SOCIAL RESPONSIBILITY 2017

COMMUNICATION ON PROGRESS

EXTRACT FROM 2017 REFERENCE DOCUMENT

ARKEMA
INNOVATIVE CHEMISTRY

SUSTAINABLE OFFER DRIVEN BY INNOVATION

Doubling of PEKK Kepstan® production capacities in France

Joint development agreement with EOS, a world leading technology supplier in the field of industrial 3D printing

2017 TOP 100 GLOBAL INNOVATOR Clarivate Analytics

Ranked by Clarivate Analytics among the 100 most innovative companies in the world for the seventh consecutive year

Manufacturing of a wind turbine blade from Elium® thermoplastic resin

STRATEGIC CONTRIBUTION TO SDGs

Arkema is committed to the 2030 UN Agenda for Sustainable Development. Through its innovation, operational excellence and social policy the Group directly contributes to 9 SDGs.

2017 KEY NON-FINANCIAL FIGURES

SAFETY

2017	2025 target
1.6	<1.2

TRIR(1)

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

SOCIAL

2017	2025 targets
19%	23% to 25%

Senior executive positions to be held by women

2017	2025 targets
37%	42% to 45%

Senior executive positions to be held by non-French nationals

ENVIRONMENT

(basis 100% in 2012)

2017	2025 target
-48%	-50%

Greenhouse gas emissions

2017	2025 target
-30%	-40%

Chemical oxygen demand

2017	2025 target
-11%	-15%

Net energy purchased

2017	2025 target
-34%	-33%

Volatile organic compounds

MESSAGE

Dear Stakeholders,

I am pleased to renew Arkema's support for the UN Global Compact we joined in 2014. Our commitment to the initiative and its 10 principles, together with the Responsible Care® initiative, drive our sustainability approach and continuous improvement programs.

Offering sustainable solutions that meet current and future social challenges is a centerpiece of our strategy and drives Arkema's innovation policy and product lines evolution. Our innovation platforms include lightweight materials and design, electronics solutions, new energies, bio-based products, water management and home efficiency.

Thanks to its innovation, together with its responsible operations management, the group has a direct contribution to 9 of the UN Sustainable Development Goals. This contribution is reflected in our strategic objectives covering environment protection and social progress.

In 2017, the efforts allocated to these objectives enabled significant progress to be made in reducing our environmental footprint. In particular, the group continued its momentum on GHG emissions which are now close to 2025 target of 50% intensity reduction compared to 2012. At the same time, thanks to its dedicated water management program, Arkema has achieved its 2025 target in water quality release and has set a more ambitious target.

Supporting sustainability along our value chain, we are firmly committed to promote human rights, labor standards, environment protection and anti-corruption in our supply chain. By year end 2017, through our participation in the Together for Sustainability initiative, more than 1000 suppliers and contractors have already been integrated in our ongoing assessment and progress program.

The Group's continuous improvement in extra-financial rating and its decision to adopt the DJSI index as a key indicator for CSR progress is a clear indication of its ambition to be among the leading performers of the industry.

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

I sincerely thank you for your continued support and interest in our sustainable performance.

THIERRY LE HÉNAFF
CHAIRMAN AND
CHIEF EXECUTIVE OFFICER

2017 KEY FIGURES

€8,326M
SALES

€1,391M
EBITDA

16.7%
EBITDA margin

Adjusted net income per share
€7.82

Free cash flow[1]
€565 M

Dividend per share[2]
€2.30

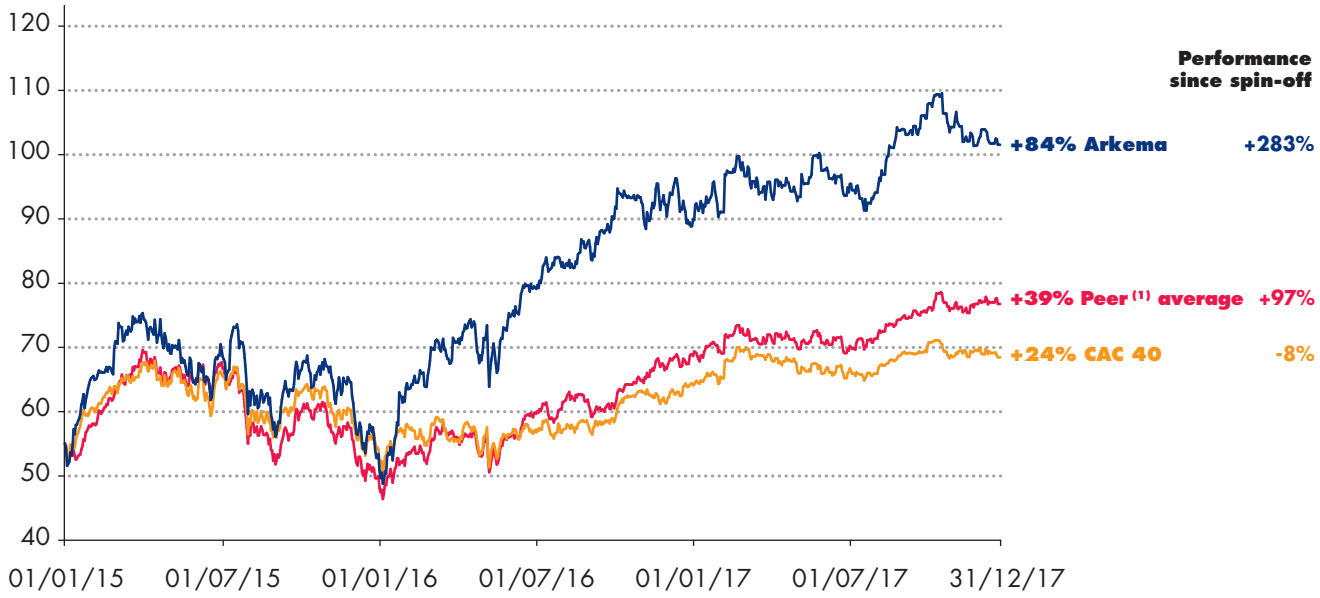
Net debt
€1,056 M

Capital expenditure[3]
€431 M

Number of employees
19,779

Number of industrial sites
136

SHARE PRICE IN 2017



(1) AkzoNobel, BASF, Clariant, DSM, Evonik, Lanxess, Solvay

(1) Cash flow from operations and investments excluding the impact of portfolio management.
(2) Dividend proposed to the shareholders' annual general meeting of 18 May 2018.
(3) Recurring capital expenditure as defined in note C.1 to the consolidated financial statements at 31 December 2017.

AMBITIOUS 2023 TARGETS

A GLOBAL PLAYER IN SPECIALTY CHEMICALS

Objective to achieve over **80%** of Group sales in specialty businesses
(from 71% in 2017)

2023 financial targets

REBIT MARGIN	EBITDA TO FREE CASH CONVERSION
11.5% to 12.5%	**35%**

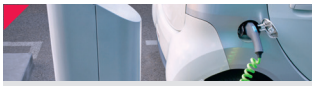
Strict financial discipline

ROCE	NET DEBT	RATING
at least 10%	**<2x EBITDA**	**Solid investment grade**

Defined in normalized market conditions and under current IFRS rules

SUPPORTED BY A WAVE OF SIGNIFICANT PROJECTS

Expected start-up ····· 2018 ····· 2019 ····· 2020 ····· 2021 ····· ▸



+20% PVDF Kynar® production capacities at Calvert City (US)

Markets
New energies and water filtration

90kt acrylic acid reactor at Clear Lake (US)

Markets
Paints, coatings, adhesives and water treatment

Doubling of thiochemicals capacities in Malaysia

Markets
Animal nutrition and petrochemicals and refining applications

+50% global PA11 monomer and polymer production capacities

+50% global Pebax® production capacities

Markets
Lightweight materials, sports and electronics

Powder coating resins facility in India

Markets
Paints, coatings and construction

+30% Sartomer photocure resins production capacities in Nansha (China)

Markets
3D printing, graphic arts and electronics

+25% global PA12 production capacities (China)

Markets
Lightweight materials, sports and electronics

PEKK plant at Mobile (US)

Markets
Aeronautics, 3D printing and oil & gas

Asia North America

AND A **STRONG AMBITION** IN ADHESIVES AND ADVANCED MATERIALS

Our ambition in adhesives

- Exceed **1/3** of Group sales
- **More than double** sales versus 2016
- **12.5%** to **13%** REBIT margin target

Our ambition in advanced materials

- Exceed **25%** of Group sales
- **14%** to **15%** REBIT margin target

2

CORPORATE SOCIAL RESPONSIBILITY

The different parts constituting the annual financial report are identified in the table of contents by the pictogram AFR

2.1 ARKEMA'S CORPORATE SOCIAL RESPONSIBILITY (CSR) APPROACH

2.1.1 Introduction

In a world facing numerous economic, environmental and social challenges, Arkema's ambition, as a global leader in specialty chemicals and advanced materials, is to act as a responsible chemicals producer by reducing its environmental footprint and offering its customers innovative, sustainable solutions. In this way, Arkema aims to drive sustainable, responsible growth in its business, while effectively responding to the planet's social and environmental challenges.

FOCUS

Thierry Le Hénaff,
Chairman and Chief Executive Officer

"Our strategic position as a central player in the industry, dedicated to serving our customers, creates a responsibility for us to set an example of excellence in environmental awareness, safety and sustainability in chemical production."

Excerpt from COP 2016, commitment to the Global Compact

In line with this approach, Arkema's CSR policy has been structured around five commitments:

1. Being a top quartile performer in safety in the chemical industry;
2. Reducing the environmental footprint of its operations;
3. Placing solutions for sustainable development at the heart of its approach to innovation and product range;
4. Promoting the individual and collective development of all its employees; and
5. Encouraging open dialogue with all its stakeholders.

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, the OECD Guidelines for Multinational Enterprises, the ten principles of the United Nations Global Compact, of which Arkema has been a participant since 2014, and the Responsible Care® program, of which the Group has been a member since 2006.

For several years now, Arkema has been engaged in a voluntary process to improve its corporate social responsibility 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 or SRI rating agencies.

The very significantly improved ratings obtained in 2017 confirm the relevance 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.

ROBECOSAM	FTSE4Good	CDP	2017 CSR Rating GOLD ecovadis	EURONEXT vigeo eiris INDICES
Participation since 2015, with a significantly improved assessment in line with the Group's objective of joining the DJSI	Renewed every year since its initial inclusion in 2015	A- score achieved on Climate Change in 2017 reflecting continuous improvement over three years. B score obtained on Water for the first year of participation	Gold recognition level achieved in 2015 and renewed in 2017	Included in the Europe 120 and Eurozone 120 indices since 2015

2.1.2 Governance and ethics

2.1.2.1 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 fully led by the Chairman and Chief Executive Officer and the Executive Committee. The Group's commitment to the United Nations Global Compact is renewed each year via its annual Communication On Progress. Internally, environmental, social and ethics policies are validated by the Executive Committee members, who are responsible for their dissemination and application across the Group.

Arkema has thus deployed, for all its entities, a Health, Safety, Environment and Quality Charter, a Code of Conduct and Business Ethics, a Supplier Code of Conduct, a charter for the promotion and application of the International Labour Organization's conventions, a policy on conflict minerals and a policy on the use of Group products for medical applications.

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 twice a year.

The Group's CSR ambition, the related initiatives and their monitoring, the main KPIs and the sustainable development targets are defined and validated by the Executive Committee and presented once a year to 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.

All of the 2017 CSR indicators were reviewed by the independent third-party auditor, as indicated in its limited assurance statement in section 2.8 of this chapter.

2.1.2.2 CSR 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 scope of reporting for safety, environmental, employee and social data is described in the methodological note in section 2.8 of this document. 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 Articles L. 225-102-1, R. 225-105 and R. 225-105-1 of the French Commercial Code (*Code de commerce*) and in accordance with the recommendations of ISO 26000. In compliance with the above articles, this information is reviewed by an independent third-party auditor, who issues a report attesting to the completeness and fairness of the CSR information.

The reporting process follows the fourth generation of the Global Reporting Initiative guidelines (GRI G4). The concordance table can be found in section 2.8.4 of this document.

2.1.2.3 APPLICATION OF THE LAW ON DUTY OF CARE

Pursuant to French Law no. 2017-399 of 27 March 2017 on the duty of care of parent companies and contracting firms, the Group has carried out an in-depth review of the risk of serious violations of human rights and fundamental freedoms, as well as of health, safety and environmental risks, for the Group itself and in its relationships with stakeholders, in order to supplement existing reasonable care measures and establish and implement a duty of care plan for the activities of all Group companies, in a spirit of continuous improvement.

The risk review was carried out using a collaborative approach involving the Sustainable Development, Human Resources, Health, Safety and Environment, Legal Affairs, Procurement and Internal Control and Internal Audit departments. The main risks identified for the Group itself are presented in section 1.7.2 of this document and are included in the Group's risk mapping process.

For health, safety and environmental risks, a harmonized approach based on a vision set out in the Health, Safety, Environment and Quality Charter has existed within the Group for many years and is managed centrally. The management system for these risks, which is described in detail in sections 2.3 and 2.4 of this document, includes risk prevention measures as well as measures for mitigating impacts in the event of an incident or accident. For risks relating to human rights and fundamental freedoms, the Group confirms its commitment presented in section 2.7.4 of this document and intends to leverage its duty of care plan to strengthen and harmonize its system for preventing as much as possible risks of serious violations across all Group entities.

For risks relating to the activities of suppliers and subcontractors with which the Group has established business relationships, Arkema has published a Supplier Code of Conduct and is a member of Together for Sustainability (TfS), a chemical industry initiative that organizes the assessments required by duty of care legislation. The audits carried out at Group subsidiaries by the Internal Audit department also include supplier-related tests. For more details on the Group's management of its relationships with suppliers and subcontractors, see section 2.7.5 of this document.

A whistleblowing system introduced as part of the Group's compliance with the Sapin II Law also meets the requirements of the law on duty of care. For further details, see section 2.7.3 of this chapter.

As part of the follow-up 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.

2.2 CSR PERFORMANCE CHALLENGES AND MANAGEMENT

2.2.1 Growth and value creation model

As described in detail in section 1.1.1.1 of this document, the Group's activities are part of a very diversified value chain, both in terms of the suppliers upstream and the customers and end users downstream. Beyond this commercial value chain, the Group is part of a broader ecosystem comprising a wide variety of stakeholders, including research partners, the financial community and shareholders, employees and employee representatives, neighboring communities, civil society and NGOs, public authorities and professional associations. The various members of the value chain and the ecosystem have diverse CSR processes that reflect their own activities, history, culture and strategy.

Determined to create value on the economic, environmental and social fronts, the Group has developed a robust CSR policy.

The Group supports its customers in developing their potential, improving their performance and becoming more competitive with innovative, sustainable solutions derived from its applications-driven research and development, which takes into account the needs and expectations of end users.

The Group is striving to build lasting relationships with its suppliers and has issued a Supplier Code of Conduct for this purpose. By becoming a member of the Together for Sustainability program, the Group has demonstrated its commitment to a responsible supply chain, as explained in section 2.7.5 of this chapter.

2.2.2 Stakeholders and materiality assessment

OPEN DIALOGUE

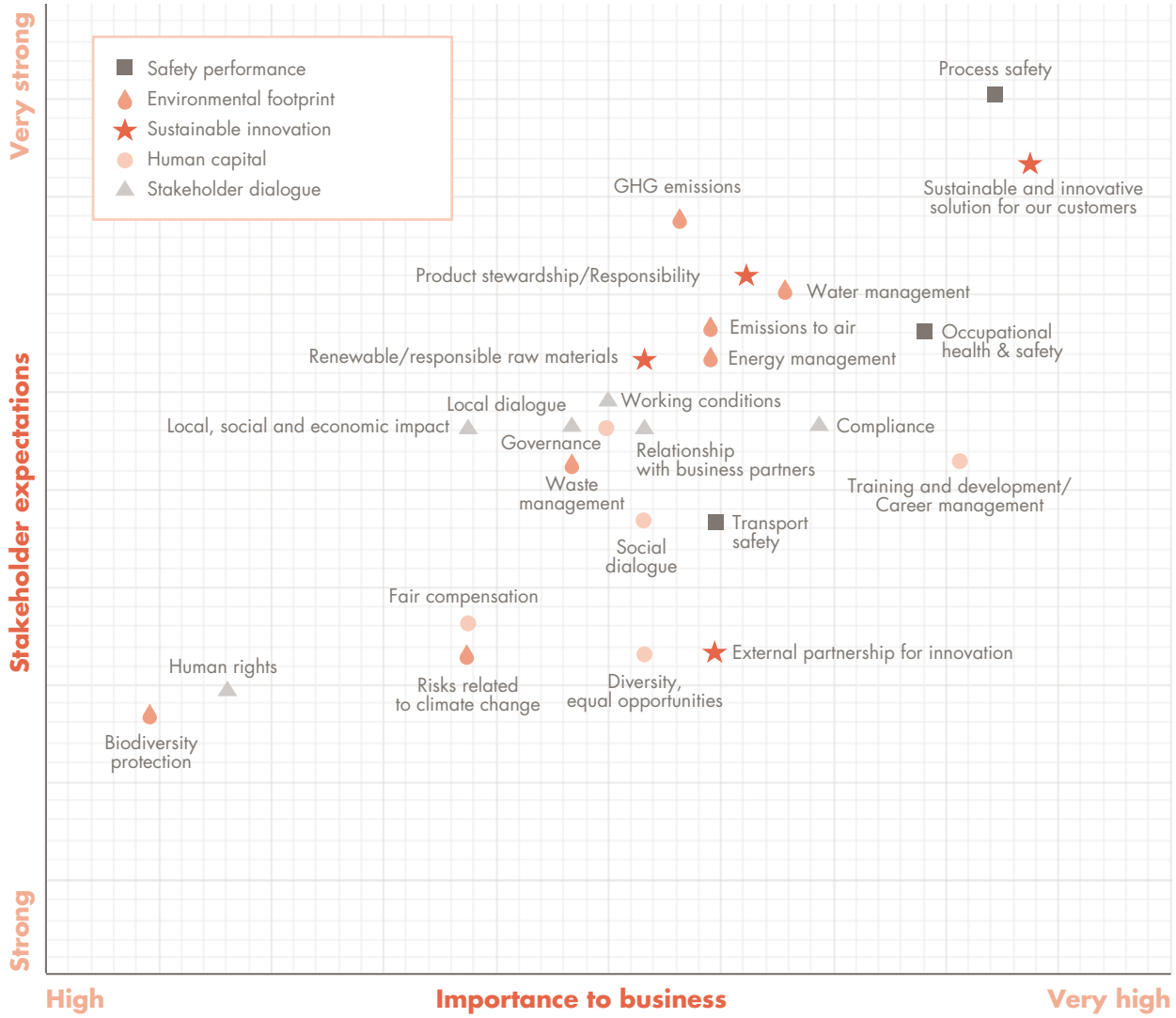
Consultation and open dialogue with internal and external stakeholders is a prerequisite for understanding their expectations, building relationships based on trust and cooperation, and creating value for all.

The following table summarizes the Group's dialogue with its main stakeholders and refers to other sections of this document for more details.

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: • dedicated management of global key accounts as part of a commercial excellence program; • joint innovation programs with customers; and • development of new digital solutions that increase this value added for customers and partners
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
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 For more details, please refer to section 1.4.2.3
Financial community and shareholders	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	• Results presentations; • Meetings with institutional investors and analysts; • Discussions with financial rating agencies; and • Annual general meeting. For further details, see section 5.4 of this document.
Employees and employee representative bodies	Dialogue with employee representative bodies and direct dialogue with employees	• 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 more details, please refer to section 2.6.4.
Neighboring communities	Neighbors and communities that interact locally with Group sites	The Common Ground® initiative described in section 2.7.6 promotes local dialogue at each of the Group's sites
Civil society and NGOs	Proactive and reactive dialogue	• 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.
Public authorities	Regular and occasional contact aimed at ensuring the responsible development of our activities	• Responding to periodic surveys; • Participation in various consultation and working groups; and • Occasional contact at various levels (departments and cabinets) on specific topics.
Professional associations	Continuous contribution to defending the industry's interests vis-à-vis the public authorities	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.

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

	Safety	Environment	Innovation	Employees	Social
Priority topics	• **Safety of people and processes**	• **Resources management (water and energy)**	• **Sustainable and innovative solutions** • **Product stewardship and responsibility**	• **Diversity and equal opportunities** • **Training and individual development**	
Important topics	• Transport safety	• Climate change • Direct environmental impact of operations	• Renewable/responsible raw materials	• Working conditions	• Compliance • Local dialogue • Relationships with business partners • Governance
Permanent topics		• Biodiversity protection	• Open innovation	• Social dialogue • Fair compensation	• Local, social and economic impact • Human rights

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. Participants expressed their satisfaction with the consultation process and their desire to continue the collaboration initiated in the form of direct dialogue.

The Group made a commitment to organize annual meetings in order to respond to this request.

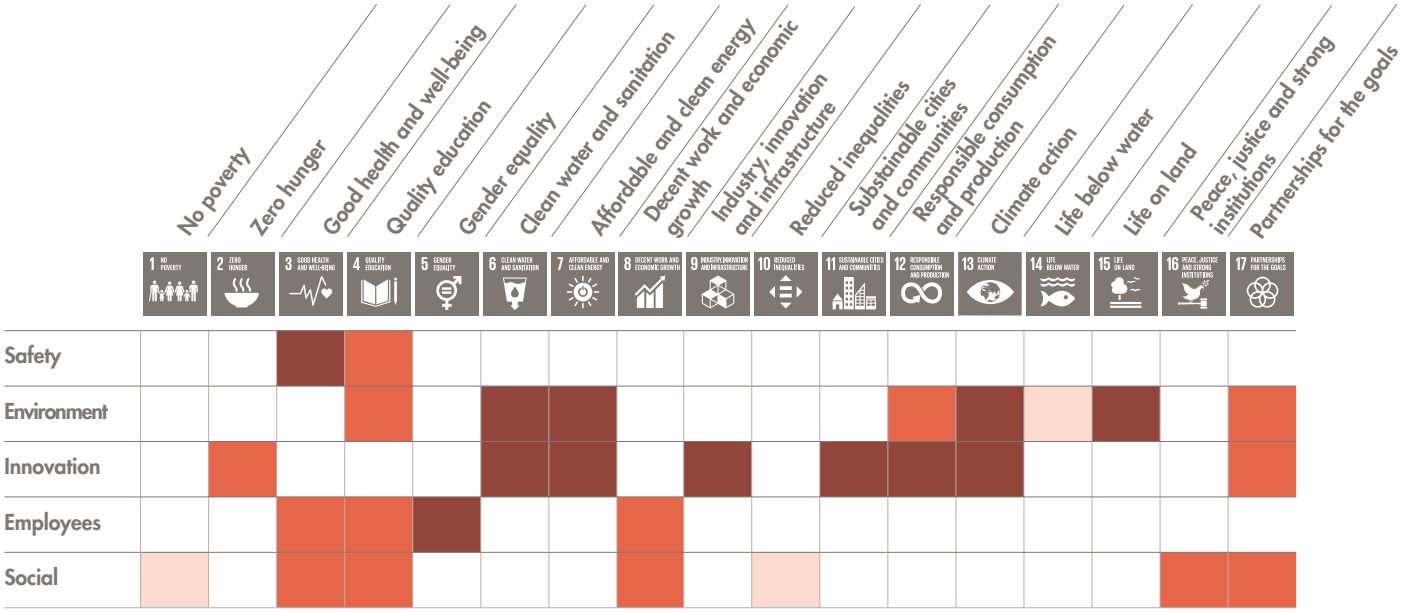
To extend the scope of the initial assessment and take into account changes to stakeholder expectations, a new materiality assessment will be carried out in 2019.

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 are part of its sustainable development process in order to mitigate the negative effects and accentuate the positive effects, both for the Group 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 1.7.2 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 (see section 2.5.2 of this chapter).

The Sustainable Development Goals defined by the United Nations (SDGs) 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 five commitments structuring its CSR policy, Arkema has mapped its contribution to the SDGs by identifying the intensity of its commitments and actions in relation to its impacts.



The quantitative targets are presented in section 2.2.4 of this chapter.

2.2.3 The Group's five CSR commitments

1. **Safety: being a top quartile performer in safety in the chemical industry**

The Group's industrial safety initiative has been rolled out around the world and comprises complementary technical, organizational and human aspects. By introducing a Group-wide safety culture and making safety a priority, the Group has continuously improved its safety performance since its stock market listing.

The Group also takes care that neither people's health or safety, nor the environment, are impacted by its products.

2. **Environment: reducing the environmental footprint of its operations**

All employees share the objective of reducing the Group's environmental footprint, by pursuing three types of actions: limiting emissions from operating activities, reducing the use of natural resources and developing the use of renewable resources.

3. **Innovation: placing sustainable development solutions at the heart of its approach to innovation and product range**

The Group uses its product R&D and marketing teams to support sustainable development and address the challenges facing the planet. To this end, it creates innovative solutions in support of new energies, lightweight materials, the fight against climate change, access to water, and the use of bio-based raw materials. R&D policies are described in section 1.4 of this document.

4. **Social: promoting the individual and collective development of all its employees.**

While unique in their know-how, capabilities, nationality, role and personality, together, the Group's employees make up a community. Employment policies around the world focus on two aspects: the individual development of employees and social development through actions that aim to improve working conditions for all.

5. **Societal: encouraging open dialogue with all its stakeholders**

The Group invites dialogue on its activities and products with all stakeholders, through programs such as the Common Ground® initiative, developed to build mutual understanding and trust-based relationships with local residents, associations and schools. With its suppliers, the Group also adopts responsible behavior based on the desire to develop balanced, long-term, trust-based relationships.

2.2.4 CSR key performance indicators

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

The Group's 2025 targets attest to the strength of its commitment to sustainability and social responsibility. In 2017, given that the environmental target for chemical oxygen demand (COD) was achieved earlier than expected, the 2025 target was reinforced from 0.80 to 0.60.

	2025 targets	2017	2016	2015
Safety				
Total recordable injury rate (TRIR) [1]	<1.2	1.6	1.5	1.5
Percentage of sites having implemented peer observation in the last three years	100%	59%	56%	57%
Percentage of AIMS audited sites	100%	69%	63%	61%
Environment (in EFPI terms compared with 2012)				
Greenhouse gas emissions	0.50	0.52	0.60	0.62
Volatile organic compound emissions	0.67	0.66	0.80	0.83
Chemical oxygen demand	0.60	0.70	0.78	0.93
Net purchases of energy	0.85	0.89	0.92	0.98
Innovation				
Number of patent applications filed during the year relating to sustainable development		150	116	121
Percentage of sales from products made from renewable raw materials		9%	10%	N/A
Social				
Percentage of women in senior management and executive positions	23% to 25%	19%	18%	17%
Percentage of non-French nationals in senior management and executive positions	42% to 45%	37%	39%	N/A
Average number of training hours per employee		25	27	27
Societal				
Percentage of plants taking part in the Common Ground® program		78%	86%	82%

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

Based on the results of the materiality assessment, which positions process safety and sustainable and innovative solutions as priority topics, the Group introduced a new Process Safety Event Rate indicator in 2017 and is working on the definition of an indicator for 2018 that will measure the Group's contribution to the United Nations' Sustainable Development Goals. Targets will be defined for these two indicators once they have been monitored for a certain period of time.

2.3 HEALTH AND SAFETY INFORMATION

BEING A TOP QUARTILE PERFORMER IN SAFETY IN THE CHEMICAL INDUSTRY

2.3.1 Safety management

Safety and protecting health and the environment are core priorities in the management of the Group'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, a voluntary initiative undertaken by the chemical industry to responsibly manage its operations and products, based on a continuous improvement process.

The Group's safety 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, which have been formally defined in a Safety, Health, Environment and Quality Charter and in a global standard, the Health, Safety and Environment (HSE) manual. The charter and manual form the basis of HSE management systems in all Group entities.

The materiality assessment performed in 2016 confirmed that employee and process safety was one of the major aspects of the Group's CSR approach.

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

Extend the peer observation program to every Group site*

Audit every Group site* in accordance with the Arkema Integrated Management System (AIMS)

These policies are being implemented worldwide by the Group Safety and Environment department, with the support of safety and environmental experts in each region.

2.3.2 Employee safety and health

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.

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 work-life are also important factors in protecting employee health.

* *For newly acquired companies, this program or system will be deployed within approximately three years*

2.3.2.1 EMPLOYEE SAFETY

Instilling a culture of safety through employee training, awareness-building and industrial safety and environment systems

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 is enabling every employee to share the Group's safety challenges, policies and tools.

Some of these tools are covered in more detail below.

Safety training effort

In 2017, safety training [1] totaled 207,581 hours (*i.e.*, 15 hours per year per employee trained), and the number of employees who attended at least one safety training session totaled 13,566 (71% of the Group headcount) [1].

In addition over 6,000 people (33% of the Group headcount) took e-learning courses on safety in 2017 [1].

FOCUS

Using neuroscience for a behavior-based approach

In 2017, the Group initiated a review in conjunction with a neuroscientist of the mechanisms associated with human error, particularly among experts (which most of the Group's employees are in their respective professions). The lessons learned are being converted into simple, practical measures to modify behavior and thereby avoid accidents or limit their consequences.

The "Safety in Action" and "Essentials" programs

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

Peer observation

Peer observation aims 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). During the deployment phase that is currently underway, employees with similar qualifications are encouraged to observe each other while carrying out their duties.

As of today, peer observation programs have already been successfully deployed in the United States and are now being rolled out in Asia and the main European countries.

In 2017, 59% of the sites had put in place peer observation practices to improve safety, compared with 56% in 2016. 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. In 2017, the Group decided to train all employees in the fundamentals of this approach by 2020.

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 representatives from the Group Procurement and Safety and Environment departments. These events provide an opportunity to share best workplace health and safety practices.

(1) In entities at least 50%-owned and employing more than 30 people.

Certain entities, such as the coating resins business, carry out an annual employee satisfaction survey with a particular focus on safety. To extend this approach, in 2017 the Group prepared a tool for assessing the engagement and safety culture of its employees, which was presented to all sites in France. In 2018, the tool will gradually be rolled out across these sites and presented to other sites in Europe.

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 in 2025.

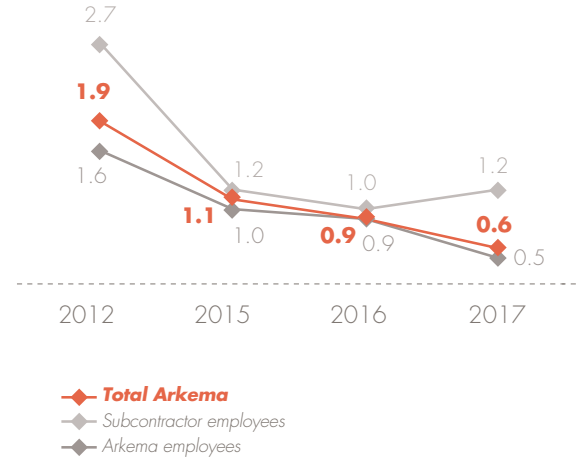
After several years of strong improvement, the Group continued to consolidate its safety performance in 2017 at a very good level with a TRIR of 1.6, virtually unchanged from the very good result achieved in 2016. The overall TRIR reflects an excellent performance by Group employees, with a decline in TRIR to 1.2 in 2017 versus 1.4 in 2016, which offset the weaker performance among subcontractor employees, for whom the TRIR rose to 3.2. Preventive measures aimed at subcontractor employees will therefore be reinforced starting in 2018.

The Group also made very significant progress in its drive to reduce lost-time injuries, thanks to the implementation of prevention initiatives. The lost-time injury rate (LTIR), which reflects the severity of incidents, therefore declined to 0.6 in 2017 from 0.9 in 2016. An average 44 days were lost per incident in 2017 across all Group and subcontractor employees working on site, compared with 24 in 2016. The increase was primarily due to lost-time injuries among subcontractor employees, for whom the average time lost per incident came to 62 days. For Group employees, the average was 32 days. Initiatives targeting subcontractor employees will therefore be reinforced starting in 2018 and beyond. No fatal accidents have been recorded since 2013.

The following charts show consolidated injury rates for the 2015 to 2017 period, in number of incidents per million hours worked, calculated according to the methodology described in section 2.8 of this chapter. They also show data for 2012, the baseline year used to set the Group's long-term CSR targets.

TOTAL RECORDABLE INJURY RATE (TRIR) (1)

LOST-TIME INJURY RATE (LTIR) (1)



In 2017, a total of 42 Group employees were victims of reported incidents recorded in the TRIR for the year, of which 16 resulted in lost time, out of a total worldwide workforce of 19,779 people. The rate also reflected the 27 incidents involving subcontractor employees reported during the year, of which 11 were lost-time incidents. Analysis of the data shows a decrease in the number of very serious incidents, which account for a very small proportion of the total. In the years ahead, the Group's ambition remains to further reduce this number.

As part of its drive to continuously reduce the number of serious incidents, Arkema decided to launch a process in 2017 to identify 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.

(1) A lost-time incident 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.

2.3.2.2 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. Health risks are described in section 1.7.2 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 residual employee exposure to hazardous chemicals be regularly measured in order to attenuate the risk of occupational illness in the future. Measurement data are stored in conditions that guarantee their long-term integrity.

In 2017, 56 occupational illnesses were reported Group-wide, of which 23 were related to exposure to asbestos and 4 to exposure to chemicals.

In France, the Group also deploys traceability programs to track potential exposure to arduous working conditions, (including chemicals) in its facilities, as part of the annual occupational risk assessment report (*document unique*). Globally, the Group is working on digitizing its risk assessment data using the dedicated STARMAP tool (see section 2.3.2.4 of this chapter), which guarantees internal traceability. At end-2017, 48% of the Group's sites worldwide had entered their workplace risk assessment data into the STARMAP tool.

2.3.2.3 MEDICAL CARE

Regular medical check-ups were available in 93.6% of Group companies in 2017, covering 93.9% of employees.

2.3.2.4 HEALTH AT WORK

To maintain health at work, Arkema has undertaken continuous improvement initiatives to prevent arduous working conditions, stress and workstation risk and generally to improve employee well-being.

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 unions, following on from the previous one. In this context, numerous initiatives have contributed to improve working conditions, such as:

- workstation ergonomics studies;
- workstation upgrades;
- the development of handling support systems;
- 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.

As part of this process, many initiatives have been undertaken to improve working conditions. For example, after the major workstation ergonomics project carried out at the Honfleur, France plant, ergonomic considerations were also taken into account in the project to fit out a new facility at the Orgasol unit in Mont. As a result, field observations were used to make practical improvements to the debagging workstation.

FOCUS

Workstation ergonomics

The principles of workstation ergonomics are integrated into all large projects thanks to the use of 3D models. These models are developed by technical experts as part of the Group's digital strategy.

The network of ergonomics correspondents (comprising one to two correspondents per Arkema France site) was set up in 2016 and an initial round of six days training in ergonomics was provided to its members. Since its creation, the network has met three times to share best practices. More members will be added in 2018 and the network will continue to meet at least twice a year.

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 voluntary 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.

The primary stress management initiatives undertaken in 2017 included:

- continuation of conferences, workshops, quality of work days and other local initiatives concerning quality of work life;
- a new map of the OMSAD results for Arkema and for all sites concerned: communication of the results to the central and local workplace stress prevention task forces;
- adaptation of training programs to help managers deal effectively with workplace stress and psychosocial risks, while enhancing quality of work life;
- changes in the way psychosocial risks are taken into account in the annual occupational risk assessment report (*document unique*) describing workstation risk factors; and
- changes to the OMSAD questionnaire to include questions about well-being in the workplace.

In addition, a teleworking system is being gradually introduced in agreement with the employees concerned and their managers.

An agreement was signed by four of Arkema France's five unions on this company-wide workplace stress management initiative. With this agreement, the Group affirms its ambition to offer employees a working environment favorable to their well-being. This agreement calls for a variety of training and information initiatives, as well as the introduction of a procedure for identifying working environments at risk together with an analysis to determine stress factors and take corrective action.

Protecting health at the workstation

To consolidate all of the workstation health and safety initiatives, the Group is developing a workstation risk assessment application, known as STARMAP, to prevent health and safety risks more effectively by capitalizing on globally managed data libraries and best practices.

Agreements on early retirement for employees in asbestos-contaminated facilities

In France, five Group operating plants 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 addition, on 30 June 2003, Arkema France signed an agreement with all of the representative 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 19 to the 2017 consolidated financial statements in section 4.3.3 of this document.

2.3.3 Process safety

The Group carefully analyzes the 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, new facilities, operations that require the use of new chemical products, and 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 2017, Group capital expenditure allocated to safety, the environment and maintaining the production facilities to standard amounted to €242 million, versus €240 million in 2016.

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 conducted in the United States, Europe and Asia for plant employees and managers by experts from the Center for Chemical Process Safety of the American Institute of Chemical Engineers.

In France, Technological Risk Prevention Plans (PPRTs) put in place in accordance with environmental legislation help manage urban development around the Group's Seveso facilities. As of year-end 2017, 16 facilities operated by the Group in France are subject to a PPRT and the Group will support any of the related measures through 2018. Furthermore, the 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, is also entailing 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, industrial accident risk management is primarily regulated by the Superfund Reauthorization Act, the Risk Management Process and the Emergency Planning and Community-Right-to-Know Act. In particular, the latter requires companies to inform government authorities when more than the minimum authorized quantity of a hazardous substance is being used or stored, and if such substances are stored, to have emergency plans and procedures in place. Other regulations at the federal, state or local levels govern certain specific aspects of the storage of chemicals, the safety of workers when handling stored products and the storage of highly hazardous substances.

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)

In terms of process safety, the Group's objective is to minimize the number of process safety events. Starting in 2017, Arkema has decided to use the new process safety event criteria published by the International Council of Chemical Associations (ICCA).

Major PSEs are reported as soon as possible to Executive Committee members and to the surrounding community in the event of nuisances.

Since 2013, the number of PSEs has been systematically reviewed at every meeting of the Executive Committee.

In 2017, the PSE rate (number of PSEs per million hours worked) according to the new ICCA/CEFIC criteria was 4.7.

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.

2.3.4 Audits

The effective implementation of safety policies is regularly audited, with a focus on measuring progress and harmonizing practices. These audits are also 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, with follow-up audits every year.

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

	2017	2016	2015
% of facilities AIMS-audited over the past three years	69	63	61

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 2017, as for previous years, to the Group's ongoing efforts in these areas:

Number of units certified according to each standard	2017	2016	2015
ISO 9001	150	130	135
ISO 14001	84	72	74
OHSAS 18001	74	66	71
ISO 50001	29	21	17

45% of Group facilities have been certified to OHSAS 18001 standard in Europe, 43% in North America and 49% in Asia. 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; and
- 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 contractor employees, and are performed in every aspect of the site's operations, including production, logistics, maintenance, offices, capital works and turnarounds.

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 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 is helping to improve the Group's safety expertise and ensure the effectiveness of the deployed measures.

2.3.5 Responsible 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 Safety, Health, Environment and Quality Charter and by endorsing the International Council of Chemical Associations' (ICCA) Responsible Care® initiative. In particular, Arkema participates in a variety of international ICCA programs, such as the High Production Volume (HPV) initiative, which delivers globally-harmonized data sets and initial hazard assessments for around 1,000 chemical substances.

Leveraging its organization and the scientific and regulatory expertise acquired over many years, Arkema ensures to define product-specific HSE roadmaps by country that are well 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.

2.3.5.1 REGULATORY COMPLIANCE

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

In recent years, Arkema has deployed the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) and implemented the REACH regulations in Europe.

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.

Implementation of the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) legislation 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. Arkema endorses the objectives of REACH, which represents an additional pathway to continuously improving knowledge of its substances and their safe use, in line with the legitimate expectations of civil society. Arkema therefore complies with all of the REACH standards governing the registration, evaluation, authorization and restriction of chemicals.

REACH compliance is managed at Group level by the Product Safety and Environment department, whose team of experts in toxicology, ecotoxicology and compliance oversee implementation of the regulation. 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 dossiers submitted to the ECHA	Dossiers accepted by the ECHA
2010 and 2013 deadlines	277	122	311	100%
2018 deadline	146	49	129	70%

In all, Arkema plans to register 423 substances. This number has been adjusted after the first two registration deadlines were met and after surveying forthcoming developments in the businesses' portfolios. REACH compliance is expected to cost around €25 million over the 2016-2020 period, and to represent a total cost to the Group of an estimated €65 million between 2008 and 2020.

The Group regularly revises its existing substance registration dossiers following the acquisition of new data or at the request of the ECHA. Preventive updates designed to improve the dossiers again accounted for around 40% of the Group's dossier maintenance activity in 2017.

Arkema is also participating in the Community Rolling Action Plan (CoRAP) launched by the authorities after the first registration phase. Once a substance has been evaluated, 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.

Since 2012, 28 Group 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	28	4	5	12	7

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

Arkema has put in place a dedicated process to track the REACH-defined substances of very high concern (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 call for comments by the ECHA for substances whose use(s) may be subject to authorization.

In cases where these substances are finally identified as SVHCs and 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	10	9
SVHCs on the REACH candidate list	44	30

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

In November 2015, Arkema filed an application with the ECHA to authorize the 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 1 June 2017, the industry candidate list contained 174 substances, including (i) the hydrazine produced at the plant in Lannemezan, France, (ii) the 2-imidazolidinethione (ETU) produced by MLPC, and (iii) the nonylphenol ethoxylates (NPE) produced by CECA.

On 13 June 2017, NPE was added to the list of substances that require authorization. To date, Arkema has not yet finalized its strategy for the limited range of products that fall under this 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 is not 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 expected to be recommended for restriction, after an analysis of the most effective risk management option. The ECHA is expected to submit the file in mid-2018. The change should not affect the Group, which uses the substance as a processing aid at the Jarrie site in France (industrial use). Nevertheless, pending a formal proposal for restriction and as a precautionary measure, an alternative solution is being explored.

Compliance with other legislation

Outside Europe, Arkema markets its chemicals in accordance with national and regional mandatory inventories, 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, dossiers 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 completed Phase I registration of substances in Taiwan and submitted its first annual report to the Korean authorities in 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 will register around ten substances by June 2018.

Following the publication of rules aimed at reforming the Toxic Substances Control Act (TSCA) Inventory in the United States, the Group is preparing to notify the US authorities of active substances in its portfolio by February 2018.

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

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, Medical Applications Assessment Committees have been tasked with assessing the compliance of the intended products with prevailing laws and regulations.

2.3.5.2 PRODUCT INFORMATION

Arkema relies on an in-house team of expert toxicologists and ecotoxicologists who 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 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 physical-chemical-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.

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.

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 dossiers 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. Arkema will continue to publish these summaries as part of the next REACH deadline in 2018.

2.3.5.3 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. Toxicology studies conducted on vertebrate animals are strictly limited to those required for regulatory compliance. They are contracted to outside laboratories subject to oversight by the relevant ethics committees.

The Group always conducts in-depth analyses of existing literature data, thanks to constant tracking of information on Group substances, in order to use all of the available public information. 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 FRANCOPA, a French platform dedicated to the development, validation and dissemination of alternative animal testing methods, using the 3Rs (reduction, refinement, replacement).

2.4 ENVIRONMENTAL INFORMATION

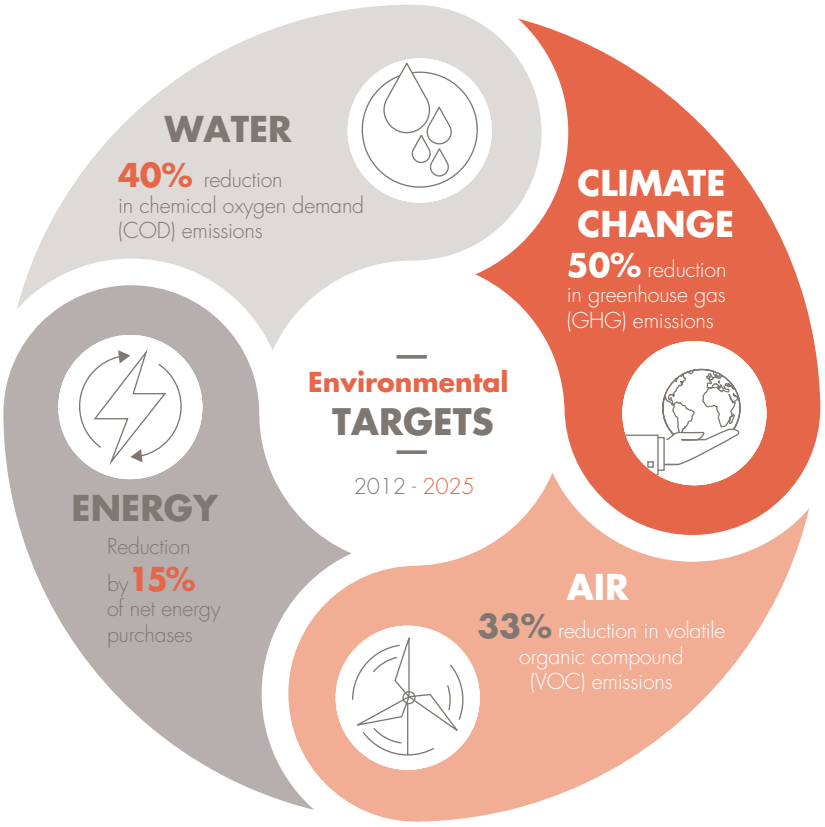
REDUCING THE ENVIRONMENTAL FOOTPRINT OF THE GROUP'S OPERATIONS

2.4.1 Environmental management

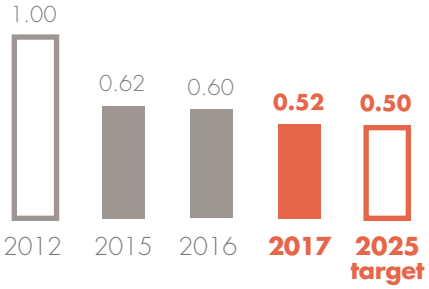
Reducing the environmental footprint of its operations is one of the Group's five CSR commitments. To achieve it, the Group is upgrading its manufacturing practices to minimize emissions and to optimize and reduce the use of energy, water and non-renewable raw materials. By stringently tracking their effluent releases, air emissions and waste production, the plants are implementing effective initiatives.

The findings of the 2016 materiality assessment confirmed the importance of environmental topics for stakeholders, for which the Group has already defined four objectives. These objectives apply to intensive indicators, known as Environmental Footprint Performance Indicators (EFPI) 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.

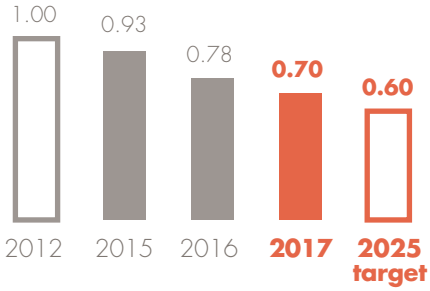
In 2017, given that the environmental target for chemical oxygen demand (COD) was achieved earlier than expected, the 2025 target was reinforced from 0.80 to 0.60.



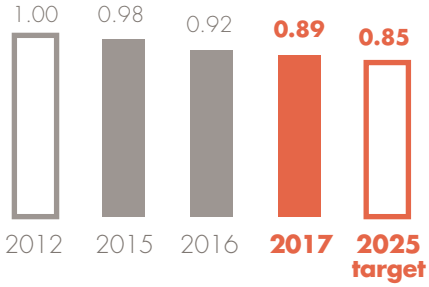
CLIMATE (DIRECT GREENHOUSE GAS EMISSIONS EFPI)



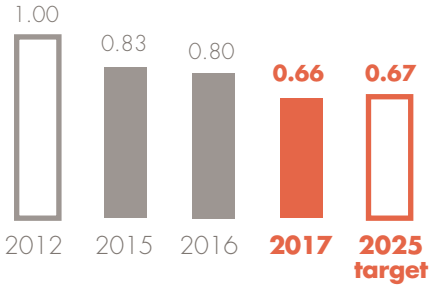
WATER (CHEMICAL OXYGEN DEMAND EFPI)



ENERGY (NET ENERGY PURCHASES EFPI)



AIR (VOLATILE ORGANIC COMPOUNDS EFPI)



NB: the change in the EFPI indicators 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 EU regulations, such as Phase III of the European Union Emissions Trading Scheme (EU ETS) or the Industrial Emissions directive (IED), as well as the latest environmental data reporting rules which concern it, thanks to the organization of awareness-building sessions. 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.

Instilling an environmental culture through employee training and information

As regard the environment, 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 installation restart operations, and waste sorting.

At the 52% of Group facilities that earned ISO 14001 or, in the United States, RCMS certification in 2017, 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.

Details on employee training and the new-hire induction process may be found in section 2.6.3.2 of this chapter, "Special professional training programs for employees". Environmental training totaled 22,665 hours in 2017, or an average of 6.7 hours per employee. In all, 3,398 employees, or 23% of the consolidated workforce, attended at least one environment-related course during the year (excluding e-learning) [1].

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 159 initiatives were undertaken in 2017. 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 outside certification process.

A certified environmental management system

The Group deploys environmental management systems in its production plants, most of which have also earned environmental certification in accordance with the ISO 14001 standard. Depending on local conditions, certain facilities have been certified to other standards, such as the Responsible Care® Management System (RCMS) in the United States.

	2017	2016	2015
% of facilities ISO 14001 or RCMS-certified	52	52	62

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.

To harmonize the identification, assessment and analysis of environmental risks, the Group rolled out in 2013 a new methodology, with global application, while a dedicated IT system was deployed in Europe, the United States and Asia in 2016. In 2017, 60% of the Group's industrial sites received training in how to use the system and around 40% updated their environmental assessment in the system.

This process is being supported on every site by environmental audits performed by the Internal Audit department, AIMS audits conducted by the Group Safety and Environment department and certifications by third-party accreditation bodies, depending on the country.

Environmental declaration

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 2.8 of this chapter.

(1) In entities at least 50%-owned and employing more than 30 people.

2.4.2 Resources

Reducing the environmental impact of the Group's industrial sites consists of 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 reduce the Group plant's use of water, energy and raw materials.

2.4.2.1 RAW MATERIAL CONSUMPTION

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 control initiatives and developing best operating practices. These initiatives are described in more detail in section 1.6 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 circular economy initiatives that are described in section 2.4.5.2 of this chapter.

Lastly, the Group is expanding the use of renewable and especially bio-based raw materials in its products. The resulting Group products are presented in section 1.4.4.2 of this document. This ongoing commitment was demonstrated in 2017 by the fact that products at least 20% made from renewable raw materials accounted for around 9% of Group sales.

2.4.2.2 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, facilities and relevant Procurement and Technical departments. It focuses on optimizing the energies used in the production facilities and processes, which account for 98% of consolidated energy consumption. 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 embed 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 reinforce the production plants' competitiveness.

The Arkenergy process mainly consists in:

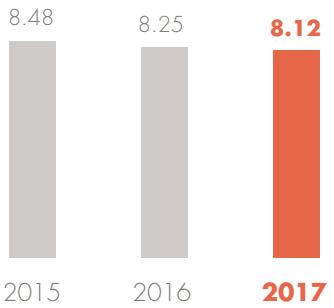
- rolling out energy efficiency audits worldwide, focusing on the facilities with the highest net energy purchases. The energy efficiency audits carried out to date represent 86% of the Group's total energy consumption;
- implementing the ISO 50001 energy management system in Europe and Asia. To date, a total of 29 sites are ISO 50001-certified, which corresponds to 57% of Arkema's total energy use; and
- allocating a dedicated capital expenditure budget specifically for Arkenergy initiatives. In 2017, 60 capital projects were funded out of the budget, including 41 in Europe, 11 in the Americas and 8 in Asia.

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

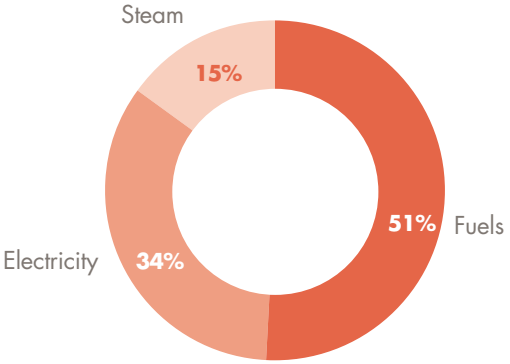
Absolute indicator for energy purchases

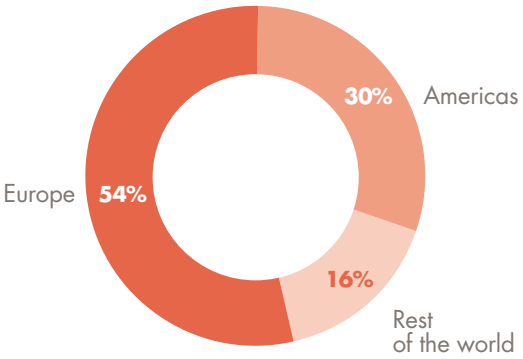
The chart hereafter presents consolidated net energy purchases in 2017, 2016 and 2015, calculated in terawatt-hours according to the methodology described in section 2.8 of this document.

NET ENERGY PURCHASES (in TWh)



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





93% of the terawatt-hours generated by fuel were natural gas-fired.

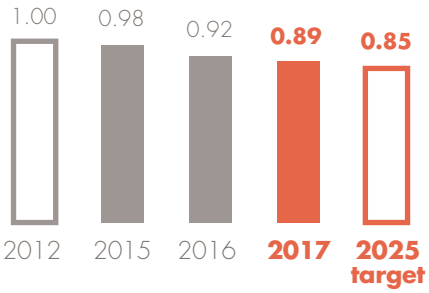
18% of the net terawatt-hours purchased by the Group, regardless of source, were from low-carbon electricity.

Intensive indicator for energy purchases

The chart below presents the net energy purchases EFPI for the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this document. Net energy purchases are calculated using the Group's biggest net energy purchasing entities, which account for more than 80% of the consolidated total.

The indicator showed significant improvement in 2017, demonstrating the effectiveness of the capital investments committed as part of the Arkenergy project. The energy performance of Group installations was also considerably improved by the high utilization rates in the production units and their reliability.

NET ENERGY PURCHASES EFPI



2.4.2.3 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 ground 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.

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 20 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%.

The program for managing sites located in water-stressed regions has kicked off, with a production site in Australia serving as the pilot.

The chart below presents consolidated water withdrawals in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

Water use	2017	2016	2015
Total water withdrawn (in millions of cu. m)	118	126	124

The significant decline in the amount of water withdrawn in 2017 can be attributed primarily to the shutdown of a production unit at the Pierre-Bénite site (France), but also to process optimization initiatives that resulted in a reduction in water use at the Lacq site (France).

Rating agency CDP gave Arkema a Water score of B in 2017, in recognition of the Group's approach and actions in the area of responsible water management.

2.4.3 Land and biodiversity

Arkema wants to limit its land footprint and use as well as its impact on biodiversity.

2.4.3.1 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's environmental responsibility is managed to ensure control of health risks and protection of the environment 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 management 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.

Brownfield redevelopment

To redevelop certain brownfield sites, the Group is partnering with local officials, academics and specialized companies. They use these brownfield sites either for biomass production projects or for the installation of photovoltaic panel projects.

Provisions for the management of legacy pollution

The amount of provisions for environmental risk at 31 December 2017 may be found in note 19.3 to the consolidated financial statements, in section 4.3.3 of this document.

2.4.3.2 BIODIVERSITY

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 underway are therefore designed to reduce each plant's releases into the surrounding water, soil and air.

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;
- 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;
- a reduction in SO_2 and NOx emissions, thereby helping to prevent the formation of acid rain which, in addition to its direct impact on plant life, can also alter soil characteristics; and
- the pursuit of soil remediation projects at sites with long-standing industrial operations, as described in the preceding section, so as to protect all of the species that depend on their land or groundwater.

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, hundreds of olive trees are being tended on the grounds of the Gissi facility, helping to safeguard the surrounding plant and animal ecosystem.

2.4.4 Emissions

The Group is leading an active policy of managing and reducing the impact of its operations on air emissions, effluent releases and waste production.

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

In this way, the manufacturing plants are reducing their releases by optimizing their use of raw materials, energy or natural resources, so that they produce fewer emissions and less waste. Following the findings of the environmental assessments conducted according to the Group methodology, production units are also being constantly improved with process upgrades and the installation of effluent treatment facilities.

2.4.4.1 AIR EMISSIONS

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

Climate change: direct greenhouse gas emissions

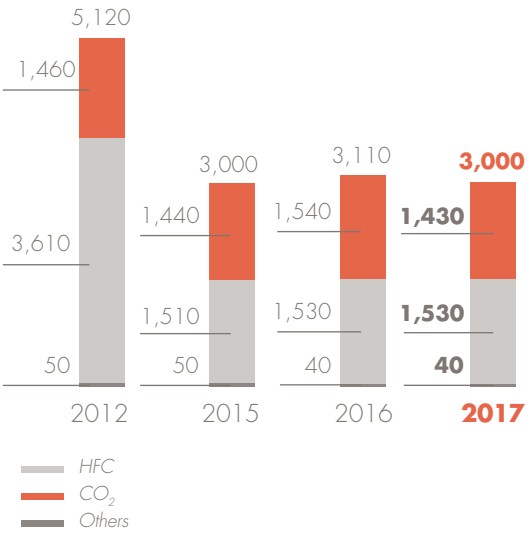
The Group's direct greenhouse gas emissions (Scope 1 GHG) arise from:

- 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 (CO_2), nitrous oxide (N_2O) or methane (CH_4) as a product, by-product, co-product or waste, and gas discharges from processes such as thermal oxidation, which converts VOCs into CO_2.

Absolute indicator for direct greenhouse gas emissions

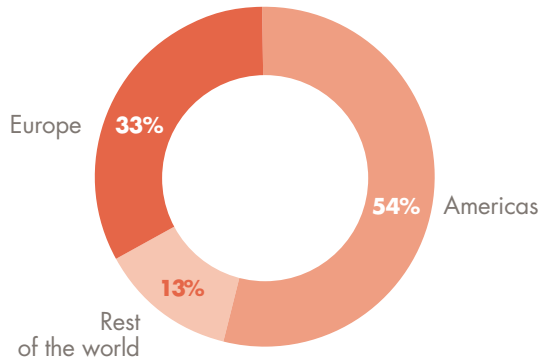
The chart below details direct greenhouse gas emissions (in kt CO_2 eq.) from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

DIRECT GHG EMISSIONS (in kt per year)



The net reduction in GHG emissions in 2017 was 3.5% and primarily related to CO_2. It was driven in particular by improvements made to boilers by changing fuel type (notably in China) or boiler technology (Pierre-Bénite in France). It also reflects the impact of maintenance turnarounds in Clear Lake (United States) and Marseille (France). These factors more than offset the additional emissions generated by increased production at certain sites.

The breakdown of direct GHG emissions by region is as follows:



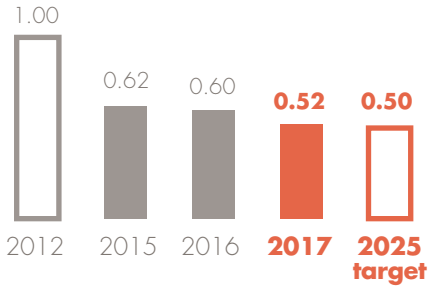
To reduce its impact on global warming, the Group has undertaken a number of actions and deployed effective measures to minimize direct GHG emissions, such as:

- 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 section 2.4.2.2 of this chapter).

Intensive indicator for direct greenhouse gas emissions

The chart below presents the direct greenhouse emissions EFPI from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter. The index base is 1 for 2012. Emissions are calculated using the Group's biggest GHG emitters, which account for more than 80% of the consolidated total.

DIRECT GHG EMISSIONS EFPI



The improvement in this indicator in 2017 was led by the progress made at all of the most emission-intensive sites.

2025 TARGET

Reduce GHG emissions, expressed in EFPI terms, by 50% compared with 2012.

Internal carbon price

In 2016, to strengthen its long-term approach, the Group set an internal price for Scope 1 and Scope 2 GHG emissions, expressed in terms of CO_2 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.

Indirect greenhouse gas emissions

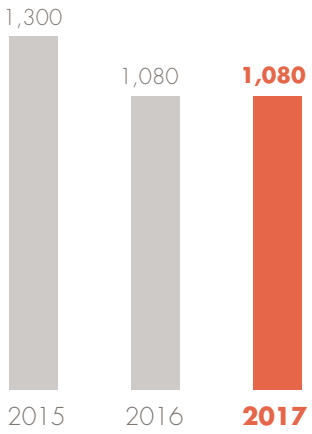
The Group analyzes the following indirect GHG emissions:

- Scope 2 GHG emissions from the use of purchased electricity and steam; and
- Scope 3 GHG emissions, categories 2, 5, 6, 7, 8, 9 and 12.

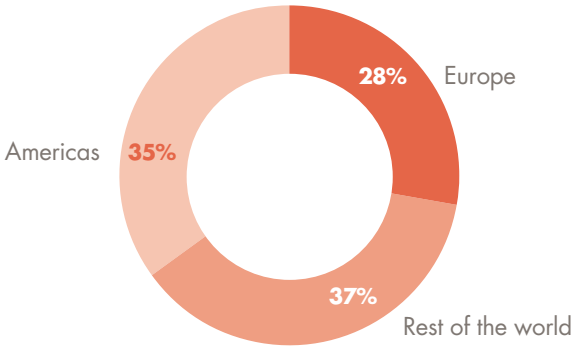
The chart below presents the Scope 2 emissions from the Group's operations in 2017, 2016 and 2015, as defined above and calculated according to the methodology described in section 2.8 of this chapter.

Scope 2 GHG emissions break down as follows:

INDIRECT GHG EMISSIONS (SCOPE 2) (kt CO_2 eq.)



INDIRECT GHG EMISSIONS BY REGION



Scope 2 GHG emissions remained stable in 2017 despite the year-on-year decline in energy use, due to the less favorable energy mix used by our energy suppliers.

The Group deploys a wide range of actions to reduce Scope 2 emissions as part of both the Arkenergy program (see section 2.4.2.2 of this chapter) and its operational excellence strategy (see section 1.6 of this document).

SCOPE 3 EMISSIONS INVENTORY

Following an initial inventory of its indirect Scope 3 emissions in 2016, the Group calculated the Scope 3 emissions arising from seven categories of upstream and downstream activities related to its value chain in 2017, 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 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. The emissions calculated for the Group in 2017 are presented by category in the following table:

Category number	Category name	Emissions (kt CO_2 eq.)	Comment
1	Purchased goods and services	Data not available	For this major source of GHG emissions, the inventory begun in 2017 will be continued during 2018
2	Capital goods	1,086	Application of the default calculation method proposed by the WBCSD (see the note on methodology in section 2.8)
3	Fuel- and energy-related activities not included in Scope 1 or 2	Data not available	Additional measures are required for the calculation of this category in light of its complexity
4	Inbound freight (upstream transportation and distribution)	Data not available	Additional measures are required for the calculation of this category in light of its complexity
5	Waste generated	455	Based on actual data relating to the waste generated by the Group in 2017, application of the WBSCD's default calculation rules (see the note on methodology in section 2.8)
6	Business travel	26	The emissions in this category relate to air travel in 2017 (see the note on methodology in section 2.8)
7	Employee commuting	40	Emissions were estimated based on the most unfavorable scenario, *i.e.*, that all Group employees commute by car (see the note on methodology in section 2.8)
8	Upstream leased assets	9	See the note on methodology in section 2.8
9	Downstream transportation and distribution	282	Based on Group companies' internal logistics data, application of the emission factors set out in the Guidelines for Measuring and Managing CO_2 Emissions from Freight Transport Operations (see the note on methodology in section 2.8)

10	Processing of sold products	Data not available	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 in a reasonable and reliable way
11	Use of sold products	Data not available	
12	End-of-life treatment of sold products	1,665	The methodology used takes into account the nature of the products marketed by the Group and their end-of-life treatment (see the note on methodology in section 2.8)
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	
TOTAL		**3,563**	

For 2017, Scope 3 CO_2 emissions from Category 9 – "Downstream transportation and distribution" were estimated at 282 kt CO_2 eq., plus or minus 10%, according to the methodology described in section 2.8 of this document. The increase of around 23 kt CO_2 eq. between 2016 and 2017 reflects better reporting by the subsidiaries and a significant increase in air and maritime freight, partly offset by a reduction in road freight and more accurate data.

Emissions in Category 12 – "End-of-life treatment of sold products" were estimated at 1,665 kt CO_2 eq. in 2017, or 59% of Scope 1 emissions, and therefore represented a major source of GHG emissions. Scope 3 emissions in Category 2 – "Capital goods" were estimated at 1,086 kt CO_2 eq., or 36% of Scope 1 emissions, and also represented a major source of GHG emissions.

Emissions relating to Category 5 – "Waste generated" were estimated at 455 kt CO_2 eq. in 2017, or 15% of Scope 1 emissions, confirming that this category is material.

Indirect emissions relating to Category 6 – "Business travel", Category 7 – "Employee commuting" and Category 8 – "Upstream leased assets" all represented less than 2% of the Group's Scope 1 emissions and are therefore considered not material.

In 2017, estimated Scope 3 indirect GHG emissions came to 3,563 kt CO_2 eq., or 119% of Scope 1 emissions.

Building on this seven-category analysis in 2017, the Group will improve the data collection process (particularly for categories where no data has been available) and continue, in 2018, to inventory its Scope 3 emissions in the categories identified as material. The goal is to prepare effective action plans to reduce the Group's material Scope 3 emissions.

Rating agency CDP gave Arkema a Climate Change score of A-in 2017, versus B in 2016. The significant improvement reflects the Group's approach, actions and contribution to meeting this key challenge.

Volatile organic compound emissions

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

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

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

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

At the Feuchy site in France, for example, a modification to a synthesis process reduced VOC emissions significantly, by around 50% or 50 tonnes.

Absolute indicators for air emissions

The indicators in the table below present air emissions from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

Air emissions	**2017**	**2016**	**2015**
Acidifying substances (*t SO_2 eq.*)	3,380	3,570	4,430
Carbon monoxide (CO) *(t)*	860	690	1,900
Volatile organic compounds (VOCs) *(t)*	4,280	4,800	5,010
Dust *(t)*	230	300	520

The divestment of the activated carbon and filter aids facilities in 2016 led to a reduction in air emissions over the year, in particular in carbon monoxide.

The steady decline in acidifying substances since 2015 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. In 2017, a change in methodology resulting in more accurate reporting from a site also contributed to the reduction.

The significant decline in volatile organic compounds resulted from an emissions reduction and recovery program at Hengshui (China) and Bostik Tanay (Philippines), and from progress made in particular in reducing fugitive emissions at the Pierre-Bénite site (France).

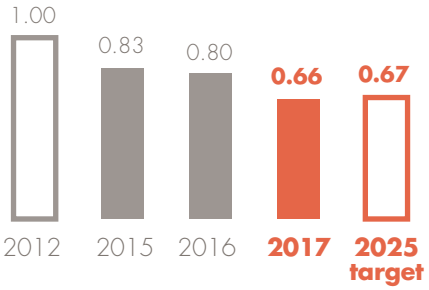
For carbon monoxide, the change is primarily attributable to high levels of activity at certain industrial facilities and to an improvement in reporting.

The further reduction in dust emissions in 2017 was mainly linked to a change in fuel at a facility in China.

Intensive indicator for air emissions

The chart below presents the volatile organic compound emissions EFPI from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter. Emissions are calculated using the Group's biggest VOC emitters, which account for more than 80% of the consolidated total.

VOLATILE ORGANIC COMPOUND EFPI



The significant improvement in this indicator in 2017 was led by the progress made by several plants following the investments undertaken in previous years.

Action plans are being deployed to sustain the improvement dynamic through to 2025.

2025 TARGET

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

2.4.4.2 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 in section 2.4.2.3 of this chapter under its water consumption aspects, is also aiming 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 or address forthcoming standards, such as the Best Available Techniques reference documents (BREFs) and the Common Waste Water (CWW) document issued by the European Union; and
- implement the pretreatment of process effluent, where relevant, to reduce the COD content of effluent sent to wastewater treatment facilities.

In 2017, the Optim'O project focused its efforts on building a detailed map of the treatment conditions of effluent from the Group's industrial sites. The analysis revealed 39 priority sites that contribute significantly to the COD EFPI. These sites will be the target of an action plan to be implemented during 2018.

Absolute indicators for effluent releases

The environmental indicators in the table below present effluent released from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

Effluent releases	2017	2016	2015
Chemical oxygen demand (COD) (*t* O_2)	2,440	2,600	3,200
Suspended solids (*t*)	920	770	870

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

FOCUS

Becancour plant (Canada): the introduction of additional substance-specific treatment processes, together with excellent operational management, has driven a 50% reduction in COD emissions compared with 2016.

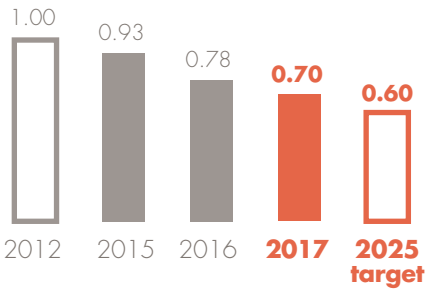
In 2017, the reduction in COD emissions was driven by improvements in the effectiveness of wastewater treatment facilities and in the quality of reporting at certain sites.

Emissions of suspended solids increased in 2017 despite the improvement measures carried out at various sites. The increase resulted from technical problems at two physico-chemical wastewater treatment facilities, which led to specific corrective actions.

Intensive indicator for effluent releases

The chart below presents the COD effluent EFPI from the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter. Emissions are calculated using the Group's biggest COD effluent emitters, which account for more than 80% of the consolidated total.

CHEMICAL OXYGEN DEMAND EFPI



The improvement in results since 2016 notably illustrates the positive impact of the Optim'O project.

The initial 2025 target of reducing COD emissions by 20% was surpassed in 2016, resulting in the definition of a new, more ambitious target.

2025 TARGET

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

2.4.4.3 WASTE

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 waste by burning it as fuel, wherever possible.

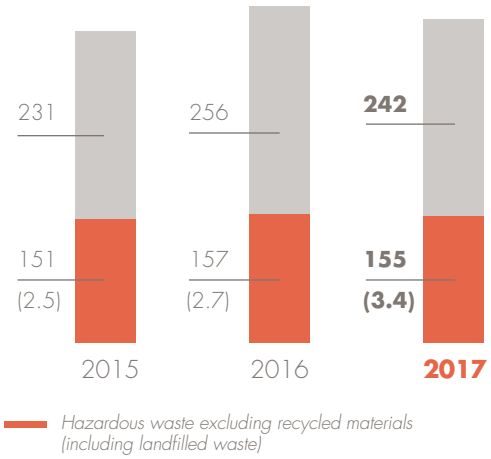
In recent years, the Group has in particular:

- explored new ways to recover and reuse certain types of waste, for example, to replace conventional fuels in boilers;
- recycled cleaning solvents and optimized cleaning cycles; and
- installed filters to reduce sludge volumes.

The following chart shows the amounts of hazardous and non-hazardous waste generated by the Group's operations in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

NON-HAZARDOUS AND HAZARDOUS WASTE

(in kt per year)



2017 saw a significant reduction in non-hazardous waste due to a change in fuel at a facility in China and to product mix effects.

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.

The following table shows the amounts of hazardous waste that were either recycled or burned as fuel in 2017, 2016 and 2015, calculated according to the methodology described in section 2.8 of this chapter.

Hazardous waste (kt per year)	**2017**	**2016**	**2015**
Waste recycled into materials	27	28	26
Waste burned as fuel	90	92	84
Total waste (including recycled)	184	188	177

Recovering waste for reuse as fuel is continuing to gain ground across the Group. Accordingly, in 2017, 15% of hazardous waste produced by the Group worldwide was recycled on- or off-site to recover useful materials, and 49% was burned as fuel.

2.4.4.4 OTHER EMISSIONS

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

- odors, by upgrading incinerators to cut SO_2 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.

2.4.5 Products and services

Arkema strives to optimize its environmental footprint by participating in recycling and circular economy initiatives and assists customers in assessing the environmental performance of its products.

2.4.5.1 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's LCA Network, which is instilling this LCA culture across the organization, in particular through periodic employee training courses, and endurably embedding it into the Group's CSR process.

The Group is supplying 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. Assessments are also performed for acrylic monomers and PMMA through trade associations.

Depending on the type of product, internal experts assess the impacts in such areas as climate change (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 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.

2.4.5.2 RECYCLING AND CIRCULAR ECONOMY PROJECTS

The Group is contributing to preserve non-renewable fossil-based raw materials by reusing the by-products of its industrial processes, supporting the recyclability of its own and its customers' products, and extending the lifespan of customers' products.

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.

CECA 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.

Circular economy

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

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 tighten coordination with partners.

In 2017, as in 2016, some 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-rich water helps to minimize sulfur loss in the process regeneration loops.

At the Hebei Casda Biomaterials Co. Ltd plant in Hengshui, China, the residual sulfuric acid generated by the sebacic acid manufacturing process is neutralized to obtain a sodium sulfate solution, which is then concentrated and crystallized. Instead of discharging the residual acid as waste, the plant now uses the new process to produce 50,000 tonnes a year of solid sodium sulfate for sale.

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 marketing channels, are an example of how existing products are re-used.

After the signature in 2016 of a "Commitment to green growth" with the French government to promote a complete recycling chain for PMMA as part of the Reverplast project, the multi-year PMMA recycling project is continuing in France in line with objectives.

Extending the lifespan of customer products

Arkema is constantly enhancing the performance over time of both its own and its customers' products.

For example, Kynar® offers a coating with a particularly long lifespan. Aquatec® version, used for reflective roofs (see section 2.5.2 of this chapter), 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.

2.5 INNOVATION INFORMATION

PLACING SOLUTIONS FOR SUSTAINABLE DEVELOPMENT AT THE HEART OF THE GROUP'S APPROACH TO INNOVATION AND PRODUCT RANGE

2.5.1 Managing innovation to support sustainable development

In a fast-changing world characterized by global warming, a rising world population, the increasing difficulty in accessing energy and safe drinking water, and the growing scarcity of certain resources, manufacturing companies like Arkema must constantly innovate and adapt their product range to offer solutions addressing these challenges.

To contribute actively to these major changes, the Group has structured its innovation strategy around six innovation platforms, described in section 1.4 of this document, that are developing and delivering for its customers usable, innovative and environmentally friendly solutions in such areas as bio-based products, lightweight materials and design, new energies, water management, electronics solutions, and home efficiency and insulation.

These six platforms are addressing issues that are of rising interest, as evidenced by the entry into force on 1 January 2016 of the 17 Sustainable Development Goals (SDGs) defined by the United Nations in their "2030 Agenda for Sustainable Development", and to which governments, civil society and companies are being encouraged to contribute.

Arkema has identified six SDGs where its expertise and innovation efforts will enable it to offer new solutions and thus to contribute to their achievement. These SDGs are:

- "Ensure sustainable consumption and production patterns" (SDG 12);
- "Ensure access to affordable, reliable, sustainable and modern energy for all" (SDG 7);
- "Ensure availability and sustainable management of water and sanitation for all" (SDG 6);
- "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (SDG 9);
- "Take urgent action to combat climate change and its impacts" (SDG 13); and
- "Make cities inclusive, safe, resilient and sustainable" (SDG 11).

The materiality assessment performed in 2016 and presented in section 2.2 of this chapter confirmed that the development of sustainable, innovative solutions was one of the important aspects of the Group's CSR approach.

The Group's ambitious partnership and open-innovation policy is supporting internal R&D efforts, as described in section 1.4.2.3 of this document.

In addition, the Group is developing new processes and upgrading the manufacturing technologies used on its production sites so as to attenuate the environmental risks relating to their operations and reduce their emissions of potential pollutants as well as to optimize their use of energy and raw materials. These initiatives, described in section 1.6 and sections 2.4.2 and 2.4.5 of this document, will also contribute to the achievement of certain of these SDGs.

Information on industrial safety, environmental and climate change risks for the Group may be found in section 1.7.2.3 of this document.

2.5.2 Arkema's solutions to sustainable development challenges

The Group has developed a range of innovative solutions that respond perfectly to six of the UN's Sustainable Development Goals, as shown in the examples described below.

"Ensure sustainable consumption and production patterns"

The growth in the world's population, the improvement in living standards and the rapid pace of industrialization are all driving the increased use and therefore growing scarcity of the planet's fossil raw materials.

By developing products using renewable raw materials within its "Bio-based products" innovation platform, the Group is helping to preserve non-renewable fossil materials and to introduce eco-design solutions with optimized environmental footprints, for example through recycling or as part of the circular economy (see section 2.4.5.2 of this chapter).

This ongoing commitment was demonstrated in 2017 by the fact that products at least 20% made from renewable raw materials accounted for around 9% of Group sales. These products are described in section 1.4.4.2 of this document.

Leveraging their more than 60 years of expertise, the Group's R&D teams will continue their efforts in this field to further expand the range of solutions offered.

The Group is also striving to reduce its own use of raw materials, particularly petrochemical feedstock, as part of the continuous improvement in its production processes (see section 2.4.2.1 of this chapter).

"Ensure access to affordable, reliable, sustainable and modern energy for all"

New energies are one of Arkema's important research areas. By offering innovative solutions in this area, the Group is helping to preserve the planet's fossil resources and fight against climate change.

Through its "New energies" innovation platform, Arkema offers a wide range of products and innovations designed to support the growth of alternative energy production methods, including:

- Kynar® and Evatane® resins, and the Apolhya® Solar resin, which are used to encapsulate module components or to produce the coatings for photovoltaic panels; and
- Elium® recyclable thermoplastic resin, which is being tested for the production of wind turbine rotor blades.

The Group's innovation focus also includes a range of solutions for the batteries used for energy storage and in electric vehicles (see section 1.4.4.2).

In addition to product innovations, the Group is also working on reducing the energy used in its production processes.

"Ensure availability and sustainable management of water and sanitation for all"

Growth in the world's population and its increasing urbanization are sharply impacting water demand and tightening access to safe drinking water. Global access to high-quality water is a major challenge for the 21st century. In addition, the increased treatment of industrial, agricultural and domestic wastewater is driving the emergence of new needs.

To help prevent the risk of a shortage of water resources, the Group offers solutions – through its existing product range and its "Water management" innovation platform – aimed at various stages in the water treatment process:

- acrylic monomers, which are used as flocculants to purify wastewater;
- Hydrogen Peroxide, used as a water disinfectant; and
- Rilsan® and Kynar® resins, which can be used to produce materials for water transportation and to make filtration processes more effective, more energy-efficient and less costly.

Details of these innovations are provided in section 1.4.4.2.

In addition, the Group is continuing its efforts and is finding innovative ways to optimize its own water consumption in its production processes (see section on the Optim'O project in section 2.4.2.3) and improve the quality of its discharges (see strategic objective for COD in section 2.2.4).

"Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"

This SDG addresses the important social challenge of sustainable and inclusive industrialization. Two of its main drivers are technology and innovation, particularly digital technologies and electronics, which will enable manufacturers in the developed world to optimize their production facilities and supply chain. In developing countries, they will help to give equal access to information and knowledge to the more than four billion people living without internet access in these countries. The Group is positioning itself, with the "Electronics solutions" innovation platform, as a player in the upstream part of this chain.

The electronics industry is characterized by strong growth and very short time-to-market cycles for new solutions. With its Technical Polymers range, the Group offers solutions for the mobile device segment, which includes smartphones and tablets. For further details, see section 1.2.1.3 of this document.

In addition, an ambitious research project in the area of nano-scale semiconductor etching, housed in the incubator, aims at using the directed self-assembly process, based on ultra-pure block copolymers, where the Group enjoys unique expertise. By enabling the fabrication of even smaller silicon chips, this innovation offers a promising pathway to increasing microprocessor storage capacity, a key factor in the spread of digital technology. The recent developments are described in section 1.4.4.2 of this document.

"Take urgent action to combat climate change and its impacts"

An increasing global population, growing urbanization, rising living standards (with a corresponding increase in the number of cars and air travel) and the faster pace of industrialization in emerging markets all contribute to the gradual warming of the planet and to climate change. The fight against global warming is therefore a major challenge that mobilizes the entire international community.

To actively participate in this fight, the Group is developing, within its "Lightweight materials and design" innovation platform, solutions that reduce vehicle weight and thereby their fuel consumption. In doing so, they also contribute to minimizing CO_2 emissions in the transportation sector. These products include the Altuglas® ShieldUp nanostructured polymer sheet that replaces glass in automobile windows, Rilsan® HT and, more recently, Kepstan® PEKK, which can be used as metal substitutes, and thermoplastic composites such as the Elium® resin. In addition, Bostik and Platamid® adhesives offer automotive and aerospace manufacturers lightweight bonding solutions for materials assembly.

For example, in the case of cars, the use of Altuglas® ShieldUp roofs can reduce fuel consumption by 0.4 liters and reduce CO_2 emissions by seven kilograms per 100 kilometers traveled. Assuming that 100,000 vehicles driving 20,000 kilometers a year were equipped with this innovation, CO_2 emissions would be reduced by 140,000 tonnes a year.

The Group's lightweight materials solutions are presented in detail in section 1.4.4.2 of this document.

In addition, within the Fluorogases Business Line, the Group is developing chemicals with low global warming potential (GWP), in particular low-GWP HFO refrigerants with zero ozone-depletion potential (ODP).

"Make cities and human settlements inclusive, safe, resilient and sustainable"

With growing urbanization, access to high-quality, sustainable housing is becoming increasingly problematic. The "Home efficiency and insulation" innovation platform offers solutions that insulate buildings more effectively, which in turn improves the energy efficiency of their air-conditioning systems. These innovations are also helping to fight against global warming.

One of them is the Kynar Aquatec® PVDF resin, a water-based formulation for the white paint on reflecting roofs, whose use reduces a building's energy consumption in high-sunlight regions by 20%, or 20 kilowatt-hours per square meter a year. For ten buildings with a roof area of 15,000 square meters, this would represent a total reduction of 1,500 tonnes of CO_2 a year, assuming an emission coefficient of 0.5 tonnes of CO_2 per 1,000 kilowatt-hours.

FOCUS

The BSTC experiments successfully with Kynar Aquatec®

In 2017, 800 square meters of roof at the Bostik Smart Technology Center (BSTC) in France were coated with Kynar Aquatec®. The results demonstrate the innovation's potential: the building's interior is 3°C to 4°C cooler on the sunniest days and the amplitude of temperature variations has been reduced by a factor of two, generating a significant improvement in comfort.

In addition to addressing these energy efficiency challenges, the Group is also participating in the development of solutions that reduce a home's environmental footprint and make it healthier and more comfortable for residents. In particular, these solutions are being trialed in the "Smart House by Arkema", a world-unique laboratory for construction technologies.

The Group's home efficiency and insulation initiatives and solutions are described in more detail in section 1.4.4.2 of this document.

2.5.3 R&D organization and outcome

R&D organization and outcomes are described in section 1.4 of this document. The key R&D indicators are presented in the table of CSR indicators in section 2.8.3 of this chapter.

To develop the technologies of the future and invent new products, the Group is innovating directly with its ecosystem in a seamless, interconnected way. Initiatives undertaken as part of partnerships and open innovation are described in section 1.4.2.3 of this document.

FOCUS

Sustainable innovation

In 2017, 150 patent applications were filed by the Group for innovative solutions that contribute to meeting the United Nations' Sustainable Development Goals. The significant increase in patent applications versus previous years reflects the efforts made by Arkema to generate innovative, sustainable solutions, particularly in the areas of bio-based polymers (SDG 12) and lightweight materials (SDG 13).

To secure its commitment to developing sustainable solutions that benefit the entire value chain, the Group is currently working on the definition of a new indicator for 2018 to assess its contribution to the United Nations' Sustainable Development Goals. The indicator's progress will be supported by innovation. A target will be set once the indicator has been monitored for a certain period of time.

2.6 SOCIAL INFORMATION

PROMOTING THE INDIVIDUAL AND COLLECTIVE DEVELOPMENT OF ALL ITS EMPLOYEES

2.6.1 Social management

The Group's success is deeply linked to its 19,779 employees in some fifty countries around the globe, who each contribute to its development and performance. The Group benefits from a strong corporate culture, rooted in the four core values of simplicity, solidarity, performance and accountability.

Arkema's human resources policies are designed to encourage employee development by providing career opportunities within an innovative, global company, and to attract and retain the best talent. This implies an environment offering good working conditions and guaranteeing fair treatment in every circumstance.

These policies cover both personal development initiatives and programs focused on the workplace environment as follows:

- personal development initiatives concern hiring, training and career development, with the aim of improving each employee's skills and capabilities. Career management policies help to build career paths that enhance the expertise of employees and, by extension, the entire Group. They are supported by training programs that provide the knowledge and practices required to take up a new position or acquire new job skills. Employee development is also being encouraged by a policy of proper recognition and fair compensation, regularly benchmarked against peer groups; and
- programs focused on working conditions that are designed to drive continuous improvement. They include initiates to improve the working environment and preserve employee health and safety. They are also designed to foster positive employee relations, by paying close attention to employee feedback, maintaining social dialogue and broadening the diversity of national origins, profiles and educational backgrounds among employees.

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 2.7.3 of this chapter.

2.6.2 Employment

Through its human resources policies, 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.

The Group supports the personal development of every employee, provides opportunities for promotion and transfer and is actively broadening the diversity of its teams.

2.6.2.1 TOTAL HEADCOUNT AND EMPLOYEES BY REGION, GENDER AND AGE

Data in this section concern all of the companies that are more than 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 note on methodology in section 2.8 of this chapter.

TOTAL WORKFORCE OVER THE PAST THREE YEARS

	31 December 2017	31 December 2016	31 December 2015*
GROUP TOTAL	**19,779**	**19,637**	**18,912**
France	7,144	7,145	7,282
Europe (excluding France)	3,936	3,838	3,120
North America	3,742	3,694	3,568
Asia	4,104	4,061	3,979
Rest of the world	853	899	963
Of which permanent [1]	18,701	18,607	17,801
Of which fixed-term	1,078	1,030	1,111

(1) See the note on methodology in section 2.8 of this chapter.
** Excluding Den Braven.*

There were no significant changes in scope in 2017 since the acquisition of Den Braven was carried out in December 2016 and that of XL Brands in January 2018. The Group's total headcount increased by a slight 0.7% in 2017 compared with 2016.

The regional headcounts were also relatively stable and break down as follows:

	31 December 2017	31 December 2016	31 December 2015*
France	36.1%	36.4%	38.5%
Europe (excluding France)	19.9%	19.5%	16.5%
North America	18.9%	18.8%	18.9%
Asia	20.8%	20.7%	21.0%
Rest of the world	4.3%	4.6%	5.1%

** Excluding Den Braven.*

HEADCOUNT BY REGION AND GENDER

The proportion of men in the total headcount continued to decline slightly in 2017 to reach 75% (down 0.4 points versus 2016 and 1.1 points versus 2015).

	MALE			FEMALE		
	2017	2016	2015*	2017	2016	2015*
France	73.4%	74.0%	74.7%	26.6%	26.0%	25.3%
Europe (excluding France)	75.2%	75.5%	77.9%	24.8%	24.5%	22.1%
North America	77.7%	78.2%	78.4%	22.3%	21.8%	21.6%
Asia	74.6%	74.3%	74.3%	25.4%	25.7%	25.7%
Rest of the world	78.3%	79.0%	80.2%	21.7%	21.0%	19.8%

** Excluding Den Braven.*

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 73.1% of the workforce.

HEADCOUNT BY CATEGORY AND GENDER

At 31 December 2017, managers accounted for 26.9% of Group employees. The table below shows a slight increase in the proportion of managers in the total headcount.

	MANAGERS			NON-MANAGERS		
(in %)	2017	2016	2015*	2017	2016	2015*
Total	26.9%	26.2%	25.8%	73.1%	73.8%	74.2%
Of which women	*29.1%*	*28.3%*	*27.4%*	*23.5%*	*23.3%*	*22.7%*

* *Excluding Den Braven.*

Women accounted for an average 29.1% of managers, an increase of 0.8 points year-on-year, and 4.1 points higher than the percentage of women in the workforce as a whole (25%).

HEADCOUNT BY AGE GROUP

	31 December 2017	31 December 2016	31 December 2015*
GROUP TOTAL	**19,779**	**19,637**	**18,912**
Under 30 years	13.8%	14.5%	15.3%
30 to 39 years	26.1%	26.0%	25.6%
40 to 49 years	28.7%	28.7%	28.3%
50 to 59 years	25.9%	25.9%	26.1%
Over 60 years	5.5%	4.9%	4.7%

* *Excluding Den Braven.*

HEADCOUNT BY AGE GROUP AND GENDER

	MALE			FEMALE		
	2017	2016	2015*	2017	2016	2015*
Under 30 years	12.8%	13.8%	14.4%	16.5%	16.6%	18.1%
30 to 39 years	25.6%	25.3%	25.0%	28.2%	28.2%	27.5%
40 to 49 years	29.3%	29.2%	28.8%	26.8%	27.4%	27.1%
50 to 59 years	26.6%	26.7%	27.1%	23.7%	23.3%	22.8%
Over 60 years	5.7%	5.0%	4.7%	4.8%	4.5%	4.5%

* *Excluding Den Braven.*

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. 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.

2.6.2.2 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.

A recruitment charter has been issued to help promote the principles of fairness and non-discrimination in the selection of job applicants.

In 2017, Arkema continued to develop its employer brand, revised in 2016. New videos focusing on the Group's professions were produced in Asia for dissemination via the Group's communication media and for use locally in its relations with academic institutions.

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 part in a large number of school events, such as job forums, presentations and plant tours. These initiatives seek to promote the Group and its professions to the students of general engineering schools (Mines de Paris, Centrale Paris and Polytechnique), chemical engineering schools (such as ESPCI, Chimie Paris, ENSIC and ENSIACET), business schools (particularly HEC, ESSEC and ESCP-Europe), and technical schools in the fields of safety and maintenance.

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 26 IVB program participants in 2017, of which 10 who 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 2017 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 work-study programs, whose participants represent an important source of new hires. The objective is for one-third of positions open to young graduates to be offered to people already on a work-study contract with the Group. Students on work-study programs accounted for 3.5% of the workforce in 2017.

In the United States

Arkema Inc. nurtures close relations with universities whose students can meet the Group's hiring needs. In 2016, for example, a series of meetings was organized between Group researchers and students from MIT, the University of Massachusetts, Cornell University and Pennsylvania State University. In addition, 51 internships were offered during the year. The Group also recently invested in an MBA Rotational Leadership Development program with the goal of recruiting candidates with technical backgrounds who are capable of moving into management positions. The two-year program offers participants experience in a variety of corporate positions.

In China

To meet its hiring needs, operations in China are fostering closer relations with selected universities. Seven university visits were organized in 2017, providing the opportunity to meet more than 2,100 students. In addition, 46 internships were offered to students in target universities.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY REGION

In 2017, Arkema hired 1,616 people under permanent contracts, compared with 1,694 in 2016.

	31 December 2017	31 December 2016*	31 December 2015*
France	22.5%	17.4%	17.9%
Europe (excluding France)	15.7%	11.0%	11.9%
North America	28.7%	31.2%	32.6%
Asia	27.1%	30.2%	30.3%
Rest of the world	6.0%	10.2%	7.3%

* *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 turnover in both regions.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY REGION AND GENDER

Women represented 28.5% of total new hires in 2017, an increase of 3.8 points year-on-year, and higher than the percentage of women in the workforce as a whole (25.0%).

	MALE			FEMALE		
	2017	2016*	2015*	2017	2016*	2015*
France	65.1%	67.5%	66.8%	34.9%	32.5%	33.2%
Europe (excluding France)	66.5%	73.1%	73.4%	33.5%	26.9%	26.6%
North America	72.6%	76.0%	76.7%	27.4%	24.0%	23.3%
Asia	76.9%	78.3%	74.9%	23.1%	21.7%	25.1%
Rest of the world	79.4%	79.7%	84.0%	20.6%	20.3%	16.0%

* *Excluding Den Braven.*

RECRUITMENTS UNDER PERMANENT CONTRACTS BY CATEGORY AND GENDER

	MANAGERS			NON-MANAGERS		
(in %)	2017	2016*	2015*	2017	2016*	2015*
Total	29.1%	26.3%	25.9%	70.9%	73.7%	74.1%
Of which women	*29.1%*	*34.1%*	*31.9%*	*28.2%*	*21.4%*	*23.2%*

* *Excluding Den Braven.*

In 2017, 29.1% of recruitments concerned managerial positions, compared with 26.3% in 2016. This is slightly higher than the proportion of managers in the total workforce (26.9%), thereby ensuring an efficient succession process and driving an increase in the number of managers.

The percentage of women among managerial hires decreased in 2017, to 29.1% from 34.1% in 2016. 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 2.6.5.2 of this chapter.

RECRUITMENTS UNDER PERMANENT CONTRACTS BY AGE GROUP

Recruitment practices are designed to provide the skills and expertise that the technical, sales and administrative professions need. The recruitment of people under 40 illustrates the initiatives in place to proactively respond to the wave of departures projected over the next ten years.

Recruitments	31 December 2017	31 December 2016*	31 December 2015*
GROUP TOTAL	**1,616**	**1,694**	**1,450**
Under 30 years	38.5%	41.9%	41.7%
30 to 39 years	33.6%	33.8%	35.0%
40 to 49 years	18.5%	16.5%	15.4%
50 to 59 years	8.3%	7.4%	7.4%
Over 60 years	1.1%	0.4%	0.5%

* *Excluding Den Braven.*

RECRUITMENTS UNDER PERMANENT CONTRACTS BY AGE GROUP AND GENDER

	MALE			FEMALE		
	2017	2016	2015*	2017	2016	2015*
Under 30 years	37.6%	41.7%	41.2%	40.6%	42.5%	42.8%
30 to 39 years	34.5%	34.0%	35.5%	31.3%	32.9%	33.3%
40 to 49 years	19.1%	16.3%	15.9%	17.0%	17.2%	14.1%
50 to 59 years	8.0%	7.5%	7.0%	9.1%	7.2%	8.7%
Over 60 years	0.8%	0.5%	0.4%	2.0%	0.2%	1.1%

* *Excluding Den Braven.*

DEPARTURES OF EMPLOYEES UNDER PERMANENT CONTRACTS

In 2017, the Group recorded 1,705 departures of permanent employees, versus 2,023 in 2016, which break down as follows:

	France	Europe (excluding France)	North America	Asia	Rest of the world	Total
TOTAL DEPARTURES OF PERMANENT EMPLOYEES	**376**	**292**	**422**	**464**	**151**	**1,705**
Of which resignations	70	130	253	380	29	862
Of which dismissals	36	58	68	57	113	332

RESIGNATIONS OF PERMANENT EMPLOYEES

The following table shows employee turnover, defined as resignations as a percentage of the total workforce, for 2017, 2016 and 2015.

	2017	2016*	2015*
Resignations	862	866	758
Turnover *(resignations as a percentage of employees under permanent contracts)*	4.6%	4.7%	4.3%

* *Excluding Den Braven.*

Concerning 2017 resignations, turnover by region and global turnover were all within the industry average.

2.6.2.3 ORGANIZATION OF WORKING TIME

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

Employees work full time and, to a lesser extent, part time. At Arkema France, for example, full-time employees work 1,575 hours a year while part-time hours range from 50% to 80% of the full-time equivalent. In the United States, full-time employees work 1,960 hours a year and part-time hours range from 50% to 90% of the full-time equivalent. For the Group overall, part-time employees accounted for 3.7% of the total workforce at 31 December 2017, compared with 3.8% in 2016.

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.

2.6.2.4 ABSENTEEISM

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

	2017	2016*	2015*
Percentage of hours of absence (excluding authorized leave)/ number of hours worked.	3.9	3.7	3.4

* *Excluding Den Braven.*

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

	2017	2016*	2015*
Percentage of hours of medical leave/number of hours worked	2.8	2.6	2.4

* *Excluding Den Braven.*

The absenteeism rate rose slightly but remained in line with the average 3.5% to 4.5% reported by the global manufacturing industry.

2.6.2.5 COMPENSATION AND CHANGES IN COMPENSATION

Total payroll costs for 2017 and previous years are presented in note 25 of chapter 4 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.

In addition, the compensation structure is regularly benchmarked.

32% of employees receive some form of individual bonus, whose amount 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 a safety or other CSR objective.

67% of employees are eligible for some form of collective bonus, which give 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.

Nearly all employees, *i.e.*, 99.6% of the total workforce, are covered by a guaranteed minimum compensation agreement. In the few countries where there is no minimum wage, Group companies regularly perform benchmarking studies and are in line with standard chemical industry practices.

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 2006 stock market listing, Arkema has encouraged employee share ownership, with plans offered every two years in the Group's main host countries to enable the purchase of Company shares on preferential terms.

The participation rate has increased over time to an average of 40% (close to 70% in France and 21% in other countries) and the average amount invested by employees reached €5,700 in 2016. These figures reflect the employees' engagement and their confidence in the Group's development.

As a result, 5.1% of outstanding shares were owned by employees at 31 December 2017, collectively making them one of the Group's main shareholders.

In the spring of 2018, Arkema will carry out another capital increase reserved for employees, the sixth since its stock market listing in 2006. The plan will be open to employees in around 30 countries.

For more details, please refer to section 5.2.7 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 2017, performance shares were granted to 1,400 beneficiaries, representing 7% of the total headcount and around 200 more than in 2016.

For more information, please refer to section 3.5, section 5.2.6 and note 27 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

2.6.2.6 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 93% of Group employees thus receive supplementary life cover and 90% supplementary disability cover.

2.6.3 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 set objectives for the coming year and to discuss the employee's desired career path. They also review the training completed over the year, and on that basis, 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, 99% of Group companies conduct 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.

2.6.3.1 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 and continued employability.

Training hours are reported for entities at least 50%-owned and employing more than 30 people, corresponding to 96% of the total workforce.

NUMBER OF TRAINING HOURS (EXCLUDING E-LEARNING)

	2017	2016*	2015*
Total number of training hours, Group-wide	484,578	464,706	463,065
Training hours per employee per year	25	27	27
Number of employees having attended at least one course	16,161	16,256	17,062
Percentage of employees having attended at least one course during the year	85	94.7	99.3

* *Excluding Den Braven.*

Employees continued to benefit from a significant level of training in 2017, with an average of 25 training hours per employee. The figures for 2015 and 2016 were particularly high due to the deployment of the global Safety Academy program.

NUMBER OF EMPLOYEES WHO TOOK AN E-LEARNING COURSE

To facilitate access to training, the Group offers e-learning modules, which are easy to use, particularly for courses on safety and corporate subjects. The curriculum currently consists of more than 20 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.

A new version of the platform that manages e-learning modules was implemented in 2017, enabling better management and more detailed tracking of e-learning across the Group.

	2017	2016*	2015*
Number of employees who took an e-learning course	10,496	9,298	8,218
Percentage of employees having taken at least one e-learning course during the year	55	54	45

* *Excluding Den Braven.*

E-learning courses continue to grow in popularity, as measured by both the number and percentage of participating employees. After the deployment in 2016 of the "Code of Conduct and Business Ethics" module, a new training module relating to the Arkenergy project was developed and rolled out worldwide. Backed by a dedicated communication campaign, the module is designed to raise employee awareness of energy savings.

2.6.3.2 SPECIAL PROFESSIONAL TRAINING PROGRAMS FOR EMPLOYEES

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

International initiatives include:

- the Isafe program that was launched during the year and the cyber security awareness campaign deployed in all countries via a network of correspondents; and
- the SMART program dedicated to operational excellence, which is being rolled out at 10 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.

Regional initiatives include:

- the Share Strategic Challenges seminar that was held in Europe in June 2017 for newly hired managers (with two to five years of experience), enabling them to deepen their understanding of the Group's strategy and projects and to embrace its changes and challenges; and
- the two leadership development programs held in 2017, one in Asia and the other in Europe. Inspired by feedback from the Arkema Cornell Leadership Program offered in the United States, the two programs provided training for more than 50 managers. Known together as the Arkema Leadership Academy, these three programs round out the Group's offering of training dedicated to high potentials.

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

2.6.3.3 TALENT MANAGEMENT

One of the cornerstones of the Group's human resources development process, talent management helps to diversify the experience that employees acquire along their career paths, while steadily enhancing their capabilities, which is a fundamental driver of 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 implement their projects based on the potential and opportunities available in the Group.

Employee talent management is led by career managers, whose responsibilities include:

- overseeing talent management at the corporate level for managers in France and grade 15 jobs and higher internationally; and
- working in collaboration with other career managers 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-potentials to encourage acceptance of responsibility and support career development;
- encouraging mobility between subsidiaries and geographies; and
- enabling every employee to move up in the organization and enrich his or her experience and skills, while ensuring organizational flexibility.

In every country, a career development program has been rolled out Group-wide for high-potentials, 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.

In France

In addition to the recruitment targets for young people and seniors (see section 2.5.1.2 of this chapter), the Provisional Management of Employment and Skills agreement renewed in 2016 for Group companies in France includes measures for recognizing experts through skills/professions charts, in addition to the Hay classification. The agreement also includes specific measures to manage career endings for seniors, such as knowledge transfer, retirement counseling, and the possibility of working 80% of full-time equivalent at 90% of pay for the 24 months preceding retirement.

In the United States

To support the talent management process, human resources teams are using the SAP SuccessFactors software to manage hiring, career development, annual performance reviews, training and performance initiatives for all US employees. The system is now being introduced worldwide to support a holistic, global vision of employee career paths.

In China

In 2015, a talent management leader was appointed and tasked with encouraging the development of employee skills not only in China, but also across all of Asia, in liaison with the country human resources managers.

2.6.3.4 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, as follows.

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.

2.6.4 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.

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.

The social dialogue process and the results of the collective agreements signed within the Group are presented in section 2.6.4.1 of this chapter.

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

2.6.4.1 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 2017, 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 2017, as shown in the following table.

PERCENTAGE OF EMPLOYEES REPRESENTED BY ELECTED BODIES AND/OR UNIONS, BY REGION

	2017
GROUP TOTAL	**89%**
France	100%
Europe (excluding France)	88%
North America	77%
Asia	83%
Rest of the world	87%

2.6.4.2 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. Over the past two years, internal surveys have been organized in 17 countries in Asia, Europe and the United States covering such topics as employee engagement, organization, compensation, working conditions and health and safety. Participation among employees of the various entities involved was very high, with response rates often above 85%.

2.6.4.3 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 the macroeconomic environment. The main topics negotiated in 2017 concerned total compensation (salaries, health and welfare plans, health insurance, employee savings plans and other employee benefits), employment and skills management, quality of work life, workplace health and safety, workplace equality and diversity, and social dialogue. In France, 22 major agreements were signed in the subsidiaries or Group-wide during the year.

Collective agreements have a positive impact on working conditions, as illustrated in France by the measures taken in favor of people with disabilities, described in section 2.6.5.3 of this chapter, and the agreement signed in 2017 on employees' right to disconnect.

2.6.5 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 disabled employees 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.

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.

2.6.5.1 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 locals in every aspect of the business, from shop floor to executive teams. 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 objective for 2025:

2025 TARGET

42% to 45% of senior management and executive positions to be held by non-French nationals.

In 2017, 37% of senior managers were non-French nationals. The change versus 2016 reflects an increase in the number of senior managers in corporate positions based in France.

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.

2.6.5.2 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, more than 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;
- introducing career workshops designed in particular to encourage women to maintain their career goals;
- 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 2017, women accounted for 19% of all senior managers and executives across the Group, compared with 18% in 2016. This figure is consistent with the average 0.5% a year increase required to meet the 2025 target.

In France

In 2015, Arkema France signed an agreement on gender equality and diversity, covering such issues as hiring and induction, compensation and promotions, access to training and work/life balance.

In 2017, 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. Around 40 women have benefited from the program over the past two years.

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.

2.6.5.3 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 2017, disabled employees accounted for 3.83% 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 disabled employees over four years and increase the amount spent on social enterprises and work centers by 21%.

In addition, actions in favor of the disabled 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 the first meeting of the network of disabled employment correspondents and coordinators;
- hiring and integration: making the website's Careers pages accessible; participating in various local and national recruitment events; maintaining relations with certain partners such as the Club House, which promotes the integration of disabled people;
- increasing the use of social enterprises and work centers: strengthening support for all sites via a partner specialized in this area;
- training: starting up a fourth "Manufacturing Operator" job certification cycle and launching a project to introduce a job certification course to train laboratory technicians; and
- 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 the disabled and emailed to local community organizations that help disabled people find employment.

2.6.5.4 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 2017, 45 of the 364 people hired under permanent contracts in France were over 50 years old, representing 12.4% of the total (versus 9% in 2016), 2.4 points above the targeted 10%.

2.7 SOCIETAL INFORMATION

ENCOURAGING OPEN DIALOGUE WITH ALL THE GROUP'S STAKEHOLDERS

2.7.1 Societal management

The Group's activities are part of a value chain and an ecosystem comprising numerous partners and stakeholders, as described in section 2.2.2 of this document. High-quality dialogue is essential to creating value for all involved.

All of the international standards and principles that the Group upholds, which are presented in section 2.1.1 of this document, are included in corporate reference documents, such as the Code of Conduct and Business Ethics; the Supplier Code of Conduct; the Health, Safety, Environment and Quality Charter; and the Energy Policy.

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.

2.7.2 Institutional initiatives

As a responsible chemicals producer, the Group interacts with public authorities in every country where it operates, in particular to contribute preparing legal and regulatory frameworks favorable to the development 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, the Group 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 the *Cercle de l'industrie* in France, and chemical industry trade associations, such as *Union des industries chimiques* - UIC in France, CEFIC in Europe and the American Chemistry Council in the United States.

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, in response, defending or promoting the interests both of the Group. 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. The consolidated budget allocated to institutional relations amounted to around €400,000 in 2017.

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 2017, calculated according to the prescribed rules, amounted to around $730,000. Two Arkema Inc. employees have been registered as lobbyists to Congress, particularly on the issue of refrigeration gases.

2.7.3 Compliance and ethics

THE CODE OF CONDUCT AND BUSINESS ETHICS

The Group has a Code of Conduct and Business Ethics that is based on Arkema's values and the principles of the Global Compact and describes the good business practices to be applied in every aspect of the Group's operations

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", the Code of Conduct and Business Ethics as updated in 2013, together with an Anti-Corruption Charter (hereafter the "Code of Conduct"), will be disseminated within the Group and integrated into the internal rules of all sites in France during the first half of 2018. 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.

PROCESSES FOR IDENTIFYING AND REDUCING THE RISKS OF NON-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, export control and anti-corruption legislation. It defines and describes guidelines, procedures and risk management processes applicable throughout the Group.

To ensure that the program runs smoothly, the following resources have been implemented:

- training to build employee awareness of the need to comply with competition rules, export control regulations and anti-bribery practices;
- 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;
- an e-learning module on the Code of Conduct; and
- a compliance statement signed by all employees potentially exposed to these risks, attesting that they will abide by the Code of Conduct's principles.

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, consists of the Internal Audit and Internal Control Vice-President, a Human Resources department representative, the Sustainable Development Vice-President, the Group Safety and Environment Vice-President, a representative of the Legal Affairs department, a representative of the Finance/Treasury/Tax department and 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 five times in 2017.

For all practical questions regarding an ethical issue in general, and any problem in applying the Code of Conduct in particular, an application may be made to the Compliance Committee either by executive management or by an employee.

To strengthen its business ethics compliance program, Arkema has introduced a whistleblowing system that 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, consists of the Internal Audit and Internal Control Vice-President, the Sustainable Development Vice-President, a representative from the Legal Affairs department and the head of Institutional Affairs.

In the host regions, the regional Vice-Presidents are appointed as correspondents to the whistleblower committee.

In the area of personal data protection, the Group has initiated a project to bring it into compliance with the EU regulation of 27 April 2016 on protecting personal data, which will come into force on 25 May 2018.

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 1.7.1 of this document.

2.7.4 Commitment to human rights

Arkema recognizes the importance of protecting human rights wherever the Group operates, both in conducting its business and in its supplier relationships.

The Group has undertaken to comply with the main international texts and standards presented in section 2.1.1 of this document. It also endeavors to comply with the constitutional texts, treaties, conventions, laws and regulations in force in its host countries and regions.

Arkema therefore ensures that human rights are upheld in its relations with its employees, contractors, temporary workers and suppliers. 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, respect for private life, freedom of association, the right to strike and the right to collective bargaining.

The Group wishes to extend its commitment to human rights and fundamental freedoms by enhancing and harmonizing its management processes across all geographies.

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 2.7.5 of this document.

2.7.5 Procurement, suppliers and subcontracting

The Group has integrated labor, environmental and social issues into its procurement process and strives to build long-term, balanced, sustainable, trust-based relationships 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.

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 2.7.3 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.

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.

RESPONSIBLE PURCHASING TRAINING AND AWARENESS

Group buyers are all trained to apply the Supplier Code of Conduct, with regular follow-up meetings to inform and maintain awareness.

ASSESSMENTS BY THREE PROCUREMENT DEPARTMENTS

The Goods and Services Procurement department regularly assesses the employee safety performance of the leading contractors working on Group sites. As explained in section 2.3 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

"PRAGATI, sustainable castor caring for environmental and social standards"

In May 2016, the Group and three other partners – BASF, Jayant Agro and NGO Solidaridad – launched the PRAGATI initiative to promote sustainability in the castor oil supply chain. The aim is to improve the living and working conditions of castor bean farmers in India, the world's largest producing country, and to reduce their environmental impact while improving crop yields. The farmers involved in the program benefit from training and support during the growing season.

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.

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, in line with 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 their suppliers' CSR performance 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 2017, more than 1,000 of the Group's suppliers and subcontractors had been assessed with regard to CSR criteria. 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, the Group will continue to perform voluntary assessments, with a particular focus on the suppliers that are most at risk according to such criteria as activity, location or the portion of the Group's total purchases that they represent.

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 €242 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.

2.7.6 Direct and indirect socio-economic impact

In the 50 countries where it operates, the Group's business operations are contributing to develop 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 chapter 4, the Group's economic contribution to host communities includes a wide range of components – sales, capital expenditure, operating expenses, wages and salaries and payroll taxes, income and other business taxes, dividends, etc. – that together make up 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.

REVITALIZATION OF REGIONAL LABOR MARKETS

The Group pays close attention to the possible consequences of business relocation. When such reorganization is called for in France, the Group endeavors to offset any job losses, wherever possible, and contributes to revitalize the impacted labor markets. These initiatives are legally defined in accordance with the revitalization agreements signed with public authorities and include a variety of measures, such as:

- financial support for the creation or acquisition of companies; and
- a search for new business activities and support for their development.

More generally, 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 are contributing to stimulate 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.

SUPPORT FOR SCIENTIFIC RESEARCH

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 1.4 of this document, which looks at open-innovation programs.

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. The decision to locate the center on a university campus reflects the Group's vision of partner-based research as a bridge between industry and academia.

2.7.7 Corporate citizenship and philanthropy

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 nearness communication initiatives to foster high-quality, trust-based relationships with host communities. 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.

THE COMMON GROUND® INITIATIVE

Formalized and introduced nearly 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 events and tours that enable neighbors to discover what the plant does, the products it makes and the processes it uses, and get a reassuring first-hand view of how the site runs and what its projects are; and
- **Risk prevention and progressing**. In addition to continuously improving the safety, health 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.

Building better relations around the world

In 2017, more than 1,011 Common Ground® initiatives were carried out worldwide, with 78% of production plants actively participating. These initiatives break down by region as follows over the past three years:

NUMBER OF COMMON GROUND® INITIATIVES BY REGION

	2017	2016*	2015*
GROUP TOTAL	**1,011**	**866**	**1,014**
Europe	359	328	353
North America	409	376	542
Asia	204	124	96
Rest of the world	39	38	23

* *Excluding Den Braven.*

In all, 85% of production plants took part in these initiatives in the United States, 73% in Europe, and 64% in Asia.

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

	2017	2016*	2015*
Local communities	379	334	577
Education	293	240	292
Associations	339	292	145

* *Excluding Den Braven.*

The number of Common Ground® initiatives rose from 866 in 2016 to 1,011 in 2017, 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 C. Génial foundation.

The percentage of production plants participating in the Common Ground® program decreased in 2017 due to the recent integration of Den Braven sites. However, the program is expected to be phased in at the new sites over time.

Initiatives involving local communities and the public

In 2017, around 72% of Group facilities conducted public tours, in particular to explain how the solutions offered by chemistry and chemicals 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. For example, in 2017, the Navi Mumbai site in India participated in a mass tree planting day organized by authorities and NGOs, during which 1,500 trees were planted.

Educational initiatives

Around the world, the Group gives priority attention to strengthening its ties with schools and universities.

Programs and events are regularly conducted 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, such as Rho University in Italy.

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 the United States, the Arkema Inc. Foundation, set up in 1996, runs a number of disinterested initiatives focused on science and education at all levels. Its yearly Science Teacher Program has reached hundreds of researchers and teachers.

In 2016, the Group began working with France's C. Génial Foundation to support its programs designed to promote and valorize sciences among middle and high school 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 initiatives.

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. Nine education-related non-profits were selected for the first session launched in January 2017.

Initiatives involving associations

The Group's values of solidarity and responsibility show through in the initiatives being led 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 actively participating in their local communities.

The Group regularly leads or partners a broad range of community outreach initiatives in such areas as:

- jobs for the disabled, with support for several associations that are helping disabled people to enter the mainstream 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 2.4.3 of this chapter).

2.8 REPORTING METHODOLOGY

2.8.1 Methodological note on environmental and safety indicators

2.8.1.1 ENVIRONMENTAL REPORTING TOOLS AND SCOPE

Absolute data

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 2.4 of this document.

The data are entered by the plant Health, Safety and Environment 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 2017. On this basis, the scope covered 99% of the Group's industrial operations in 2017.

The scope of consolidation for environmental 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 production base. 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 2017 were removed from the scope of reporting for the year but remain in prior-year data.

For activities that were acquired in 2017, all operations for the year are included in the scope of reporting.

Operations that started up in 2016 reported data from their start-up date, except for operations of Den Braven, acquired in late 2016, which are not included in the 2016 environmental data.

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 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 Health, Safety and Environment (HSE) departments and validated first by the Industrial Vice-President 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 2017 and which are among the biggest contributors of the Group's sites. In all, these sites account for around 80% of the total prior-year emissions or consumption.

Any activities sold or terminated in 2017 are not included in the scope of EFPI reporting for 2017, but are still included for previous years.

Operations started up in 2016 will be included in the scope of EFPI reporting in 2018, compared with their 2017 performance.

Operations acquired in 2017 will be included in the 2019 scope of EFPI reporting for all of their 2019 activities, compared with their 2018 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.

2.8.1.2 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 2.8.1.4 of this document) or subject to peer observation.

2.8.1.3 CHOICE OF INDICATORS, MEASUREMENT METHODS AND USER INFORMATION

Group indicators have been designed to track the emissions and consumption levels that concern its operations, in accordance with the French New Reporting Requirement Act and its associated decree of 20 February 2002.

They were introduced at the time of the Group's creation and have been tracked since 2006.

They also comply with the standards defined in Articles L. 225-102-1 and R. 225-104 *et seq.* of the French Commercial Code as amended by the "Grenelle II" Law no. 2010-788 of 12 July 2010.

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 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.

2.8.1.4 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 (SOx), ammonia (NH_3) and nitrogen oxide (NOx) emissions converted into tonnes of sulfur dioxide (SO_2) 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).

Emissions from US sites are therefore obtained by adding 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 introduced 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, seawater, 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 CO_2 eq.).

In this report, 2012 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 CO_2 emissions were calculated using electricity and steam consumption and emission factors in tonnes per kilowatt-hour (KWh) or tonnes of steam 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, SEMARNAT data issued by Mexico's Federal Environmental Agency for Mexico and data issued by the French environmental agency, ADEME, for a variety of countries.

For the purposes of this report, indirect Scope 3 CO_2 emissions were calculated using the default scenarios in the GHG Protocol calculation 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 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 and the emission factors are respectively 1.3kg of CO_2 and 2.85kg of CO_2 per euro spent.
- Category 5 – Waste generated: the emissions calculated are those related to the waste generated during the Group's operations. The WBCSD default rule is applied: emissions are estimated based on the Group's waste treatment breakdown – incinerated, landfilled and recycled waste – and on the corresponding default emission factors. 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 mode of transportation that emits the most GHGs) by Group employees representing 90% of the global scope. Data were provided by the travel agency, which used the calculation method developed jointly by the Department of Energy & Climate Change (DECC) and the Department for Environment, Food & Rural Affairs (DEFRA) in the United Kingdom.
- Category 7 – Employee commuting: emissions were estimated using the least favorable scenario, *i.e.*, assuming that all 20,000 employees use their own car to get to work, traveling an average distance of 50km per day. The emission factor used corresponds to the average CO_2 emissions per kilometer by vehicle type and fuel type reported by the United Kingdom's department for Business, Energy and Industrial Strategy (September 2016 version, Passenger vehicles table).
- Category 8 – Upstream leased assets: the assets taken into account in this category are leased real estate assets (head offices, sales offices and research centers), except for those already included in Scope 2 reporting. When energy use data were not provided directly, estimates were made based on the floor space leased and the emission factor by energy source, or by extrapolating data for the missing floor space based on the average space per employee and building type and applying an emission factor of 145kg of CO_2 per square meter per year, which corresponds to the maximum value of class F (the least favorable class) under French legislation on the energy performance assessment of existing buildings.
- Category 9 – Downstream transportation and distribution: the emissions were estimated using Group company logistics data, which account for 99% of consolidated shipments. By shipment, the Group means 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 mode of transportation (road, rail, air, etc.) and applying the emission factors defined in the Guidelines for Measuring and Managing CO_2 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 sold products: the products sold by the Group have been classified into 23 different product 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, landfill or recycling. Emission factors were then applied in accordance with the WBCSD guide. For this first-time 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 incident rates (TRIR) and lost-time incident 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 2017 scope. The TRIR and LTIR data presented above do not include Group employees or subcontractor employees working on Den Braven sites for 2017.

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 (PSE) rate, 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.

2.8.2 Note on methodology used for employment, social and R&D information/indicators

2.8.2.1 SCOPE AND REPORTING TOOLS

Employee data are taken from several different reporting processes.

The employee data presented in section 2.6 of this document:

- 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 30 or more employees in which the Group has at least a 50% interest at 30 June of the reporting year, which accounts for 96.1% of the Group's total headcount.

Any modifications or corrections to prior-year data are noted in section 2.6 of this document.

2.8.2.2 CHOICE OF INDICATORS, MEASUREMENT METHODS AND USER INFORMATION

The Group has defined indicators that are relevant to its activities and its employee relations policies.

Indicators concerning employees and safety performance were introduced at the time of the Group's creation and have been tracked since 2006.

Additional employee information and indicators, and social data have been reported since 2012 via the AREA 2 compilation system. They were expanded in 2013, in particular with the tracking of reported training hours.

The information and indicators also comply with the regulatory requirements of Article 225-I of the French "Grenelle II" Law no. 2010-788 of 12 July 2010 and its implementing decree of 24 April 2012.

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.

2.8.2.3 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. The 2015 data in this chapter have been recalculated using the method applied for the 2016 data.

2.8.2.4 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 2.5 of this document.

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 contracts signed by Arkema France during the year and recorded by the R&D department in its Athena database.

2.8.3 Indicators

		2017	2016	2015
SAFETY [1]				
Total recordable injury rate (TRIR)	*per million hours worked*	1.6	1.5	1.5
Lost-time injury rate (LTIR)	*per million hours worked*	0.6	0.9	1.1
Percentage of sites audited according to Arkema Integrated Management System (AIMS) standards	%	69	63	61
Percentage of sites practicing peer observation	%	59	56	57
Safety, environment and maintenance expenditure	€m	242	240	203
Percentage of OHSAS 18001-certified sites	%	46	47	52
Percentage of OHSAS 18001-certified sites in Europe	%	45	54	51
Percentage of OHSAS 18001-certified sites in the Americas	%	43	45	60
Percentage of OHSAS 18001-certified sites in Asia	%	49	34	45
ENVIRONMENT [1]				
Percentage of ISO 14001/RCMS-certified sites	%	52	52	62
Percentage of ISO 14001-certified sites in Europe	%	53	56	69
Percentage of RCMS-certified sites in the Americas	%	48	57	60
Percentage of ISO 14001-certified sites in Asia	%	54	34	41
AIR EMISSIONS				
Acidifying substances	*t SO_2 eq.*	3,380	3,570	4,430
Carbon monoxide	*t*	860	690	1,900
Volatile organic compounds (VOCs)	*t*	4,280	4,800	5,010
Volatile organic compound (VOCs) EFPI		0.66	0.80	0.83
Dust	*t*	230	300	520
EFFLUENT RELEASES				
Chemical oxygen demand (COD)	*t O_2*	2,440	2,600	3,200
Suspended solids	*t*	920	770	870
Chemical oxygen demand (COD) EFPI		0.70	0.78	0.93
WASTE				
Hazardous waste (excluding material recovery)	*kt*	155	157	151
of which landfilled	*kt*	3.4	2.7	2.5
Hazardous waste recycled into materials	%	15	15	15
Hazardous waste burned as fuel	%	49	49	47
Non-hazardous waste	*kt*	242	256	231

		2017	2016	2015
RESOURCES				
Total water withdrawn	*millions of cu. m*	118	126	124
Net energy purchases	*TWh*	8.12	8.25	8.48
• of which in Europe	*TWh*	4.37	4.37	4.66
• of which in the Americas	*TWh*	2.47	2.64	2.69
• of which in the Rest of the world	*TWh*	1.28	1.24	1.12
Energy EFPI		0.89	0.92	0.98
Net energy purchases by type				
• fuel	*TWh*	4.11	4.42	4.69
• electricity	*TWh*	2.76	2.71	2.70
• steam	*TWh*	1.25	1.12	1.08
Natural gas in net purchases of fuels	*%*	93	91	89
Low-carbon electricity in net energy purchases	*%*	18	17	17
Number of energy efficiency audits launched or completed		70	75	62
• of which in Europe		46	54	46
• of which in North America		20	19	14
• of which in Asia		4	0	2
Number of Arkenergy investments		60	51	38
• of which in Europe		41	31	21
• of which in the Americas		11	9	10
• of which in the Rest of the world		8	11	7
Number of ISO 50001-certified sites		29	22	17
Number of sites working to achieve ISO 50001 certification		7	9	14
Direct greenhouse gas emissions corresponding to the Kyoto Protocol	*kt CO_2 eq.*	3,000	3,110	3,000
• of which CO_2	*kt CO_2 eq.*	1,430	1,540	1,440
• of which HFC	*kt CO_2 eq.*	1,530	1,530	1,510
Direct greenhouse gas emissions corresponding to the Kyoto Protocol, by region				
• Europe	*%*	33	32	33
• Americas	*%*	54	56	59
• Rest of the world	*%*	13	12	8
Scope 2 indirect greenhouse gas emissions of CO_2	*kt*	1,080	1,080	1,300
• of which in Europe	*kt*	302	255	272
• of which in the Americas	*kt*	378	425	521
• of which in the Rest of the world	*kt*	400	400	507
Scope 3 indirect greenhouse gas emissions of CO_2 (to within 10%)	*Mt*	3.56	0.26	0.20
Direct GHG emissions EFPI		0.52	0.60	0.62

		2017	2016	2015
ADAPTING TO THE CONSEQUENCES OF CLIMATE CHANGE				
Number of sites exposed to a severe risk of storms and/or flooding		22	22	21
Sales from products made in full or in part from renewable raw materials	%	9	10	N/A
EMPLOYMENT (1)				
HEADCOUNT				
Total headcount at 31 December		19,779	19,637	18,912
• of which permanent employees		18,701	18,607	17,801
• of which fixed-term employees		1,078	1,030	1,111
Managers	%	26.9	26.2	25.8
Women	%	25.0	24.6	23.8
Women in senior management and executive positions (Hay grade 15 or higher)	%	19	18	17
Non-French nationals in senior management and executive positions (Hay grade 15 or higher)	%	37	39	N/A
Recruitments		1,616	1,694	1,450
Women recruitments	%	28.5	24.7	25.4
New hires aged 50 and over	%	9.4	7.9	8.0
New hires aged under 30	%	38.5	42.0	41.6
Departures		1,705	2,023	1,914
• of which resignations		862	866	758
• of which dismissals		332	428	253
• of which following a divestment/merger		0	324	354
Part-time employees	%	3.7	3.8	3.1
TRAINING				
Number of training hours	*thousands*	484	465	463
Number of training hours per employee		25	26	25
Number of employees who received training, excluding e-learning		16,161	16,256	17,062
Number of employees who took an e-learning course		10,496	9,298	8,218
Number of safety training hours	*thousands*	207	181	173
Number of safety training hours per employee trained		15	14	12
Number of employees who received safety training (excluding e-learning)		13,556	12,862	14,582
Number of employees who took safety-related e-learning courses		6,276	4,479	5,538
Number of environment-related training hours		22,665	19,029	20,447
Number of environment-related training hours per employee trained		6.6	6.3	7.2
Number of employees who received environment-related training (excluding e-learning)		3,398	3,012	2,841
Percentage of work-study students (Arkema France)	%	3.5	3.9	4.2
Group companies conducting annual performance reviews	%	99	99	97

		2017	2016	2015
HEALTH AND WELFARE				
Absenteeism	%	3.9	3.7	3.4
Hours off work on medical grounds as a % of hours worked	%	2.8	2.6	2.4
Employees benefiting from medical care	%	94	92	95.2
Employees benefiting from supplementary disability cover	%	90	89	86
Employees benefiting from supplementary life cover	%	93	94	92
Employees covered by death benefits representing at least 18 months' salary	%	81	74	75
COMPENSATION				
Employees benefiting from minimum compensation guarantees	%	99.6	99.2	99.5
Employees benefiting from collective variable compensation components	%	67	68	60
Employees benefiting from individual variable compensation components	%	32	31	22
REPRESENTATION				
Percentage of employees benefiting from personnel representation and/or trade union representation	%	89	90	88.2
SOCIETAL (1)				
Number of Common Ground® initiatives		1,011	866	1,014
Group industrial sites taking part in Common Ground®	%	78	86	82
European industrial sites taking part in Common Ground®	%	73	84	88
North American industrial sites taking part in Common Ground®	%	85	92	90
Asian industrial sites taking part in Common Ground®	%	64	93	80
PRODUCT STEWARDSHIP				
Number of substances with REACH registration		406	317	277
Number of GPS sheets voluntarily published		145	145	145
INNOVATION (1)				
Sustainable development patents addressing SDGs		150	116	121
R&D expenditure as a percentage of consolidated revenues	%	2.8	2.9	2.5
Number of non-disclosure, cooperation and intellectual property agreements signed by Arkema France		415	276	286

(1) Indicators are defined in detail in the methodological notes in sections 2.8.1 and 2.8.2 of this document.

2.8.4 Grenelle II, GRI-G4 and SDG concordance table

The concordance table for social and environmental information corresponding to France's Grenelle II legislation may be found in section 7.3.3 of this document.

The GRI G4 in accordance option is "Essential Criteria".

CONCORDANCE TABLE FOR THE FOURTH GENERATION OF THE GLOBAL REPORTING INITIATIVE GUIDELINES (GRI G4) AND THE UN SUSTAINABLE DEVELOPMENT GOALS (SDG)

GRI indicator		Sustainable Development Goal	Reference document
GENERAL STANDARD DISCLOSURES			
STRATEGY AND ANALYSIS			
G4-1	Statement from most senior decision maker		2.1.1
G4-2	Description of key impacts, risks, and opportunities		1.1.2/1.3/1.4/1.5 /1.6/1.7/2.1.1 /2.2.2/2.2.3/2.2.4 /2.5/2.5.2
ORGANIZATIONAL PROFILE			
G4-3	Name of the organization		1.1
G4-4	Primary brands, products and services		1.2
G4-5	Location of the organization's headquarters		Last page
G4-6	Number of countries where the organization operates		1.1.1
G4-7	Nature of ownership and legal form		1.1.1
G4-8	Markets served, sectors served, and types of customers		1.2/1.5
G4-9	Scale of the organization		1.1.1
G4-10	Employment by contract type, work time and gender	SDG 8	2.6.2
G4-11	Collective bargaining agreements	SDG 8	2.6.4
G4-12	Supply chain		2.2/2.7.2
G4-13	Significant changes during the reporting period		1.2
G4-14	Position regarding the precautionary principle		1.7
G4-15	Adherence to charters, principles or other initiatives		2.2.3/2.7.3
G4-16	Memberships		2.7.2
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES			
G4-17	Entities		2.2/2.8
G4-18	Process for defining the report content and the aspect boundaries		2.1.2
G4-19	Material aspects		2.2.2
G4-20	Boundary of material aspects within the organization		2.8.1/2.8.2
G4-21	Boundary of material aspects outside the organization		2.8.1/2.8.2
G4-22	Restatements of information		1.2
G4-23	Significant changes		1.2
STAKEHOLDER ENGAGEMENT			
G4-24	Stakeholder groups		2.2.2
G4-25	Identification and selection of stakeholders		2.2.2
G4-26	Approach to stakeholder engagement		2.2.2
G4-27	Key topics and concerns raised through stakeholder engagement		2.2.2

GRI indicator		Sustainable Development Goal	Reference document
REPORT PROFILE			
G4-28	Reporting period		2.2.2
G4-29	Date of most recent previous report		2.2.2
G4-30	Reporting cycle		2.2.2
G4-31	Contact persons		2.1.2/2.8.6
G4-32	GRI content for "in accordance"		2.1.2/2.8.5
G4-33	External assurance		2.1.2/2.8.5
GOVERNANCE			
G4-34	Governance structure		3/2.1.2
G4-56	Codes of conduct and codes of ethics	SDG 16	2.7.3
ECONOMY			
G4-DMA			2.5.1
ECONOMIC PERFORMANCE			
G4-EC1	Direct economic value	SDG 8	1.4/2.7.5/2.7.6
PROCUREMENT PRACTICES			
G4-EC7	Infrastructure investments and services supported	SDG 8	2.7.4
G4-EC9	Proportion of spending on local suppliers		2.7.4
ENVIRONMENT			
G4-DMA			2.2.3/2.4.1
MATERIALS			
G4-EN1	Materials used by weight or volume	SDG 12	2.4.2
ENERGY			
G4-EN3	Energy consumption within the organization	SDG 7	2.4.2
G4-EN6	Reduction of energy consumption	SDG 7	2.4.2
G4-EN7	Reduction in energy requirements of products and services	SDG 7	2.4.2
WATER			
G4-EN8	Total water withdrawal by source	SDG 9	2.4.2
G4-EN9	Water sources significantly affected by withdrawals	SDG 9	2.4.2
BIODIVERSITY			
G4-EN12	Impacts of activities on biodiversity	SDG 15	2.4.3
EMISSIONS			
G4-EN15	Total direct (Scope 1) GHG emissions in tonnes of CO_2 equivalent	SDG 13	2.4.4
G4-EN16	Total indirect (Scope 2) GHG emissions in tonnes of CO_2 equivalent	SDG 13	2.4.4
G4-EN17	Other indirect (Scope 3) GHG emissions in tonnes of CO_2 equivalent	SDG 13	2.4.4
G4-EN18	GHG emissions intensity		2.4.4
G4-EN19	Reduction of GHG emissions	SDG 13	2.4.4
G4-EN21	Other significant air emissions	SDG 13	2.4.4

GRI indicator		Sustainable Development Goal	Reference document
EFFLUENTS AND WASTE			
G4-EN22	Total water discharge	SDG 6	2.4.4
G4-EN23	Total weight of waste	SDG 6	2.4.4
G4-EN24	Significant spills	SDG 6	2.4.4
G4-EN25	Waste deemed hazardous	SDG 6	2.4.4
PRODUCTS AND SERVICES			
G4-EN27	Mitigation of environmental impacts of products and services	SDG 12	2.4.5
G4-EN28	Packaging materials reclaimed by category	SDG 12	2.4.5
TRANSPORT			
G4-EN30	Impacts of transporting products, goods and materials, and members of the workforce	SDG 12	2.4.5
SUPPLIER ENVIRONMENTAL ASSESSMENT			
G4-EN32	Suppliers screened using environmental criteria	SDG 11	2.7.4
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved	SDG 16	2.4.1/2.7.4
SOCIAL			
G4-DMA		SDG 8	2.6.1
EMPLOYMENT			
G4-LA1	Employee turnover	SDG 8	2.6.2
G4-LA2	Benefits provided to full-time employees		2.6.2
G4-LA4	Minimum notice periods regarding operational changes		2.6.4
OCCUPATIONAL HEALTH AND SAFETY			
G4-LA5	Health and safety committee	SDG 8	2.3
G4-LA6	Type of injury and rates of injury, occupational diseases, lost days and absenteeism, and total number of work-related fatalities	SDG 8	2.3
G4-LA7	Workers exposed to diseases related to their occupation	SDG 8	2.3
G4-LA8	Health and safety topics covered in formal agreements with trade unions	SDG 8	2.3
TRAINING AND EDUCATION			
G4-LA9	Employee training	SDG 8	2.6.3
G4-LA10	Programs for skills management and lifelong learning	SDG 8	2.6.3
G4-LA11	Regular performance and career development reviews	SDG 8	2.6.3
DIVERSITY AND EQUAL OPPORTUNITY			
G4-LA12	Diversity	SDG 5	2.6.5
EQUAL REMUNERATION FOR WOMEN AND MEN			
G4-LA13	Ratio of basic salary and remuneration of women to men	SDG 5	2.6.5
G4-LA14	Suppliers screened using labor practices criteria	SDG 12	2.7.4
G4-LA15	Significant impacts for labor practices	SDG 12	2.7.4

GRI indicator		Sustainable Development Goal	Reference document
HUMAN RIGHTS			
DMA-HR			2.7.1
NON-DISCRIMINATION			
G4-HR1	Agreements and contracts that include human rights clauses		2.6.5
G4-HR4	Freedom of association and collective bargaining	SDG 8	2.6.4
G4-HR5	Child labor	SDG 16	2.7.1
G4-HR6	Forced or compulsory labor	SDG 8	2.7.1
SOCIETY			
DMA-SO			2.7.1
LOCAL COMMUNITIES			
G4-SO1	Operations with implemented local community engagement	SDG 1	2.7.5/2.7.6
COMPLIANCE			
G4-SO3	Operations assessed for risks related to corruption and the significant risks identified	SDG 16	2.7.3
G4-SO4	Communication and training on anti-corruption policies and procedures	SDG 12	2.7.3
G4-SO8	Compliance with laws and regulations	SDG 12	2.7.3
SUPPLIER ASSESSMENT FOR IMPACTS ON SOCIETY			
G4-SO9	Suppliers that were screened using criteria for impacts on society	SDG 16	2.7.4
PRODUCT RESPONSIBILITY			
DMA-PR			2.2.3/2.3.5/2.4.5
CUSTOMER HEALTH AND SAFETY			
G4-PR1	Assessments of health and safety impacts	SDG 12	2.3.5
G4-PR2	Compliance with laws and regulations	SDG 16	2.3.5
PRODUCT AND SERVICE LABELING			
G4-PR3	Type of product and service information	SDG 12	2.3.5
G4-PR4	Compliance with laws and regulations	SDG 16	2.3.5/2.4.5/2.7.3
MARKETING COMMUNICATIONS			
G4-PR7	Incidents of non-compliance with regulations and voluntary codes concerning marketing communications	SDG 16	2.3.5/2.4.5/2.7.3

2.8.5 Independent third-party opinion pursuant to Article L. 225-102-1 of the French Commercial Code

REPORT BY ONE OF THE STATUTORY AUDITORS, APPOINTED AS INDEPENDENT THIRD PARTY, ON THE CONSOLIDATED SOCIAL, ENVIRONMENTAL AND SOCIETAL INFORMATION INCLUDED IN THE MANAGEMENT REPORT

This is a free English translation of the statutory auditors'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.

For the year ended 31 December 2017.

To the Shareholders,

In our capacity as statutory auditor of Arkema S.A., (hereinafter named the "Company"), appointed as independent third party and certified by COFRAC under number 3-1049 [1], we hereby report to you on the consolidated human resources, environmental and social information for the year ended 31 December 2017, included in the management report (hereinafter named "CSR Information"), pursuant to article L.225-102-1 of the French Commercial Code (*Code de commerce*).

Company's responsibility

The Board of Directors is responsible for preparing a company's management report including the CSR Information required by article R.225-105-1 of the French Commercial Code in accordance with the procedures used by the Company (hereinafter the "Guidelines"), summarised in the management report and available on request from the Company's head office.

Independence and quality control

Our independence is defined by regulatory texts, the French Code of ethics (*Code de déontologie*) of our profession and the requirements of article L.822-11-3 of the French Commercial Code. In addition, we have implemented a system of quality control including documented policies and procedures regarding compliance with the ethical requirements and applicable legal and regulatory requirements.

Independent third party's responsibility

On the basis of our work, our responsibility is to:

- attest that the required CSR Information is included in the management report or, in the event of non-disclosure of a part or all of the CSR Information, that an explanation is provided in accordance with the third paragraph of article R.225-105 of the French Commercial Code (Attestation regarding the completeness of CSR Information);
- express a limited assurance conclusion that the CSR Information taken as a whole is, in all material respects, fairly presented in accordance with the Guidelines (Conclusion on the fairness of CSR Information).

However, it is not our responsibility to pronounce on the compliance with the relevant legal provisions applicable if necessary, in particular those envisaged by article L. 225-102-4 of the French Commercial Code (Duty of care) and by the law n° 2016-1691 of 9 December 2016 known as Sapin II (fight against corruption).

Our work involved seven persons and was conducted between October 2017 and February 2018 during a fourteen-week period. We were assisted in our work by our CSR experts.

We performed our work in accordance with the order dated 13 May 2013 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) relating to this engagement and with ISAE 3000 [2] concerning our conclusion on the fairness of CSR Information.

(1) Which scope is available at www.cofrac.fr

(2) ISAE 3000 – Assurance engagements other than audits or reviews of historical financial information

1. Attestation regarding the completeness of CSR Information

Nature and scope of our work

On the basis of interviews with the individuals in charge of the relevant departments, we obtained an understanding of the Company's sustainability strategy regarding human resources and environmental impacts of its activities and its social commitments and, where applicable, any actions or programmes arising from them.

We compared the CSR Information presented in the management report with the list provided in article R.225-105-1 of the French Commercial Code.

For any consolidated information that is not disclosed, we verified that explanations were provided in accordance with article R.225-105, paragraph 3 of the French Commercial Code.

We verified that the CSR Information covers the scope of consolidation, i.e. the Company, its subsidiaries as defined by article L.233-1, and the controlled entities as defined by article L.233-3 of the French Commercial Code within the limitations set out in the methodological note, presented in section 2.8 of the management report.

Conclusion

Based on the work performed and given the limitations mentioned above, we attest that the required CSR Information has been disclosed in the management report.

2. Conclusion on the fairness of CSR Information

Nature and scope of our work

We conducted around fourty interviews with the persons responsible for preparing the CSR Information and, where appropriate, responsible for internal control and risk management procedures, in order to:

- assess the suitability of the Guidelines in terms of their relevance, completeness, reliability, neutrality and understandability, and taking into account industry best practices where appropriate;
- verify the implementation of data-collection, compilation, processing and control process to reach completeness and consistency of the CSR Information and obtain an understanding of the internal control and risk management procedures used to prepare the CSR Information.

We determined the nature and scope of our tests and procedures based on the nature and importance of the CSR Information with respect to the characteristics of the Company, the human resources and environmental challenges of its activities, its sustainability strategy and industry best practices.

Regarding the CSR Information that we considered to be the most important (see table below):

- at parent entity, we referred to documentary sources and conducted interviews to corroborate the qualitative information (organisation, policies, actions), performed analytical procedures on the quantitative information and verified, using sampling techniques, the calculations and the consolidation of the data. We also verified that the information was consistent and in agreement with the other information in the management report;
- at the level of a representative sample of sites selected by us [1] on the basis of their activity, their contribution to the consolidated indicators, their location and a risk analysis, we conducted interviews to verify that procedures are properly applied and to identify potential undisclosed data, and we performed tests of details, using sampling techniques, in order to verify the calculations and reconcile the data with the supporting documents. The selected sample represents 33% of headcount considered as material data of social issues, between 10% and 100% of environmental data considered as material data of environmental issues (listed in the table of environmental indicators below) and 22% of "Common ground" initiatives as a main characteristic of societal data.

(1) Social information: Arkema France S.A.; Bostik S.A.; Arkema Thiochemicals Sdn. Bhd. (Malaysia)

Environmental information: Arkema France S.A.: Plants in Lannemezan, Carling, Saint-Menet, Pierre-Bénite, Jarrie, La Chambre, Mont, Feuchy, Lacq; Bostik S.A.: Ribécourt; Arkema Thiochemicals Sdn. Bhd. (Malaysia): Kerteh; Arkema Srl (Italia): Spinetta; Arkema Delaware Inc. (USA): Calvert City.

Societal information: Arkema France S.A.; Arkema Delaware Inc. (USA): Calvert City.

SOCIAL INDICATORS

Total headcount as at 31/12 and breakdown by age, gender and geographical area
Recruits and leavers
Number of training hours
Absenteeism rate
TRIR (Total Recordable Injury Rate)
LTIR (Lost Time Injury Rate)
Percentage of sites implementing peer observation
Percentage of AIMS (Arkema Integrated Management System) audited sites
Percentage of employees benefiting of personnel representation and/or trade union representation
Percentage of employees benefiting from regular medical check-ups
Percentage of women in management position
Percentage of OHSAS 18001 certified sites

ENVIRONMENTAL INDICATORS

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
VOC emissions (Volatile Organic Compounds)
Total substances contributing to acidification
Water withdrawn
Chemical Oxygen Demand (COD)
Hazardous waste
Percentage of ISO 14001 and ISO 50001 certified sites
Number of first patent applications filed by the Group in response to sustainable development issues

SOCIETAL INDICATORS

Number of "Common Ground®" initiatives

QUALITATIVE INFORMATION

Social topics	Social dialogue Occupational health and safety conditions Measures taken to promote equal treatment
Environmental topics	Company organisation to take environmental issues into account and, as necessary, environmental evaluation and certification processes Resources dedicated to preventing environmental and pollution risks Measures to prevent, reduce or remedy discharges into the water, air and soil that have serious environmental effects Water consumption and water supply adapted to local constraints, in particular the "Optim'O" project initiated to strengthen the water resources management Energy consumption and measures implemented to improve energy efficiency and the use of renewable energy Significant greenhouse gas emissions items generated as a result of the Group's activity, particularly by the use of goods and services they provide
Societal topics	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 Measures implemented to promote consumers health and safety

For the remaining consolidated CSR Information, we assessed its consistency based on our understanding of the Company.

We also assessed the relevance of explanations provided for any information that was not disclosed, either in whole or in part.

We believe that the sampling methods and sample sizes we have used, based on our professional judgement, are sufficient to provide a basis for our limited assurance conclusion; 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 CSR information cannot be totally eliminated.

CONCLUSION

Based on the work performed, no material misstatement has come to our attention that causes us to believe that the CSR Information, taken as a whole, is not presented fairly in accordance with the Guidelines.

EMPHASIS OF MATTER

Without qualifying the above conclusion, 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 2.8.1 of the reference document including the management report. The improvement approach implemented made it possible to reduce the uncertainty associated with the reporting process of this data.

Paris-La Défense, 21 February 2018
French original signed by
KPMG S.A.

Anne Garans
Partner
Sustainability Services

François Quédiniac
Partner

2.8.6 Contacts

See section 7.2 of this document.

APPENDIX 1

1.4 R&D STRATEGY AND INNOVATION

1.4.1 R&D objectives

Research and development (R&D) is one of the key drivers in Arkema's growth strategy.

R&D is focused on four primary goals:

- contributing to Arkema's operational excellence by making innovative improvements to production facilities, thereby enabling the Group to produce safely and competitively with the smallest environmental footprint possible;
- developing the Group's products by continuously improving their performance in existing markets and by systematically exploring new markets;
- anticipating technological and market changes and developing products today that meet society's needs in the coming years; and
- introducing disruptive innovations that will secure the Group's technological positioning in the medium term.

In a constantly changing world, achieving these last two goals is largely contingent on the Group's ability to anticipate the main challenges of tomorrow. Therefore, Arkema has identified the main megatrends shaping society, a work which it is regularly updating and which has led it to define and leverage research platforms in the six following areas:

- bio-based products;
- lightweight materials and design;
- new energies;
- water management;
- electronics solutions; and
- home efficiency and insulation.

The R&D department is also responsible for developing disruptive project innovations, enabling Arkema to anticipate product and technology trends that are fundamental to Arkema's businesses. The department relies on a dedicated unit called the incubator, which supports these innovations until they are ready to be brought to market. When the products or technologies have reached an appropriate level of maturity, they are transferred to the relevant businesses for commercial development.

Renowned for its strong innovation culture, Arkema was listed as one of the world's 100 most innovative companies for the seventh year in a row in the "2017 Top 100 Global Innovators" by Clarivate Analytics.

1.4.2 R&D resources

1.4.2.1 QUANTITATIVE INFORMATION

In 2017, R&D expenditure represented almost 2.8% of Arkema's sales and the Group's R&D teams comprised more than 1,500 researchers, spread across three regional research and innovation hubs in Europe, Asia and North America.

R&D efforts break down among Arkema's three divisions and its corporate research program as follows:

- the High Performance Materials division accounts for 51% of Arkema's R&D expenses, with a particular focus on the materials of tomorrow. Innovations combining performance with sustainable development include materials made from renewable feedstocks, materials and adhesives with a low environmental impact, lightweight materials for transportation, structural adhesives used to assemble these materials, and functional adhesives for the construction and manufacturing industries. High Performance Materials 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 strong reputation of brands such as Rilsan®, Pebax®, Luperox® and Bostik®, and in the widespread consumer awareness of retail brands like Sader® and Quelyd®;
- the Industrial Specialties division represents 20% of Arkema's R&D expenses, with an emphasis on ensuring 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;

- the Coating Solutions division accounts for 19% of Arkema's R&D expenses, with its main priority being to 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 at an industrial scale; and
- 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 innovations of tomorrow.

1.4.2.2 ORGANIZATION AND MANAGEMENT OF INNOVATION

The R&D department reports directly to the Chairman and Chief Executive Officer. It coordinates all of Arkema's research programs worldwide, the development of research platforms and the implementation of partnerships.

The R&D department ensures that all projects funded by Arkema's various businesses are scientifically and technologically relevant and in line with the Group's overall strategy. The ideas for projects come from various sources: scientific or technological proposals, current or future needs of customers or the market to meet health, safety and environment challenges and product or process innovations that contribute to sustainable development.

Each business manages its own project portfolio, measuring the degree of maturity of the various projects based on a structured decision-making process (design, feasibility, development, and marketing) and defining portfolio management priorities while optimizing the resources used.

The R&D department creates and steers corporate R&D programs, identifies development opportunities and new research areas and manages open innovation tools.

To do this, it leverages the following resources:

- a scientific committee made up of the Group's scientific directors, who are specialized in either a major scientific field or a region, the global R&D managers for the businesses, the incubator's department heads and the head of intellectual property. Outside experts may also be invited to take part in this committee;
- research centers spread across the three regional hubs in Europe, North America and Asia;
- the Intellectual Property department, which directs patent filing Group-wide and coordinates the management of intellectual property, a fundamental part of Arkema's asset base (see section 1.4.3); and
- the Incubator, which develops the Group's disruptive innovations until they are ready to be brought to market.

This organization is supplemented by R&D partnerships, which sometimes extend to shared laboratories (see section 1.4.2.3).

Lastly, the R&D department ensures that the skills and equipment at Arkema's R&D centers are kept up-to-date and in line with the latest digital and technological innovations.

FOCUS

Industry 4.0 and the use of digital technology in research

As part of the innovation process, Arkema's R&D teams leverage the expertise required in an increasingly digital environment. Therefore, while projects are conducted by groups of experts in the areas being researched, their success also depends on the use of calculation skills and tools. Digital skills, such as modeling, 3D views and calculation algorithms and their interpretation, enhance the efficiency of research carried out to develop and roll out new products or materials. These technologies are critical in enabling Arkema to meet the quality and productivity challenges set by its customers in such areas as the production of composites for the automotive industry. They also make it possible to predict and optimize the impacts of an industrial site's raw material, product and waste flows within its regional ecosystem.

1.4.2.3 COLLABORATIVE RESEARCH

Partnerships

Partnerships are a fundamental prerequisite for research excellence.

Research partnerships may take the form of upstream partnerships with scientific bodies, research contracts, for example with doctoral or postdoctoral students, and original and innovative structures. In France, for example, Arkema takes part in industrial endowment programs, such as the Industrial Organic Electronics Chair in Bordeaux. It has also formed special partnerships as part of major strategic research programs, such as with the laboratory of the ESPCI physics and chemistry engineering college in Paris, France.

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.

Numerous structuring tools have been put in place both nationally and internationally to encourage the implementation of collaborative research programs. Arkema makes the use of these tools one of the key aspects of its research policy. Many collaborative programs have been undertaken with the European

Commission, such as Horizon 2020, and with various French bodies like the national research agency ANR, the environment and energy management agency ADEME, and the interministerial fund. These partnerships allow Arkema's R&D to benefit from joint funding with the public sector and from active collaboration with multiple partners. In France, Arkema has been particularly active in the various aspects of the French government's *Investissements d'Avenir* investment program by taking part in both collaborative research projects and multidisciplinary bodies such as technological research institutes. In 2015, Arkema became a partner of the Raw Materials Knowledge Innovation Community (KIC) in Europe, which aims to address the problem of European access to critical raw materials and to develop projects in the areas of mineral extraction, recycling and rare product substitution.

Open innovation

In addition to research-contract partnerships, Arkema has implemented a dynamic policy on open innovation.

Two examples of this policy are outlined below:

Shared laboratories

The R&D department has set up several shared laboratories that team Group employees with staff from another organization, most frequently on the latter's premises.

Examples of partners include:

- French atomic energy agency CEA, with the creation of shared laboratories within the following organizations:
  - French solar energy institute INES, with the aim of improving polymer performance in photovoltaic applications, and
  - IT electronics laboratory LETI for organic electronics and micro-electronics;
- the Lorraine-based *Pôle de Plasturgie de l'Est* (PPE) for the development of thermoplastic composites; and
- Hydro-Québec, Canada's largest electricity producer, which set up a shared energy storage R&D laboratory with the Group at Arkema's Lacq Research Center in France. The laboratory primarily works on developing the next generations of materials used to make lithium-ion batteries.

Technology acquisition policy

The R&D department has a technology acquisition policy that involves targeting high value-added SMEs and startups and supporting them through the development process, allowing them to grow in an application-oriented environment thanks to Arkema's resources and expert staff. These equity interests enable Arkema to position itself in the ultra-innovative product and high-tech markets.

1.4.3 Patent and trademark management

Arkema attaches great importance to industrial property rights in respect of both trademarks and patents in order to protect the innovations that result from its R&D and to promote its products among customers. Together, the Group's patents and trademarks represent a key asset for its business.

1.4.3.1 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 how much a company invests in R&D, and how promising the results are. In 2017, Arkema filed 239 priority patent applications. At 31 December 2017, it held 8,711 patents and had 5,461 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, North America, India 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

(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.

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.

1.4.3.2 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 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®, 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®, Nanostrength® and Apolhya®.

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.

1.4.4 The incubator and the six innovation platforms

1.4.4.1 THE INCUBATOR

The incubator was set up to develop disruptive innovations. Since its creation, it has notably developed a new PEKK polymer capable of withstanding ultra-high temperatures under the Kepstan® brand, 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 commercial thermoplastic composites line, which includes:

- the Elium® range of solutions for infusion molding and resin transfer molding (RTM) technologies; and
- the Polystrand® range of continuous fiber-reinforced thermoplastic solutions in tape or sheet form, for thermo compression, thermo-stamping and lamination technologies.

In 2017, Arkema doubled its Kepstan® PEKK production capacities in France and confirmed its plan to invest in a world-scale PEKK plant at its Mobile, Alabama site in the United States, scheduled to come on stream in second-half 2018. These investments will help to meet growing demand in the carbon fiber reinforced composites and additive manufacturing (3D printing) markets.

1.4.4.2 INNOVATION PLATFORMS

Arkema has six innovation platforms: bio-based products, lightweight materials and design, new energies, water management, electronics solutions, and home efficiency and insulation. Their purpose is to keep Arkema's R&D in line with the megatrends shaping our world now and in the future.

Bio-based products platform

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 such as bio-based polyamides. In addition, the Group also uses bio-based products from other sources, such as the bioethanol used as a feedstock for Acrylics and Thiochemicals.

Bio-based Rilsan® and Pebax® polyamides

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 1947, when polyamide 11 entered industrial production. With the Pebax® Rnew range, for example, Arkema has developed thermoplastic elastomers that combine blocks of polyamide 11 with blocks of flexible material. Boasting outstanding energy return, lightness, shock resistance and durability as well as a broad spectrum of flexibility, this range of polymers has become the standard for ski boots and sport shoe soles.

Arkema has also leveraged its expertise in bio-based technology to develop the flexible yet temperature-resistant Rilsan® HT range. These polyamides offer outstanding performance enabling them to replace metal automotive parts, thereby helping to lighten vehicles and, by extension, reduce vehicle emissions.

The highly transparent Rilsan® Clear Rnew polyamides offer another, equally renewable-based variation of this range, with notable applications in the eyewear industry.

Lastly, the Group has developed a range of new, highly rigid materials under the Rilsan® XD brand for the production of numerous small parts found in telephones, computers and tablets.

Bio-methionine development partnership

Together with South Korea-based CJ CheilJedang, Arkema participated in the technical development of L-methionine, which is also partly based on the use of renewable raw materials.

Currently, virtually all methionine worldwide is produced from a chemical pathway using propylene. CJ CheilJedang has developed a completely different pathway that produces methionine from renewable sources by replacing the use of propylene with a unique bio-fermentation process, for which Arkema developed a special sulfur-based intermediate.

Implemented in the Kerteh facility in Malaysia, this highly innovative process has given rise to a number of patents. Its remarkable results have also led Arkema to study biocatalysis or enzyme catalysis as a synthesis process for other products in its portfolio.

Lightweight materials and design platform

Lightweight materials, particularly for transportation applications, can reduce fuel consumption while increasing vehicle speed and autonomy. The strong trend toward their development offers benefits for both users and society as a whole.

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.

The development of thermoplastic composite materials 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 crosslinking process is irreversible. Examples include polyester and epoxy resins, which 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 by adapting its high-level chemical expertise in areas such as acrylics and polyamides to the specific needs of various markets. The Elium® resin, for example, is used in applications in the automotive and wind turbine industries. In the wind turbine market, where this resin's recyclability represents a major advantage, 25-meter-long Elium® blades have been installed on a demonstration turbine for qualification tests. The technology won an award at JEC Asia in 2017. Arkema has also developed, in partnership with IRT M2P, an industrial demonstration pilot showcasing fast resin transfer molding (RTM) technology that uses Elium® resin. With the help of its partners, the Group hopes to quickly reduce cycle time to under two minutes, thereby fulfilling a highly important criteria for automotive applications. In terms of performance, replacing steel parts with Elium® substitutes is expected to deliver weight savings of between 30% and 50%. In addition to development in the composites market, Arkema's R&D teams are assessing the processes for recycling the polymers concerned (acrylics, polyamides), which will enable users to recycle their waste via dedicated channels.

The Lightweight materials and design platform places particular emphasis on fast manufacturing technologies, such as 3D printing. Arkema regularly expands its product range with a view to becoming a key player in this fast-growing market, where strong demand is being driven by the aerospace, electronics, automotive and healthcare industries. The Group has significantly diversified its product range over the past years, enabling it to occupy a unique position with a range that now caters to the demands of all additive manufacturing technologies: selective laser sintering, stereolithography, material jetting and fused filament fabrication (FFF). The Rilsan® and Orgasol® polyamide powders in the Invent® range, for example, are used in selective laser sintering (SLS), offering such benefits as an excellent finish, ease of use and superior mechanical properties. The ultra-high performance Kepstan® PEKK makes it possible to obtain particularly hard-wearing and flame-retardant parts that meet the stringent specifications of the aerospace industry. And Arkema's range of UV-curing acrylic resins developed through the Sartomer subsidiary have been specially designed for PolyJet and stereolithography technologies, which are widely used in the 3D printing industry. In 2016, Sartomer launched the new N3xtDimension™ range of high performance solutions to meet this market's growing requirements for mechanical performance and esthetics. The same year, the Group announced a partnership with HP Inc. for the development of materials to be used in the US company's Multi Jet Fusion printers. In 2017, Arkema announced a development

partnership with EOS, a world leader in 3D printing of metals and polymers. The agreement is in line with Arkema's strategy of developing industrial applications directly with end-users.

New energies platform

The development of new energies is a far-reaching megatrend driven by the world transition to a less fossil-fuel-dependent economy. Innovative polymer materials and chemicals are used to varying degrees in all available new energy solutions, including rechargeable batteries, supercapacitators, solar photovoltaic panels, wind turbines and heat pumps. Thanks to its technological expertise, Arkema can offer these various markets a number of innovative solutions.

In particular, Arkema has developed:

Materials for rechargeable batteries

Thanks to innovation in materials, binders and electrolytes, Arkema has a range of solutions designed for use in the development of batteries, particularly for electrical vehicles.

The Group's main product in this field is the Kynar® resin, a fluoropolymer used in lithium-ion batteries for several applications – in the 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. For this reason, innovative research is constantly being undertaken to improve their adhesion, chemical resistance, ease of use and other properties.

Arkema also develops lithium salts, which move lithium ions from one electrode to the other in lithium-ion batteries. Battery manufacturers need lithium salts that can withstand the increasingly challenging conditions in which their products are used, including high temperatures and rising electrochemical potential. Arkema has developed a synthesis process for innovative salts in its laboratories, in partnership, for example, with one of the world's industry leaders, Hydro-Québec. Following the success of these laboratory tests, the process is now being extrapolated to the pilot phase prior to commercial-scale production.

Materials for photovoltaic cells

Photovoltaic cells are made up of a number of highly technical organic materials that protect the silicon from outside elements. Arkema has harnessed its performance materials expertise to bring this market a large number of innovations, such as:

- the Apolhya® grafted polyolefins, which are used for the encapsulation or protection of photovoltaic cells due to their high transmittance and UV resistance;
- highly effective fluoropolymers for backsheet applications, and in particular the Kynar® resin films, which offer excellent UV resistance, chemical stability and mechanical performance. Arkema produces Kynar® film, for example, with an innovative formulation providing effective protection for the backs of solar modules while offering customers excellent value for money in this highly competitive industry; and
- Bostik Vitel® polyester adhesives, which are used for binding photovoltaic backsheets (PVDF on PET).

Arkema's research also benefits wind turbines, supercapacitators and many other fields related to new energies. Arkema's R&D teams are also attentive to future trends, such as the development of new batteries.

Water management platform

An important part of Arkema's technological research into process improvement is aimed at decreasing discharges to water. To this end, a global water management project, known as Optim'O, has been launched within Arkema (for more details, see section 2.4.2.3 of this document).

In terms of its product range, Arkema develops innovative solutions for water treatment, transportation and filtration.

Acrylic acid, for example, 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 hydrogen peroxide to disinfect cooling systems or as a water treatment product for drinking water and swimming pools. Unlike the chlorinated products typically used, this solution avoids chlorinated water discharges.

In terms of water transportation, Arkema has launched a Kynar® PVDF grade that is suitable for multi-layered pipes used to transport drinking water and can be implemented without additives. Thanks to its purity, it delays the growth of thin layers of bacteria and is compatible with the use of powerful disinfectants to ensure excellent water quality. The grade has received KTW certification from the German water and gas agency. Similarly, Rilsan® fine powders have been chosen by many cities to coat their drinking-water pipe networks and wastewater treatment plant equipment because of their strength, durability and flow properties.

However, Arkema deploys its main water management innovations in the area of filtration. Filtration membranes for waste and drinking water treatment are typically based on fluoropolymers, notably PVDF. Kynar® resin delivers outstanding performance in this market. When implementing water filtration systems, one of the key factors to monitor is the gradual clogging of the membranes by biofilms. With this in mind, Arkema and Polymem, a French SME specialized in hollow-fiber membrane filtration modules, jointly developed a new hydrophilic technology. Arkema developed a resin with durable hydrophilic properties and Polymem used this resin to develop a hollow-fiber membrane using these properties. The benefits of this technology include much finer filtration (suspended solids, bacteria and viruses), higher (+20%) volume of water filtered for constant energy consumption, and extended lifetime of filtration systems, from 5 to 10 years. The new Neophil™ PVDF hollow-fiber ultrafiltration membranes were granted NSF/ANSI 61 certification in 2017, enabling the Group to secure its first resin sales and its partner to immediately enter the North American market and to create its first drinking water production systems.

Electronics solutions platform

With its range of Technical Polymers (specialty polyamides and fluoropolymers), Arkema brings innovative solutions to the electronics market, which is currently experiencing strong growth in the smartphone and tablet segments, among others. Arkema markets materials designed to meet the most exacting specifications, be it for electronic devices' internal structural parts, which are required to be increasingly thin and made using the same simple injection molding process as well as offering ultra-high rigidity, or for external parts such as the cables and stylus, which need to be stain and shock resistant. Thanks to the Group's global network and the close collaboration between research teams in France, the United States and Asia, new technical solutions are constantly being developed to meet the needs of the main manufacturers.

A new polyphthalamide, for example, was successfully launched on the portable devices market, opening up new design possibilities thanks to its exceptional rigidity, dimensional stability and fatigue resistance. In addition, the Pebax® MH and MV range delivers a full spectrum of antistatic additive solutions, particularly for electronics packaging.

One of this platform's most ambitious projects concerns directed self-assembly (DSA), where block copolymers are used for nanoscale semiconductor etching.

Traditionally, lithography has been used to etch the structure of microprocessor and memory chips onto silicon wafers. The lithography process uses UV light to project a pattern of the structure onto the substrate, meaning that performance is governed by the laws of optics. However, this process has today reached its limits due to the use of extremely small patterns of just some dozen micrometers that are much smaller than the wavelengths of visible and UV light.

DSA lithography represents a major breakthrough, converting lithography from an optical technology to a molecular one. By using block copolymers' capacity to self-assemble at the scale of several dozen nanometers to form a variety of tunable geometric patterns (nanolines and nanocontacts), it is possible to create a desired nanostructure and thereby obtain extremely thin electronic nanocomponents. With this process, a 50:50 block copolymer will form nanometric lamellar structures whereas a 30:70 block copolymer will form cylinders. These forms are correctly aligned thanks to precise control of the surface energies, enabling patterns to be etched onto the surface of the silicon substrate before being transformed into electrical contacts.

Arkema owns proprietary technology for the synthesis of ultra-pure block copolymers with perfectly defined structures. The Group already produces these block copolymers on a pilot production line at its Lacq site in France, as part of the European PLACYD project whose participants include CEA-Leti, Intel and STMicroelectronics. The pilot line is able to produce block copolymers with the quality consistency required by the electronics industry.

Thanks to these positive results, in November 2015, Arkema forged a special R&D and marketing partnership with Brewer Science, a world leader in materials for the microprocessor industry. Numerous other partnerships have since been developed with major semiconductor players to assess this technology, for which production could begin in 2018.

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. This trend is likely to continue over the long term. Against this backdrop and following the expansion of the Group's building material and home comfort product portfolio due to the acquisition of Bostik in 2015, Arkema has decided to make home efficiency and insulation a key focus of its R&D strategy and to set up a sixth innovation platform in this area.

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 constructing 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 800, are phthalate- and solvent-free and have sufficiently low volatile organic compound (VOC) emissions to obtain an A+ rating as well as EC1 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 a high water content, enhanced dust 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 was inaugurated at the Venette R&D site in France in 2015. This one-of-a-kind house-laboratory 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 new adhesive concepts that simplify floor replacement and make recycling possible, and solutions that improve occupants' acoustic comfort. 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.

APPENDIX 2

1.7 RISK FACTORS

1.7.1 Comprehensive internal control and risk management procedures

1.7.1.1 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 1.1.1.2 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 and IT, to ensure the coherence and optimization of the Group as a whole (see section 1.1.1.2 of this document); and
- the subsidiaries, in which Arkema performs its business activities (see section 5.1.2 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.

1.7.1.2 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 Nominating, 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 providing the resources for these targets to be met;
- 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. The Executive Committee relies on the Internal Audit and Internal Control department and the expertise of all its own members to help in its implementation and operation.

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 1.7.1.3 of this document) 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 convenes under the Chairmanship of Arkema's Strategy Executive Vice-President to review:

- 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.

Upon completion of the process, the Executive Committee may decide whether or not to update the main risks described in section 1.7.2 of this document.

The Risk Review Committee met twice in 2017.

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 program 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 2017, the Internal Audit department carried out the following 36 audits:

- 7 audits of industrial sites and 3 audits of research centers in France, China, Mexico, Brazil and the United States;
- 16 audits of subsidiaries in Europe, Asia, the Middle East, North America and South America;
- 3 process audits in Europe and North America; and
- 7 audits of businesses in Asia, Europe and North America.

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.

Virtually all subsidiaries were covered by Arkema's internal control system in 2017, with the exception of the Den Braven entities acquired on 1 December 2016.

In 2012, Den Braven put in place an internal control system based on a selection of key controls. In 2017, the Den Braven Benelux subsidiary, responsible for most of the activity, was audited by the Internal Audit department and its internal control system was assessed. The Den Braven subsidiaries will gradually switch to Arkema's system in 2018 according to a two-year rollout plan, finishing in 2019.

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 resources allocated to them by the Executive Committee 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 mainly 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.

1.7.1.3 INTERNAL CONTROL AND RISK MANAGEMENT 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 and Electronic Communication Resources, and the Code of Conduct and Business Ethics put in place by Arkema. In line with the AMF Reference Framework published in 2007 and updated in 2010, the Internal Control Framework is based on five components:

- control environment;
- risk management (detailed in section 1.7.1.4 of this document);
- 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 and Electronic Communication Resources.

Arkema has put in place a compliance program, which mainly covers antitrust, export control and anti-corruption legislation. 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 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 was put in place from 2008 onward 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 managers, 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 and Telecommunications 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 management 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 further details, see section 1.7.2.6 of this document.

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 entity is responsible for improving internal control performance within its own scope.

In general, any weaknesses in the internal control system must be reported to 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.

1.7.1.4 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, who also sits on 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 1.7.2 of this document, where they have been classified into the following sections:

- economic and business risks,
- supply chain risks,
- industrial safety, environmental and climate change risks,
- regulatory and legal risks,
- financial risks,
- IT risks,
- strategic projects risks, and
- insurance cover default risks.

1.7.1.5 ACCOUNTING AND FINANCIAL INTERNAL 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:

- functions under his direct supervision, in particular:
  - the production of consolidated financial and accounting information, falling within the remit of the Accounting and Controlling department, which is responsible for ensuring the reliability of the data constituting Arkema's financial information and for providing management analyses common to Arkema's different entities, thereby facilitating the management of each entity,
  - cash management and optimization of Arkema's financing, under the responsibility of the Financing and Treasury department, and
  - investor relations, 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;
- delegated functions:
  - 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 for its half-year and full-year financial information.

Accounting reporting and management control

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.

Medium-term plan

Every year, the Strategy department draws up a five-year plan, which is reviewed and approved by the Executive Committee. It enables the Executive Committee to understand the financial consequences of the Group's major strategic choices and the main threats identified in the environment under consideration.

Budget

The budget sets out the financial performance targets for the following year in line with the medium-term plan approved by the Executive Committee.

The budget is the main benchmark to measure the actual performance of the three divisions, their respective businesses, the corporate departments, the subsidiaries and Arkema overall.

The budget is prepared annually under the responsibility of the Accounting and Controlling department.

The businesses and corporate departments submit their budget proposals, prepared with the subsidiaries, to the Executive Committee members overseeing them.

The budget of each business and each corporate department is then submitted to the Executive Committee.

The process is completed when the budget is approved by the Company's Board of Directors.

Year-end forecasts

Once approved by the Executive Committee and reviewed and approved by the Board of Directors, the budget may no longer be modified. Based on a frequency defined by the Accounting and Controlling department, quarter-end and year-end forecasts are prepared by the businesses and corporate departments.

Monthly reporting

Every month, the Accounting and Controlling department prepares detailed consolidated reports by division and business for the Executive Committee.

Financial statements, analytical accounts, capital expenditure and cash flow details are presented together with a commentary on the past month's significant events.

The Executive Committee analyzes these reports in detail at one of its monthly meetings.

Consolidated financial statements

The Company publishes consolidated financial information on a quarterly basis. Figures for the six months to 30 June and the twelve months to 31 December are published as full financial statements under IFRS, while the quarterly information to 31 March and 30 September is in summary form only (balance sheet, income statement and cash flow statement).

The half-year financial statements to 30 June are subject to a review by the statutory auditors, while full-year financial statements are fully audited.

As part of the closing of each accounting period, the Accounting and Controlling department identifies the specific closing issues during preparatory meetings with the support functions and businesses. Similar meetings are also organized at least once a year with Arkema's main legal entities.

Each quarter, the Accounting and Controlling department receives a risk report from each business, corporate department and subsidiary.

Additionally, each entity is responsible for identifying, compiling and monitoring its off-balance sheet commitments. The Financing and Treasury department consolidates all these commitments every six months as part of the half-yearly and annual financial statement preparation process.

The Accounting and Controlling department is also responsible for monitoring changes in accounting regulations and issues technical notes on points of specific relevance to Arkema.

Parent company financial statements

The preparation of the Company's financial statements is part of the Accounting and Controlling department's general process for the preparation of annual financial information. Furthermore, the Company submits management forecast documents to the Board of Directors in compliance with the appropriate regulations.

IT systems

The IT department (iTeam) 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 then 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.

Investor relations

Press releases concerning financial information are prepared by the Investor Relations team and reviewed, internally, by the relevant units of the Finance department, and then by the statutory auditors and the Company's Audit and Accounts Committee. The Company's Board of Directors approves the final text.

1.7.1.6 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 with technical recommendations followed up on a regular basis), 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 2017, 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.

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.

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.

Arkema selects its insurers from the best and most financially sound companies when subscribing its 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, which could adversely affect the Group's business, financial position or results.

The Group's insurers, under certain conditions deemed customary in the insurance industry for the particular contract type, 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 from policy to policy.

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 2017, the maximum total retention in the event of a major claim was €17.5 million.

The combined cover limit of the policies in place for direct damage and business interruption is €500 million (after retention of €17.5 million).

Transportation

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 took out a cyber insurance program from 15 January 2017 covering all subsidiaries worldwide, within the limits of an annual coverage ceiling of €40 million and subject to a deductible of €2 million.

1.7.2 Main risks

Arkema carries out its business activities in a rapidly changing environment, which creates risks that may be beyond its control. The items described below do not constitute a comprehensive list of the risks and uncertainties that Arkema currently faces or may face in the future. Other risks and uncertainties of which Arkema is currently unaware or that it deems not to be significant at the date of this document could also adversely affect its business activities, financial position, results or future prospects. The means implemented by Arkema to assess and manage risks, particularly its regularly updated risk map, are generally outlined in section 1.7.1 of this document and described in more detail below, for each of the risks to which Arkema is exposed.

The occurrence of one or more of the risks described below could have a material adverse impact on Arkema's business activities, financial position, results or future prospects and, in certain cases, negatively affect Arkema's image or reputation.

1.7.2.1 ECONOMIC AND BUSINESS RISKS

Arkema has identified three main types of risks related to the economic and business environment: risks related to fluctuations in supply and demand, country-related risks and competition-related risks.

Risks related to fluctuations in supply and demand

Arkema's results could be directly or indirectly affected by changes in supply and demand, both upstream of its activities (raw materials and energy resources) and downstream, in the various end markets it serves, such as the decorative paints, automotive, construction and energy markets.

Upstream of its activities, the Group uses raw materials and energy resources as part of its manufacturing processes. Some of these materials and resources, such as propylene and butadiene,

are indirectly linked to the price of crude oil, while others, such as sulfur, castor oil and fluorspar, are only minimally connected or not at all. Regardless of their link to the price of crude, the prices of these raw materials can be highly volatile, with any fluctuation leading to significant variations in the cost price of the Group's products.

External factors over which the Group has no control, such as economic conditions, competitors' activities or international situations and events, can also lead to volatility in demand and hence changes in the sales volumes and prices of products manufactured and marketed by the Group. This may have a material adverse impact on the Group's business activities, financial position, results or future prospects.

Risk management

Arkema seeks to secure its raw material and energy supplies and to optimize their cost by diversifying its sources of supply. In some cases, it may also 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 to the consolidated financial statements at 31 December 2017 in section 4.3.3 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. Thanks to its diversified portfolio of application-oriented products and markets, and its balanced global presence, the Group manages to limit the risks and adverse effects of demand volatility. These advantages also enable it to mitigate the risk related to worsening economic conditions in any one of its end markets.

Arkema is also continuing to consolidate its positioning in higher value-added niche markets, a strategy that allows it to offset potential slowdowns in its main end markets.

Lastly, the Group's integration in certain product lines such as acrylics, fluorochemicals and specialty polyamides reduces its exposure to market cycles.

Country-related risks

Arkema operates on the global market with production facilities mainly located in Europe, North America and Asia. Many of its main customers and suppliers also operate internationally, with a presence in various countries and regions. Consequently, the Group's business and financial results are likely to be directly or indirectly impacted by any adverse changes to the economic and political environment in the countries in which the Group operates.

The direct and indirect consequences of conflicts, terrorist activities, political instability or the emergence of health risks in countries where the Group is active or markets its products could impact the Group's financial position or future prospects, in particular by causing delays or losses in raw material and product delivery or supply, and increased safety costs, insurance premiums or other expenses needed to ensure the continuity of the operations concerned.

Arkema's international 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, and to develop and implement effective policies and strategies in each of its foreign operations.

Risk management

In most countries in which it has industrial and commercial operations, Arkema relies on subsidiaries, which are placed under the responsibility of a regional Vice-President. 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.

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.

Risks related to competition

Arkema faces strong competition in each of its businesses.

In the Industrial Specialties division, the commoditization of certain products can lead to significant price competition. Some of the Group's 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. Downstream of Coating Solutions and in High Performance Materials, an important role is played by differentiation, innovation, product quality and related services.

The economic emergence of certain countries, notably China, has been accompanied by the rise of local competitors and, subsequently, growing competition on certain product lines, such as Fluorogases and Acrylics. This could intensify in the future or extend to other products and, consequently, put lasting downward pressure on the price of these products.

The Group's competitive position could also be affected by innovative new products, new technologies, or the emergence of new competitors on the market.

Risk management

Since it was created, Arkema has 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.

Arkema invests heavily in R&D, particularly in the High Performance Materials division, which has enabled it to bring to market a large number of innovative new products (see section 1.4 of this document).

The Group has also built its strategy around the development of customer and supplier partnerships with leaders in their respective fields, allowing it to build strong business relationships with its main partners.

1.7.2.2 SUPPLY CHAIN RISKS

Risks related to transportation

Arkema has various hazardous, toxic or flammable materials transported by road, rail, sea and air, particularly as part of shipments to customers in countries where it operates, giving rise to the risk of accidents. Any such accidents could result in claims against Arkema, in particular in its role as the shipper.

Furthermore, due to (i) stricter regulations on the transportation of hazardous materials, (ii) the temporary or permanent lack of transportation means for certain toxic or hazardous products to certain destinations, (iii) the market dominance of a single supplier, and (iv) job action affecting transportation, Arkema may face the following problems:

- 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, unless geographical swaps are set up with other manufacturers.

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 can never be ruled out. In addition to the environmental impact, such an accident would adversely affect the operation of certain units at its industrial sites and could therefore have a material adverse impact on Arkema's business activities, financial position, results or future prospects.

Risk management

In order to prevent or minimize the risks related to transportation, Arkema endeavors to:

- diversify its service providers and share its product movements between several carriers where possible;
- use transportation methods that are deemed less dangerous (barge, pipeline, road-rail or rail), when technical and financial conditions permit;
- strictly select suppliers based on the Safety and Quality Assessment System (SQAS), which was established by a consortium of European chemical manufacturers under the aegis of the European Chemical Industry Council (CEFIC) whose activities extend to the Middle East and Asia;
- 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; and
- 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.

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.

Risks related to storage

Arkema uses many storage and warehousing facilities located on its industrial sites and elsewhere that may present risks to the environment or to public health and safety. Arkema could be held liable for accidents occurring in the storage and warehousing facilities that it uses.

Moreover, some of the storage providers that Arkema uses derive substantial revenues from it in certain regions. Should one of these providers fail to perform, Arkema could be compelled to renegotiate storage contracts under less favorable terms, or to store its products in other locations.

Risk management

To anticipate and minimize the above-mentioned risks related to storage, Arkema endeavors to:

- diversify its service providers where possible;
- develop alternative emergency solutions combining transportation plans and distribution schemes, with a lag time for implementation;
- select suppliers based strictly on the SQAS Warehouse and CDIT (Chemical Distribution Institute – Terminals) guidelines; and
- conduct storage audits prior to signing contracts – repeated every three years for warehouse facilities hosting hazardous materials – under the responsibility of the relevant business management.

Risks related to dependence on suppliers

Arkema has developed a policy of spreading supplier risk at product-line level and at geographic exposure level for its supplies of raw materials, energy and gas, services and some equipment. However, in the case of certain raw materials or equipment that are essential to its business, it is significantly dependent on a limited number of suppliers and, in some cases, a single supplier. For example, some of Arkema's operational units in France – in the acrylic acid, oxo-alcohols and functional polyolefins segments – were built downstream of steam crackers. These units present a particularly high level of physical integration with the production capacities supplying the raw materials.

Furthermore, Arkema has entered into long-term agreements featuring minimum supply commitments with a number of its raw materials suppliers. 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.

Other events that could have an adverse impact on Arkema's industrial and financial performance include failure to perform 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.

Arkema's main contracts are described in section 1.5 of this document.

Risk management

One of the aims of Arkema's centralized procurement policy for raw materials and goods and services is 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 permit;
- the development of long-term partnerships and 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 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. 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 failure to perform by one of its suppliers in its insurance policies.

Risks related to dependence on customers

Arkema has entered into agreements representing significant financial income with certain customers. 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.

Risk management

Arkema has a highly diversified customer base and makes less than 25% of its sales to its top 40 customers. No customer represented more than 2.5% of its sales in 2017.

Furthermore, Arkema's business policy is based on developing alliances or partnerships with 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.

Lastly, Arkema hedges its customer 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.

1.7.2.3 INDUSTRIAL SAFETY, ENVIRONMENTAL AND CLIMATE CHANGE 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), the use, 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 safety, environmental and climate change risks described below are considered in view of the potential impact they could have both on Arkema and on the environment and stakeholders.

Risks related to the operation of industrial facilities

Arkema's facilities may be subject to risks of accidents, fires, explosions and pollution due to the very nature of their operations and to the level of hazard, toxicity or flammability of certain raw materials, finished products and production or supply processes. Any accident, regardless of whether it occurs at one of Arkema's production sites or during the transportation or use of products manufactured by Arkema, may cause delays in production or give rise to compensation claims on grounds of contractual liability or product liability, as appropriate.

Furthermore, Arkema's production facilities may experience extended shutdowns, particularly as a result of problems with raw material or energy resource supplies, reliability of major equipment or even industrial action.

In addition, Arkema operates many industrial facilities, including 35 "Seveso" classified sites in Europe as per directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, which amended and subsequently repealed Council directive 96/82/EC, known as the "Seveso III directive". It also operates facilities outside Europe that have been given a similar classification due to their use, production or storage of hazardous substances that may present significant risks to the health or safety of neighboring communities and to the environment. In this respect, Arkema could 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.

Created by French Act no. 2003-699 of 30 July 2003 on the prevention of technological and natural risks and compensation for damages, Technological Risk Prevention Plans (PPRTs) form part of the Group's risk management policy for areas hosting high-risk industrial sites corresponding to "upper-tier Seveso" establishments. Arkema has completed 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. Arkema has estimated the cost of all measures that it is responsible for implementing in the coming years, and set aside provisions to this end.

These risks, over and above any liability issue, could have an impact on Arkema's results, financial position or business activities.

Risk management

All Arkema's facilities and activities worldwide are covered by a Group-wide safety management program adapted to the risks that each may face.

Developed in line with the Health, Safety, Environment and Quality Charter, the program is based on taking action at three priority levels:

- at the technical level, for example when designing or improving production units (process safety and ergonomics), 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, which are also adapted to the level of risk at each site. These requirements are reflected in the Arkema Integrated Management System (AIMS), which combines all the Group's safety, environment and quality audits in a single audit; and
- at the human level, by developing social dialogue and a safety culture that raises everyone's awareness of their individual responsibility and of the importance of their behavior.

These points are detailed in section 2.3 of this document.

Arkema has also taken out insurance policies for civil liability and property damage with leading insurance companies (see section 1.7.1.6 of this document).

Risks related to security

Arkema may suffer the consequences of possible malicious acts against its facilities or its employees, including theft and pilferage risks particularly in the fields of research and technology and the growing threat of cybercrime.

Risk management

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.

The Group's upper-tier ("*seuil haut*") Seveso sites in France have undergone security audits by the French authorities, with no evidence found of significant deviations from standards. The audits highlighted Arkema's high level of security, and 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. It has also taken additional security measures in response to deliberate acts of violence at other industrial companies in Isère and Étang de Berre, France.

The Group's action plan also covers cyber security and protection from cyber attacks (see section 1.7.2.6 on IT risks). As part of this, Arkema has begun working more closely with the IT security agency ANSSI in France and has developed a specific strategy to enhance cyber security.

Risks related to health

Arkema uses and has used in the past toxic or hazardous substances to manufacture its products. 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 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.

Certain products may also be used directly or indirectly in sensitive applications, particularly medical and food applications.

Furthermore, several types of serious government-declared health crises could result in the shutdown of facilities, research centers, and even head offices and other facilities. Serious health crises of this sort notably include:

- major epidemics or pandemics;
- crises related to contaminated or polluted medicines, food or vaccines;

- health crises related to climate or weather events, such as heat waves, droughts, tornadoes, cyclones and exceptional flooding; and
- the consequences of long-term, chronic exposure to a hazardous contaminant.

Risk management

Arkema has put in place safety and monitoring procedures at the Group level and at individual production sites. It also conducts regular research into the toxicity of the products it uses, and in addition has developed a tool for monitoring individual exposure to toxic products. The various procedures in place are described in section 2.3.2 of this document.

Arkema may also be forced to withdraw certain products, particularly in certain sensitive markets.

In the event of a serious health emergency, crisis units managed by trained employees are set up in the facilities, in the countries and at Group level to define the standards that guarantee high levels of health protection and the rules governing certain activities in order to achieve the lowest possible risk level, and to put in place response plans to address health emergencies and exceptional situations. Additionally, in the specific event of epidemics or pandemics, most Arkema sites around the world have set out business continuity plans with actions on two levels:

- health and organization measures to limit the transmission of viruses and protect the health of employees and subcontractors working on the sites by (i) informing all employees about health measures, raising awareness and providing alcohol-based hand sanitizers and protective masks, (ii) issuing instructions on how to contain isolated cases, (iii) reducing the number of meetings and business trips, and (iv) implementing teleworking solutions; and
- measures to adapt business activities to the level of absenteeism by creating a structure that enables a site to continue operating despite the absence of significant numbers of employees and, in extreme cases, to ensure safety and environmental protection in the absence of a very large number of employees.

Risks related to the environment

Arkema has activities in business areas that entail significant environmental liability risks.

While the Group has secured insurance policies from leading insurance companies to cover environmental risks (see section 1.7.1.6 of this document), 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. Furthermore, 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 cause delays in production or give rise to compensation claims on grounds of contractual liability or product liability, as appropriate.

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 health, safety and 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 for Arkema sites that are still in operation, or for sites where operations have ceased, entails a risk that could generate substantial financial costs for Arkema.

Contingent environmental liabilities are detailed in note 20 to the consolidated financial statements at 31 December 2017 in section 4.3.3 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 2.4 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 2017 in section 4.3.3 of this document.

Risks related to 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 extent and frequency of which may evolve as a result of climate change. In 2017, 22 sites (unchanged from 2016) were identified as currently being exposed to climate risks. However, Arkema has no data enabling it to estimate how the exposure of these or other sites may evolve in the future as a result of climate change.

Arkema monitors developments in international, European and national regulations on greenhouse gas (GHG) emissions reduction, notably as concerns CO_2 quota systems. The tightening of such regulations could have a negative impact on the Group's business activities, operating costs or profitability.

Risk management

Arkema pays close attention to the publication of any works that will enable it to assess the medium- and long-term impact of climate change on its industrial operations and supply chain.

At the same time, it implements a range of Group-wide initiatives to anticipate the effects of climate change as effectively as possible. In 2016, for example, an internal carbon pricing system was introduced to steer investment toward low-carbon solutions. In the same year, Arkema implemented the Optim'O water management plan in a drive to further improve water management at its sites and in its production processes. For further details on these initiatives, see section 2.4.2.3 of this document.

Lastly, Fluorogases have been identified as the products that have been most exposed to regulatory developments for many years. Accordingly, Arkema is already anticipating the relevant regulatory changes by developing new blends or substitutes.

Risks related to the management of sensitive data and in particular the dependence on certain technologies

In the course of its business, Arkema uses both technologies that it owns and a certain number of technologies under license from third parties. Furthermore, in some cases, Arkema's activities rely on technologies that require specific skills from its employees. It also invests in new industrial units and is exposed to the risk of disclosure of confidential documents and of copying of processes or technologies that are critical to its production and to maintaining its international competitiveness.

If Arkema were no longer able to use these technologies, it could have an adverse impact on its business activities, financial position, results or future prospects.

Risk management

Arkema implements a technological development policy for its processes, in particular as part of its R&D programs, to give it direct ownership over the technologies that it uses in its major activities, and to help reduce its level of technological exposure to third parties.

It also has an employee retention policy (see section 2.6 of this document), and ensures that skills in certain sensitive technologies are shared by a sufficient number of employees.

Furthermore, Arkema only 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, specifically the business process officers and technical center engineers.

Arkema has decided to strengthen its security policy and to broaden the documentation to be applied in its sites worldwide, by drawing on services provided by the French State in France and on feedback from other regions. This strategy resulted in updates and improvements to application guides and procedures, particularly to take into account IT risks, the protection of sensitive data, the protection of sites and the protection of employees working in high-risk countries. The documentation includes security audit guides, vulnerability analysis guides and the classification of documents containing sensitive data.

It continues to strengthen employee training and awareness initiatives in this area. In particular, it introduced the iSafe program in 2017 to share throughout the Group a set of rules that it considers essential to ensuring cyber security.

Risks related to land that Arkema does not own

While Arkema owns most of the land on which its industrial sites are built, some 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.

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.

1.7.2.4 REGULATORY AND LEGAL RISKS

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, antitrust law, company law, commercial law, patent protection, labor law, personal data protection, tax law and customs regulations.

Arkema's corporate and regional units and subsidiaries ensure regulatory watch in their respective fields of expertise in order to maintain a high level of knowledge and anticipate possible future changes.

Risks related to product regulations

If existing regulations were to be amended to become more restrictive for Arkema or if new regulations were adopted, it could (i) compel Arkema to significantly scale back on the production and marketing of certain products or, possibly, discontinue production and marketing altogether, (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.

A large number of these regulations, described in section 2.3.5 of this document, require chemical products to be recorded in lists, called inventories, and accompanied by files of varying degrees of complexity.

Risk management

To ensure that its products are marketed in accordance with local, national or international regulations, Arkema employs regulatory experts supported by a global network of correspondents based in the industrial sites, 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 manufactured, imported and marketed by Arkema. All these experts also use efficient IT resources and have access to databases allowing them to follow scientific developments and regulatory changes, and to produce the documents required to comply with the regulations within the prescribed time. These experts take part in professional associations that monitor proposed regulatory changes at the state or agency level, thus helping the Group to anticipate regulatory changes and prepare accordingly.

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. This is the case, for example, with Arkema's successful development of resins-for-paint formulations that meet the latest VOC requirements, such as alkyds in emulsions, VAE emulsions, powder resins and high solid resins.

Finally, in the particular case of the Registration, Evaluation and Authorization of Chemicals (REACH) regulation and local legislation described in chapter 2 of this document, Arkema has put in place a specific organization to optimize the implementation of these regulations.

Risks related to industrial property

Arkema attaches great importance to industrial property rights in respect of trademarks and patents in order to protect the innovations that result from its R&D. Taken together, its patents and trademarks represent a key asset for its business. Arkema is also attentive to the risk of direct and indirect patent infringement as well as all types of trademark infringements.

Patent infringement can occur when a third party uses products or industrial processes patented by Arkema. Trademark infringement, on the other hand, can occur when a third party unlawfully seeks to take advantage of the investments or reputation of Arkema brands in a given market. These actions have an instantly negative impact on Arkema's sales and results and can harm the reputation and the perceived quality of the products concerned as well as the image of the Company.

Patent infringement can also occur involuntarily because of Arkema, particularly given the risk related to the time during which patent applications are not made public. Patent applications filed by third parties and made public only on publication could impact ongoing developments or even products recently brought to market. This situation would oblige Arkema to change the product, thereby increasing the related R&D costs, or to negotiate a license to use the patented component. In either case, there would be an impact on the project's profit margins.

Inadequate protection of the innovations resulting from its research or trademarks could therefore have a material adverse impact on Arkema's business activities, results, financial position or future prospects.

Risk management

Arkema has developed an assertive policy to protect its innovations and know-how (registration of patents and trademarks), particularly with the support of a global network of industrial property consultants (for further details on Arkema's industrial property protection policy, see section 1.4.3 of this document). Arkema is also attentive to any infringements of the rights conferred by its patents and trademarks. If, therefore, products on the market suggest that protected products or technologies or trademarks have been infringed, Arkema can take whatever action it deems necessary to notify, end and sanction the infringement of its intellectual property rights.

This risk is managed by the Intellectual Property department, which reports to the R&D department for patent matters and to the Legal department for trademark and design matters. The role of these departments is to apply in practice the principle of respect for intellectual and industrial property rights enshrined in the Code of Conduct and Business Ethics. They go about this by ensuring customers are only offered products that are not covered by valid, third-party patents, based on the best knowledge that can be obtained by regularly reviewing competitors' patents throughout the development of new products. In addition, the role of the Legal department is to constitute trademark rights for certain product ranges and, where appropriate, protect them via designs. To this end, it carries out research for prior user rights before trademark and/or design applications are filed, to the greatest extent allowed by resource availability and information accessibility, in order to identify any prior third-party rights that may form an obstacle to a new project.

Risks related to business practices

Arkema 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 Arkema 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 legislation. 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, see section 2.7.3 of this document.

Arkema is also 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 choice of commercial intermediaries used in order to minimize the risk of corruption.

Furthermore, 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 1.7.1.4 of this document). It is intended to serve as a guide for implementing procedures to assess customers, suppliers and intermediaries.

Risks related to current or potential litigation

In the normal course of its business, Arkema is or may become a party to a number of administrative, legal or arbitration proceedings, as a result of which it may be found liable on various grounds, such as violating antitrust laws relating to cartel behavior, full or partial failure to fulfill contractual obligations, termination of established commercial relationships, pollution, or non-conformity of products.

A description of the most significant current or potential litigation is given in note 20 to the consolidated financial statements at 31 December 2017 in section 4.3.3 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.

Provisions are made in the accounts whenever the payment of a quantifiable and large indemnity is likely (see note 19 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document). However, the resulting provisions, and in particular those relating to large claims, can prove insufficient, which could have material adverse consequences on Arkema's business activities, financial position, results or future prospects.

In addition, it generally 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.

Risk management

All legal risks related to current or potential litigation are subject to a quarterly review. On the first day of the last month of every quarter, each business, corporate department and subsidiary must provide Arkema's Accounting and Controlling department and Legal department with a written summary of any legal risks or proceedings that affect Arkema's business activities, results or financial position or are likely to do so. Representatives from the Accounting and Controlling department and the Legal department meet to analyze the risks and legal proceedings that were identified and to determine, in conjunction with the businesses, corporate departments and subsidiaries, the amount of the provisions relating to such risks and legal proceedings based on the rules described in note B. "Accounting policies" to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

1.7.2.5 FINANCIAL RISKS

Arkema is exposed to various types of financial risks, such as liquidity risk, foreign exchange risk, interest rate risk, credit risk (counterparty risk), pension funding risk and tax 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.

Liquidity risk

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 section 4.1.8.1 and notes 21 and 22 to the consolidated financial statements at 31 December 2017 in section 4.3.3 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 2017, Arkema had a strong financial profile, with:

- a net debt to EBITDA ratio of 0.8;
- cash reserves of around €2 billion; and
- a Euro Medium Term Note (EMTN) program, representing a maximum amount of €2.75 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 five and a half years; and
- Arkema's long-term credit ratings are BBB (stable outlook) according to Standard & Poor's and Baa2 (stable outlook) according to Moody's.

Consequently, at the date of this document, Arkema is able to meet its financial commitments as part of its operations, and does not anticipate any problems in the coming months.

Foreign currency risk

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. For an indication of the impact of the translation effect on Arkema's income statement and balance sheet, especially with regard to the US dollar-to-euro exchange rate, see sections 4.1.5 and 4.1.9 of this document; and
- competition risk related to the fact that, proportionately, in the euro zone, Arkema 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 exchange 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 2017 in section 4.3.3 of this document.

Competition risk has gradually decreased following the implementation of a more balanced Arkema development and geographic expansion strategy.

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.

Interest rate risk

Arkema is exposed to interest rate fluctuations.

At 31 December 2017, Arkema's debt stood at €2,494 million, which mainly included a €480 million bond issue with a 3.85% fixed rate, a €150 million bond issue with a 3.125% fixed rate, a €700 million bond issue with a 1.50% fixed rate and a €900 million bond issue with a 1.50% fixed rate. Neither the revolving multi-currency credit line nor the commercial paper program had been used at 31 December 2017. The terms of this financing are described in section 4.1.8.1 of this document.

Given the Group's net debt and the distribution of net debt between fixed rate and variable rate borrowings, a 1% increase in interest rates would reduce the cost of the debt by around €4 million.

Risk management

Arkema's policy is to minimize the impact of interest rate fluctuations on its financing 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 due to the historically low rates. However, it regularly re-assesses its position based on market developments, and could enter into rate swaps on its bonds in order to reduce the cost of its debt.

For further details, see note 22 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

Credit risk

Accounts receivable and other debtors

Arkema fosters relations with a large number of counterparties, most of which are its customers. At 31 December 2017, accounts receivable net of provisions amounted to €1,115 million. These accounts receivable are detailed by due date in note 22.4 to the consolidated financial statements at 31 December 2017 in section 4.3.3 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's objective is to secure the collection of its accounts receivable through a global insurance policy implemented by the Financing and Treasury department.

- Arkema has a highly diversified customer base and makes less than 25% of its sales to its top 40 customers.
- There is no geographical concentration of credit risk as sales are evenly balanced across the different geographic regions in which Arkema operates.
- Arkema hedges most of its customer risk with a global credit insurance program. Given the quality of the Group's customer portfolio and low claim rate, this program 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 further details, see note 22 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document. The policy concerning provisions for doubtful accounts on fully or partially uninsured accounts receivable is also detailed in note 22.

Investments

Investment risk is related to financial investments with financial institutions. Arkema is indebted overall, but at times may be required to invest cash, in particular to maintain a certain level of liquidity, to comply with local regulations or to manage cash lags. At 31 December 2017, the amount of cash invested with banking institutions or money market funds amounted to €1,438 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 objective is to minimize this risk by centralizing the management of its financing resources and requirements.

- 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.
- Arkema minimizes its exposure to credit 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 2017 in section 4.3.3 of this document.

Risks related to pension funding

Arkema has obligations to its employees for pension benefits and other post-employment benefits in most countries where it operates (see section 2.6 of this document). These obligations could:

- exceed its related provisions if the actuarial assumptions used were inaccurate or if regulations changed; or
- result in asset shortfalls in certain countries where Arkema operates, particularly the United States and the United Kingdom, in the event of an adverse trend in the financial markets.

Risk management

Arkema's objective is to minimize this risk by opting for defined contribution plans wherever possible. Thus:

- the main defined benefit plans have been closed to new entrants, sometimes for a number of years, and in some cases to further accrual too;
- certain plans have been the subject of a transfer of pension rights to insurance institutions, in particular in France and the Netherlands; and
- the management of assets allocated to cover employee pension benefit obligations in some host countries, when such requirements exist, is outsourced to qualified professionals and controlled by independent trustees who themselves use the services of recognized professionals.

For further details, see note 18 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

Tax and customs risks

Changes in tax or customs duty laws or regulations or amendments in the interpretation of case law, international treaties or administrative doctrine in any one of the many countries in which Arkema operates could adversely impact its business activities, financial position or results.

Furthermore, Arkema benefits from special tax treatment in some countries, such as reduced tax rates under certain conditions and for limited periods of time. If such special tax treatment were to be withdrawn, amended or not renewed, it could adversely impact its financial position or results.

Similarly, certain customs procedures may be reviewed by the customs administration on account of different practices in place in different countries or changes to regulations, which could adversely impact Arkema's business activities, financial position or results.

Risk management

Arkema's objective is to comply with the tax and customs regulations in all the countries in which it operates, while minimizing its tax burden.

The tax function is overseen by a team within the Financing and Treasury department that is made up of specialists supported by local employees and that uses the services of major external consultants whenever necessary. The Central Tax department is responsible for regularly updating Arkema's transfer pricing policy. Tax audits are overseen by the Tax department, which ensures corrective measures are implemented when required.

In addition, Arkema has a dedicated "customs" team that centralizes all key issues, with the help of an internal and external network of customs specialists and purpose-designed IT systems.

For further details on the financial impact of tax disputes, see note 20 to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

1.7.2.6 IT RISKS

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. Their failure could have a material impact on the Group's business activities, results or financial position. These threats also apply to the industrial businesses' production unit control systems. The main cyber and other risks related to IT systems are as follows:

- 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 an industrial unit or department; and
- risk of intrusion or malicious use of the IT systems, particularly to steal information, misappropriate money, disrupt the operation of industrial facilities or impede the Group's business activities.

Risk management

The Group's IT department (iTeam) 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 mentioned above. 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.

Pursuant to this policy, iTeam 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.). Strict version management procedures that include non-regression testing are also in place to minimize any incidents brought about by the rollout of new versions of software or hardware.

The Security Operations Center, currently being set up, will also boost 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.

The regular review of the Group's IT Systems Security Policy, particularly with regard to industrial systems, and closer collaboration with government security bodies enables the Group to deal with threats to its management systems and to the operations of its industrial units (see section 1.7.2.3 on industrial safety, environmental and climate change risks). The Group also adapts its security policy in line with regulatory developments on personal data protection (European General Data Protection regulation) and network and information system security (European NIS directive).

The technical requirements of the Group's IT systems security policy comprise a behavioral component with a program to raise employee awareness in the areas of data protection and cyber security, including the distribution of a booklet of essential rules to all Group employees as well as regular and periodic awareness raising sessions.

The Group has also taken out an insurance policy for cyber security risks with leading insurance companies (see section 1.7.1.6 of this document).

Lastly, the Group has set up an internal control system consisting of a number of general IT controls to ensure the reliability of the Group's critical processes and compliance with security rules. The effectiveness of these measures is assessed every year and action plans are put in place to address any identified weaknesses.

1.7.2.7 STRATEGIC PROJECTS RISKS

Risks related to innovation

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. Furthermore, Arkema invests in new industrial units and is exposed to the risk of disclosure of confidential documents and of copying of a process or technology that is critical to its production and to maintaining its international competitiveness.

Risk management

Each year, Arkema invests heavily in R&D to develop new products and processes. In the High Performance Materials and Coating Solutions divisions, the regular introduction of innovative new products is a key success factor. Similarly, in Industrial Specialties, process performance is a major driver of competitiveness. Arkema focuses its R&D efforts on fast-growing markets such as new energies, water treatment, 3D printing and lightweight materials to replace metal and glass.

This major focus on innovation also enables the Group to adapt to regulatory trends.

Furthermore, Arkema only subcontracts the manufacture of equipment essential for critical processes to specific companies bound by confidentiality agreements. Files and technical manuals are managed by a restricted number of individuals, specifically the business process officers and technical center engineers.

Risks related to mergers, acquisitions and disposals

As Arkema implements its strategy, it may provide a number of guarantees to third parties when disposing of businesses. It cannot be ruled out that when some of these guarantees are invoked, the compensation claims could exceed the provisions made by Arkema and therefore have an adverse impact on its results or financial position.

Arkema has also carried out several acquisitions in recent years that may expose it to various risks and in particular potential liabilities or responsibilities related to these activities. Should the assumptions on which these acquisitions were made fail to materialize, the development prospects of these activities may not be achieved. This could consequently impact the valuation of goodwill and have a material adverse impact on Arkema's business activities, results or financial position.

Risk management

Arkema endeavors, before entering into any external growth transaction, to take all 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 with the advice of external consultants with expert industry knowledge. Furthermore, acquisitions are carried out by teams of qualified experts under the responsibility of the Strategy department.

Arkema's policy in terms of business disposals is to limit its liability with respect to guarantees to the buyers.

Risks related to joint ventures

Arkema is subject to risks related to the non-controlling interests that it holds in companies, some of which are major suppliers or customers of Arkema. The joint ventures included in the Group's scope of consolidation are described in the notes to the consolidated financial statements at 31 December 2017 in section 4.3.3 of this document.

In accordance with the contracts and agreements governing the operation, control and financing of these joint ventures, certain strategic decisions can be made only with the agreement of all partners. There are risks of disagreement or deadlock between the partners in these joint ventures. In certain cases that are beyond Arkema's control, these joint ventures could also make decisions that go against Arkema's interests. Lastly, despite all the precautions taken when choosing partners, the Group cannot rule out the possibility that one of its partners could file for bankruptcy.

Investment decisions made within these joint ventures, whether as part of general operations or pursuant to specific agreements with the partners in these companies, may require Arkema to incur additional expenses, to invest further or to purchase or sell certain companies.

Risk management

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 terms designed to resolve deadlocks and maintain its decision-making powers. The contracts or agreements relating to joint ventures that Arkema considers material are described in section 1.5 of this document.

1.7.2.8 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 1.7.1.6 of this document.

At the date of this document, Arkema believes that the limits of cover described in said section take into account the type of risks it incurs and are consistent with those currently available on the insurance market for groups of similar size and involved in similar business activities.

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. Indeed, while the insurance market offers property insurance levels that cover any probable maximum claims, this is not the case with respect to civil liability, where the potential maximum claims exceed what the insurance market can offer on acceptable terms for Arkema.

For a description of the various types of insurance contracts subscribed by Arkema, see section 1.7.1.6 of this document.

APPENDIX 3

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 which 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 the shareholders 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.

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.

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 27 February 2017 in order to ensure 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 format 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 annual general 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 document.

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. Since 2016 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 eight times in 2017, as in 2016. Attendance rate at these meetings was 90.5% (versus 95% in 2016 and 93% in 2015). On average, the meetings lasted approximately three hours.

The following table summarizes the individual attendance rates of directors at the meetings of the Board of Directors and its committees in 2017.

	Board of Directors		Audit and Accounts Committee		Nominating, Compensation and Corporate Governance Committee	
Directors	**Attendance rate**	**Number of meetings**	**Attendance rate**	**Number of meetings**	**Attendance rate**	**Number of meetings**
Thierry Le Hénaff	100%	8/8	-	-	-	-
Yannick Assouad	100%	5/5	-	-	-	-
Patrice Bréant	87.5%	7/8	-	-	-	-
Marie-José Donsion	100%	8/8	100%	6/6	-	-
François Enaud	87.5%	7/8	-	-	100%	4/4
Victoire de Margerie	50%	4/8	-	-	100%	4/4
Laurent Mignon	62.5%	5/8	-	-	-	-
Hélène Moreau-Leroy	100%	8/8	83.5%	5/6	-	-
Thierry Morin	87.5%	7/8	-	-	100%	4/4
Nathalie Muracciole	100%	8/8	-	-	-	-
Marc Pandraud	100%	8/8	-	-	-	-
Fonds Stratégique de Participations represented by Isabelle Boccon-Gibod	100%	8/8	100%	6/6	-	-
TOTAL	**90.5%**	**8**	**96%**	**6**	**100%**	**4**

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 • review and, where necessary, updating of the risk map • presentation and approval of the insurance program • changes in the competitive environment **Specific topics in 2017** • integration of Den Braven and progress in the implementation of synergies • various strategic projects: acquisition of XL Brands, investments in specialty polyamides in Asia and project to double thiochemical production capacity in Malaysia • report on the situation and analysis of the financial and non-financial impacts of Hurricane Harvey on the Group's sites in the United States • review of the Group's position in terms of cybersecurity • progress report on the Group's digital objectives
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 2017** • renewal of the Euro Medium Term Notes (EMTN) program for a maximum amount of €2.75 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 stock-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 • approval of the report on corporate governance **Specific topics in 2017** • appointment of Yannick Assouad and renewal of the terms of office as directors of Marc Pandraud and Thierry Morin • appointment of Marie-José Donsion as Chairman of the Audit and Accounts Committee • acknowledgment of the fulfillment of the performance conditions applicable to the 2013 performance share plan • 2017 performance share plan • 2018 capital increase reserved for employees
Corporate social responsibility	**Recurring annual topics** • the Group's situation in terms of safety and the environment • human resources policy • the Group's CSR initiatives

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.

In 2017, the Board of Directors traveled to Honfleur (France) in late April for a tour of the new molecular sieve production unit and a comprehensive presentation on the business, and to Serquigny (France) for a tour of the Group's performance materials Cerdato R&D center and a presentation on innovations in the area of Technical Polymers. It also visited the Group's polyamide production unit there. Lastly, in September 2017, the Board of Directors visited L'Atelier 4.20 by Arkema, a new showroom located at the Company's headquarters, which presents the innovative solutions and advanced materials developed by Arkema's research teams.

Since the beginning of 2018, the Board of Directors has met twice, with an attendance rate of 92%. In addition to recurring topics such as the approval of the 2018 annual budget, the approval of the annual consolidated and Company financial statements for 2017, the proposal of 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, the Audit and Accounts Committee and the Nominating, Compensation and Corporate Governance Committee, with proposals for the appointment of Marie-Ange Debon and Alexandre de Juniac, the renewal of office of Fonds Stratégique de Participation and support for Jean-Marc Bertrand's appointment as director representing shareholder employees; and
- the application of the provisions relating to compliance set out in the Sapin II Law.

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.

An assessment of the Board of Directors was carried out in early 2016 by consulting firm Spencer Stuart, which conducted individual interviews of each director based on a guide that 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. This external assessment showed that the operating procedures of the Board of Directors are very good and that the Board has demonstrated its maturity and efficiency and continued to improve since the previous independent assessment conducted by an external consultant in 2012. Following the assessment and the presentation of the report, certain areas for improvement were identified and agreed by the Board. They related primarily to the introduction of periodic site visits, the continuation of the work carried out on the Board's composition, in particular to maintain the diversity of expertise among its members, and stricter monitoring of risks by the Board. They have all been taken into account, as demonstrated during the assessment carried out in 2017.

For 2017, the annual assessment of the Board of Directors was carried out on the basis of a questionnaire prepared by the Nominating, Compensation and Corporate Governance Committee, which notably included questions about the Board's composition, its collective performance during the year, the individual contributions of each director and the quality of the Board's discussions. The assessment was discussed at the Board of Directors' meetings on 24 January 2018 and 21 February 2018. After it had analyzed the answers given by the directors, the Nominating, Compensation and Corporate Governance Committee presented a report to the Board of Directors showing that the directors continue to be very satisfied overall with the operating procedures of the Board and that the main recommendations made after the previous assessment had all been taken into account. The areas for improvement identified during the assessment and agreed upon by the Board include enhancing the Board's international dimension over the medium term (see section 3.2.2.1 of this document for more information) and pursuing work on succession plans and talent management. In 2018, the assessment of the Board's operating procedures will be carried out by an independent advisory firm.

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