary).

Every six months, or more often in response to specific events, the committee reviews:

- summaries of audits and assessments carried out by the Internal Audit and Internal Control, the Safety, Environment and Quality and the Insurance departments;
- reports on fraud or attempted fraud prepared by the anti-fraud unit;
- a summary and progress report of ongoing disputes presented by the Legal department;
- assessments of commercial intermediaries made by the commercial intermediaries review commission;
- a list of risks identified in the surveys carried out by the Internal Audit and Internal Control, Legal, and Accounting and Controlling departments;
- a risk map prepared by the Internal Audit and Internal Control department; and
- the monitoring of corrective measures in all of these areas.

Following its review, the Risk Review Committee can decide on further corrective measures or request additional information, and can also request updates to the risk map.

The conclusions of its review are reported to the Executive Committee which, upon completion of the process, may decide whether or not to update the main risks described in section 2.1 of this chapter.

The Risk Review Committee met twice in 2018.

INTERNAL AUDIT AND INTERNAL CONTROL DEPARTMENT

The Internal Audit and Internal Control department is made up of the Internal Audit sub-department and the Internal Control sub-department, both of which are independent functions under the responsibility of the Strategy Executive Vice-President.

The role of Internal Audit is principally to improve and develop controls in Arkema's management systems and processes and, more broadly, to ensure that its operating procedures comply with the Internal Control Framework.

All processes and management systems may be subject to an internal audit. The Internal Audit department discusses and agrees its findings with the audited entities before presenting them with a set of recommendations and related action plans that the entities commit to implementing.

An internal committee consisting of the Chief Financial Officer, the Strategy Executive Vice-President and the Internal Audit and Internal Control Vice-President regularly ensures that the recommendations have been followed.

The Internal Audit and Internal Control department defines a draft proposal for the audit plan based on:

- risk identification initiatives;
- interviews with Arkema's operational and corporate departments; and
- a selection of priorities from the various proposals gathered.

The final program is validated by the Executive Committee, and then approved by the Audit and Accounts Committee.

In 2018, the Internal Audit department carried out the following 38 audits:

- 7 audits of industrial sites and 1 audit of a research center in France and the United States;
- 16 audits of subsidiaries in Europe, Asia and South America;
- 3 process audits in Europe;
- 8 audits of businesses in Asia, Europe and North America;
- 3 follow-up audits in the United Kingdom and the United States.

The primary mission of Internal Control is to strengthen Arkema's internal control systems. Its initiatives are communicated and implemented, at subsidiary level, by a network of correspondents within the subsidiaries' Finance and IT departments.

Internal Control is involved in the analysis and formal implementation of processes that impact financial information, for which key controls have been defined.

The methodology consists of:

- analyzing the main risks of error, omission or fraud in processes or sub-processes, which could have a material impact on Arkema's consolidated financial statements;
- identifying and implementing control procedures to minimize any risk of error, omission or fraud;
- periodically checking the existence and effective operation of these controls, carried out by the Internal Control correspondents based in the subsidiaries (self-audit) or by the Internal Audit department; and
- defining corrective measures in the event of shortcomings and overseeing their implementation.

The list of procedures covered by this methodology is based on the 14 procedures of the AMF Reference Framework application guide published in 2007 and updated in 2010. It is adapted to the specific features and size of the subsidiaries.

All significant subsidiaries were covered by Arkema's internal control system in 2018.

2.2.3 Internal control framework

Arkema's internal control and risk management systems are based on three core principles:

- clear definition of responsibilities and delegations of authority, observing rules governing the segregation of duties (in particular distinguishing between those who perform actions and those who approve them), to ensure that any person who makes commitments to third parties on behalf of Arkema has the authority to do so;
- identification, analysis and management of risks; and
- regular reviews, notably via annual internal control assessments and the internal audit program, to ensure internal control and risk management systems operate correctly.

Arkema's Internal Control Framework defines its organization and the guiding principles behind its operating procedures. Approved by the Executive Committee and available to all employees, notably via the intranet, it is based on the Safety, Health, Environment and Quality Charter, the Users' Guide for IT Resources and Electronic Communication, and the Code of Conduct and Business Ethics put in place by Arkema, available on Arkema's website under the heading "Ethics and integrity". In line with the AMF Reference Framework published in 2007 and updated in 2010, the Internal Control Framework is based on five components:

DIVISIONS, BUSINESS LINES, CORPORATE DEPARTMENTS AND SUBSIDIARIES

Arkema is organized into divisions as described in section 1.2 of this document. The divisions are made up of Business Lines, which coordinate the use of the resources required to meet the targets set in their respective areas. Each business is responsible for its own performance and for implementing suitable control procedures and processes, in accordance with the principles and procedures defined in Arkema's Internal Control Framework, Code of Conduct and Business Ethics, charters and guidelines.

The corporate departments ensure that Arkema's organization is consistent and optimized.

Each subsidiary is placed under the responsibility of a local executive who is responsible for employing the resources defined with the businesses and the support functions to meet the subsidiary's targets, in accordance with current laws and the rules and principles defined by Arkema.

- control environment;
- risk management (detailed in section 2.2.4 of this chapter);
- control activities;
- information and communication; and
- continuous assessment of internal control systems.

CONTROL ENVIRONMENT

The control environment is the basis for the other components of internal control and refers primarily to Arkema's organizational principles, its values as set out in the Code of Conduct and Business Ethics and the level of awareness among employees.

All employees are informed of the importance attached to observing the rules of proper conduct set out in the Code of Conduct and Business Ethics, the Health, Safety, Environment and Quality Charter, and the Users' Guide for IT Resources and Electronic Communication.

Arkema has put in place a compliance program, which mainly covers antitrust, export control and anti-corruption laws. Each area is the subject of various procedures and/or guides, which are provided to employees. To ensure that the compliance program has been followed, the Group's Legal department sends a declaration of compliance each year to the heads of the businesses, the corporate departments and the main subsidiaries and sites, which they must sign and return to show that they are aware of the compliance program, that they have acted in accordance with it over the past year, and that they undertake to continue to do so in the coming year. These heads are then responsible for obtaining an identical declaration, signed by the employees concerned within their business, corporate department, subsidiary or site.

A fraud prevention procedure has been put in place to record and centralize situations of fraud and therefore improve their handling and prevention.

In general, the roles and duties of every operational and corporate manager are set out in a job description. Their objectives, which include an internal control dimension, are set by their respective line manager, to whom they must periodically report on their activities.

Lastly, Arkema has set up a dynamic human resources management approach and a policy of ongoing training designed to ensure that employees' skills are continuously adapted, and to maintain a high level of individual engagement and motivation.

CONTROL ACTIVITIES

Control activities involve applying the standards and procedures that help ensure that Group management directives are implemented at every level of the Arkema Group.

To this end, a set of regulations has been formally documented in the Internal Control Framework, and general principles applicable to all Arkema entities have been defined in order to be able to control the application of the operating procedures defined by the Executive Committee. For example, delegations of authority and investment management are the subject of specific notes.

- Businesses and subsidiaries are responsible for operational processes and therefore for internal control.
- Corporate departments are responsible for defining and communicating policy and best practice guidelines relating to their area of expertise and ensuring that they are correctly applied, particularly in the following fields:
 - compliance with laws and regulations;
 - safety and environmental protection; and
 - the reliability of financial information.
- Controlling access to IT systems forms a key part of internal control and is subject to a formal management process, which involves both the departments using the systems and the IT department.

The Internal Audit team conducts assessments of Arkema's compliance with its Internal Control Framework in accordance with the audit plan validated annually by the Executive Committee and approved by the Audit and Accounts Committee.

INFORMATION AND COMMUNICATION

IT systems are a key component of Arkema's organization.

Mindful of the opportunities and risks related to the use of information technologies, Arkema has set up an IT governance structure to control risks while creating value and improving performance.

This approach consists of deploying Group-wide the ten IT management practices drawn up formally by the French IT association for major companies, CIGREF (*Club informatique des grandes entreprises françaises*), as part of Arkema's IT systems security policy (for more details, please refer to section 2.1.6 of this chapter).

Additionally:

- Arkema has a highly detailed financial reporting system, an essential management tool used by executive management;
- the main internal control documents are available on Arkema's intranet; and
- each support function develops professional best practices and communicates them throughout Arkema via the intranet.

CONTINUOUS ASSESSMENT OF INTERNAL CONTROL SYSTEMS

The internal control system is assessed on an ongoing basis. The Executive Committee is responsible for the overall internal control system, its performance and its oversight. However, each subsidiary is responsible for improving internal control performance within its own scope.

In general, any weaknesses in the internal control system must be reported to line management and, if necessary, to the Executive Committee.

In addition, recommendations made by the Internal Audit department on completion of its audits are systematically reviewed, and a summary is presented to the Audit and Accounts Committee. When decisions to apply corrective measures are adopted, their implementation is monitored on a formal basis.

Furthermore, as part of their engagement, the statutory auditors may alert Arkema (represented by the Finance department and the Internal Audit and Internal Control department) and the Group's Audit and Accounts Committee regarding any weaknesses that they may have identified. These factors are taken into account by Arkema in its efforts to improve internal control.

2.2.4 Risk identification and management

In the course of its business, Arkema is exposed to a number of internal and external risks.

As Arkema's structure is highly decentralized, risk assessment and management is the responsibility of the businesses, corporate departments and subsidiaries. Each of these entities has a duty to reduce the risks inherent in their activities.

Arkema's risk management system is based on regular reviews of risk identification, analysis and treatment, as follows:

- every month, each business presents its results and indicators to its operational Executive Vice-President, member of the Executive Committee, and the Executive Committee reviews the results of the divisions and their respective businesses;
- the Accounting and Controlling department organizes a quarterly review of risks and legal disputes that may have to be reported in Arkema's financial statements. The businesses, corporate departments and subsidiaries report on their entity's risks, which are analyzed and addressed at quarterly meetings with the Chief Financial Officer, the Accounting and Controlling department, the Legal department, and the Internal Audit and Internal Control department; and
- the Internal Audit and Internal Control department carries out an annual survey of risks amongst Arkema's main entities, namely the businesses, corporate departments and subsidiaries. The risks are identified and analyzed and the most significant generic risks are positioned on a risk map,

which is presented to the Risk Review Committee. The Risk Review Committee then assesses the need to update the risk map and puts forward suitable action plans where necessary. As part of this generic risk map, certain specific risks may be presented on an additional map. The Committee's conclusions are reported to the Executive Committee prior to the definition of the internal audit plan. This plan is drawn up on the basis of the risk map and the need to cover Arkema's scope of activity on a regular basis. Material risks known to Arkema are allocated to a member of the Executive Committee. They are also examined by the Audit and Accounts Committee and presented to the Board of Directors. The main risks are set out in section 2.1 of this chapter, where they have been classified into the following sections:

- industrial risks,
- risks relating to compliance, societal expectations and internal control,
- operational risks,
- project and innovation risks,
- economic and business risks,
- IT risks,
- financial risks,
- talent and skills risks,
- insurance cover default risks.

2.2.5 Accounting and financial control procedures

Operational and corporate managers' control and understanding of their business' financial performance represent one of the key factors in Arkema's financial control system.

ORGANIZATION OF THE FINANCE FUNCTION

The finance function is the responsibility of the Chief Financial Officer and includes:

- an Accounting and Controlling department, which produces the consolidated financial and accounting information, ensures the reliability of the data constituting Arkema's financial information and provides management analyses and financial forecasts to Arkema's different entities to facilitate their management;
- a Tax department, which ensures compliance with the applicable laws and regulations on tax declarations and payment and carries out the overall tax planning process for the Group;

- a Financing and Treasury department, whose role is to optimize the Group's financing and liquidity and manage counterparty risk; and
- an Investor Relations department, whose remit is to establish, develop and maintain relations with investors, shareholders and financial analysts, and publish financial information once it has been approved by the Board of Directors.

Each business has its own management control team, which monitors and analyzes the business' performance monthly, and each subsidiary is responsible for its own monthly accounts and half-year and full-year financial information.

ACCOUNTING REPORTING AND MANAGEMENT CONTROL

The Accounting and Controlling department defines the financial principles and guidelines set out in the financial reporting manual and Arkema's management framework. It also monitors accounting laws and regulations for the Group and ensures that specific technical provisions applicable to Arkema are taken into account.

The purpose of the financial reporting process, established in accordance with these principles, is to analyze actual performance compared with forecasts and prior periods. The reporting schedule is structured around:

- a five-year plan drawn up each year by the Strategy department. The plan is reviewed and approved by the Executive Committee and enables it to understand the financial consequences of the Group's major strategic choices and the main threats identified in the environment under consideration;
- an annual budget, which sets out the financial performance targets for the following year in line with the medium-term plan. The budget preparation process falls within the remit of the Accounting and Controlling department. The budget represents a key benchmark for measuring the actual performance of the three divisions, their respective businesses, the corporate departments and Arkema's subsidiaries as a whole;
- a monthly forecast and reporting process, which enables business trends to be taken into account in order to refine end-of-period forecasts for the quarter and the year. The Accounting and Controlling department prepares a consolidated report each month, by division and business, that includes the month's significant events, the performance indicators and the updated forecasts. These components are systematically reviewed by the Group's Executive Committee.

The fundamental financial reporting principles are set out in the financial reporting manual and Arkema's management framework. These reference documents are updated regularly by the Accounting and Controlling department, following approval by the Chief Financial Officer or the Executive Committee, depending on the type of amendment and its significance.

One of the main purposes of accounting-related reporting is to analyze actual performance compared with forecasts and prior periods based on the processes described below.

PARENT COMPANY AND CONSOLIDATED FINANCIAL STATEMENTS

Arkema publishes consolidated financial information on a quarterly basis. The half-year financial statements at 30 June are subject to a review by the statutory auditors and the full-year financial statements to an audit. The quarterly information to 31 March and 30 September is presented in summary form

only (balance sheet, income statement and cash flow statement). Press releases concerning financial information are prepared by the Investor Relations team and submitted to the Company's Board of Directors for approval.

At the end of each accounting period, the Accounting and Controlling department reviews the financial risk portfolio with each business, corporate department and main legal entity of the Group.

The preparation of the parent company's financial statements is part of the general procedure for the preparation of annual financial information. Furthermore, the Company submits management forecast documents to the Board of Directors in compliance with regulatory provisions.

IT SYSTEMS

The IT department defines and coordinates the IT systems for the entire Group.

Arkema is continuing its transformation program using SAP integrated software, which is helping to improve the Group's control environment, particularly through procedure review, improved automated checks, and the removal of interfaces.

REPRESENTATION LETTERS

Each year, Arkema issues a representation letter attesting in particular to the accuracy and consistency of the consolidated financial statements. This letter is signed by the Chairman and Chief Executive Officer and the Chief Financial Officer and addressed to the Group's statutory auditors. In support of this representation letter, the operational and financial heads of each consolidated subsidiary make an annual undertaking to observe the internal control rules and ensure the accuracy of the financial information supplied, in the form of a representation letter to the Group's Chairman and Chief Executive Officer, the Chief Financial Officer and the statutory auditors.

Following the same procedure, Arkema's half-yearly representation letter is based on the main subsidiaries' half-yearly letters of representation, which certify that the subsidiaries' half-yearly consolidated financial statements have been prepared in accordance with Arkema's financial reporting manual.

2.2.6 Arkema's insurance policy

Arkema implements an insurance cover strategy that combines a prevention policy designed in close cooperation with insurers (in particular for property damage, via periodic visits to the sites together which result in the regular issuance of technical recommendations implemented by the Group), and the purchasing of insurance policies.

The Group's policy is to centralize its insurance against risks relating to the production, transportation and marketing of its products worldwide. Arkema uses international insurance brokers to optimize its cover of all Group companies. As a general rule, the Group's insurance cover limits apply either to each claim, or to each claim and each year, and vary according to the risks covered. In most cases, cover is limited both by certain exclusions standard to these kinds of contracts and by deductibles that are reasonable given the size of the Group.

For the financial year ended 31 December 2018, total premiums paid by the Group, and relating to the Group's insurance policies presented below, amounted to less than 1% of its sales for the period.

The Group's insurance policies are drawn up to cover current risks while also accommodating any new acquisitions or disposals that may take place during the year.

The Group retains a certain level of risk through the deductibles on its insurance policies, and centrally through a captive insurance company that is active only in property insurance. The objective of the captive company is to optimize the Group's external insurance costs.

Arkema believes that its insurance policies are consistent with those currently available on the insurance market for groups of similar size and involved in similar business activities.

Descriptions of the insurance policies taken out by Arkema are provided below to a level of detail that enables it to comply with confidentiality requirements and protect its interests and competitiveness.

CIVIL LIABILITY

The Group has contracted civil liability insurance policies with leading insurance companies. The civil liability policies are subject to applicable exclusions and sub-limits but cover the Group worldwide against the financial consequences of civil liability claims in the context of its business activities and in respect of physical, material or non-material damages or losses caused to third parties. These policies cover up to €1 billion for the Group. Deductibles vary, particularly depending on the subsidiaries' location.

PROPERTY DAMAGE

The Group's sites are covered by leading insurance companies against material damage and any resulting business interruption. This cover is intended to avoid any significant financial loss and to ensure the resumption of operations in the event of property damage. However, certain property and types of damage can be excluded from the insurance policy's cover depending on the country in which the loss occurs.

The cover includes a "direct damage" component and a "business interruption" component, with the compensation period for the latter limited to either 24 or 36 months, depending on the site. These policies may include sub-limits, particularly for machinery breakdowns, natural disasters and terrorism. Deductibles vary depending on the size of the site concerned. In 2018, the maximum total retention in the event of a claim, excluding natural disasters, was €20 million. This amount is increased to €25 million in the event of a natural disaster-related claim.

The combined cover limit of the policies in place for direct damage and business interruption, over and above the total retention, is €500 million.

TRANSPORT

The Group is insured against the risk of damage to its manufacturing assets, equipment, finished or semi-finished products and raw materials during transportation or storage by third parties up to a limit of €12 million per shipment. The policy includes a deductible and several exclusions that are standard for this kind of agreement.

ENVIRONMENTAL RISKS

Arkema has taken out an environmental liability insurance program with leading insurance companies. For production sites located in the United States, the limit is US\$75 million. For production sites outside the United States, the limit is €80 million.

These programs cover, under certain conditions, environmental liabilities linked to the production sites of the Group. They include in particular damages suffered by third parties as a result of pollution generated either on Group production sites or as a result of transporting Group products.

CYBER RISKS

Arkema has taken out a cyber insurance program covering all subsidiaries worldwide. The coverage ceiling was increased to €50 million with effect on 15 January 2018, with a deductible of €2 million.

APPENDIX 3 : DUTIES AND OPERATING PROCEDURES OF THE BOARD OF DIRECTORS



3.3.2 Duties and operating procedures of the Board of Directors

3.3.2.1 DUTIES

The Board of Directors is a collegiate body that takes decisions collectively. It is mandated by and accountable to all of the shareholders.

The Company's Board of Directors exercises the powers assigned by law in order to act in the Company's best interests in all circumstances. It decides the Company's overall business strategy and oversees its implementation. Subject to those powers expressly conferred upon it at shareholders' meetings and within the limits of the Company's corporate purpose, the Board of Directors considers any issue involving the proper operation of the Company and decides on any issue concerning the Company. Lastly, it strives to create value over the long term by also factoring social and environmental challenges into the Group's business plans.

To this end, it must in particular monitor and review the Group's strategic developments, appoint the executive officers responsible for managing the Company in line with the corporate strategy, monitor the implementation of this strategy, take decisions regarding major transactions, ensure the quality of information supplied to shareholders and the markets, particularly in the financial statements, and guarantee the quality of its operations. It analyses opportunities and risks – especially financial, legal, operational, social and environmental risks – on a regular basis in line with the Group's strategy and the related measures taken.

The Board of Directors can decide to set up one or more specialized committees. It defines the composition and remit of these committees, which operate under the responsibility of the Board of Directors. In accordance with the Internal Rules of the Board of Directors and each of its committees, some matters are therefore subject to prior review by the appropriate committee before being submitted to the Board of Directors for approval.

3.3.2.2 OPERATING PROCEDURES

The operating procedures of the Board of Directors are determined by current laws and regulations, the Company's Articles of Association and its Internal Rules as updated most recently on 26 February 2019 in compliance with the AFEP-MEDEF Code.

The Board of Directors meets at least four times a year and whenever the interests of the Company so require. Meetings are convened by its Chairman. The convening notice may be delivered by any means, even verbally, eight days before the date of the meeting and, in urgent cases, without notice. It specifies where the meeting will take place. Since 2017, the convening notice and meeting support documents are made available via a digital platform that enables the secure exchange of data. In principle, meetings take place at the Group's head office but may in certain cases be held by conference call in accordance with the law, the Company's Articles of Association and the Board of Directors' Internal Rules.

The Board of Directors' meetings are chaired by the Chairman of the Board or, in his absence, by the oldest director in attendance.

The Board of Directors may legitimately deliberate even in the absence of a notice of meeting if all members are present or

represented. In accordance with its Internal Rules, in all cases permitted by law and if specified in the notice of meeting, directors attending the meeting by means of videoconferencing or any other telecommunication method that meets the requisite technical specifications set by current laws and regulations are deemed present for the purpose of quorum and majority requirements.

Decisions are taken by majority vote of the members present, deemed present or represented. In the case of a split vote, the Chairman has the casting vote.

In accordance with corporate governance best practice and the recommendations of the AFEP-MEDEF Code in particular, the Board of Directors' Internal Rules also set out the rights and obligations of the directors and notably impose that:

- before accepting their duties as director of the Company, the directors must ensure that they are familiar with the Company's Articles of Association, the Board of Directors' Internal Rules, and the legal and regulatory provisions governing the functions of a director of a French joint stock corporation (*société anonyme*), and in particular the rules relating to the definition of the powers of the Board of Directors, multiple directorships, the agreements falling within the scope of Article L. 225-38 of the French Commercial Code, the holding and use of insider information, the declarations of trading in the Company's shares and the black-out periods during which directors may not trade in those shares;
- the directors are elected by all the shareholders and must act in all circumstances in the Company's best interests;
- the directors must devote the necessary time and attention to their duties. Consequently, the directors may not hold more than four other directorships in listed companies, including foreign companies, outside the Group. Accordingly, the directors undertake to inform the Chairman of the Nominating, Compensation and Corporate Governance Committee of any new non-executive or executive directorship that they might accept in a company outside the Group or outside the group of which he or she is a member, including their participation in the committees of these companies' Boards; executive directors may not hold more than two other directorships in listed companies outside the Group and must seek the opinion of the Board of Directors prior to accepting any new directorship in a listed company;
- the directors must be committed and, where possible, take part in all the Company's Board of Directors' meetings and the meetings of the committees to which they have been appointed, as well as general shareholders' meetings;
- prior to each Board of Directors' meeting, except in the event of an emergency justified by exceptional circumstances, the agenda and information on items on the agenda that require special analysis and prior consideration are sent to each director with the notice of meeting or at least in sufficient time before the meeting, whenever this can be accomplished without any breach of confidentiality. The directors may also request from the Chairman and Chief Executive Officer any additional information they may consider necessary to properly fulfill their duties, particularly in the light of the meetings' agenda;

- if they deem it necessary, the directors may also request additional training on the Group's specific features, businesses, and sector of activity, at the time of their appointment or during their term of office. This training is organized by the Company, which pays the related costs;
- all documents provided for Board of Directors' meetings and all information collected during or outside Board of Directors' meetings are confidential, without exception, whether or not the information collected is presented as being confidential. In this regard, the directors must consider themselves bound by strict professional confidentiality beyond the simple duty of discretion provided for by the law. Furthermore, the directors undertake not to express their individual views outside the boardroom on matters discussed during Board of Directors' meetings, or on the opinions expressed by individual directors; and
- as required by law and regulations, the directors must refrain from trading in the Company's securities (including derivative financial instruments) insofar as, by virtue of their duties, they have access to insider information. They are therefore added, as soon as they take up their duties, to the list of people subject to the black-out periods implemented by the Company. Furthermore, the directors must disclose any transactions they have entered into in respect of the Company's securities.

The Internal Rules also provide that, when the positions of Chairman and Chief Executive Officer are held by the same person, the Board of Directors shall appoint one of the independent directors to serve as senior independent director, based on the recommendation of the Nominating, Compensation and Corporate Governance Committee. For further details, see section 3.3.3 of this chapter.

In accordance with the AFEP-MEDEF Code and with best governance practices, the Chairman and Chief Executive Officer does not take part in any discussions concerning his term of office and compensation. The other Board members therefore have the opportunity to conduct discussions in an executive session, without his presence, at least once a year. The Board's Internal Rules have also provided that following the annual assessment of the Board of Directors' operating procedures, the senior independent director may organize another meeting of non-executive directors, from which executive or employee directors are excluded.

3.3.2.3 ACTIVITIES OF THE BOARD OF DIRECTORS

The Board of Directors met six times in 2018. The attendance rate at these meetings was 97% (versus 90.5% in 2017 and 95% in 2016). On average, the meetings lasted approximately three and a half hours.

The following table summarizes the individual attendance rates of directors at the meetings of the Board of Directors and its committees in 2018.

Directors	Board of Directors		Audit and Accounts Committee		Nominating, Compensation and Corporate Governance Committee	
	Attendance rate	Number of meetings	Attendance rate	Number of meetings	Attendance rate	Number of meetings
Thierry Le Hénaff	100%	6/6	-	-	-	-
Yannick Assouad	100%	6/6	-	-	-	-
Jean-Marc Bertrand ⁽²⁾	100%	3/3	-	-	-	-
Patrice Bréant ⁽¹⁾	67%	2/3	-	-	-	-
Marie-Ange Debon ⁽²⁾	100%	3/3	100%	4/4	-	-
Marie-José Donsion ⁽¹⁾	100%	3/3	100%	2/2	-	-
François Enaud	100%	6/6	-	-	100%	3/3
Alexandre de Juniac ⁽²⁾	100%	3/3	-	-	100%	1/1
Victoire de Margerie	100%	6/6	-	-	67%	2/3
Laurent Mignon	100%	6/6	-	-	-	-
Hélène Moreau-Leroy	100%	6/6	100%	6/6	-	-
Thierry Morin	84%	5/6	-	-	100%	3/3
Nathalie Muracciole	100%	6/6	-	-	-	-
Marc Pandraud	100%	6/6	-	-	-	-
Fonds Stratégique de Participations represented by Isabelle Boccon-Gibod	100%	6/6	100%	6/6	-	-
TOTAL	97%	6	100%	6	92%	3

(1) Term of office expired on 18 May 2018.

(2) Appointed on 18 May 2018.

The agenda of the Board of Directors' meetings included recurring annual topics as well as more specific topics.

Operations, strategy and risk management

Recurring annual topics

- review and approval of the strategy and main operational priorities presented during the annual seminar
- follow-up of the roll-out of targeted acquisitions and major capital expenditure programs
- review and, where necessary, update of the risk map
- presentation and approval of the insurance program
- changes in the competitive environment
- review of the Group's position in terms of cybersecurity
- progress report on the Group digital transformation program
- business presentation by the industrial division
- presentation and review of the business of each division

Specific topics in 2018

- review of strategy in Acrylics in China and of the authorization to buy back shares in Jurong Chemical, partner in the Sunke joint-venture
- review of acquisition policy in the adhesives business
- review of the consequences of the Crosby incident in Texas following Hurricane Harvey.

Accounting and financial situation

Recurring annual topics

- approval of the annual budget
- approval of the annual consolidated and Company financial statements, proposed allocation of profit and distribution of dividends
- approval of the management report and, more generally, of the reference document
- preparation of the annual general meeting including approval of the draft resolutions
- approval of management forecast documents
- approval of the half-yearly financial statements and review of quarterly financial information
- review of reports on the work carried out by the Audit and Accounts Committee
- approval of draft results press releases
- review of the Company's needs in terms of financial resources and therefore of the Euro Medium Term Notes (EMTN) program and definition of the maximum issue amount
- feedback from roadshows

Specific topics in 2018

- renewal of the Euro Medium Term Notes (EMTN) program for a maximum amount of €3 billion.

Corporate governance and compensation

Recurring annual topics

- assessment of the Board of Directors' operating procedures
- assessment of the independence of directors
- review of directors' terms of office and proposal of renewals/appointments
- review of reports on the work carried out by the Nominating, Compensation and Corporate Governance Committee
- review of related-party agreements and agreements entered into and authorized during previous years which were implemented during the year
- definition of the amount and the principles for allocating attendance fees
- policy on the Chairman and Chief Executive Officer's compensation
- compensation due or awarded to the Chairman and Chief Executive Officer for the prior year
- compensation for Executive Committee members (fixed compensation, variable compensation for the prior year and criteria used to determine variable compensation)
- definition of share-based compensation for Group employees (performance share plan, capital increase reserved for employees, etc.)
- changes in the Executive Committee and its succession plan, including for the Chairman and Chief Executive Officer, as well as career management policy for executives
- definition of the Chairman and Chief Executive Officer's powers to issue deposits, commitments and guarantees
- activity report of the senior independent director
- approval of the report on corporate governance

Specific topics in 2018

- creation of a whistleblowing facility and amendment of the Code of Conduct and Business Ethics in accordance with the provisions set out in the Sapin II Law and a general review of the different compliance initiatives and measures deployed within the Group
- changes in the Executive Committee, particularly the replacement of the Chief Financial Officer and the Executive Vice-President, Human Resources and Communication
- appointments of Marie-Ange Debon and Alexandre de Juniac as members of the Board of Directors and reappointment of *Fonds Stratégique de Participations* represented by Isabelle Boccon-Gibod
- support for Jean-Marc Bertrand's appointment as director representing shareholder employees
- decision to maintain François Enaud as senior independent director
- acknowledgment of the fulfillment of the performance conditions applicable to the 2014 performance share plan
- 2018 performance share plan.

Corporate social responsibility**Recurring annual topics**

- the Group's situation in terms of safety and environment
- Group human resources policy, especially its diversity policy
- Group CSR approach and roadmap

Specific topics in 2018

- set-up of the "Plan de vigilance" (duty of care plan).

At each meeting, the Chairman reviews the transactions concluded since the previous meeting and seeks the authorization of the Board of Directors for the main projects underway that are likely to be completed before the next meeting.

Once a year, the Board of Directors dedicates a day to reviewing Arkema's strategy in the presence of the Executive Committee members and the head of R&D. During this meeting, the directors are given detailed presentations on key components of the Group's strategy, including R&D, with a demonstration of the recent innovations in various areas, the acquisition strategy, safety and sustainable development, the digital strategy, the competitive landscape, and specific operational risks. This is also an opportunity for the Board to analyze the main challenges of the coming years and changes in the Group's profile. At the end of the seminar, the directors meet with around 20 of the Group's senior executives and high potentials.

The Board of Directors oversees the Company's quest for gender balance within the Executive Committee and the 10% of most senior positions. For further details on human resources diversity policy, see section 4.4.1.5 of this document.

Lastly, the Board of Directors, using the preparatory work of the Nominating, Compensation and Corporate Governance Committee, and in complete cooperation with the Chairman and Chief Executive Officer, examines succession planning for the Chairman and Chief Executive Officer and the members of the Executive Committee, and career management policy for Group executives. This work is used to prepare for reappointments and replacements in view of the different term of office renewal dates and to handle long-term succession planning scenarios or for dealing with crisis situations.

Since the beginning of 2019, the Board of Directors has met three times, with an attendance rate of 98%. In addition to recurring topics such as the approval of the 2019 annual budget, the approval of the annual consolidated and Company financial statements for 2018, the proposed allocation of profit and distribution of dividends and, more generally, the preparation of the annual general meeting including approval of the proposed resolutions, these meetings focused in particular on:

- changes to the composition of the Board of Directors with (i) the proposed appointment of Ian Hudson to replace François Enaud as independent director and who will join the Audit and Accounts Committee and (ii) the proposals to reappoint Victoire de Margerie, Hélène Moreau-Leroy and Laurent Mignon;
- the appointment of Hélène Moreau-Leroy as senior independent director to replace François Enaud from 21 May 2019, subject to her reappointment as a director by the annual general meeting on the same date;

- maintaining Thierry Morin as Chairman of the Nominating, Compensation and Corporate Governance Committee;
- a review of the Group's social and environmental challenges as part of CSR performance reporting requirements pursuant to Article L. 225-102-1 of the French Commercial Code and the report on the effective deployment of the *Plan de vigilance* (duty of care plan);
- a review of the Group's tax situation; and
- the assessment of the operating procedures of the Board of Directors and its committees conducted by an independent advisory firm.

One of these three meetings was held in Shanghai, China, at the headquarters of Arkema (China) Investment Co. Ltd. In addition to recurring topics, the Board focused on key strategic priorities and projects in advanced materials and Arkema's Chinese businesses. After this meeting, the Board members visited the Changshu industrial platform where they enjoyed a presentation of Arkema's key activities at this site.

3.3.2.4 ASSESSMENT OF THE OPERATING PROCEDURES OF THE BOARD OF DIRECTORS

In accordance with the AFEP-MEDEF Code and its Internal Rules, the Board of Directors conducts an annual assessment of its operating procedures by means of a formal questionnaire. Every three years in principle, an assessment is conducted by an external consultant. The form and terms of the Board's assessment are discussed by the Nominating, Compensation and Corporate Governance Committee every year.

The Chairman of the Nominating, Compensation and Corporate Governance Committee and the Secretary of the Board of Directors are involved in all areas of the assessment process (drafting/updating the questionnaire, setting the schedule, reviewing the answers to the questionnaire, preparing the feedback, attending preparatory and feedback meetings with the consulting firm).

At the beginning of 2019, the Board of Directors' 2018 operating procedures were assessed by consulting firm Spencer Stuart. In this context, individual interviews of each director were conducted based on a guide that was drawn up in advance and specifically tailored to Arkema and to the objectives set for the performance of this external assessment. The guide was approved by the Chairman of the Nominating, Compensation and Corporate Governance Committee and the Secretary of the Board of Directors. Prior to the interviews, each director was invited to complete an online questionnaire.

The findings from this assessment process were detailed in a report that was first presented to the Nominating, Compensation and Corporate Governance Committee on 19 February 2019 and then to the Board of Directors on 26 February 2019.

In general, this assessment shows that Arkema's governance is among the best in the industry in terms of governance practices. More than 75% of directors consider that the operating procedures of Arkema's Board of Directors continued to improve compared with the last external assessment carried out in 2016 and a large majority of directors who also sit on the boards of comparable companies consider the operating procedures of Arkema's Board to be the best, in particular due to the Chairman's attitude towards the directors and the directors' active and positive contribution.

This assessment highlighted the following strengths:

- the current governance structure with the combined role of Chairman and Chief Executive Officer, which is entirely suited to Arkema, in particular due to the attitude of transparency of the Chairman and CEO's towards the Board. Indeed, the Chairman and CEO listens to the Board's opinion and seeks discussion and interactions;
- the diverse expertise of the directors;
- the directors' genuine commitment to and interest in Arkema and the successful integration of new directors;

- the freedom of expression, friendliness and trusting relationship among the Board members, which has not been affected by the replacement of directors;
- increased interaction with the entire Executive Committee team thanks to more regular meetings with its members and better knowledge of the latter;
- committees that play an excellent role in fulfilling their duties and provide the Board with real support;
- high quality Board documents; and
- a highly successful strategy seminar and trip to China in early 2019, which brought genuine value-added.

Following this assessment, the following subjects were identified by the Board to be further developed or consolidated:

- strengthening of skills in the areas of chemicals and international exposure and the continued presence of a Chief Executive Officer or former Chief Executive Officer from the industrial sector with a strong international dimension to the Board;
- the ongoing succession plan for the Chief Executive Officer and the Executive Committee in general; and
- institutionalizing the holding of a Board meeting at one of the Group's foreign sites.

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