SOLVAY
asking more from chemistry®

our energy your success

2018 **Annual Integrated Report**

Every day, with all our energy, we work on products that improve your daily life. When you drive a car, take a plane, use a smartphone, a shampoo, our technologies bring you innovative functionalities.

We do this by partnering and innovating with scientists and customers to develop solutions that contribute to ever more sustainable mobility and help optimize the use of natural resources.

Our 2018 Annual Integrated Report explains how our 24,500 employees across the world, through their constant commitment and expertise, strive to achieve the best and serve you, our stakeholders.

OUR ENERGY > YOUR SUCCESS

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ILHAM KADRI, CEO OF SOLVAY

The new CEO's priority will be to further accelerate the Group's transformation to unleash its full potential.

CARING FOR OUR PEOPLE

We leverage new ways of working, fostering collaboration and empowerment, and focusing firmly on our customers.

OUR STRATEGIC JOURNEY

Our two growth engines serve fast-growing markets, primarily focusing on sustainable mobility and resources efficiency.

"We have a really active partnership with Solvay."

John Bradfute, Sealed Air

Solvay Executive Committee members discuss with stake-holders to better meet their expectations.

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This report is also available online with expanded content, including interactive GRI Content Index:
annualreports.solvay.com/2018/en

For greater insight into the Group, visit our corporate website:
www.solvay.com

ABOUT THIS REPORT

For Solvay, 2018 was a year of extensive transformation and growth. We are now ready to unleash our full potential. Our Annual Integrated Report explains how. It also reflects our progress on an integrated management journey that began six years ago.

Our Annual Integrated Report explains how we are completing the ongoing transformation of our portfolio to deliver sustainable solutions created to play their part in meeting the key challenges of caring for our planet. How we continue to deliver through an ever-sharper focus on our customers, through innovation, through collaboration with all our stakeholders to create more sustainable value for them. How in 2018, we have worked to shape an organization and a culture to support a Solvay that is now ready to deliver growth as an advanced materials and specialty chemicals company.

Jean-Pierre Clamadieu has substantially transformed the Group since 2011 and initiated the change in its organization and culture. His successor, Ilham Kadri, will begin a new chapter in this company's history, building on the potential of its portfolio and its employees, and taking it to the next level.

We are convinced that collaboration makes a real difference and we are continuing to progress in building closer relationships with our stakeholders. In this year's report, we highlight how much we care about collaboration at Solvay, by sharing direct conversations between stakeholders and members of our Executive Committee on a number of central topics. This too is part of delivering on our commitments.

Moving ahead on our integrated management journey

Solvay's third Annual Integrated Report reflects our progress on an integrated management journey that began in 2012 when the Group introduced an integrated thinking approach to strengthen the connection between its businesses, sustainability and finance. Since then, our business and product portfolio decisions have been made with both economic value creation and sustainability in mind.

> "Integrated thinking at Solvay is not about compliance, it is about the way we are doing business every day. Integrated reporting is a highly demanding approach that adds transparency and, for us, it is becoming the new standard. The Integrated Thinking Award we received in 2018 from the Institut du Capitalisme Responsable is a recognition of our progress. We still have more to do."

KARIM HAJJAR
Member of the Executive Committee and Chief Financial Officer

Once again, this report is based on the guiding principles and content elements of Integrated Reporting, as established by the International Integrated Reporting Council (IIRC).

The report details the Group's new, streamlined business model. It also highlights stakeholder engagement, sharing the outcomes of these interactions.

Links in the Understanding Solvay section lead to the Management Report which provides a more detailed analysis of key topics, including a focus on high materiality issues. Information on the materiality assessment process and other reporting guidelines are illustrated in our Extra-financial statements, within the "basis of preparation" and "materiality analysis" sections.

Driven at the highest level

From day one, the Board of Directors has supported the Group's integrated management approach, which is fully in line with Solvay's values and culture. All the Group's Governance bodies – the Comex, the CEO and the Board – were involved in preparing, reviewing and approving this Annual Integrated Report, which complies with Belgian legislation and governance code, the 2014/95/EU directive on non-financial reporting, IFRS financial reporting rules and <IR> guiding principles and content elements.

The 2018 Annual Integrated Report builds on last year's report, and integrates feedback from our stakeholders, including several recognized bodies such as the Global Reporting Initiative (GRI) and the World Business Council for Sustainable Development (WBCSD).

This year, for the first time, we also brought together a panel of employees and asked for their feedback on the report, with the aim of making it clearer and more reader-friendly, and meeting their expectations in terms of content.

It is aligned with GRI Standards and the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Its contents also serve as a progress report on implementation of the ten principles of the UN Global Compact and the Sustainable Development Goals (SDGs).

UN GLOBAL COMPACT
COMMUNICATION ON PROGRESS

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

2018 Sections with this icon have been audited

Sections with the Sustainable Development Goals (SDGs) icon show how the individual goals are implemented

Further Reading & Features

Solvay's strategic objectives

Accounting policies

2018 highlights

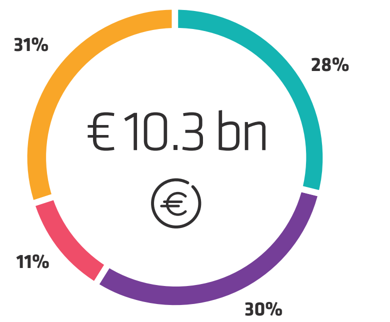
2018 KEY FIGURES

Solvay is an advanced materials and specialty chemicals company, committed to developing chemistry that addresses key societal challenges. Solvay innovates and partners with customers worldwide in many diverse end markets. Its products are used in planes, cars, batteries, smart and medical devices, as well as in mineral and oil & gas extraction, enhancing efficiency and sustainability. Its lightweighting materials promote cleaner mobility, its formulations optimize the use of resources and its performance chemicals improve air and water quality. In 90% of its portfolio, Solvay ranks among the world's top three leaders. Solvay is headquartered in Brussels.

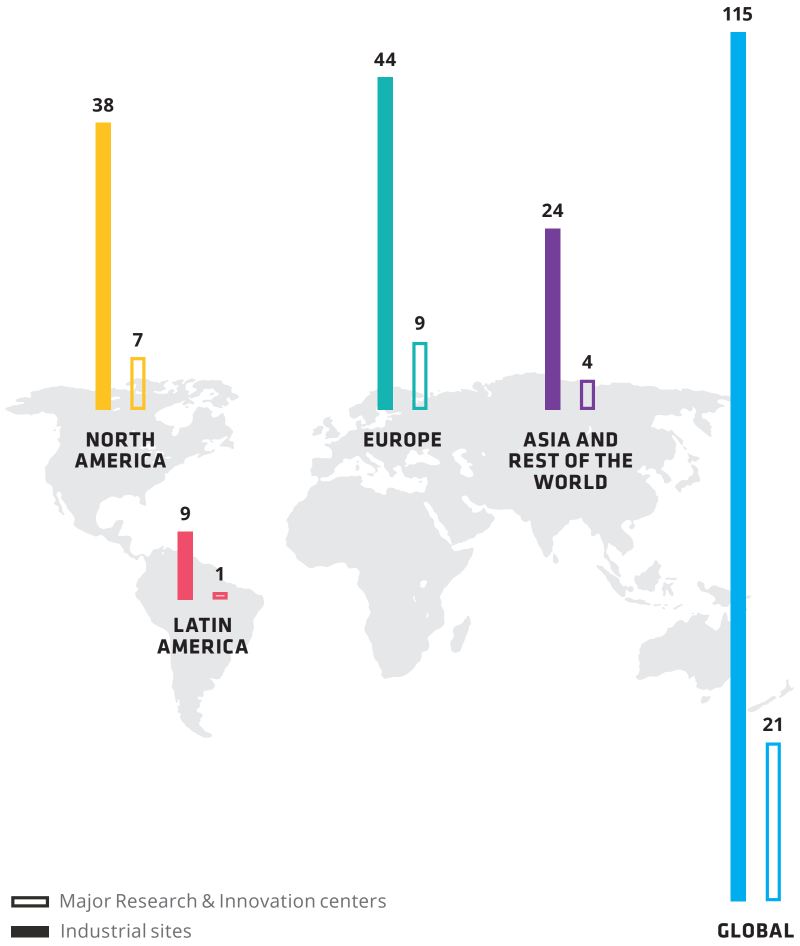
Underlying and restated 2016, 2017 & 2018 information (except for CFROI, and for environmental and social figures).

NET SALES

by zone

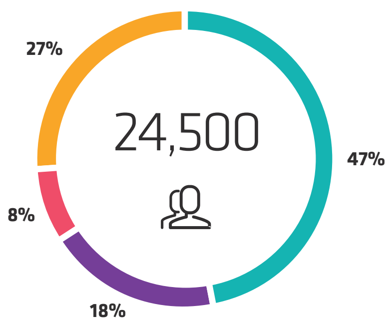


SOLVAY AROUND THE WORLD

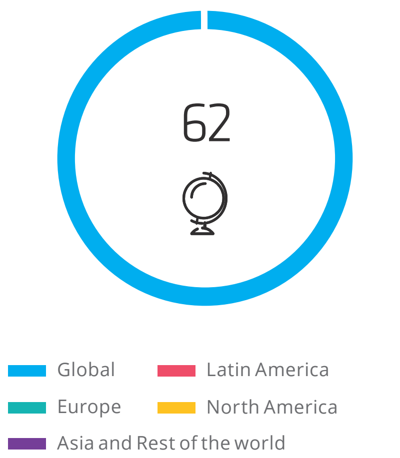


EMPLOYEES

by zone



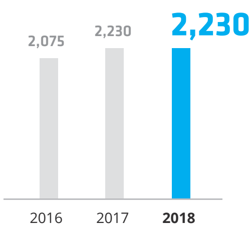
NUMBER OF COUNTRIES



FINANCIAL STRATEGIC OBJECTIVES

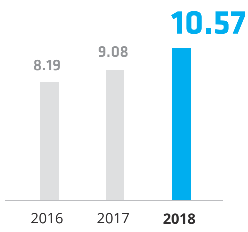
UNDERLYING EBITDA

in € million



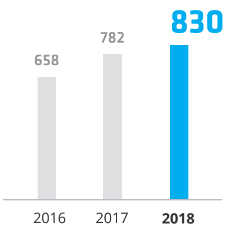
UNDERLYING EARNINGS PER SHARE

in €



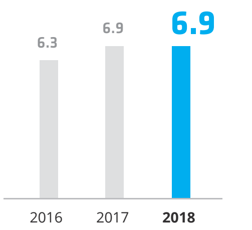
FREE CASH FLOW FROM CONTINUING OPERATIONS

in € million



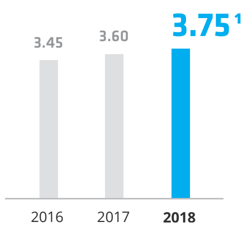
CFROI

as percentage



DIVIDEND

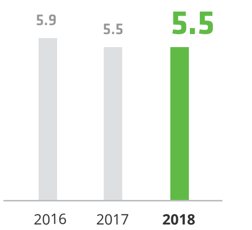
in € per share



SOCIAL AND ENVIRONMENTAL STRATEGIC OBJECTIVES

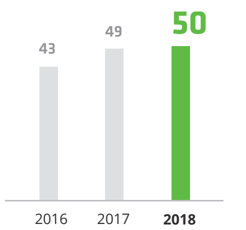
GREENHOUSE GAS INTENSITY

Kg CO_2 eq. per€ EBITDA



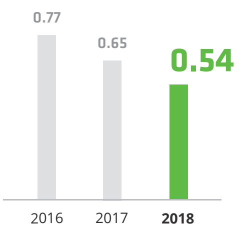
SUSTAINABLE SOLUTIONS (SPM)

as percentage of Group sales



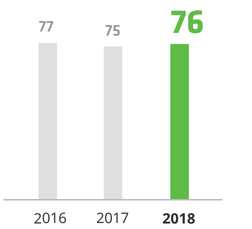
OCCUPATIONAL ACCIDENTS AT GROUP SITES[2]

per million hours worked



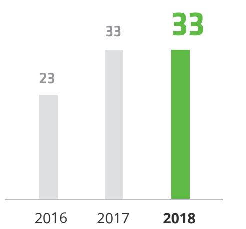
EMPLOYEE ENGAGEMENT INDEX

as percentage of employees



EMPLOYEES INVOLVED IN SOCIETAL ACTIONS

as percentage of employees



1 Recommended to the Shareholders meeting on May 14, 2019
2 Rate of accidents with medical treatment, with or without work stoppage

PRESIDENTS' MESSAGE

In 2018, Solvay successfully concluded a cycle in its history, delivering on the mid-term objectives set in 2016, which covered both sustainability and financial performance as integrated signals of progress. Solvay has shifted its position towards advanced materials and specialty chemicals. The Group will now focus on fully unleashing its growth potential.

"On behalf of Solvay, I would like to thank Jean-Pierre Clamadieu for his achievements at the helm of the Group. Thanks to his vision and leadership, we can lean on a strong basis today with Ilham Kadri, who after a rigorous process emerged as the obvious choice to take our Group to the next level and to step up value creation."

NICOLAS BOËL

2018 was a pivotal year, during which the Group's governance played its full role. In preparation for Jean-Pierre Clamadieu's succession, the Board of Directors reaffirmed Solvay's priorities: further accelerate transformation to unlock the Group's full potential.

2018 was a year of growth, as Solvay posted strong organic growth thanks to both good volume dynamics and the ability to manage prices effectively. Cash Flow generation was strong and contributed to further deleveraging the Group's balance sheet. Solvay's robust operational performance as well as its ability to optimise financial charges are reflected in the EPS' double-digit growth. As a consequence, the Group was able to keep duly rewarding the commitment of its shareholders and proposed to increase the 2018 dividend by 4.2%.

On a change journey

Solvay also delivered its medium-term extra-financial objectives. Regarding safety at work, the number of accidents decreased overall on Solvay sites, and the Group's objective over the next years will be to curb the persisting occurrence of severe accidents. Half of the Group's activities now qualify

“ I am honored to join the Solvay community as the Group’s 11th CEO. My excitement is shared by our 24,500 highly engaged employees looking forward to embarking into a new chapter of our company’s transformation. Sharper customer focus, innovation, collaboration, disciplined capital allocation and a clear sense of purpose will drive Solvay’s new growth trajectory.”

ILHAM KADRI

as “sustainable solutions”, with respect to both their impact on end-markets and their manufacturing footprint. Solvay has exceeded its initial greenhouse gas emission reduction targets and it has thus raised its ambitions to reduce CO_2 targets in absolute terms.[1]

Lastly, the 2018 Group-wide survey revealed that employee engagement remained high, demonstrating that Solvay teams stay proud and committed as they navigate through change.

Solvay pressed ahead with the transformation of its portfolio, and the divestment of its polyamides business was approved by the European Commission in the first weeks of 2019. This was an important step in an intense sequence of more than 50 Mergers & Aquisitions operations since 2012, during which Solvay has evolved to become more of an advanced materials and specialty chemicals company.

Solvay will continue to transform

Looking ahead, the Group will continue to transform, as we want to grow in pace with the accelerating needs of the society we serve. We intend to engage our teams, rally behind a single overarching vision and become truly customer-obsessed. Solvay’s key drivers will be technologies, innovation and people, to deliver superior solutions to our clients. Companies with a strong sense of purpose innovate, adapt better and deliver consistent growth. We want our Group to join the ranks of the few highly successful companies that have managed to embed their purpose in all of their actions.

Some uncertainty prevails, with looming trade wars, disturbance in Europe and questions about the solidity of the global economy, but we are confident in our ability to succeed by leveraging our portfolio and innovating with our customers in order to deliver value. Our Group has made bold stragegic choices and is well equipped, with solid business solutions and a strong presence in future markets. Let us all move Solvay to the next level, delivering more value for all stakeholders.

NICOLAS BOËL
Chairman of the Board of Directors

ILHAM KADRI
Chairman of the Executive Committee and CEO

1 Based on currently anticipated Soda Ash capacity

HELPING TO CREATE A MORE SUSTAINABLE FUTURE

Solvay believes in a future where innovation means progress for all. Our vision for that future is rooted in our history. 155 years of connecting with the world through science to create a sustainable future for our customers, for our people, for society and for our planet.

At Solvay, we have a strong conviction: growth cannot be sustainable if it is achieved at the expense of our planet and its resources. We aim to be recognized as the preferred partner in creating sustainable innovations that offer our customers the solutions that matter, now and in the future. As a leader in advanced materials and specialty chemicals and a key player in the value chain, we take our responsibilities seriously. We find it very motivating to work alongside organizations such as the Ellen McArthur Foundation, in its efforts to drive the transition to a Circular Economy forward, or the World Alliance for Efficient Solutions founded by Bertrand Piccard, to develop and implement concrete solutions to meet environmental and health objectives.

Achieving all this means building deep relationships with our stakeholders. Partnering with our customers to build sustainable value and innovative, tailored solutions. Partnering with other scientists, with business, with academic leaders to foster open innovation. Always aligning our expertise with the challenges facing our world.

Committed to well-being at work

Since its creation in 2016, Solvay's multidisciplinary Well-Being@Work Council has developed dedicated training sessions for managers and for local teams that directly support well-being. It will deploy e-learning trainings in 2019 to raise awareness among all employees.

Its priorities include the development of competencies in stress prevention and the implementation of positive behaviors within the Group, with training for managers extending right through to the members of the Group's Executive Committee and Leadership Council.

In 2018, the Council held nine training sessions for managers in six countries, with more than 530 participants in Germany and China alone.

Caring for our people

Our people are the lifeblood of our Group. And in a fast-changing world, disrupted by digital, they are the key enablers of Solvay's success. In today's transformed Solvay, we encourage them to champion collaboration among teams. We seek to create a climate of trust and collaboration that fosters empowerment, puts customers at the forefront of our actions, encourages smart risk taking, creates a sense of inclusion. And we take care to build trust and create the best possible environment for each and every one of them, because our people are the architects of our unique and innovative solutions. Through policies that promote a diverse and inclusive company culture, through facilitating mobility, training and development opportunities, through Solvay Cares, a universal benefits package that exceeds local market standards.

76%

Employee engagement index

83%

employees feel proud to work at Solvay*

72%

employees say they have the opportunity to continuously learn and grow*

*from 2018 internal Solvay Employee Survey

9%

Employee turnover

49%

e-Learning exposure

IN CONVERSATION WITH...

This year, our Annual Integrated Report showcases the relationships Solvay has built with its stakeholders and how we engage with them. As part of this ongoing dialog, representatives of our employees, our customers and our investors discussed their views and expectations with members of our Executive Committee.

How to be an ever more inspirational employer?

“Heritage”, “Caring”, “Innovation”, “Global”, “Sustainable”. These are some of the key topics that inspire the people who work for Solvay. They value the Group’s 155-year heritage and are proud of their contribution. They see Solvay as a Group with strong values, that cares about and invests in its talents and offers opportunities to grow and move.

> “Over all these years, it is innovation that has been motivating people at Solvay to keep making progress and bring added value to society.”

PETYA TSEKOVA
Export Maritime Logistics Manager EMEA,
GBU Soda Ash & Derivatives

Solvay’s people also see a need for more diversity as a way of driving the company’s transformation forward. They want to be part of a more agile, solutions-driven Group that moves and takes decisions more quickly, simplifying bureaucracy to better meet customers’ needs.

> “We need to become more solution-driven with more frontline thinking from people across the organization.”

XIAOWEI HUANG
Project management officer,
Comex Organization

Members of the Executive Committee Cécile Tandeau de Marsac and Pascal Juéry agreed with several points. They confirmed the need to simplify the ways of working, cutting down red tape and focusing on innovating for the end-consumer.

How to strengthen relationships with our customers to create more value?

Solvay and packaging specialist Sealed Air. have decided to launch a feedback program with dialog at many levels of the company.

"We have a really active partnership with Solvay. We listen to each other and we've been able to develop core actions that help both companies."

JOHN BRADFUTE
Global Resin Purchasing Director, Sealed Air

Augusto Di Donfrancesco, Member of the Executive Committee, points out the importance of promoting a culture of active listening across all frontline teams to fostering a much more customer-centric culture throughout the Group.

Powertrain cooler manufacturer TitanX faced a series of problems with its new Aluminium-Brazing-Flux supplier and Solvay stepped in with solutions.

"Thanks to their fast reaction and expertise, we were able to implement a new product. We have now switched back to Solvay and are looking at extending our relationship."

BRUNO JOUANNET
Vice President of Operations NA, TitanX Engine Cooling

Hua Du, Member of the Executive Committee, stressed how crucial it is to understand customer needs to create value on both sides.

In the employees' conversation with ExCom, Marcelo Burdelis stated that at Solvay, we are not afraid to put ourselves in question.

ExCom member Vincent De Cuyper commented on the sustainability profile of Solvay products.

42%

Net Promoter Score

Discussing with ExCom members, Stéphanie Halver stressed that Solvay really invests in its people and develops them.

Bruno Jouannet hailed the responsiveness of Solvay's teams and their ability to develop solutions.

Why is Solvay's ESG approach important to investors?

Discussions with investors began with Solvay's Sustainable Portfolio Management (SPM) tool, and how it guides strategic resources allocation and portfolio choices. ExCom member Vincent De Cuyper explained that the tool is particularly useful because *"the same product may have a different sustainability profile from one market application to another"*.

The exchanges also focused on Solvay's internal CO_2 price, which is higher than market price, the move toward green chemistry, including using renewables for energy supply, and the training and education on the circular economy. The investors also stressed the importance of quality ESG indicators to bring value and help investors understand the company.

"I think a holistic approach to capturing value is why ESG so important. It is about the ability to price companies more accurately with a more detailed representation of the cost of capital challenges, how the risks might play out in business."

AN ANALYST

Read more about these conversations online:
annualreports.solvay.com/2018/en

OUR SUSTAINABLE VALUE CREATION MODEL

Resources we use

PEOPLE

100 nationalities. 49% of our employees are located in Europe, 18% in Asia and rest of the world, 23% in North America and 10% in South America. 8% work in Research & Innovation.

24,500 Employees[1]

23% of women

FINANCIAL

We have invested€711 million of Capex from continuing operations and€352 million in our Research & Innovation activities.

€8 bn Equity attributable to Solvay share

€5.1 bn Underlying net debt

NATURAL RESOURCES

Our energy costs represented€0.65 bn. Excluding energy, the Group overall raw materials expenses amounted to circa€2.8 bn in 2018.

127 pj Energy consumption

488 M m³ Total water intake

How we create value

PERFORMANCE CHEMICALS

Soda Ash & Peroxyde Chemicals

Performance Chemicals operates in mature and resilient markets and has leading positions in chemical intermediates.

30% of Group EBITDA

ADVANCED MATERIALS

Polymer & Composite Technologies

ADVANCED FORMULATIONS

Surface & Liquid Chemistry

Advanced Materials offers a unique portfolio of high-performance polymers and composite technologies used primarily in sustainable mobility applications. Our solutions enable weight reduction and enhance performance while improving CO_2 and energy efficiency.

49% of Group EBITDA

Advanced Formulations provides customized specialty formulations that influence surface chemistry and liquid behavior to optimize efficiency and yield while minimizing environmental impact.

21% of Group EBITDA

Where we create value

~ 50% OF GROUP SALES

			NEXT GENERATION MOBILITY		RESOURCES EFFICIENCY					
Industrial	Healthcare	Electronics	Aerospace	Automotive	Mining	Oil & Gas	Agro	Consumer goods	Food	Construction

1 Excluding the Polyamide business

We aim to optimize the use of our resources and we leverage our unique Sustainable Portfolio Management (SPM) tool to integrate sustainability into our decision-making process and create more sustainable value for our stakeholders. Our business model focuses on two growth engines, *Advanced Materials* and *Advanced Formulations*, that serve fast-growing markets driven by sustainability trends – Next generation mobility and Resources efficiency – and deliver 70% of the Group's Ebitda. Our resilient Performance Chemicals businesses contribute to support our growth.

How we win

CUSTOMER INTIMACY

- We promote a **culture of active listening** to customer feedback across all frontline teams, fostering continuous improvement, to quickly create value for our customers.
- Our **Sustainable Portfolio Management** (SPM) analysis tool allows us to engage with customers on the sustainability profile of value chains, and to initiate discussions on the transition to a Circular Economy.

INNOVATION

- 155 years of scientific and **open innovation culture** makes them part of our DNA. We have established multiple partnerships with scientific institutes and startups.
- All our R&I projects are assessed through our SPM tool.

TALENTS

- Caring for our people has always been a priority to us. Our **Solvay Cares** program extends at least minimum level company benefits to all employees worldwide.
- Our robust **Solvay Way** framework brings all our people with us on our sustainability journey, ensuring that social and environmental matters are part of the Group's strategy, and decision-making.

Value we create

Providing sustainable solutions to **CUSTOMERS**

More than 80% of our portfolio has been assessed through our SPM tool.

50%
Net sales with Sustainable solutions

42%
Net Promoter Score

Delivering return & profits to **INVESTORS & SHAREHOLDERS**

Dividend growth over 30 years and strong cash generation. We are driven by focus on cash returns.

€2.2 bn
Underlying EBITDA

6.9%
CFROI

€830 M
FCF from continuing operations

€3.75
per share
Dividend 2018 recommended[3]

Reducing our **ENVIRONMENTAL FOOTPRINT**

We are developing initiatives to increase the share of renewables in energy consumption, and promoting energy efficiency through our Solwatt® program.

5.5
Kg CO_2 eq. per€ EBITDA
Greenhouse gas intensity

32.4
thousand tons
Industrial hazardous waste[4]

AIR EMISSIONS

7.4
thousand tons
Nitrogen oxides

3.7
thousand tons
Sulfur oxides

Empowering our **PEOPLE**

We are leveraging digital tools to encourage new ways of working that will accelerate our cultural transformation toward more collaboration and empowerment.

76%
Employee engagement index

0.54[2]
Occupational accidents per million hours worked

9%
Employee turnover

Strengthening **COLLABORATION WITH SUPPLIERS**

We aim to develop collaborative relationships with our major suppliers to help them improve their sustainability performance, contributing to the creation of more valuable solutions for our customers, across the value chain.

40,000
Suppliers

810
Critical suppliers

76%
Local suppliers

Supporting our **LOCAL COMMUNITIES**

We encourage employees to get involved in local projects that focus on the environment, science, youth and education, solidarity and philanthropy.

33%
Employees involved in local societal actions

2 Rate of accidents with medical treatment, with or without work stoppage 3 Recommended to the Shareholders meeting on May 14, 2019
4 Not treated in a sustainable way

A HIGHLY FOCUSED STRATEGIC JOURNEY

Solvay's strategic journey has a constant focus: a step-by-step transformation towards unleashing potential. First, an in-depth overhaul of our portfolio that made us an advanced materials and specialty chemicals group. Next, a reshaped organization and culture to focus firmly on our customers. Now, a strong position to continue our journey, delivering on growth as we travel.

50%
Sales with Sustainable solutions

More than
50%
Sales in GDP+ markets

More than
70%
Sales with specialty products

~33%
Sales in each main region

2012-2017

A refocused portfolio delivering synergies & growth

In 2012, we began a strategic journey to comprehensively redefine our business model. We transformed our portfolio and, in doing so, transformed Solvay. We moved from being a commodity chemicals company to become an advanced materials and specialty chemicals group.

We are a solutions provider and have refocused our business on high-growth markets that now account for the majority of our sales, and many new names stand out among our top customers.

Our business transformation has allowed us to generate substantial synergies. We have moved away from a largely diversified portfolio, reliant on cyclical markets, to a focused portfolio of highly specialized products and solutions that are tailor-made to solve our customers' challenges. This means we are creating more value for our customers and for Solvay. Sustainability is central to our business, our ambition and our strategy. Far-reaching sustainability targets, and our Integrated Thinking approach, Sustainable Portfolio Management tool and Solvay Way program embed sustainability in all of our decision-making, from innovation to investment projects. As a result, it is now a key driver of our business growth.

2018

Customers at the heart of our organization & culture

2018 was decisive in simplifying and streamlining our organization and processes to make Solvay more agile, more outward-looking, with a sharper focus on our customers' needs across the Group, from the Board to the shop floor. Solvay builds on its ability to understand its customers and forge long-lasting relationships to co-create innovative solutions that meet their challenges.

We also began an in-depth cultural transformation to support growth and unlock our potential. By introducing new working practices and encouraging three behaviors – I trust, I take smart risks, I focus on customer needs – we aim to take customer-focus and collaboration ever further, empower our people and accelerate innovation in 2019 and beyond. We are seizing the opportunities of digitalization to build on the excellence that has always been one of Solvay's features, enhance employee experience, support us as we transform our culture, and bring innovation to our industrial processes.

Fostering connections and creativity on the new Solvay Brussels headquarters

Innovating, working together, acting sustainably for society, being open and connected with the world - this is the spirit guiding the transformation of Solvay and the reinvention of the 22-hectare site which has housed many of its activities since 1953.

Solvay's ambition is to bring its employees together in one modern building and to turn the site into a buzzing campus that showcases the new Solvay and expresses the Group's humanist vision of science, fosters innovation, attracts talent and makes its people proud.

The site will be dedicated to high-technology innovations in chemistry and advanced materials. From there, Solvay's mission is to grow its own Research & Innovation activities, as well as those with its partners: startups, universities and research institutions creating solutions for a rapidly advancing society.

2019-2021+

Unleashing Solvay's full potential

Today and tomorrow, Solvay is committed to maximizing organic growth. Unflagging customer focus and sustainable innovation will be its dual drivers, supported by our new culture and our committed people. We aim to be the lead provider of sustainable solutions for our customers. We have confirmed our 2025 extra-financial targets. Regarding GHG, we switched to a commitment in absolute terms, aiming at reducing our emissions by 1 million tons.

We are leveraging our key assets:

Innovation

We will innovate faster by embedding new, collaborative ways of working and leveraging internal and external connections. Innovation is a key enabler of customer-intimacy and we will step up collaboration with customers at our 21 major research centers. In Brussels, we have decided to build a unique **Advanced Material Science Applications Center,** where we will co-develop with our customers, designing and testing prototypes, mainly in the aerospace and automotive industries. With 1,000 scientists and engineers, our **new Research & Innovation Center in Lyon** will be world-class and Solvay's largest. Its digital expertise will accelerate and enhance the quality of our research.

We will continue to ensure all our innovation projects meet sustainability targets, leveraging our SPM methodology. We will also champion collaborative innovation to accelerate the transition to a Cicular Economy, an increasingly strategic priority for customers.

Customer-intimacy

We drive customer-intimacy right across the Group, investing in and training our frontline teams, ensuring researchers and marketing colleagues work together to develop solutions that create value for the customer. We are developing feedback programs between our frontline teams and our customers, to drive continuous imrovement, changes in behaviors and differentiation for priority accounts. Our new integrated Excellence Center will also coordinate all our key competencies and support GBUs in getting the best from our assets. Our Sustainable Portfolio Management (SPM) analysis tool allows us to engage with customers on the sustainability profile of value chains, and to initiate discussions on the transition to a Circular Economy.

Talents

We will continue to ensure our talents make the difference to the quality of our projects. We empower them by supporting an entrepreneurial and collaborative mindset. As increasing the diversity of our teams is a priority, we are seeking out the profiles that will continue to drive innovation and building the skills that our growth businesses need. Composed of both change agents and specialists, the Excellence Center will also act as a talent incubator to spread the excellence culture across the Group.

Developing our Talents

May 2018 saw the launch in Europe of a pilot program on entrepreneurial leadership for Solvay's "Leaders of the Future". The pilot, developed in partnership with Ashoka, one of the world's top 10 most influential NGOs, invited five Solvay Talents to work with five Ashoka Fellows Social Entrepreneurs. The Talents said the program helped them to be responsible, effective leaders and create an entrepreneurial mindset. Building on the first pilot, a second one was launched in North America in November 2018 for six Solvay Talents.

LinkedIn Talents Award 2018

Solvay has also been awarded the LinkedIn Talent Awards 2018 - Best Employer Brand in recognition of its communication strategy to attract talents worldwide.

ACCELERATING INNOVATION

The seeds of Solvay's passion for innovation were sown by our founder, Ernest Solvay, and continue to flourish across the Group today. Our customers trust us for our scientific excellence and our extensive, yet balanced, portfolio of technologies. These are just two of the assets that enable us to create and innovate, bringing society sustainable solutions that address the issues of the future, with a focus on internal and external teamwork that facilitates breakthrough innovation.

Dynamic innovation portfolio management

A healthy innovation pipeline is a priority for Solvay and we use verifiable data to assess all projects on sustainability, probability of success, value and availability of internal resources. That means our innovations are aligned with market needs from Proof of Concept on.

We use our Sustainable Portfolio Management (SPM) tool to carry out a full analysis of all R&I projects at every one of their key stages. That ensures we select only those that offer proven sustainability.

2,200

Employees

€352 M

R&I effort

More than

75%

Expected revenue of the R&I pipeline that should come from "Sustainable Solutions"

19%

New sales ratio*

*% of products/applications < 5 years

264

Patent applications

1,500

Intellectual Property agreements with customers and academic bodies

"We have decided to put in place a process to enhance our ability to deliver breakthrough innovation, focusing on exploring new territories in clean mobility and resource efficiency to create options for future growth, being jointly governed by R&I and businesses."

NICOLAS CUDRÉ-MAUROUX
Group General Manager
Research & Innovation

Teaming up for innovation

We champion collaboration. The increasing complexity of technologies means we can no longer innovate alone. Collaboration is key to innovation at Solvay, within our teams and beyond. We encourage our teams to work together across entities, sharing best practices to build synergies. We undertake open innovation projects in cooperation with external research institutes and academia, startups or customers.

Investment in or close collaboration with startups allows Solvay to widen its portfolio and accelerates its solution delivery. In some cases, external teams take novel technologies right through to late-stage development, allowing us to focus our expertise on swiftly finalizing development and bringing the solution to market. Our recent investment in Solid Power (USA), a leader in solid-state battery, and NOHMs Technologies (USA), a provider of solutions for safer batteries, are examples of this approach focused on electrical vehicles.

€80 M

Allocated to evergreen funds and startups

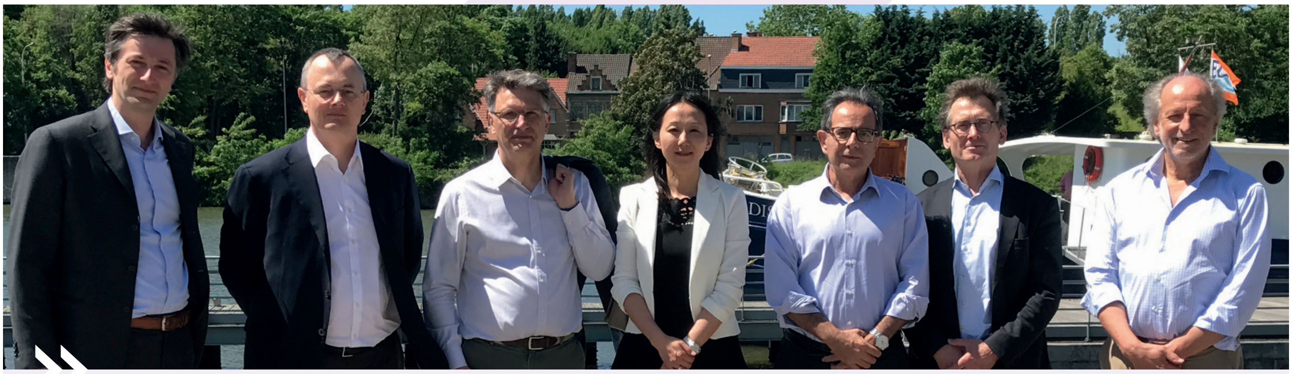
Teaming up with EPFL on an atomic-scale modeling project

Solvay and the Ecole polytechnique fédérale de Lausanne (EPFL) are partnering to use atomic-scale modeling to increase understanding of key chemical reactions and optimize the properties of the composites involved. For EPFL, pooling expertise in chemistry, quantum modeling and machine learning, makes it possible to study complex chemical reactions from a whole new angle, while for Solvay, modeling helps both identify the best potential composites and manage costs. *"Innovation is about more than transferring technology from laboratory to industry and can be enhanced by bringing the challenges of industry into the equation,"* says Marc Gruber, Vice President for Innovation at EPFL. Other projects are likely to follow.

We get closer to our customers. Solvay's researchers work closely with their marketing colleagues to sharpen their understanding of customer needs and so develop solutions that feature the expected functionalities.

We empower our teams and foster diversity. Successful innovation also depends on motivated and diverse teams. As well as pure chemists, Solvay's research teams feature physicists and mathematicians, for example, because scientists with different profiles take different pathways to new ideas. And we empower our R&I teams to take an entrepreneurial approach, encouraging scientists to undertake short term missions that enhance their work and share their expertise across entities and geographies.

We leverage digital. Digital technologies are also key to developing better, faster industrial processes. Artificial intelligence, machine learning or molecular modelling enhance processes and so both improve productivity, safety, cost efficiency and return on capital, and reduce CO_2 and resource consumption. To support our efforts in molecular modelling, we have decided to set up new teams of developers hosted with our chemists in our R&I centers. We are using molecular modeling, for example, to speed up the design of new supramolecular polymers for advanced materials.



Networking at the highest level

Solvay's internal network of Fellows scientists is a vehicle for sharing technologies, best practices, recruitment, and contacts. *"My primary role as a Fellow is to develop competencies and technology platforms to support the development of products that meet the future needs of our customers",* say Rob Maskell, Solvay's R&I Fellows Network expert in molecular structure. After a year as a Fellow, he acknowledges he has a much better understanding of the underlying science and technology at a fundamental level available within Solvay as a whole. The Solvay Fellows are all world-renowned external scientific experts who challenge Solvay's research directions and connect the Group with high-potential external partners.

Extending this networking policy at the highest level, Solvay's Science Advisory Board is another team of world-renowned external scientific experts, including Pr. Ben Feringa (University of Groeningen, Netherlands), Nobel Prize in Chemistry 2016, Pr. Avelino Corma (University of Valencia, Spain), Pr. Zhenan Bao (Stanford University, USA) and Pr. Juan J. de Pablo (University of Chicago, USA). Their key mission is also to challenge Solvay's long-range research directions and to help us detect new challenges or breakthrough opportunities in the chemistry of the future.

MANAGEMENT REPORT

Solvay Management Report presents the Group's social, environmental and financial performance in 2018, as well as its achievements in terms of governance.

MANAGEMENT REPORT

CORPORATE GOVERNANCE STATEMENT

2

Corporate Governance Statement

1. Introduction

Solvay SA – headquartered in Belgium – is committed to the highest governance principles and seeks to consistently enhance corporate governance performance, emphasizing transparency and promoting a sustainable culture of long-term value creation.

Solvay's governance bodies are responsible for the Group's long-term approach, pursuing the vision of Solvay's founder, and implementing the Group's strategy. The Board of Directors is entrusted with steering Solvay's development strategy while advising the Executive Committee, which oversees its business operations.

This Corporate Governance Statement applies the recommendations of the 2009 Belgian Corporate Governance Code's "comply or explain" principle. It includes information on Solvay's share capital, shareholders and investor relations, governance bodies, Compensation report, risk and internal control, and external auditor.

The Board of Directors of Solvay adopted a Corporate Governance Charter (the "Charter") on December 13, 2016. The Charter is available on Solvay's website and describes the main aspects of the Solvay Group's corporate governance, including its governance structure and the internal rules of the Board of Directors, the Executive Committee, and other committees set up by the Board of Directors.

In accordance with this principle, none of the rules described in this Corporate Governance Statement depart from the 2009 Belgian Corporate Governance Code.

2. Capital, Shares and Shareholders

2.1. Capital

Solvay's capital amounts to €1,588,146,240 and comprises 105,876,416 issued shares. No changes were made to the Company's capital in 2018.

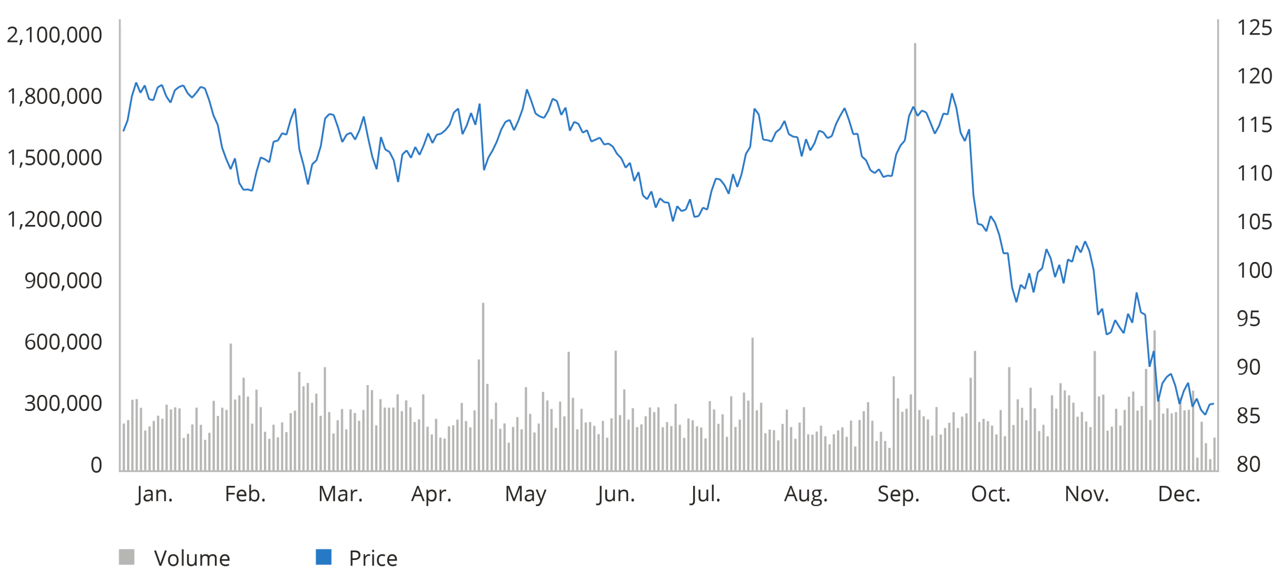
2.2. Solvay Shares

Solvay (SOLB.BE) is listed on Euronext Brussels, its primary listing stock exchange. Solvay has a secondary listing on Euronext Paris. Solvay shares are also traded over the counter (OTC) as a Level 1 sponsored American Depository Receipt (ADR) through Citibank, as of October 1, 2016.

Solvay's stock is a constituent of the BEL20, the main Belgian index. In September 14, 2018 it became part of the Next20 index following the exit from the CAC40 index. The Group is still considered to be the largest (specialty) chemicals company on the Paris stock exchange. Solvay shares are part of other major indexes including the BEL Chemicals, STOXX family (DJ STOXX and DJ Euro STOXX), MSCI index, Euronext 100, Dow Jones Sustainability TM World Index, and FTSE4Good Index.

During 2018, the average share price was €110.07 while the 52-week range was €85.44 – €120.65 per share. Average daily trading volume as reported by Euronext was 277,313 shares in 2018, compared to 245,621 shares in 2017.

Solvay share prices and trading volumes from January 1, 2018 to December 31, 2018

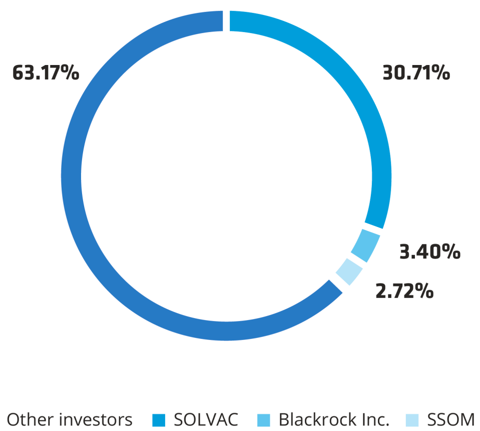


2.3. Shareholders

2.3.1. Shareholder Structure

The chart below represents Solvay's shareholder structure as of December 31, 2018, based on the notifications made by its shareholders. These transparency notifications are required by Belgian law or pursuant to Solvay's bylaws, when the shareholding crosses the thresholds of 3%, 7.5% or any multiple of 5%.

Shareholder structure



Solvay received the following declarations in 2018:

- Solvac SA gave notice that it held 30.71% of Solvay's share capital on December 31, 2018;
- Solvay Stock Option Management SPRL notified Solvay, through Solvac SA, that its shareholding amounted to 2.72% on December 31, 2018;
- Blackrock Inc., an institutional investor, gave notice on October 2, 2018, that it holds a 3.40% interest.

The remaining shares for approximately 63% are thereby held by institutional and retail shareholders, with an individual shareholding not exceeding 3%.

At the Ordinary Shareholders' Meeting held on Tuesday, May 8, 2018, shares were deposited and votes casted in respect of 63.94% of Solvay SA's capital.

Solvac

Solvay's major shareholder is Solvac SA, which holds more than 30% of Solvay's share capital. Solvac SA is a public limited liability company established under Belgian law, founded in 1983. Its assets consist exclusively of the Solvay shares, thereby contributing to the anchorage of Solvay.

Solvac's CEO, Bernard de Laguiche, is a non-independent and non-executive director on Solvay's Board of Directors.

Solvac's shares are traded on Euronext Brussels. It has approximately 14,000 shareholders. Among them, more than 2,300 persons are related to the founding families of Solvay, which combined hold approximately 77% of the Solvac shares.

Solvay Stock Option Management

Solvay Stock Option Management SPRL, is an indirect subsidiary of Solvay, and hold 2.72% of Solvay's capital through shares and purchase options combined. These are held as part of the Group's strategy to hedge the risk linked to stock options granted by Solvay to senior executives of the Group.

2.4. Relations with investors and analysts

Solvay facilitates an open dialog with the investment community to build long-term relationships. Following the guidelines issued by the FSMA (Belgian Financial Services and Markets Authority) it complies with disclosure obligations defined by Belgian law and contained in the Market Abuse Regulation (MAR).

Solvay provides accurate information in a transparent, timely, and meaningful manner to help the investment community understand Solvay's business and strategy, leading to a fair valuation by the market. Extensive information about Solvay's business operations, strategy, and financial performance may be found in a wide variety of regulatory and other publications, such as the Annual Integrated report, financial reports and press releases, as well as on the company's website (www.solvay.com). The website was fully revamped in 2018.

The investor relations team is readily accessible by the investment community via email or phone throughout the year. Executive Committee members and the investor relations team also directly interact with various members of the investment community throughout the year via roadshows and investor conferences.

During our last Investor Update in September, the Executive Committee members communicated the updated Solvay portfolio and illustrated the key markets and main levers that will enable the Group to deliver superior and sustainable value growth.

2.4.1. Interactions with Solvac and Solvay founding families

Solvay has regular meetings with its major shareholder Solvac. It presents to the Solvac Board and participates to events organized by the founding family shareholders. All these interactions are based on public information and new presentation material is shared on Solvay's website.

In 2018 Solvay management representatives participated at three Solvac board meetings and participated to five events organized by Solvay's founding families.

2.4.2. Interactions with institutional investors

Solvay undertakes specific actions to interact with institutional investors. Roadshows are organized with Executive Committee members and investor relations representatives. They attend investor conferences around the world. The resulting face-to-face interactions enable dialog with the investment community on Solvay's strategy and business performance.

In 2018, Solvay participated in 59 events (among which 26 interactions with Executive Committee members), including roadshows and conferences in 18 countries across Europe, America and Asia, as well as reverse roadshows at Solvay's offices. This resulted in 80 individual meetings. Solvay also hosted a site visit to its research center in Shanghai, China.

2.4.3. Interactions with sell-side analysts

Solvay is covered by 20 sell-side analysts who publish active research on the stock. The up-to-date list of covering analysts can be found on Solvay's website. The sell-side analysts are an essential tool in communicating the information on Solvay to the investor community.

Besides the regular individual meetings, emails, phone contacts, Solvay organizes quarterly conference calls between Executive Committee members and the sell-side analysts base following the Group's results publication. Although specifically geared to analysts, these conference calls are accessible live to all investors and available through replay or transcript on Solvay's website afterwards. Twice a year, following full and half year results, Solvay also sets up face-to-face meetings in London and Brussels.

2.4.4. Interactions with individual investors

Every shareholder has access to clear, comprehensive, transparent information tailored to his or her individual needs through Solvay's Investors' Club, or through direct contacts with the investor relations team. In addition, Solvay's Registered Share Management Service (shareholders@solvay.com) responds to all queries and requests for information and services. In 2018 Solvay participated in two investor events in Belgium (in Brussels and Antwerp).

Solvay also engages with private banks, regularly interacting with their analysts and occasionally participates in their events.

3. Board of Directors and Board Committees

The Charter defines the role and mission, functioning, size, composition, training, and evaluation of the Board of Directors. The internal rules of the Board of Directors are attached to the Charter.

3.1. Board of Directors

3.1.1. Structure and composition

As at December 31, 2018, the Board was composed of 16 Directors:

- 15 of the 16 directors on the Board are non-executive;
- 12 of the 16 directors have been recognized as independent by the Ordinary Shareholders' Meeting, according to the criteria defined by the Belgian law and further refined by the Board of Directors;
- Directors represent seven different nationalities; and
- 37.5% are women.

Board meeting attendance is high: 96.87 %

- The mandates of Ms. Rosemary Thorne and Mr. Gilles Michel were renewed for a four-year term at the Ordinary Shareholders' Meeting of May 8, 2018. These mandates will expire at the end of the Ordinary Shareholders' Meeting to be held in May 2022;
- Mr. Denis Solvay and Mr. Bernhard Scheuble left the Board at the Ordinary Shareholders' Meeting of May 8, 2018, and have been replaced by respectively Mr. Philippe Tournay and Mr. Matti Lievonen, who were appointed as Board members for a four-year term;
- Their mandate will expire at the end of the Ordinary Shareholders' Meeting to be held in May 2022;
- The Board of Directors has appointed Ms. Ilham Kadri as Board member in replacement of Mr. Jean-Pierre Clamadieu, who has announced he will step down on March 1, 2019. Ms. Ilham Kadri will complete the mandate of Mr. Jean-Pierre Clamadieu according to article 16 of the Solvay By Law until the Ordinary Shareholders' Meeting of 2021.

At the end of the Ordinary Shareholders' Meeting of Tuesday, May 14, 2019, the following mandates will expire:

- Mr. Yves-Thibault de Silguy will leave the Board, as he has reached the age limit;
- Mr. Charles Casimir-Lambert; and
- Ms. Marjan Oudeman.

At the same Ordinary Shareholders' Meeting of Tuesday May 14, 2019, it will be proposed:

- To renew the mandates of Mr. Charles Casimir-Lambert and Ms. Marjan Oudeman for a new term of four years;
- Not to replace Mr. Yves-Thibault de Silguy and to change the composition of the Board from 16 to 15 members; and
- To confirm the appointment of Ms. Ilham Kadri as Director in replacement of Mr. Jean-Pierre Clamadieu. She will complete Jean-Pierre Clamadieu's mandate according to article 16 of the Solvay Bylaws. Her mandate will end at the Shareholders' Meeting of May 2021.

Year of first appointment   Presence at Board meetings in 2018

Nicolas Boël
Belgian
Non independent Director
1998 10/10

Born in: 1962

Solvay SA mandates: Chairman of the Board of Directors, Chairman of the Finance Committee and Chairman of the Compensation Committee, Member of the Nomination Committee

Directorship expiry date: 2021

Diplomas: MA in Economics (Université catholique de Louvain, Belgium), Master of Business Administration (College of William and Mary, Virginia, US)
Activities outside Solvay: Director of Sofina

Year of first appointment | Presence at Board meetings in 2018

Jean-Pierre Clamadieu(1)
French
Non independent Director
2012 | 9/10

Born in: 1958

Solvay SA mandates: Chairman of the Executive Committee and CEO, Director and Member of the Finance Committee

Directorship expiry date: 2019

Diplomas: Engineering degree from the École des Mines (Paris, France).
Activities outside Solvay: Director of Axa, Airbus. Chairman of Cytec Industries Inc., Chairman of Engie SA, Chairman of the Opéra de Paris

Bernard de Laguiche
French/Brazilian
Non independent Director
2006 | 10/10

Born in: 1959

Solvay SA mandates: Member of the Executive Committee until September 30, 2013, Director, Member of the Finance Committee and Member of the Audit Committee since May 13, 2014

Directorship expiry date: 2021

Diplomas: MA in Economics and Business Administration, HSG (Universität St. Gallen, Switzerland). MBA in Agribusiness, University of São Paulo (USP ESALQ)
Activities outside Solvay: Managing Director of Solvac SA, Chairman of the Board of Peroxidos do Brazil Ltda, Curitiba (Brazil), Board member of Le Pain Quotidien Brasil Ltda, Sao Paulo and Luxembourg, Founder and President of Grupo Ortus SA, Curitiba (Brasil), President of Agro Mercantil Vila Rica Ltda, Parana (Brazil).

Jean-Marie Solvay
Belgian
Non independent Director
1991 | 10/10

Born in: 1956

Solvay SA mandates: Director, Member of the Innovation Board, Member of the Compensation and Nomination Committees since March 2018

Directorship expiry date: 2020

Diplomas: Advanced Management Programme – Insead.
Activities outside Solvay: Chairman of the Board of the International Solvay Institutes. Member of the Board of the Innovation Fund, Brussels. CEO of Albrecht RE Immobilien GmbH & Co. KG., Berlin (Germany)

(1) Employed full time by the Solvay Group.

Year of first appointment | Presence at Board meetings in 2018

Denis Solvay
Belgian
Non independent Director
1997
3/4
Left the Board at the AGM of May 8, 2018

Born in: 1957

Solvay SA mandates: Director, Member of the Compensation and Nomination Committees

Directorship expiry date: 2018

Diplomas: Business engineering – Solvay Business School (Université Libre de Bruxelles, Belgium).
Activities outside Solvay: Abelag Holding, SA. Voluntary Director of the Healthcare Institute ANBCT and Queen Elisabeth Music Chapel

Prof. Dr. Bernhard Scheuble
German
Independent Director
2006
4/4
Left the Board at the AGM of May 8, 2018

Born in: 1953

Solvay SA mandates: Independent Director, Chairman of the Audit Committee

Directorship expiry date: 2018

Diplomas: MSc, Nuclear Physics & PhD, Display Physics (Albert-Ludwigs-Universität Freiburg, Germany).
Activities outside Solvay: Former Chairman of the Executive Committee of Merck KGaA, (Darmstadt, Germany) and former member of the E. Merck OHG Board of Directors

Charles Casimir-Lambert
Belgian
Independent Director
2007 10/10

Born in: 1967

Solvay SA mandates: Independent Director, Member of the Audit Committee

Directorship expiry date: 2019

Diplomas: MBA Columbia Business School (New York, USA)/London Business School (London, UK), Master's degree (lic.oec.HSG) in Economics, Management and Finance (Universität St. Gallen, Switzerland).
Activities outside Solvay: Management of family's global interests.

Year of first appointment   Presence at Board meetings in 2018

Hervé Coppens d'Eeckenbrugge
Belgian
Independent Director
2009 9/10

Born in: 1957

Solvay SA mandates: Independent Director, Member of the Finance and Audit Committees

Directorship expiry date: 2021

Diplomas: MA in Law from the Université catholique de Louvain (Belgium), Diploma in Economics and Business, ICHEC (Belgium)
Activities outside Solvay: Until June 30, 2013 Group Director Petercam SA, Director of Vital Renewable Energy Company LLC (Delaware), Independent Director, VISONARITY AG (Basel, Switzerland) until April 2018.

Yves-Thibault de Silguy
French
Independent Director
2010 10/10

Born in: 1948

Solvay SA mandates: Independent Director, Member of the Compensation Committee and Chairman of the Nomination Committee, Member of the Finance Committee

Directorship expiry date: 2019

Diplomas: MA in Law from the Université de Rennes (France), DES in public law from Université de Paris I (France), graduate of the Institut d'Études Politiques de Paris and the École Nationale d'Administration (France)
Activities outside Solvay: Former European Commissionner of the Economics, Monetary and Financial Affairs (1995-1999), Director and Vice-Chairman of the Board of the Vinci Group, Director of LVMH, Chairman of the Supervisory Board of Sofisport (France), Director of VTB bank (Moscow, Russia), and Chairman of YTSeuropaconsultants

Evelyn du Monceau
Belgian
Independent Director
2010 10/10

Born in: 1950

Solvay SA mandates: Independent Director, Member of the Compensation and Nomination Committees

Directorship expiry date: 2021

Diplomas: MA in Applied Economics from the Université catholique de Louvain (Belgium).
Activities outside Solvay: Chair of the Board and Chair of the Governance Nomination and Compensation Committees of UCB SA, Member of the Board of Directors of La Financière de Tubize SA, Member of the Corporate Governance Commission.

Year of first appointment   Presence at Board meetings in 2018

Françoise de Viron
Belgian
Independent Director
2013 9/10

Born in: 1955

Solvay SA mandates: Independent Director, Member of the Compensation and Nomination Committees

Directorship expiry date: 2021

Diplomas: Doctorate of Science (Université catholique de Louvain, Belgium). Master in Sociology (Université catholique de Louvain, Belgium)
Activities outside Solvay: Professor at the Faculty of Psychology and Education Sciences and Louvain School of Management (Université catholique de Louvain, Belgium), Academic Member for Center in Research Entrepreneurial Change and Innovative Strategies, and of the Interdisciplinary Group for Research in Socialization, Education and Training, of the Interdisciplinary Research Group in Adult Education at the Université Catholique de Louvain (Belgium). Chairman and Director of AISBL EUCEN – the European Universities Continuing Education network.

Amparo Moraleda Martinez
Spanish
Independent Director
2013 10/10

Born in: 1964

Solvay SA mandates: Independent Director, Member of the Compensation and Nomination Committees

Directorship expiry date: 2021

Diplomas: Degree in Industrial Engineering, ICAI (Universidad Pontifica Comillas, Spain) PDG, IESE Business School (Universidad de Navarra, Spain).
Activities outside Solvay: Former General Manager of IBM Spain, Portugal, Greece, Israel and Turkey Former Chief Operating Officer, International Division (Spain) and Acting CEO, Scottish Power (UK) part of Iberdrola Group. Member of the Boards of the following listed companies: Airbus SE (The Netherlands), Faurecia (until oct.2017) (France), Caixabank SA (Spain), Vodafone plc (UK) .Member of the Consejo rector of Consejo Superior of Investigaciones Cientificas. Member of the Spanish Royal Academy of Economics and Financial Sciences

Rosemary Thorne
British
Independent Director
2014 10/10

Born in: 1952

Solvay SA mandates: Independent Director, Member of the Audit Committee (Chairman since May 2018)

Directorship expiry date: 2022

Diplomas: Honours Degree in Mathematics and Economics from the University of Warwick (UK). Fellow of the Chartered Institute of Management Accountants FCMA and CGMA. Fellow of the Association of Corporate Treasurers FCT.
Activities outside Solvay: Former Chief Financial Officer of J. Sainsbury, Bradford & Bingley, and Ladbrokes (UK). Member of the Board and Chair of Audit Committee of Merrill Lynch International (UK). Former Independent Director of Royal Mail Group, Cadbury Schweppes, Santander UK, First Global Trust Bank (UK) and Smurfit Kappa Group (Ireland).

Year of first appointment | Presence at Board meetings in 2018

Gilles Michel
French
Independent Director
2014 | 9/10

Born in: 1956

Solvay SA mandates: Independent Director, Member of the Finance Committee, Member of the Compensation and Nomination Committees since March 2018

Directorship expiry date: 2022

Diplomas: École Polytechnique (France). École Nationale de la Statistique et de l'Administration Économique (ENSAE) (France). Institut d'Études Politiques (IEP).
Activities outside Solvay: Former CEO Ceramics & Plastics, Saint-Gobain, France. Former member of the Management Board, PSA, France. Former CEO, Fonds stratégique d'Investissement (FSI), France. Former Chairman & CEO, Imerys, France (listed) ; non executive Chairman of the Board. Independent Director IB , Valeo : Independent Director.

Marjan Oudeman
Dutch
Independent Director
2015 | 10/10

Born in: 1958

Solvay SA mandates: Independent Director, Member of the Audit Committee since May 12, 2015

Directorship expiry date: 2019

Diplomas: Law degree, Rijksuniversiteit Groningen (the Netherlands). Masters Degree in Business Administration, Simon E. Business School, University of Rochester (New York, USA), and Erasmus Universiteit Rotterdam (the Netherlands).
Activities outside Solvay: Former member of the Board of Exco, Tata Steel and Akzo Nobel. Former executive President of Utrecht University. Former member of the Board of Statoil ASA (now known as Equinor ASA), ABN Amro, Chairman of the Board of Ronald McDonald Children's Fund. Member of the Supervisory Board of the Rijksmuseum, the Netherlands. Member of the Supervisory Board of Aalberts Industries NV and SHV Holding NV. Board member of UPM-Kymmene Corporation and PJSC Novolipetsk steel.

Agnès Lemarchand
French
Independent Director
2017 | 10/10

Born in: 1954

Solvay SA mandates: Independent Director, Member of the Audit Committee

Directorship expiry date: 2021

Diplomas: Ecole Nationale Supérieure de Chimie de Paris (France), Chemical engineering degree from MIT (Boston, US), MBA degree from INSEAD.
Activities outside Solvay: Former CEO IBFbiotechnics, Rhône-Poulenc (France). Former CEO Prodical, Ciments-Français, (France). Former CEO Lime Division, Lafarge (France). Former Executive Chairman of Steetley Dolomite Ltd (UK). Independent Director of the following listed companies : CGG Veritas (until Oct 2017) (USA/France), Compagnie de Saint-Gobain (France), BioMérieux (France).

Year of first appointment   Presence at Board meetings in 2018

Matti Lievonen
Finnish
Independent Director
2017 5/6

Born in: 1958

Solvay SA mandates: Independent Director

Directorship expiry date: 2022

Diplomas: BscEng, Electrical Engineering, Kuopio Institute of Technology, Finland eMBA, Helsinki University of Technology, Finland
Activities outside Solvay: Neste Corporation, Chairman & CEO until 1st november 2018 , CET member (Finland), Chairman of the Board of Fortum Board, SSAB, Board Member, Vice Chairman (Sweden) until 2018,Member of the Board of Nynäs AB, Ilmarinen, Supervisory Board Member (Finland), HE Finnish Fair Foundation, Member of the Board

Philippe Tournay
Belgian
Independent Director
2017 6/6

Born in: 1959

Solvay SA mandates: Independent Director

Directorship expiry date: 2022

Diploma: MA in economics LSM-UCL (Université Catholique de Louvain,Belgium)
Activities outside Solvay: Presa SA Owner & Managing Director (since 2003), Fondation Tournay Solvay, Vice Chairman (since 2007)

3.1.2. Functioning of the Board of Directors

In 2018, the Board held eight meetings. Each director's attendance is shown in the table in section 3.1.1. Structure and composition.

The Board of Directors' discussions, reviews, and decisions focused on the annual review of Group strategy, strategic projects (acquisitions, divestments, capital expenditures, etc.), quarterly financial reporting, approving quarterly financial statements and proposing a dividend to the AGM, Board Committees reports, corporate social responsibility and sustainability policy, risk management, compensation policy and the long-term incentive plan, Board and management succession planning, intragroup restructuring, and the reports and resolution proposals to the General Meeting.

In particular, the year 2018 was marked by the management succession process initiated by the Board of Directors and led by the Nomination Committee, with strong external support. A sub-committee called the "Search Committee" was established to be in charge of the day-to-day process. The sub-committee comprised of 3 members. The rigourous assessment, development and selection process involved:

- Definition of the CEO profile and skills based on the Group strategy and future challenges;
- Identification of internal and external candidates;
- External assessment of all candidates;
- Multiple interactions with the Board of Directors; and
- A unanimous decision by the Board of Directors and announcement on October 9 of the new CEO, Ms. Ilham Kadri. In reaching its decision, the Board considered Ms. Ilham Kadri to be the ideal candidate in light of her knowledge of Solvay's srategic markets, strong customer-focused mindset, her capacities to build a galvanizing vision to accelerate Solvay's cultural transformation and unleash its growht potential.

There were no transactions or contractual relationships in 2018 between the Group and its Board members giving rise to conflicts of interest.

3.1.3. Evaluation

In 2016, the Board of Directors hired an independent third party to conduct an evaluation and advise it on how it can better follow best practices. Evaluations of this kind are made every two to three years and focus primarily on Board composition, how it functions, disclosures and interactions with executive management, and the composition and functioning of the Committees it creates. Board members were invited to provide input on these points during questionnaire-based interviews by an external consultant (Spencer Stuart).

In light of the focus on succession planning during 2018 and the appointment of a new CEO, the Nomination Committee considered it important to start the Board performance evaluation process in early 2019. Key areas for improvement identified and the progress that has been observed will be presented in next year's report.

As announced, the Board of Directors launched the following evaluation process at the end of 2018.

3.1.4. Training

In 2018, a number of key executives made presentations to the Board on strategy, business and functional topics, making sure the Board stays familiar with and informed on topics that are relevant and important for the Group, even though they do not require immediate decisions.

The Board of Directors visited the industrial and research sites at: Tavaux and Research and Innovation Center Lyon (France). This trip gave the Board members the opportunity to meet local operational teams and come face to face with the reality of the sites' business and industrial conditions.

Every year the Board dedicated a specific session to an update on trends in global sustainable development issues (including climate change risks and opportunities) that impact the Group, its actions, and its performance – including progress on Solvay's five priorities, ratings by sustainable rating agencies, the Solvay Way, and the Integrated Report. This year the session focused on the changing context of sustainability (IPCC Report 2018 and the Science Based Target Initiatives).

The Board of Directors specifically endorsed the new objective for absolute reduction of greenhouse gas emissions (1 MT by 2025 compared to 2017 at constant scope). It was also kept up to date with a review of priorities for 2019, including the deployment of the Group's Climate Plan, the launch of circular economy projects, and the deployment of Solvay Way 3.0.

3.2. Board committees

The Board of Directors has set up the following permanent Committees: Audit Committee, Finance Committee, Compensation Committee, and Nominations Committee.

The terms of all the various Committee members expired on May 8, 2018.

The Board reviewed in 2018 the composition and renewed the terms of the various Committees for a two-year period starting on May 8, 2018, and ending on the date of the Ordinary Shareholders' Meeting in 2020.

As of December 31, 2018, the composition of the four Board committees 2018 was as follows:

	Independent Director	Audit Committee	Finance Committee	Compensation Committee	Nominations Committee
Mr. Nicolas Boël			Chairman	Chairman	Member
Mr. Jean-Pierre Clamadieu			Member		
Mr. Bernard de Laguiche		Member	Member		
Mr. Denis Solvay				Member(3)	Member(3)
Mr. Jean-Marie Solvay				Member(3)	Member(3)
Prof. Dr. Bernhard Scheuble	x	Chairman(6)			
Mr. Charles Casimir Lambert	x	Member			
Mr. Hervé Coppens d'Eeckenbrugge	x	Member	Member		
Mr. Yves-Thibault de Silguy	x		Member	Member	Chairman(7)
Ms. Evelyn du Monceau	x			Member	Member
Ms. Françoise de Viron	x			Member	Member
Ms. Amparo Moraleda Martinez	x			Member	Member(7)
Ms. Rosemary Thorne	x	Chairman(2)			
Mr. Gilles Michel	x		Member(4)	Member(4)	Member(4)
Ms. Marjan Oudeman	x	Member			
Ms Agnès Lemarchand	x	Member(5)			
Mr. Matti Lievonen	x		Member(1)		

(1) from Feb 2019
(2) since May 2018
(3) Denis Solvay until March 22, 2018 and replaced by Jean-Marie Solvay at same date
(4) Member of the Finance Committe from May 2018, Member of Compensation and Nomination Committees from March 22, 2018
(5) from May 2018
(6) until May 2018
(7) will be replaced as Chairman by A. Moraleda at the AGM of May 2019

The composition, role, responsibilities, and procedures of these four Board Committees are described in the internal rules described in the Governance Charter.

3.2.1. The Audit Committee

Composition:

- All members are non-executive directors, a majority of whom are independent;
- The members must fulfill the competency criterion by virtue of the training and the experience they gained in previous functions (see section 3.1.1. regarding the composition of the Board of Directors);
- The secretary is a member of the Group's internal legal department.

Meetings:

- Six in 2018, including four before the Board meetings scheduled to consider the publication of periodic results (quarterly, semiannual and annual);
- Meeting attendance was 94.4%.

Activities:

- Review and consider reports from the Chief Financial Officer, the head of the Group Internal Audit, and the auditor in charge of the external audit (Deloitte, represented by Mr. Michel Denayer);
- During the period under review, the Audit Committee reviewed the independence and effectiveness of the external auditor, Deloitte. Considering the recent audit partner rotation as well as evaluating the proposals brought forward to the Audit Committee, the Board, upon the recommendation from the Audit Committee is recommending that Deloitte's mandate be renewed for another year at the General Shareholders' Meeting of 2019;
- Examine the quarterly report by the Group General Counsel on significant ongoing legal disputes and reports on tax and intellectual property disputes;
- Meet with the auditor in charge of the external audit whenever such a meeting is deemed useful;
- Meet once a year with the Chairman of the Executive Committee and CEO (Mr. Jean-Pierre Clamadieu); all other Board members are invited on that occasion to discuss the major risks facing the Group;
- Monitor and assess risk exposure as well as the effectiveness of internal controls and mitigation plans.

3.2.2. The Finance Committee

Composition:

- Six members;
- Mr. Karim Hajjar (Executive Committee member and CFO) is invited to attend the Finance Committee meetings;
- The Secretary is Mr. Michel Defourny, Group Corporate Secretary.

Meetings:

- This Committee met four times in 2018;
- Meeting attendance was 100%.

Activities:

- Gives an opinion on financial matters such as the amounts of the interim and final dividends, the levels conditions and currencies of indebtedness, monitoring the credit strength of the Group's balance sheet, hedging foreign exchange and risks, the hedging policy for the long-term incentive plans, the content of financial communication, and financing major investments;
- Finalizes the preparation of the press releases announcing results;
- When called upon, it gives opinions on Board policies on the above matters;
- Makes all recommendations to the Board of Directors.

3.2.3. The Compensation Committee

Composition:

- The majority of members are non-executive independent directors;
- The Compensation Committee has the expertise necessary to perform its mission;
- The Chairman of the Executive Committee is invited to each meeting, except in the case of matters that concern him personally;
- The Secretary is Mr. Michel Defourny, Group Corporate Secretary.

Meetings:

- Meetings are prepared by the Group General Manager Human Resources, who attends the meetings;
- Three meetings were held in 2018;
- Meeting attendance was 100 %.

Activities:

The Compensation Committee fulfills the duties imposed on it by Article 526 quarter section 5 of the Companies Code. It advises the Board of Directors on:

- The Company's compensation policy and principles;
- The compensation levels for members of the Board of Directors and the Executive Committee;
- The Chairman of the Executive Committee's compensation, short-term incentives and long-term incentives, and performance assessment;
- The determination of the new CEO's compensation package, including short-and-long term incentives;
- The allocation of long-term incentives (performance share units and stock options) to the Company's senior management.

It prepares the annual compensation report for the Corporate Governance Statement and receives a yearly report about the compensation of General Management.

3.2.4. The Nominations Committee

Composition:

- The majority of members are non-executive independent directors;
- The Chairman of the Executive Committee is invited to meetings, except in the case of matters that concern him personally;
- The Secretary is Mr. Michel Defourny, Group Corporate Secretary.

Meetings:

- Seven meetings were held in 2018;
- Meeting attendance was 94.7%.

Activities:

The Nomination Committee gives its opinion on appointments to the Board of Directors (chairman, new members, renewals, and committees), to Executive Committee positions (chairmanship and members), and to general management positions.

In 2018, the Nomination Committee focused its activity on the CEO succession process with the help of a specialized external international consultant. The board decided to set up an ad hoc committee called the "Search Committee" (3 members), in charge of the day-to-day process (14 meetings, 100% attendance). In addition, the Nomination Committee reviewed the current composition of the Board, keeping in mind the overall tenure as well as the skills required on the Board to drive Solvay's long-term strategy. To this end, the Nomination Committee considered that the current composition of the Board was sufficiently refreshed over the recent years through the addition of new Board members with skills relevant for Solvay.

The process involved:

- Definition of the CEO profile based on Group strategy and future challenges;
- Identification of internal and external candidates;
- External assessment of all candidates;
- Multiple interactions with the Board of Directors; and
- A decision by the Board of Directors and announcement of the new CEO on October 9.

4. Executive Committee

The role, responsibilities, composition, procedures and evaluation of the Executive Committee are described in detail in the Charter. In addition, the internal rules of the Executive Committee are attached to the Charter.

As at December 31, 2018, the Executive Committee was composed of the following seven members.

Year of first appointment   Presence at meetings in 2018

Jean-Pierre Clamadieu
French
2011 13/13

Born in: 1958

Term of office ends: 2019

Diplomas and main Solvay activities: Engineering degree from the École des Mines (Paris, France). Chairman of the Executive Committee and CEO.

Vincent De Cuyper
Belgian
2006 13/13

Born in: 1961

Term of office ends: 2020

Diplomas and main Solvay activities: Chemical engineering degree (Catholic University of Louvain, Master's in Industrial Management (Catholic University of Leuven), AMP Harvard Executive Committee member.

Karim Hajjar
British
2013 13/13

Born in: 1963

Term of office ends: 2019

Diplomas and main Solvay activities: BSC (Hons) Economics (The City University, London). Chartered Accountancy (ICAEW) Qualification. Executive Committee member and CFO.

Year of first appointment   Presence at meetings in 2018

Roger Kearns
American
2008 05/05

Born in: 1963

Term of office ends: 2018

Leaves the Group in March 2018

Diplomas and main Solvay activities: Bachelor of Science – Engineering Arts (Georgetown College, Georgetown), Bachelor of Science – Technology, Atlanta, MBA (Stanford University). Executive Committee member.

Pascal Juéry
French
2014 13/13

Born in: 1965

Term of office ends: 2020

Diplomas and main Solvay activities: Graduate of the European Business School of Paris (ESCP, Europe). Executive Committee member.

Hua Du
Chinese
2018 9/9

Born in: 1969

Term of office ends: 2020

Diplomas and main Solvay activities: BS Chemistry (Being University) PhD. Organic Chemistry (University of Illinois, Urbana-Champaign), Comex member.

Cécile Tandeau de Marsac
French
2018 9/9

Born in: 1963

Term of office ends: 2020

Diplomas and main Solvay activities: Master Degree in Economics & Business Administration, Graduate from Management and Business School of Rouen, Group General Manager of Human Resources, Comex member.

Year of first appointment   Presence at meetings in 2018

Augusto Di Donfrancesco
Italian
2018 9/9

Born in: 1959

Term of office ends: 2020

Diplomas and main Solvay activities:
Gratuated from Pisa University with a Master's degree in Chemical Engineering, Senior Executive program from London Business School. Comex Member Solvay, Member of the Plastics Europe steering Board.

During the year 2018, the following changes occurred:

- Roger Kearns left Solvay Group on March 31, 2018;
- Mr. Augusto Di Donfrancesco, Mr. Hua Du, and Ms. Cécile Tandeau de Marsac were appointed Executive Committee members for two-year terms with effect from March 1, 2018.

On October 1, 2019, the Board of Directors will renew for a two-year term the mandate of Karim Hajjar. His mandate will expire in October 2021.

For the year 2019, the following changes have been announced:

- The departure of Ms. Cécile Tandeau de Marsac in mid-2019;
- Ms. Ilham Kadri will join the Executive Committee as of January 1, 2019 (Deputy CEO) and will replace Mr. Jean-Pierre Clamadieu, who will resign on March 1, 2019.

5. Compensation report

New CEO

Solvay's Board of Directors appointed Ms. Ilham Kadri as Chairman of the Executive Committee, member of the Board of Directors and CEO of the Group, with effect from March 1, 2019. On that date, Ms. Ilham Kadri officially succeeds Mr. Jean-Pierre Clamadieu, who then relinquishes his executive duties and his mandate as director of Solvay. Ms. Ilham Kadri joined Solvay on January 1, 2019 and spent two months transitioning with Mr. Jean-Pierre Clamadieu, before taking the leadership and continuing Solvay's transformation strategy.

Shareholders engagement

Solvay continues to actively reach out to its shareholders to discuss its approach to governance, including compensation matters. This is part of the Company's ongoing shareholder engagement program, which Solvay will continue to undertake as part of its commitment to build upon this constructive dialog with its shareholders.

Following engagement with Solvay's shareholders to discuss its approach to governance, including compensation matters, Solvay increased its disclosure practices regarding its short-term and long-term incentives last year. Solvay's executive compensation policy and remuneration report, bolstered by increased disclosure, was supported by approximately 97% of its shareholders at last year's Annual General Meeting.

The increased disclosure in this year's Compensation Report surrounding Solvay's short-term and long-term incentives reflects the input received from Solvay's shareholders. Solvay believes that these changes, together with the existing compensation practices, have resulted in a compensation structure that incentivizes the executive team to deliver sustained long-term performance in a transparent manner, and in line with the Company's strategy, whilst ensuring that Solvay continues to uphold its key principle of rewarding the executives for performance.

In terms of Solvay's overall compensation structure, the Compensation Committee's annual review confirmed that the current pay mix and design remains appropriate, including for the new Chief Executive Officer. Accordingly, no changes to the overall structure of pay offered to Solvay's executives were considered necessary.

5.1. Governance

The compensation report for the corporate governance has been prepared by the Compensation Committee.

5.2. Board of Directors compensation

Solvay SA directors are remunerated with fixed emoluments, the common basis of which is set by the Ordinary Shareholders' Meeting, and any complement thereto by the Board of Directors on the basis of Article 26 of the bylaws, which states that:

- *"Directors shall receive emoluments payable from overhead costs; the Shareholders' Meeting shall determine the amount and terms of payment";*
- *"That decision shall stand until another decision is taken";*
- *"The Board of Directors shall be authorized to grant directors with special duties (the Chairman, vice-Chairmen, directors charged with day-to-day management, members of the Executive Committee) fixed emoluments in addition to those provided for in the above paragraph";*
- *"Each of the Directors responsible for day-to-day management is also entitled to variable compensation determined by the Board of Directors on the basis of their individual results and of the consolidated results of the Solvay Group";*
- *"The sums referred to in the two preceding sub-sections are also paid out of overhead costs".*

5.2.1. Board of Directors individual compensation

- The Ordinary Shareholders' Meetings of June 2005 and May 2012 (for Board attendance fee) decided to set directors' pay, starting from the 2005 financial year, as follows:
  - an annual gross fixed compensation of €35,000 per director and additionally an individual attendance fee of €4,000 gross per Board meeting attended;
  - €4,000 gross for members of the Audit Committee and €6,000 gross for its Chairman for each meeting of the committee attended;
  - €2,500 gross per member of the Compensation Committee, Nominations Committee and Financial Committee and €4,000 gross for the chairmen of these committees for each meeting attended, on the understanding that a director sitting on both the Compensation Committee and the Nominations Committee does not receive double compensation;
  - no attendance fees for the Chairman of the Board, the Chairman of the Executive Committee and the executive directors taking part in these committees;
- For the Chairman of the Board, the Board of Directors used its authorization under Article 26 of the bylaws to grant an additional yearly fixed compensation of €250,000 gross, unchanged since 2012, by reason of the workload and the responsibility attached to this;
- Non-executive directors do not receive variable compensation linked to results or other performance criteria. More specifically, non-executive directors are not entitled to annual bonuses, stock options or performance share units, or to any supplemental pension scheme;
- The Company reimburses directors' travel and expenses for meetings and when they exercise their Board and Board Committee functions.

The Chairman of the Board is the sole non-executive director for whom the Group provides administrative support (including the provision of an office, use of the General Secretariat, and a car). The other non-executive directors receive logistical support from the General Secretariat as and when needed. The Company also provides customary insurance policies covering Board of Directors' activities in carrying out their duties.

The Compensation Committee expects no major changes in the structure of the compensation packages for the Board Members for the next two years (2019 and 2020).

5.2.2. Amount of the compensation and other benefits granted directly or indirectly to directors (executive and non-executive) by the Company or by an affiliated company

Gross compensation and other benefits granted to directors

Compensation

	2018		2017	
In €	**Total gross amount including fix fees**	**Board of Directors and Committees attendance fees**	Total gross amount including fix fees	Board of Directors and Committees attendance fees
N. Boël				
Fixed emoluments + attendance fees	75,000	40,000	63,000	28,000
"Article 26" supplement	250,000		250,000	
D. Solvay(1)	33,430	21,000	56,000	21,000
J-P. Clamadieu	71,000	36,000	63,000	28,000
J-M. Solvay	92,500	57,500	59,000	24,000
A. Lemarchand(2)	83,000	48,000	34,572	12,000
B. de Laguiche	109,000	74,000	97,000	62,000
B. Scheuble(1)	46,430	34,000	99,000	64,000
C. Casimir-Lambert	99,000	64,000	87,000	52,000
H. Coppens d'Eeckenbrugge	101,000	66,000	97,000	62,000
E. du Monceau	100,000	65,000	70,500	35,500
Y-T. de Silguy	148,500	113,500	81,000	46,000
A. Moraleda	130,000	95,000	66,500	31,500
F. de Viron	93,500	58,500	70,500	35,500
G. Michel	98,500	63,500	66,500	31,500
R. Thorne	105,000	70,000	87,000	52,000
M. Oudeman	99,000	64,000	87,000	52,000
M. Lievonen(3)	42,700	20,000	0	0
P. Tournay(3)	46,700	24,000	0	0
	1,824,260	**1,014,000**	**1,434,572**	**637,000**

(1) Up to May 8, 2018.
(2) From May 9, 2017.
(3) From May 8, 2018.

5.3. Executive Committee compensation

5.3.1. Solvay compensation philosophy

Solvay's compensation policy aims to ensure that its Executive Committee is rewarded according to its performance in contributing to Solvay's long-term objectives of becoming a more resilient, more sustainable, and more innovative multi-specialty Group with high added value.

The Solvay Compensation Structure is designed in line with the following principles:

- Total compensation is designed to be competitive in the relevant market and sector, so as to attract, retain, and motivate the high caliber executives needed to deliver the Group's strategy and drive business performance;
- Short-term and long-term variable compensation is tied directly to the achievement of strategic objectives to drive sustainable performance and recognize excellent results;
- Compensation decisions are compliant and equitable, and balance cost and value appropriately.

5.3.2. Compensation structure

Every year, the Compensation Committee obtains compensation data relating to the international market from Willis Towers Watson, a globally recognized compensation consultant.

Solvay's compensation structure for its Executive Committee is designed in accordance with the "pay-for-performance" approach approved by the Board of Directors, focusing on the Company's short-term and long-term performance. The level and structure of the compensation packages are aligned with market practices for similar functions at comparable companies.

Solvay's frame of reference for assessing relevant competitive practice is a selection of European chemical and industrial manufacturing companies whose international operations, annual revenues, and headcount are reasonably close to its own. The Company periodically reviews the composition of this peer group to ensure that it continues to reflect Solvay's strategic direction.

The peer group is currently composed of 17 European multinational companies incorporated in six different European countries (Belgium, France, Germany, Netherlands, Switzerland, and the UK) and active in the chemical and/or the industrial sectors.

- Umicore
- Air Liquide
- Plastic Omnium (*)
- Michelin
- DSM
- BASF
- Bayer
- BAE Systems
- Syngenta (**)
- Lanxess
- Evonik
- Akzo Specialty Chemicals
- Saint Gobain
- Vallourec
- Rolls Royce
- GKN (**)
- Johnson Matthey

Overall, Solvay seeks to position itself at or around the relevant market median for base salary and benefits. Variable compensation, both short-term and long-term, is designed to provide top quartile pay if executives deliver superior performance.

The Compensation Committee expects no major changes in the structure of the compensation packages for the Chairman and the members of the Executive Committee for the next two years (2019 and 2020).

Compensation structure components:

	Fixed Compensation and Benefits		Short and Long Term Variable Compensation		
	Annual Base Salary	Pension & Benefits	Short Term Incentive	Performance Share Units	Stock Options
Performance Period			1 year	3 years	3 years
Performance Measures			• Underlying EBITDA • Sustainable Development • Individual Objective	• Underlying EBITDA growth • CFROI % • Reduction in GHG emissions	None

Fixed Compensation and Benefits

Base salary

The base salary reflects the individual's experience, skills, duties, and responsibilities, and the contribution of the individual and role within the Group. It is paid monthly.

Base salary is reviewed annually and may increase considering a number of factors, including: (1) comparable salaries in appropriate comparator groups; (2) changes within the scope of the role; and (3) changes in the Group's size and profile.

Pension and other benefits

The primary purpose of pension and insurance plans is to establish a level of security for Solvay employees and their dependents with respect to age, health, disability, and death. The benefits offered aim to be market-competitive, driving employee engagement and commitment in Solvay's business.

(*) No compensation data provided by Arkema to Solvay's Executive Compensation consultant. As such, Arkema was replaced by Plastic Omnium.
(**) Impacted by recent M&A activities but market data still available

Short and Long Term Variable Compensation

Short-term incentive (STI)

Short-term incentives are linked partly to Group performance and partly to individual performance to drive and reward the overall annual performance of executives. Their short-term incentives have maximum award limits and are denoted as a multiple of their respective base salaries.

Performance is assessed on an annual basis using a combination of pre-determined Group and individual performance targets set at the start of the year, as approved by the Compensation Committee. More specifically, the performance measures are:

- Group performance measured against annual underlying EBITDA (under a specific Free Cash Flow constraint) and Sustainable Development indicator;
- Individual performance: measured against a set of pre-determined annual objectives, approved by the Board of Directors.

2018-STI performance (Targets and Performance)

EBITDA

	Threshold	Target	Maximum	Actual Achievement	Actual Achievement in %(1)
Underlying EBITDA – Target and Actuals (M€)	2,020	2,220	2,420	2,230	105%

(1) The scores 0% and 200% are defined using a range of -/+200M€ with a target set at 2,220M€. With 2,230 M€ underlying EBITDA achieved in 2018 before polyamide reclassification in discontinued operations, the Economic incentive scores is 105% vs target.

Sustainable development

The sustainable development measure has two components, one being the notation by external extra-financial rating agencies, and the second being progress on "Solvay Way" our internal referential to measure progress on Sustainable Development. The overall achievement is 165% of the target.

Long-term incentive (LTI)

Long-term incentives consist of a 50/50 mix of stock options (SOP) and performance share units (PSU). Each annual LTI plan is subject to prior Board approval.

The Executive Committee (or the Board of Directors for the Executive Committee members) retains the right to exercise discretion, both upwards and downwards, of 50% of the target, to ensure that the level of award payable is appropriate and fair for special or unique achievements or circumstances, or to acknowledge insufficient performance. Where discretion is exercised, the 50/50 split principle between SOP and PSU grants will be respected and the rationale for the use of such discretion will be disclosed.

Stock options

The Compensation Structure offers a competitive LTI vehicle mirroring Belgian market practice (a majority of the BEL 20 Index listed companies provide options to their executives). Under Belgian law, unlike other jurisdictions, taxes on stock options need to be paid by the executives at the time of grant. Taxes paid at the time of grant cannot be recouped if the options do not vest, demonstrating executives' commitment and belief in Solvay's long-term strategy and performance. Therefore Solvay, like other Belgian companies, sets no additional performance criteria for determining the vesting of stock options, which nonetheless need to be held for a three-year vesting schedule.

The stock option plan gives each beneficiary the right to buy Solvay shares at a strike price corresponding to the fair market value of the shares upon grant. They will only generate a potential gain for the beneficiaries if the stock price rises. The use of stock options aims to incentivize Solvay's executives to work towards achieving robust sustainable returns for shareholders while offering the Company a robust retention tool.

Every year, the Board of Directors determines the volume of stock options available for distribution, based on an assessment of the economic fair value at grant using the Black Scholes financial formula. The total volume of options available is then allocated to the top executives of the Company based on the importance of their individual contribution/position to the success of the Solvay Group.

Key features:

- Options are granted at the money (or fair market value);
- Options become exercisable for the first time after three full calendar years following grant;
- Options have a maximum term of eight years;
- Options are not transferrable inter vivos;
- The plan includes a bad leaver clause.

Performance Share Units (PSU)

The PSU ensure alignment with market best practices, helping Solvay to remain competitive and to attract and retain key executives while offering a performance-contingent vehicle to incentivize executives to help deliver Solvay's long-term strategic objectives.

The PSU are settled in cash. They vest after three years from the date of grant and only if a combination of pre-set performance objectives is met. The minimum payout can vary from zero if the minimum performance required or "threshold" target is not met, to 80% if the minimum performance "threshold" is met, and up to a maximum of 120% for a performance exceeding the pre-set stretch performance target.

Each year, the Board of Directors determines the budget available for distribution based on the closing value of Solvay's share at grant date. The total volume of PSU available is then allocated to the executives based on their expected ability to contribute substantially to the achievement of Solvay's long-term strategic objectives.

Key features:

- The plan is purely cash-based and does not encompass any transfer of shares to beneficiaries. As such, it does not dilute the shareholders' interests;
- The vesting of the awards is based on meeting pre-set performance targets for: (1) Underlying EBITDA growth (40% of the award), (2) CFROI (40% of the award), and (3) Greenhouse Gas (GHG) intensity reduction (20% of the award) (*);
- The performance period is measured over three years;
- Condition of employment up to achievement of performance targets;
- Payout in cash based on the value of Solvay shares at vesting date.

At its sole discretion, the Executive Committee (or the Board of Directors for the Executive Committee members) assesses the achievement of the targets, and the Executive Committee (or the Board of Directors for the Executive Committee members) may also re-evaluate the targets in cases of material change of perimeter or other unexpected circumstances. With regard to the latter, such discretion will not be used as a matter of routine and, if used, the rationale for the use of such discretion will be disclosed.

The Performance Share Unit (PSU) plan contains a claw-back provision for a period of 3 years after the payout in case of erroneous results.

2015-17 LTI performance share units payout

Target & Performance actuals

	Threshold	Target	Maximum	Actual	Actual %	Total actual %
CFROI bp – 50%	60 bp	90 bp	120 bp	107 bp	111.1%	103.35%
EBITDA Growth – 50%	21%	26%	30%	25%	95.6%	

Payout

The combination of the performance achievement at 103.3%, the share price differential (grant share price vs. share price at vesting), and the total dividends over three years (€10.35 per unit) has generated a payout of 108% of the target PSU amount.

5.3.3. Chief Executive Officer

The remuneration package of the Chairman of the Executive Committee/CEO, Mr. Jean-Pierre Clamadieu, is in full compliance with Article 520 ter of the Companies' Code and is set by the Board of Directors based on recommendations by the Compensation Committee.

Under Article 520 ter of the Companies Code, from 2011 onwards, in the absence of statutory provisions to the contrary or express approval by the General Meeting of Shareholders, at least a quarter of variable compensation must be based on pre-determined performance criteria that are objectively measurable over a period of at least two years, and at least another quarter should be based on pre-determined performance criteria that are objectively measurable over a period of at least three years.

CEO Compensation Structure

Base salary

The CEO's last salary review was carried out in January 2015 before the acquisition of Cytec, which was fully consolidated within the Solvay Group as from January 2016. Following an in-depth review of Solvay's peers, the Board of Directors decided in December 2017 to increase the base salary of the Chairman of the Executive Committee by approximately 9% from €1.1 to €1.2 million. The new base salary, which was approved by the Board of Directors prior to Mr. Jean-Pierre Clamadieu's decision to take on his new role as a non-executive Chairman at Engie, remains positioned around the market median of Solvay's peer group of 17 European companies.

(*) from 2019: Greenhouse Gas emission reduction

Pension & benefits

Regarding the CEO's extra-legal pension rights, given his self-employed status in Belgium, the CEO has his own separate contractual agreement, with pension, death-in-service, and disability rules that reflect the contractual conditions that prevailed in Rhodia prior to the acquisition by Solvay.

Short-term incentive

The short-term incentive target is set at 100% of base salary, with a maximum of 150%. Payout of short-term incentive is based on the achievement of pre-defined performance targets based on:

- for 50% of the award – the Group's underlying EBITDA (under a specific Free Cash Flow constraint);
- for 10% of the award – the Group's Sustainable Development indicators. These indicators include, but are not limited to, Solvay's inclusion in extra-financial indexes and progress made on the internal sustainable development reference system, Solvay Way. Solvay Way defines the Group's approach to sustainability and covers all the Group's management systems;
- for 40% of the award – individual objectives such as portfolio management (divestments/acquisitions), Research & Innovation (R&I) strategy, and People Engagement.

Long-term incentive

The long-term incentives offered to the CEO comprise a 50/50 mix of stock options and PSU, with an annual economic value target set at 150% of the base salary and a maximum guidance set at 200% of such base salary.

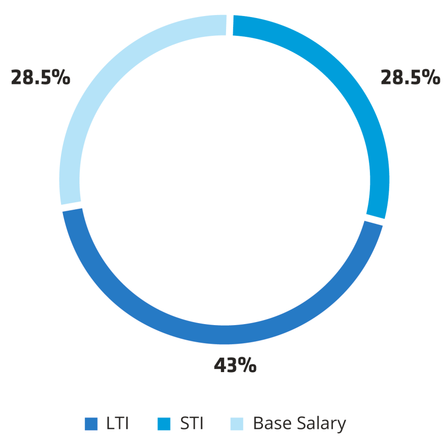
2018 Award

In 2018, the face value of his overall LTI award totaled €1.8 million, in line with his LTI target of 150% of base salary. The actual gain on the PSU at the payout date will depend upon on the level of achievement of the performance targets set under the plan as well as of the performance of Solvay shares on the stock market. The resulting numbers of stock options and PSU are calculated using the Black Scholes model.

	Annual Base	x	Target award	=	Grant Value
LTI – Perf. Share Units	€ 1,200,000	x	(150% / 2)	=	€ 900,000
LTI – Stock Option	€ 1,200,000	x	(150% / 2)	=	€ 900,000
LTI – Total					€ 1,800,000

The design of the Solvay long-term incentive plan offered to the CEO is subject to the final approval of the Board of Directors. Solvay's commitment to offering its CEO a competitive yet challenging compensation package is demonstrated by the pay mix he is offered, with close to 70% of his pay being subject to the delivery of a sustainable value creation performance.

CEO total compensation at target for 2018



Amount of compensation paid and other benefits granted directly or indirectly to the Chairman of the Executive Committee

Based on the Board of Directors' assessment of the extent to which he achieved his individual pre-set objectives and whether the Group achieved its collective economic and sustainable development indicators, the actual 2017 compensation package of the Chairman of the Executive Committee was as follows:

Compensation paid and other benefits granted to the Chairman of the Executive Committee

In €	2019	2018	2017
Base compensation	200,000	1,200,000	1,100,000
Variable compensation (Short Term Incentive) related to 2018		1,602,000	1,639,000
2015-17 Performance Share Units (Cash)(1) – paid in June 2018		864,106	888,805
Pension and death-in-service and disability coverage (costs paid or provided for)		790,665	728,241
Non Compete	1,960,000	0	0
Other compensation components(2)	3,010	18,060	16,652

(1) Includes share price differential and dividends.
(2) Company vehicle.

Short-term incentive calculation

The annual incentive target remained set at 100% of the base salary, with a maximum of 150%.

Each performance measure can vary from 0% to 200% achievement but the maximum total payout is capped at 150% of the target.

Performance Measures		% of the STI	Achievement	Payout factor
Underlying EBITDA (under cash constraint)		50%	105%	53%
Sustainable Development		10%	165%	17%
Individual Objectives	Oxygen & City Light	40%	160%	64.5%
	Strategy			
	CEO transition			
Total		100%		133.5%

	Threshold	Target	Maximum	Actual Achievement	Actual Achievement in %(1)
Underlying EBITDA – Target and Actuals (M€)	2,020	2,220	2,420	2,230	105%

(1) The scores 0% and 200% are defined using a range of -/+200M€ with a target set at 2,220M€. With 2,230 M€ underlying EBITDA achieved in 2018 before polyamide reclassification in discontinued operations, the Economic incentive scores is 105% vs target.

	Base salary	x	Target incentive	x	Performance factor	=	Final Award
STI	€ 1,200,000	x	100%	x	133.50%	=	€ 1,602,000

The 2018 STI of the CEO corresponds to 133,5% of his base salary and below the maximum of 150% of base salary, as assessed by the Compensation Committee and approved by the Board. This outcome is the result of:

- Group performance:
  - Underlying EBITDA under cash constraint with an achievement of 105% vs target;
  - Sustainable Development with an achievement of 165% (e.g. Solvay is listed on the DJSI).
- Individual performance: pre-set annual objectives
  - Oxygen reorganization and City lights (Brussels-Paris-Lyon footprint);
  - Strategy (Polyamide divestiture and Strategic Board orientation and decisions implementation);
  - New CEO transition completed.

2015-17 PSU payout

	2015-17 PSU target award	x	Payout Factor	=	Cash Payout[1]
Perf. Share Units Payout (Cash)	€ 800,000	x	108.01%	=	€ 864,106

(1) Included share price differential and dividends.

5.3.4. New CEO compensation structure

The remuneration package of the new Chairman of the Executive Committee/CEO, Ms. Ilham Kadri, is in full compliance with Article 520 ter of the Companies' Code and is set by the Board of Directors based on recommendations by the Compensation Committee.

Under Article 520 ter of the Companies Code, from 2011 onwards, in the absence of statutory provisions to the contrary or express approval by the General Meeting of Shareholders, at least a quarter of variable compensation must be based on pre-determined performance criteria that are objectively measurable over a period of at least two years, and at least another quarter should be based on pre-determined performance criteria that are objectively measurable over a period of at least three years.

The compensation package offered to the new CEO broadly resembles that of the ongoing CEO with no increase in the overall package provided and the incentive structure and award limits mirroring what was previously communicated to Solvay's shareholders. The pay mix of the new CEO follows Solvay compensation policy.

Base salary

The base salary has been set at €1.15 million, subject to an annual review, and is positioned around the market median of Solvay's peer group of 17 European companies.

Pension & benefits

Regarding Ms. Ilham Kadri extra-legal pension rights, given her self-employed status in Belgium, the CEO has her own separate contractual agreement, with pension, death-in-service, and disability rules.

She is entitled to the following benefits:

- Defined Contribution Pension plan of ~25% of her total cash at target;
- Disability and life insurance plan;
- Medical plan.

Short-term incentive

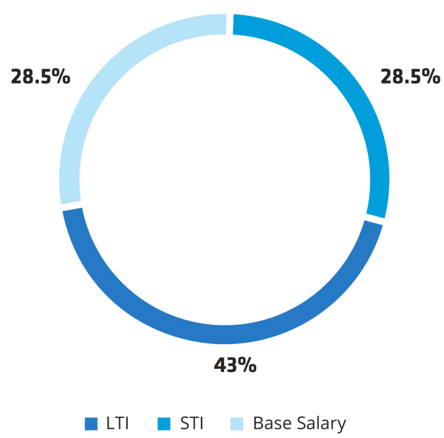
No sign-on bonus has been provided. Like the outgoing CEO, the new CEO's short-term incentive target has been set at 100% of base salary, with a maximum of 150%. Payout of short-term incentive will be based on the achievement of pre-defined performance targets based on:

- for 50% of the award – the Group's underlying EBITDA (under a specific Free Cash Flow constraint);
- for 10% of the award – the Group's Sustainable Development indicators. These indicators include, but are not limited to, Solvay's inclusion in extra-financial indexes and progress made on the internal sustainable development reference system, Solvay Way. Solvay Way defines the Group's approach to sustainability and covers all the Group's management systems;
- for 40% of the award – individual objectives such as portfolio management (divestments/acquisitions), Research & Innovation (R&I) strategy, and People Engagement.

No sign-on bonus or short term incentive guarantee has been provided to Ms. Ilham Kadri upon her joining Solvay as the new CEO.

Long-term incentive

The long-term incentives offered to the new CEO comprise a 50/50 mix of stock options and PSU, with an annual economic value target set at 150% of the base salary and a maximum guidance set at 200% of such base salary. This is the same level as the ongoing CEO, Mr. Jean-Pierre Clamadieu.



5.3.5. Other members of the Executive Committee

Pension and other benefits

The Executive Committee members are entitled to retirement, death-in-service, and disability benefits on the basis of the provisions of the plans applicable in their home countries. Other benefits, such as medical care and company cars or car allowances, are also provided according to the rules applicable in the host country. The nature and magnitude of these other benefits are largely in line with median market practice.

Short-term incentive

Target in % of base salary	Performance Measures	% of the STI
70%	Underlying EBITDA (under cash constraint)	60%
	Sustainable Development	10%
	Individual Objectives	30%
	Total	100%

The target short-term incentive for the members of the Executive Committee is 70% of base salary, with a maximum of 140% of base salary. Payout of short-term incentive is based on the achievement of pre-defined performance targets based on:

- for 60% of the award – the Group's underlying EBITDA (under a specific Free Cash Flow constraint);
- for 10% of the award – the Group's Sustainable Development indicators. These indicators include, but are not limited to, Solvay's inclusion in extra-financial indexes and progress made on the internal sustainable development reference system, Solvay Way. Solvay Way defines the Group's approach to sustainability and covers all the Group's management systems;
- for 30% of the award – the individual performance of the manager as measured against a set of predetermined objectives.

The actual annual incentive can vary from 0% in cases of poor performance to 200% of the target in cases of outstanding collective and individual performance.

Long-term incentive

	Performance Shares Units (PSU's)	Stock Options
Executive Committee	Target Grant	Target Grant
	€ 250,000	€ 250,000

Total amount of compensation paid and other benefits granted directly or indirectly to the other members of the Executive Committee by the Company or an affiliated company

Compensation paid and other benefits granted to the other Members of the Executive Committee

In €	**2018(1&2)**	2017(3)
Base compensation	3,645,109	2,337,909
Variable compensation (Short Term Incentive)(4)	2,940,408	2,288,777
Performance Share Units (Cash)(5)	1,782,072	1,111,189
Pension and death-in-service and disability coverage (costs paid or provided for)	999,741	742,561
Other compensation components(6)	134,641	139,490

(1) Base Salary: V. De Cuyper, K. Hajjar, P. Juéry. R. Kearns – up to September, C. Tandeau de Marsac, A. Di Donfrancesco and H. Du from March 1st
(2) Full year STI: V. De Cuyper, K. Hajjar, P. Juéry, C. Tandeau de Marsac, A. Di Donfrancesco and H. Du.
(3) V. De Cuyper, R. Kearns, K. Hajjar, P. Juéry.
(4) Incentives are processed either in cash or in share options based on the Euronext Index SICAV
(5) Includes share price differential and dividends
(6) Representation allowance, luncheon vouchers, company car

Variable compensation consisted of an annual incentive based on the performance achieved relative to pre-set collective Group economic and sustainable development performance objectives, and on the performance of the manager as measured against a set of pre-determined individual objectives.

The remuneration package of the members of the Executive Committee is in full compliance with Article 520 ter of the Companies' Code. Executive Committee members receive stock options and performance share units as explained above.

Executive Committee members' expenses, including those of its Chairman, are governed by the same rules as apply to all Group management staff, i.e. the justification of all business expenses, item by item. Private expenses are not reimbursed.

In the case of mixed business/private expenses (e.g. cars), a proportional rule is applied in the same way as to all management staff in the same position.

In the area of insurance, the Company takes out the same type of cover for Executive Committee members as it does for its senior managers.

Pensions and retirement and death-in-service coverage for Executive Committee members are based in principle on the provisions of the schemes applicable to senior executives in their base countries.

5.4. Stock options and PSU allotted in 2018 to Executive Committee members

In 2018, at the proposal of the Compensation Committee, the Board of Directors allotted stock options to approximately 70 Group senior executives. The exercise price amounts to €111.27 per option, with a three-year vesting period. Executive Committee members were granted a total of 132,199 options in March 2018 and 72,078 in July 2018.

In combination with the stock option plan, the Board of Directors granted performance share units to approximately 450 Group executives, for a possible payout in three years' time if pre-set performance objectives (underlying EBITDA growth, CFROI, and GHG Intensity reduction) are met. Executive Committee members were granted a total of 22,322 PSU in February 2018 and a further grant of 13,842 PSU's in July 2018.

Country	Name	Function	Number of Options[1]	Number of PSU's[2]
Belgium	Clamadieu, Jean-Pierre[3]	Chairman of the Executive Committee	47,120	7,957
Belgium	De Cuyper, Vincent	Member of the Executive Committee	25,102	4,517
Belgium	Hajjar, Karim	Member of the Executive Committee	27,720	4,959
Belgium	Juéry, Pascal	Member of the Executive Committee	29,029	5,180
Belgium	Tandeau de Marsac, Cécile	Member of the Executive Committee	25,102	4,517
Belgium	Di Donfrancesco, Augusto	Member of the Executive Committee	25,102	4,517
Belgium	Du, Hua	Member of the Executive Committee	25,102	4,517
TOTAL			**204,277**	**36,164**

(1) Stock options: Black Scholes fair value for February 2018 grant was at €19.10 and €20.81 for July 2018 exceptional grant

(2) PSU's share price for February 2018 grant was at €113.11 and €108.38 for July 2018 grant

(3) Mr Clamadieu was not eligible for the July 2018 exceptional grant

Stock Options held in 2018 by Executive Committee Members

		Stock-options				31/12/2018		
Country	Name	Held at 31/12/2017	Granted in 2018	Exercised in 2018	Expired in 2017	Held	Exercisable	Non exercisable
Belgium	Clamadieu, Jean-Pierre	223,639	47,120	0	0	270,759	72,532	198,227
Belgium	De Cuyper, Vincent	84,668	25,102	0	0	109,770	41,534	68,236
Belgium	Hajjar, Karim	66,628	27,720	0	0	94,348	10,969	83,379
Belgium	Juéry, Pascal	80,419	29,029	15,960	0	93,488	23,446	70,042
Belgium	Tandeau de Marsac, Cécile	46,527	25,102	0	0	71,629	8,775	62,854
Belgium	Di Donfrancesco, Augusto	74,560	25,102	3,724	0	95,938	27,702	68,236
Belgium	Du, Hua	51,508	25,102	0	0	76,610	18,756	57,854
TOTAL		**627,949**	**204,277**	**19,684**	**0**	**812,542**	**203,714**	**608,828**

5.5. Key provisions of Executive Committee members' contractual relationships with the Company and/or an affiliated company, including provisions relating to compensation in the event of early departure

Executive Committee members, including its Chairman (or CEO), have directorships in Group subsidiaries as a function of their responsibilities. Where such directorships are compensated, they are included in the amounts given above, regardless of whether the position is deemed to be salaried or undertaken on a self-employed basis under local legislation.

Executive Committee members will not benefit from any contractual departure indemnity linked to the exercise of their office. In case of early termination, only the legal system applies.

In the event of a decision to terminate Ms. Ilham Kadri's contract, she will be eligible for a contractual indemnity of 12 months of her total compensation target. In the event Ms. Ilham Kadri resigns after January 2021, she is subject to a non-competition clause of 12 months with no extra compensation.

Mr. Jean-Pierre Clamadieu's contract does not include a termination indemnity. However, a 24-months non-compete undertaking is provided for in his contract and has been activated by the Company, resulting in the payment to Mr. Jean-Pierre Clamadieu of a non-compete indeminity of €1,960,000. There is no accelerated vesting applied to his existing LTI, which remain subject to performance.

The above is in line with Belgian Corporate governance requirements.

Mr. Roger Kearns resigned from Solvay on March, 31 without any indemnity related to his Executive mandate.

6. Main characteristics of risk management and internal control systems

Solvay leaders and managers are accountable for the adequacy of the risk management and internal control framework in their respective entities (businesses, functions).

The Internal Audit & Risk Management Department (IA/RM) advises and ensures that leaders are well supported. The team is in charge of setting up a comprehensive and consistent system of risk management and internal control across the Group.

Solvay has set up an internal control system designed to provide a reasonable assurance that (i) current laws and regulations are respected, (ii) policies and objectives set by general management are implemented, (iii) financial and extra-financial information is accurate, and (iv) internal processes are efficient, particularly those contributing to the protection of its assets.

The five components of the internal control system are described below.

6.1. The control environment

As the foundation of the internal control system, the control environment promotes awareness and compliant behavior among all employees. Its various elements create a clear structure of principles, rules, roles, and responsibilities, while demonstrating general management's commitment to compliance.

- The **Solvay Management Book** lists guiding principles and defines the roles and responsibilities of the Executive Committee, Global Business Units, and functions;
- The **Code of Conduct** is available on Solvay's website More information can be found in the Charter on Corporate Governance;
- An **Ethics Helpline**, managed by a third party, enables employees to report potential Code of Conduct violations if they cannot go through their managers or through the Compliance organization, or if they wish to remain anonymous. More information can be found in the Charter on Corporate Governance and extra-financial section;
- **Standardized processes** are in place for financial and non-financial activities.

6.2. The risk assessment process

The process of risk management takes into account the organization's strategic objectives and is structured into the following phases:

- Risk analysis (identification and evaluation);
- Decision on how to manage the critical risks;
- Implementation of risk management actions;
- Monitoring of those actions.

The approach to designing internal controls for major processes includes a risk assessment step defining which key control objectives to tackle. This is the case in particular for processes at subsidiary, shared service, GBU, or corporate level, leading to the production of reliable financial reporting.

More information on Enterprise Risk Management, including a description of the Group's main risks and the actions taken to avoid or reduce them, can be found in the "Risk management" section.

6.3. Control activities

Solvay uses a systematic approach to designing and implementing control activities for the most relevant Solvay processes.

After a risk analysis and a risk assessment phase, the controls are designed and described by the corporate process managers with the support of the Risk Management team. The controls descriptions are used as a reference for the internal control assessment and roll-out across the Group.

At each level of the Group (corporate, Shared Services platforms, and GBUs), the manager operating the process is responsible for the control execution.

Agile internal control governance has been set up under the CFO sponsorship: Corporate Process Owners and GBU representatives (Process Risk Coordinators) are part of a network aiming to promote an Internal Control system tailored to the risks of each GBU.

Solvay implements policies, processes, and red lines applicable to all employees in the following domains: management control, financing and cash flow, financial control, financial communication, tax, and insurance policies. Control activities are defined for all these financial processes and in major cross-Group projects, like acquisitions and divestitures. Furthermore, an online Financial Reporting Guide explains how the IFRS rules should be applied throughout the Group.

Financial elements are consolidated monthly and analyzed at every level of responsibility in the Company (Solvay Business Services, the finance director of the entity, Group Accounting and Reporting, and the Executive Committee). Elements are analyzed using various methods, such as a variance analysis, plausibility and consistency checks, ratio analysis, and comparison with forecasts.

Besides the monthly reporting analysis prepared by Group Controlling teams, the Executive Committee thoroughly reviews GBU performance every quarter in the context of business forecast reviews.

6.4. Information and communication

Group-wide information systems are managed by Solvay Business Services. A large majority of Group operations are supported by a small number of integrated ERP systems. Financial consolidation is supported by a dedicated tool.

All financial reporting procedures and internal controls ensure that all material information disclosed by Solvay to its investors, creditors, and regulators is accurate, transparent, and timely, and that it fairly represents the Group's most relevant developments, financial fundamentals, and performance.

The Group Accounting and Reporting department circulates written detailed instructions to all financial actors involved before each quarterly closing.

The publication of the quarterly financial results is subject to various checks and validations carried out in advance:

- The Investor Relations team designs, develops, and issues messages and information about the Group with the needs of financial markets in mind. It does so under the supervision and control of the Executive Committee;
- The Audit Committee ensures that financial statements and communications by the Company and the Group, conform to generally accepted accounting principles (IFRS for the Group, Belgian accounting law for the Company);
- The Board of Directors approves the consolidated periodic financial statements and those of Solvay SA (quarterly – consolidated only, semiannual and annual) and all related communications.

6.5. Internal control monitoring

The Audit Committee is in charge of monitoring the effectiveness of internal control systems. It supervises the work of Internal Audit and Risk Management with regard to financial, operational, and compliance monitoring. It is kept informed of the scope, programs, and results of the internal audit work, and it verifies that audit recommendations are properly implemented. The role and responsibilities of the Audit Committee are further detailed in the Charter.

The content of internal audit assignments is planned and defined on the basis of a risk analysis; due diligence focuses on the areas perceived as having the highest risks. All the consolidated entities within the Group are inspected by Internal Audit at least every three years. Internal Audit recommendations are implemented by management.

Other entities carry out similar activities in very specific areas. For example:

- The Health Safety & Environment department carries out health, safety, and environmental audits;
- Solvay's Business Services Compliance and Risk Management department conducts information system audits, in coordination with Internal Audit;
- The Ethics and Compliance department coordinates investigations of potential Code of Conduct infringements.

7. External audit

The audit of the Company's financial situation, its financial statements, and the conformity of those statements – and the entries to be recorded in the financial statements in accordance with the Companies Code and the bylaws – are entrusted to one or more auditors appointed by the Shareholders' Meeting from among the members, either natural or legal persons, of the Belgian Institute of Company Auditors.

The responsibilities and powers of the auditor(s) are set by law.

- The Shareholders' Meeting sets the number of auditors and their emoluments in accordance with the law. Auditors are also entitled to reimbursement of their travel expenses for auditing the Company's sites and administrative offices;
- The Shareholders' Meeting may also appoint one or more alternate auditors. Auditors are appointed for three-year renewable terms, which may not be revoked by the Shareholders' Meeting other than for good reason;
- The Audit Committee assesses the effectiveness, independence and objectivity of the external auditor having regard to the:
  - Content, quality and insights on key external auditor plans and reports; in particular those summarizing audit work performed on risks identified by the Company;
  - Engagement with the external auditor during Committee meetings;
  - Robustness of the external auditor in their handling of key accounting principles;
  - Provision of non-audit services.

The Board of Directors, upon the recommendation from the Audit Committee, is recommending that Deloitte's mandate be renewed for another term at the General Shareholders' Meeting of 2019. The Committee believes the independence and objectivity of Deloitte and the effectiveness of the audit process are safeguarded and remain strong. Considering the recent audit partner rotation in 2016 as well as evaluating the proposals brought forward to the Audit Committee, the Board of Directors will propose to renew the mandate of Deloitte for a new three years. Deloitte will be represented by Michel Denayer and by Corine Magnin as alternate auditor.

At the Ordinary Shareholders's meeting of Tuesday May 14, 2019, the Board of Directors proposes to renew the mandate of Deloitte for a further three years. Deloitte will be represented by Michel Denayer and by Corine Magnin as alternate auditor.

The yearly 2018 audit fees for Solvay SA were set at €1.2 million. They include the audit of the statutory and consolidated accounts of Solvay SA. Additional audit fees for Solvay affiliates in 2018 amount to €4.8 million. Supplementary non-audit fees of €1.6 million were paid in 2018 by Solvay SA and affiliates of which:

a. Invoiced by the statutory auditor of the Group:
   – Other assurance missions: €0,8 million.
b. Invoiced by other Deloitte entities:
   – Other assurance missions: €0.4 million;
   – Tax advisory and compliance: €0.1million;
   – Other advisory missions: €0.3 million.

8. Items to be disclosed pursuant to Article 34 of the Belgian Royal Decree of November 14, 2007

According to Article 34 of the Belgian Royal Decree of November 14, 2007, the Company hereby discloses the following items:

8.1. Capital structure and authorizations granted to the Board

As at December 21, 2015, the capital of the Company amounted to €1,588,146,240 represented by 105,876,416 ordinary shares with no par value, fully paid up.

All Solvay shares are entitled to the same rights. There are no different classes of shares.

8.2. Transfer of shares and shareholders' arrangements

Solvay's bylaws do not contain any restriction on the transfer of its shares.

The Company has been informed that certain individual shareholders who hold shares directly in Solvay have decided to consult one another when questions of particular strategic importance are submitted by the Board of Directors to the Shareholders' Meeting. Each of these shareholders, however, remains free to vote as he or she chooses. None of these persons, either individually or in concert with others, reaches the initial 3% transparency notification threshold.

Solvay is not aware of any other voting agreements among its shareholders or of the existence of a concert between its shareholders.

8.3. Holders of securities with special control rights

There are no such securities.

8.4. Control mechanism of any employee share scheme where the control rights are not exercised directly by the employees

There is no employee share scheme with such a mechanism.

8.5. Restrictions on the exercise of voting rights

Each Solvay share entitles holders thereof to exercise one vote at Shareholders' Meetings.

Article 11 of the Company's bylaws provides that the exercise of voting rights and other rights attached to shares that are jointly owned, or of which the usufruct and bare ownership rights have been separated or are pledged, are suspended pending the appointment of a single representative to exercise the rights attached to the shares.

The voting rights attached to the shares in Solvay held by Solvay Stock Option Management are, as a matter of law, suspended.

8.6. Appointment, renewal, resignation and dismissal of directors

The bylaws of the Company provide that the Company is to be managed by a Board of Directors composed of no less than five members, their number being determined by the Shareholders' Meeting (Article 14).

Directors are appointed by the Shareholders' Meeting for four years (and may be reappointed).

The Board of Directors submits directors' appointments, renewals, resignations or dismissals to the Ordinary Shareholders' Meeting for approval. It also invites such Shareholders' Meetings to vote on the independence of the directors fulfilling the related criteria, having first sought the advice of the Nominations Committee, whose mission is to define and assess the profile of any new candidate using its criteria for appointment and for specific competences.

The Ordinary Shareholders' Meeting decides on proposals made by the Board of Directors in this matter by a simple majority.

If a directorship becomes vacant during a term of office, the Board of Directors may appoint a new member, subject to ratification by the next Ordinary Shareholders' Meeting.

8.7. Amendment of Solvay's bylaws

Amendments to the Company's bylaws must be submitted as a resolution to the Shareholders' Meeting, at which at least 50% of the share capital or Solvay must be present or represented, and in principle must be passed by a 75% majority of the votes cast.

If the attendance quorum is not met at the first Extraordinary Shareholders' Meeting, a second Shareholders' Meeting may be convened and will decide without any attendance quorum requirement.

For certain other matters (e.g. amendment of the purpose of the Company), higher voting majorities may apply.

8.8. Powers of the Board of Directors, in particular to issue and buy back shares

8.8.1. Powers of the Board of Directors

The Board of Directors is the highest management body of the Company.

It is entrusted with all the powers that are not reserved, by law or under the bylaws, to the Shareholders' Meeting.

The Board of Directors has kept responsibility for certain key areas for itself and has delegated the remainder of its powers to an Executive Committee (further detailed in the Charter).

In all matters for which it has exclusive responsibility, the Board of Directors works in close cooperation with the Executive Committee, which in particular is responsible for preparing most of the proposals for decisions by the Board of Directors.

8.8.2. The Board's authorizations to issue and buy back shares

The Board of Directors was authorized, until December 31, 2016, to increase the registered capital by contributions in cash up to a maximum of €1.5 billion, of which a maximum amount of €1,270,516,995 will be allocated to the "capital" account and the remainder to the "issuance premium" account in the framework of the acquisition of Cytec Industries Inc. Said acquisition was completed on December 9, 2015, and in order to finance part of it, the Board of Directors proceeded with a share capital increase for an amount of €317,629,245 by issuing 21,175,283 new ordinary Solvay shares, with an issuance premium of €1,182,216,050. This special authorization is therefore no longer relevant.

The Shareholders' Meeting has currently not authorized the Board of Directors to acquire or dispose of Solvay's own shares.

8.9. Significant agreements or securities that may be impacted by a change of control of the company

The Ordinary Shareholders' Meeting of May 10, 2016 approved the change of control provisions relating to the December 2015 euro-denominated senior and hybrid bonds and the USD-denominated senior notes issued to finance the acquisition of Cytec and the general corporate purposes of the Solvay Group.

8.10. Agreements between the Company and its directors or employees providing for compensation if directors resign or are good leavers, or in the case of a public takeover bid.

Not applicable

MANAGEMENT REPORT

RISK MANAGEMENT

3

Risk management

1. Introduction

In a context of global economic and political uncertainty, evolving power balances, changing growth dynamics, shortening market cycles, rapid technological evolution, and increased sensitivity and expectations related to climate change and energy transition, Solvay believes that effectively monitoring and managing risks is key to achieving its strategic objectives.

2. Risk management process

The risk assessment process – endorsed by Solvay's Board – helps the Group achieve its business objectives, both financial and extra-financial, while respecting laws, regulations, and the Solvay Code of Conduct.

Solvay's Enterprise Risk Management (ERM) approach – a key mechanism for achieving short, medium, and long-term objectives

Solvay's business is diverse, entrepreneurial, and international. Operations face a number of significant risks. Accordingly, Solvay has designed a dynamic process in which key players assess the risks in their area of responsibility and/or expertise.

All GBUs conduct risk assessment as an integral part of their annual strategic review process

Risk analysis

Solvay's systematic risk management approach is integrated within its strategy, business decisions, and operations. It ensures that Group leaders proactively identify, assess, and manage all potentially significant risks. Risk assessment helps create value in the short, medium, and long term, and always takes sustainability into consideration. Two of the four main impact types used to assess risks reflect our growing sensitivity to extra-financial issues, namely impacts on people and on the environment. The other two – economic and reputational impacts – directly affect the Group's operational and financial performance. In line with Solvay's strategic objectives, risks are then categorized as follows: "main risks" (rated as the most critical), "emerging risks", and "other risks".

Economic impact	Impact on people	Impact on the environment	Impact on reputation

Deciding how to manage critical risks

Both day-to-day and strategic decision-making take all key risks and opportunities fully into account using financial and extra-financial criteria.

Implementation of risk management actions

Risk management is a key success factor for Solvay because it allows us to mitigate risks associated with the solutions we provide. Improvements to Solvay's Enterprise Risk Management methodology are allowing individual GBUs and Functions – and the Group as a whole – to more effectively prioritize risks and focus their risk response. A dedicated dashboard is updated twice a year to reflect both progress on mitigating actions and new developments in the risk environment.

Monitoring of risk management actions

Critical risks for the Group are closely monitored by the Group Risk Committee – members of the Executive Committee are appointed as Risk Sponsors – to ensure that these risks are adequately addressed. Particular attention is paid to cross-checking the analysis with the materiality analysis performed by the Sustainable Development & Energy Function.

A sound risk management system embedded at all levels of the Group

GBUs and Function leaders are accountable for the identification, monitoring and management of the key risks in their domain. Risk management is therefore strongly embedded in the day-to-day running of each entity and operational managers can react rapidly in the event of changing circumstances. The risk management process is a valuable mechanism for GBUs and Functions to guide priorities and to raise the likelihood of achieving their business goals.

1		2	3	4	5
GLOBAL BUSINESS UNITS	**FUNCTIONS**	**LEADERSHIP COUNCIL[1]**	**GROUP RISK COMMITTEE[2]**	**EXECUTIVE COMMITTEE**	**BOARD OF DIRECTORS**
• Reviews and updates its own risk matrix • Defines risk owners to lead mitigation of most critical risks		Identifies a list of Group risks – the most relevant ones – to be submitted to an assessment phase	Assesses, decides on and closely monitors these Group risks	Each of these Group risks is sponsored by an Executive Committee member	Oversees and endorses

CORPORATE RISK DEPARTMENT
Supports and coordinates risk management throughout Solvay

1 Executive Committee, GBU Presidents, Function General Managers, Zone Presidents, and Solvay Business Services General Manager
2 General Managers for the Industrial, Legal, and Sustainable Development & Energy functions

Group level risks are managed with contributions from the Leadership Council for identification, the Group Risk Committee for assessment, and the Executive Committee members for sponsorship for treatment and risk response. The Audit Committee meets once a year with the Chairman of the Executive Committee and the CEO and other members of the Board to discuss the major risks facing the Group. During the year, the Audit Committee benefits from Risk Owners' presentations on Group risks, for example on industrial safety, security, cyber risk, ethics, and compliance.

Assessing major projects linked to Solvay's transformation

An appropriate risk assessment methodology is applied to significant projects, such as acquisitions, major capital investments, or transversal projects.

Internal control is one aspect of risk management. Please refer to the Corporate Governance section of this Annual Report for a detailed description of Solvay's risk management and internal control system.

Crisis preparedness operates a structured network within the Group. Assigned members perform tasks and implement programs to ensure the readiness of their business units and functions. These programs include crisis simulations, media training for potential spokespersons, maintenance of key databases, and analysis of relevant internal and external events. The risks identified through the Enterprise Risk Management approach influence the scenarios used in the simulations

3. Solvay's main risks

The Group Risk Committee has assessed the level of control of Group's risks impact, using a four-level scale for each criterion.

Four main types of impact were considered: economic impact, impact on people, impact on the environment, and impact on reputation. The level of control was assessed by considering the following questions:

- Are the mitigation/controlling actions defined?
- Are the actions implemented, fully or partially?
- Is the effectiveness of those actions monitored?

The criticality level is determined by combining the risk's two ratings (impact and level of control) at the time of the assessment.

Criticality	Risk	Trend	Sustainable development high materiality aspects	Stakeholders
High	Security	↘	Data security and customer privacy Critical incident risk management	Employees Local communities Customers
	Ethics and Compliance	→	Management of the legal, ethics & regulatory framework	Suppliers Employees Planet Investors
	Industrial safety	→	Critical incident risk management Employee health and safety	Employees Local communities
	Transport accident	→	Critical incident risk management Waste and hazardous material	Suppliers Employees Local communities
	Climate transition risk*	↘	Greenhouse gas emissions Energy management Sustainable business solutions Water and wastewater	Customers Local communities Employees Planet Investors
	Cyber-risk	↘	Data security and customer privacy	Customers Employees
Moderate	Chemical product usage	→	Waste and hazardous materials Sustainable business solutions	Employees Customers

* emerging risk – newly developing or changing risk that may have, on the long term, a significant impact which will need to be assessed in the future.

The description of the risks relevant to Solvay and Group risk-reduction actions are listed below. The mitigation efforts described do not guarantee that risks will not materialize or impact the Group, but they show how Solvay proactively manages risk exposures.

Security

Trend: Decrease

Risk description

A security event such as terrorism, crime, violence, vandalism, or theft which would impact employees, sites, assets, critical information, or intellectual property and could have negative consequences for the business.

Prevention and mitigation actions

- Solvay has a threat, risk, and compliance-based security approach to protecting sites, information, and people;
- A Group Security Director coordinates all security activities globally in order to ensure efficient security risk mitigation;
- Two governance bodies lead the security risk management effort:
  - a Security Board, chaired by an Executive Committee member;
  - a Security Coordination Working Group, chaired by the Group Security Director, which aims to run a continuous security threat monitoring program and an optimized security program for the Group.

2018 main actions

- Creation of the role of Security Champion in the GBUs and Functions to facilitate a coordinated approach to managing security risks in the Group. These Champions are the voice of their entities within the Security Coordination Working Group. They ensure that governance is implemented in a manner consistent with business priorities;
- Launching a Data Protection Plan to protect the Group's sensitive information;
- Completion of projects to improve the security of high-risk sites.

Ethics and compliance

Trend: Stabilize

Risk description

Risk arises from a potential failure to comply with:

- Solvay's Code of Conduct and all supporting policies and procedures;
- Laws and regulations in the jurisdictions in which Solvay operates.

Examples:

- Failure to implement good governance in a joint venture;
- Direct or indirect involvement in human rights violations;
- Intentional misstatement of financial reporting, corruption and by-passing of internal controls.

Prevention and mitigation actions

Solvay's Code of Conduct, policies, and procedures:

- It applies to employees, critical suppliers, and majority-owned joint venture partners;
- Solvay deployed several training courses and communication actions to address behavioral risks.

Special training courses to mitigate specific risks include:

- Anti-bribery and anti-corruption, Anti-competition, and the Gift & Entertainment Tracking System Policy;
- Human Rights in Business Policy: implementation, governance and training;
- Group-wide Speak Up program for reporting non-compliance, either directly to management or to third-party helpline.

2018 main actions

- More than 80% of employees received training on Solvay's Code of Conduct, and a large variety of languages was added to web-based training catalog for the Code of Conduct;
- A Global Human Rights Committee has been appointed to oversee implementation, compliance, and training on the Group Human Rights policy;
- More than 1,800 leaders and employees in sensitive positions attended Anti-Bribery and Anti-Corruption (ABAC) training.

Industrial safety

Trend: Stabilize

Risk description

A major accident such as a fire, explosion, or loss of containment resulting in possible fatalities, life-altering injuries, harm to the environment, or harm to local communities

Any fatality or life-altering injury not related to a major accident

Prevention and mitigation actions

Solvay's approach to occupational safety is evolving. While the group has seen a consistent reduction in the number of people who are injured in our facilities, it has have averaged one fatality per year during the past few years.

In 2018, Solvay focused on fostering an environment at our sites whereby all employees work together to ensure they go home safe at the end of each day.

Occupational safety:

Solvay's Safety Excellence initiative focuses on employee engagement across the entire company and includes the following measures:

- Safety Days;
- Leadership safety visits;
- Behavior Based Safety Programs;
- Lessons Learned Bulletins (targeting all Medical Treatment Accidents (MTA), as well as Near Miss and First Aid incidents of interest);
- Best Practice Sharing;
- A personal safety objective for each employee.

In 2017, Solvay developed a "Safety Climate Assessment" tool based on the Dov Zohar methodology to determine the maturity level of individual sites' safety culture. Several sites have started to use the tool. In 2018, the Group organized safety leadership and risk awareness workshops and different communication/presentation sessions in the GBUs and in sites.

Solvay introduced the Solvay Life Saving Rules (SLSR) in 2015. The SLSR cover those activities (e.g. Work at Heights, Line Breaking, etc.) that, when not performed safely, have resulted in either a fatality or a life-altering injury. This year, we initiated a collaborative process to further define the risks and which mitigation measures to apply. This collaborative effort produced minimum requirements for the SLSR. These minimum requirements will ensure that we have a shared understanding of the mitigation measures necessary to effectively manage the risks linked to activities in which the SLSR apply. We expect all sites to be compliant with the requirements by the end of 2019.

Safety results are reviewed monthly by GBUs and at the Executive Committee level.

Process safety management:

Solvay applies a preventive risk-based approach founded on systematic process safety risk analyses and management of change processes.

2018 main actions

Occupational safety:

- Minimum requirements for three highest priority Solvay Life Saving Rules (SLSR) implemented at all sites;
- Safety leadership and safety culture workshops in the GBUs and at the sites;
- Medical Treatment Accident Rate: 0.54.

Process Safety:

- 83% of all sites have had a process hazard assessment in line with Group requirements within the last five years (2020 target – 100%);
- No high-risk situations (Level 1 risk sheets) older than one year.

Transport accident

Trend: Stabilize

Risk description

An accident in connection with hazardous chemical transportation poses the risk of injury to neighbors or the public.

Prevention and mitigation actions

- Internal e-learning courses on transport safety;
- Global network of dangerous goods safety advisors;
- Global qualification process for dangerous goods carriers;
- Development of internal procedures and guidelines based on the transport safety recommendations of associations such as CEFIC (European Chemical Industry Council), EUROFLUOR (European Technical Committee for Fluorine), and HFIPI (Hydrogen Fluorine Industry Practices Institute);
- Implementation of programs such as Responsible Care®;
- Follow up of transport accidents with development of corrective actions and learning lessons bulletins;
- Worldwide emergency response helpline (level 1, available 24 hours a day, 7 days a week) in the language of the caller.

2018 main actions

Continuing Solvay transport safety program to reinforce preventive actions.

Climate transition

Trend: Decrease

Risk description

The Group strategy to address climate-related transition risks (as defined by TCFD[*]) could be ineffective and damage Solvay's reputation, business losses, undervaluation, and difficulty attracting long-term investors. The Group has decided to include water-related risks in climate-related transition risks, rather than in physical risks

Climate transition risks stem from various causes:

- Policies and legal context: regulations and actions to limit CO_2 emissions, for example increasing the price of greenhouse gas (GHG) emissions;
- Technology: unsuccessful investment in new, lower-emission technologies;
- Markets: failure to adapt to changing customer behavior;
- Reputation: negative stakeholder attitudes if their climate change concerns are not addressed effectively.

Prevention and mitigation actions

- Solvay's strategy focuses on businesses with higher added value and less environmental exposure;
- Every year, the Sustainable Portfolio Management (SPM) tool assesses the environmental exposure of our sales and our innovation projects portfolio. SPM includes climate-related criteria aligned on 2°C scenarios;
- Solvay has a GHG emissions reduction plan.

2018 main actions

Solvay updated in September 2018 its greenhouse gas emissions approach. Solvay commits to reducing greenhouse gas emissions by 1 million tons by 2025, by improving its energy efficiency and energy mix and by investing in clean technologies. Climate risks and opportunities will be reviewed in 2019.

(*) : TCFD – Task Force on Climate-related Financial Disclosures

Cyber risk

Trend: Decrease

Risk description

Cyber risk includes the inability to ensure service continuity or to protect confidential, critical, or sensitive information.

Prevention and mitigation actions

Cyber security program:

The two Governance bodies leading the security risk management effort also take care of the supervision of the Cyber security program.

- Independent assessments, including penetration tests are conducted by external experts;
- Solvay Business Services (SBS) has renewed its ISO 9001: 2015 quality management program for all its activities, and obtained its ISO 27001: 2013 certification – which encompasses cybersecurity for the majority of its information systems activities;
- Training on information systems security policies and best practices has been completed for all SBS information systems professionals;
- End-user security training remains mandatory for all employees. Cybersecurity tips are published regularly to increase employee awareness.

A significant cyber-attack could negatively impact the company's operations and results. Therefore the Company will continue to solidify its cyber defenses to manage the evolving cyber threat landscape.

Insurance

Solvay is insured against the potential financial impact of a cyber event with respect to assets, business interruptions, and cases of fraud.

2018 main actions

Solvay continues to enhance its overarching cyber security strategy and governance, develop the corporate information security program, and explore other functions/capabilities to enrich the company's security posture and ability to respond to a cyber-related threat.

Chemical product usage

Trend: Stabilize

Risk description

- Solvay's exposure stems from the possibility of third parties being injured, suffering an adverse health impact, or experiencing property damage caused by the use of a Solvay product, as well as from the resulting litigation;
- Inappropriate use of one of Solvay products in a customer's plant, or use in applications or markets for which the product is not designed (inappropriate use), or use by the customer that is not endorsed by Solvay;
- The possible consequences of a faulty product, including exposure to liability for injury, health impairment and damage, or product recalls. Product liability risk is generally higher for products used in healthcare and food & feed applications;
- The possibility of an authorization for the use of a marketed product being refused because it is a substance of very high concern (SVHC).

Prevention and mitigations actions

- Solvay Safety Data Sheets (SDS) ensure harmonized content by implementing a common worldwide SAP system for the Group. This SAP system is, however, not yet implemented for Composite Materials; the go-live for this GBU is planned for mid-2019;
- In particular for SVHC, all GBU perform annually an inventory of those substances in their products sold. The objective is by 2020 to have 100% risk assessment and analysis of any available safer alternatives;
- SDS are constantly maintained and distributed worldwide for all products to all customers in the appropriate languages. Global Business Units ensure that SDS are revised at least every three years, for all products they put on the market;
- Recall procedures are developed and deployed as prescribed by the product stewardship programs;
- Insurance reduces the financial impact of a product liability risk, including for first-party and third-party product recalls.

2018 main actions

The Solvay "Product Safety Management Process" (PSMP) identifies risks relating to products marketed by Solvay. It has been updated to integrate new regulatory requirements and additional potential risk causes (legal, supply chain, etc.). All GBUs are currently implementing this process with a specific focus on prioritizing the required risk assessments in the products portfolio and on regularly deploying risk assessments for the most sensitive product applications.

4. Other risks

Market and growth – strategic risk

Description

Pertains to Solvay's exposure to developments in its markets or its competitive environment, and the risk of making erroneous strategic decisions.

Prevention and mitigation actions

- Systematic and formal analysis of markets and marketing challenges with respect to investments and innovation project ramp-ups;
- Development of GDP+ growth markets: Automotive & Aerospace, Resources & Environment, Electrical & Electronics, and Agro, Feed & Food;
- Development of customized, mission-critical solutions with Solvay key accounts;
- Adaptation of operations to new energy and CO_2 markets;
- Stronger focus on cash conversion and generation;
- Disposals of businesses which were under the cyclicality radar screen.

Supply chain and manufacturing reliability risk

Description

Risks related to raw materials, energy, suppliers, production, storage units, and inbound/outbound transportation.

Prevention and mitigation actions

For manufacturing reliability:

- Geographic distribution of production units around the world;
- Maintenance;
- Group property loss prevention program focusing on the prevention and mitigation of damage to assets and loss of profit due to fire, explosion, accidental chemical release, and other adverse events.

For supply chain:

Third-party CSR assessment and adherence to the Solvay Supplier Code, ownership of mines and quarries of trona, limestone, and salt, and programs to reduce energy consumption.

Project selection and management

Description

- Allocation of resources to projects (capital expenditure, mergers and acquisitions) could be misaligned with Solvay's growth strategy ;
- Major project facing difficulties with the risk of not reaching its objectives.

Prevention and mitigation actions

- The Investment Committee provides the Executive Committee with an analytical view of capex allocation efficiency and capex plan;
- Capex Excellence methodology is used for the project portfolio on smaller projects;
- Investment decisions (capital expenditure above € 10 million and acquisitions) made by the Executive Committee or the Board of Directors include a sustainability challenge that encompasses an exhaustive SPM analysis of the potential investment;
- A performance analysis is conducted after implementation.

The combination of these actions has led to much better control over EBITDA conversion into cash and a conversion level comparable to similar companies in the industry.

Regulatory, political, and legal risk

Description

- Changes in legislation and regulations ;
- Solvay's exposure to circumstances where the normal exercise of public authority is disrupted;
- Exposure to actual and potential judicial and administrative proceedings. (Important Litigation section) ;
- A no-deal Brexit would create many uncertainties regarding the laws and regulations applicable to business ;
  Only a limited part of Solvay's activities may be actually impacted (as an indication, the trade flow between the EU and the United Kingdom represents roughly 3 % of net sales and 2% of invested capital of the Group).

Prevention and mitigation actions

- Balanced global presence to reduce the impact of adverse regulatory and political developments;
- A Government and Public Affairs department working continuously with public officials at a national level, including but not limited to European authorities, as well as through the local Belgian embassy;
- Financial provisions are made based on Solvay's awareness of legal risk;
- A Brexit task force has been established with the participation of impacted GBUs and the relevant ; functions. The GBUs have identified the main risks and work on mitigation actions under the assumption of a worst case scenario ("no-deal"), aiming to minimize any disruption to our customers.

Financial risk

Description

- Liquidity risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements);
- Foreign exchange risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements);
- Interest-rate risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements);
- Counterparty risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements);
- Pension obligation risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements);
- Tax litigation risk (see note F35 Financial instruments and financial risk management to the consolidated financial statements).

Prevention and mitigation actions

A prudent financial profile and conservative financial discipline:

- Investment Grade status: the Group is rated Baa2/P2 (stable outlook) by Moody's and BBB/A2 (stable outlook) by Standard & Poor's as of 2018;
- Solvay promotes transparent and regular discussions with leading rating agencies.

Strong liquidity reserves:

- As of the end of 2018, the Group has € 1.1 billion in cash and equivalents (namely, other current financial instruments), as well as € 3.0 billion of committed credit facilities (a multilateral revolving credit facility of € 2.0 billion, and an additional € 1.0 billion from bilateral revolving credit facilities with key international banking partners);
- The Group has access to a Belgian Treasury Bill program for € 1.5 billion and, alternatively, to a US commercial paper program for US$500 million.

Currency hedging policy:

- Solvay monitors the foreign exchange market closely and takes hedging measures, principally for terms shorter than one year and generally not exceeding 18 months.

Interest rate hedging policy:

- The Group locks in the majority of its net indebtedness at fixed interest rates. Solvay monitors the interest rate market closely and enters into interest rate swaps whenever they are deemed appropriate.

Energy hedging policy:

Solvay is hedging energy prices, and those transactions go beyond 9 months, they go up to 3 years.

Monitoring of Group counterparties' ratings:

- For its treasury activities, Solvay works with banking institutions of the highest creditworthiness (selection based on major rating systems) and minimizes the concentration of risk by limiting its exposure to each of these banks to a certain threshold;
- For its commercial activities, Solvay's external customer risk and cash collection are monitored by a strong network of credit managers and cash collectors located in the Group's various operating regions and countries. Their controls are supported by a set of detailed procedures and managed through Corporate and GBU Credit Committees. These loss mitigation measures have led, over the past few years, to a record low rate of customer defaults.

Pension governance and pension plan optimization:

- Pension governance: Solvay has set guidelines for maximizing its influence over local pension fund decisions within the limits provided by domestic laws;
- Pension plan optimization: reducing the Group's exposure to defined-benefit plans by either converting existing plans into pension plans with a lower risk profile for future services or closing them to new entrants;
- A global ALM (Asset Liability Management) analysis of the Group's pension plans, representing about 90% of the Group's gross or net pension obligations, is performed every three years to identify and manage corresponding risks on a global basis.

Control processes for tax regulation compliance and transfer pricing policies:

- Control processes for tax regulation compliance include monitoring procedures and systems, thorough internal reviews, and audits performed by reputable external consultants;
- Transfer pricing policies, procedures and controls are aimed at meeting the requirements of the authorities;
- Solvay's Tax department pays close attention to the correct interpretation and application of new tax rules to avoid future litigation.

2018 main actions:

- Issuance of a € 300 million perpetual hybrid bond (first call date in March 2024) to be used for general corporate purposes, including the possibility of refinancing the existing €700 million hybrid bond whose first call date is in May 2019;
- Maturity extension till March 2020 of two bilateral revolving credit facilities for a total amount of €500 million;
- A new cash contribution plan has been agreed with Rhodia Pension Trust Ltd (UK): £ 25 million p.a. until end 2027 (increasing 3.25% yearly). For this purpose, Solvay SA has granted a guarantee to Rhodia UK Ltd, the sponsor of the pension scheme (initial amount of £ 550 million to be amortized monthly until end 2030). This guarantee replaces a similar one, previously issued by Solvay France;
- Deployment of a bank account management tool group-wide allowing for a comprehensive inventory of banking structure across entities, enhancing visibility and control as well as facilitating appropriate management.

Occupational diseases and pandemic risk

Description

Work-related diseases recognized as resulting from exposure to occupational hazards, with generally repeated exposure.

Prevention and mitigation actions

- A strong worldwide program for monitoring occupational disease, including a comprehensive assessment of compliance with occupational hygiene standards;
- Definition of conservative exposure limits, with a specific focus on nano-materials, SVHCs, and the health-related applications of Solvay products;
- Advanced risk-based medical surveillance;
- Global pandemic preparedness plan covering all plants and businesses.

Environmental risk

Description

Managing or remediating historical soil contamination at a number of sites and complying with future changes in environmental legislation

Prevention and mitigation actions

- Careful monitoring and management of sites with a history of soil contamination;
- Rolling out a risk characterization approach at every affected site when relevant;
- Local regulatory monitoring;
- Strong governance through a dedicated Environmental Board composed of two Comex members, Industrial Function, Legal and Finance, to lead the environmental risk management effort.

IT risk

Description

Inability to ensure continuity of services or to provide information services adapted to the needs of the business.

Prevention and mitigation actions

Dedicated data network and regional internet gateways managed by trusted service providers, Annual IT audit program to ensure compliance with the information system security policies.

Important litigation

With its variety of activities and its geographic distribution, the Solvay Group is exposed to legal risks, particularly in the areas of product liability, contractual relations, antitrust laws, patent disputes, tax assessments, and HSE matters. In this context, litigation cannot be avoided and is sometimes necessary so as to defend the rights and interests of the Group.

The outcome of proceedings cannot be predicted with certainty. It is therefore possible that adverse final court decisions or arbitration awards could lead to liabilities (and expenses) that are not covered or not fully covered by provisions or insurance, and that could have a material impact on the revenues and earnings of the Group.

Ongoing legal proceedings involving the Solvay Group that are currently considered to involve significant risks are outlined below. The legal proceedings described below do not constitute an exhaustive list.

The fact that litigation proceedings are reported below is unrelated to the merits of the cases. In all the cases cited below, Solvay is defending itself vigorously and believes in the merits of its defenses.

For certain cases, Solvay has created reserves/provisions in accordance with the accounting rules to cover financial risk and defense costs (see "Provisions for litigation to the consolidated financial statements" of the present document).

Antitrust proceedings

In 2006, the European Commission imposed fines against Solvay (including Ausimont SpA, acquired by Solvay in 2002) for alleged breaches of competition rules in the peroxygens market for which Solvay was fined.

Joint civil lawsuits were filed before the Court of Dortmund (Germany) in 2009 against Solvay and other manufacturers based on an alleged antitrust violation, claiming damages from the manufacturers on a joint and several basis. The value of the claims reduced after several settlements is worth €63 million (excluding interest) after settlements were reached between the plaintiff and most of the defendants. Several questions on the jurisdiction of the Court of Dortmund have been submitted to the European Court of Justice, and proceedings before the Court of Dortmund are pending.

In Brazil, CADE (the Brazilian antitrust authority) issued fines against Solvay and others in May 2012 relating to the hydrogen peroxide activity and in February 2016 relating to the perborate activity (Solvay's shares of these fines amount to €29.6 million and €3.99 million respectively). Solvay has filed a claim with the Brazilian Federal Court contesting these administrative fines.

HSE-related proceedings

In October 2009, the public prosecutor of the Criminal Court of Alessandria (Italy) charged several individuals (including employees and former employees of Solvay and Ausimont SpA, now Solvay Specialty Polymers Italy - SSPI) in relation to alleged criminal violations of environmental laws and public health legislation. The provisional claims of civil parties admitted to the trial amounted to about €105 million.

In December 2015 the Assize Court of Alessandria sentenced three local Solvay/SSPI managers to imprisonment and awarded civil damages of around €400,000.

An appeal was lodged by all parties with the Assize Court of Appeal of Turin which rendered its decision in June 2018 confirming: 1) acquittal of two of the SSPI managers; 2) sentence of the three Solvay/SSPI managers reduced to a suspended sentence of 20 months imprisonment; 3) damages for civil parties were maintained at €400,000, but other civil claims were rejected; 4) the charge of sanitation failure was dropped; 5) SSPI not liable for damages to Alessandria Municipality. The term for lodging a further appeal before the Court of Cassation is still pending.

As of the end of 2016, seventeen civil proceedings were brought before the Civil Court of Livorno (Italy) by former workers and relatives of deceased workers at the Rosignano site seeking damages (provisionally quantified at €9 million) in relation to diseases allegedly caused by exposure to asbestos. Three of the seventeen proceedings have been dismissed so far.

Pharmaceutical activities (discontinued)

In the context of the sale of the pharmaceutical activities in February 2010, the contractual arrangements have defined terms and conditions for the allocation and sharing of liability arising out of the activities before the sale.

Subject to limited exceptions, Solvay's exposure for indemnifications to Abbott for liabilities arising out of sold activities is limited to an aggregate amount representing €500 million and is limited in duration.

This includes indemnification against certain potential liabilities under the testosterone replacement therapy (TRT) litigation focusing on the drug ANDROGEL®. These claims are proceeding at varying rates of resolution.

MANAGEMENT REPORT

BUSINESS REVIEW

4

Business review

1. Overview of the consolidated results

Key financial figures

		IFRS			Underlying		
In € million	Notes	**FY 2018**	FY 2017	*% yoy*	**FY 2018**	FY 2017	*% yoy*
Net sales	*B1*	**10,257**	**10,125**	***+1.3%***	**10,257**	**10,125**	***+1.3%***
Net operating costs, excluding depreciation & amortization	*B2*	(8,327)	(8,095)	*(2.9)%*	(8,027)	(7,894)	*(1.7)%*
EBITDA	*B3*	**1,930**	**2,029**	***(4.9)%***	**2,230**	**2,230**	**–**
EBITDA margin					*21.7%*	*22.0%*	*(0.3)pp*
Depreciation, amortization & impairments	*B4*	(944)	(1,054)	*+10%*	(684)	(704)	*+2.8%*
EBIT		**986**	**976**	***+1.1%***	**1,546**	**1,527**	***+1.3%***
Net financial charges	*B5*	(194)	(298)	*+35%*	(326)	(394)	*+17%*
Income tax expenses	*B6*	(95)	197	*n.m.*	(305)	(299)	*(2.0)%*
Tax rate	*B6*				*26.1%*	*27.5%*	*(1.4)pp*
Profit from discontinued operations	*B7*	201	241	*(17)%*	216	159	*+36%*
(Profit) loss attributable to non(controlling interests)		(39)	(56)	*(29)%*	(40)	(54)	*(26)%*
Profit attributable to Solvay shareholders		**858**	**1,061**	***(19)%***	**1,092**	**939**	***+16%***
Basic earnings per share (in €)	*B24*	**8.31**	**10.27**	***(19)%***	**10.57**	**9.08**	***+16%***
of which from continuing operations	*B24*	6.37	7.97	*(20)%*	8.48	7.59	*+12%*
Dividend(1)	*B25*	**3.75**	**3.60**	***+4.2%***	**3.75**	**3.60**	***+4.2%***
Capex	*B8*				**(833)**	**(822)**	***(1.4)%***
of which from continuing operations	*B8*				(711)	(716)	*+0.8%*
Cash conversion	*B8*				*0.7*	*0.7*	*+0.3pp*
Free cash flow	*B9*				**989**	**871**	***+14%***
of which from continuing operations	*B9*				830	782	*+6.1%*
Free cash flow to Solvay shareholders	*B9*				**725**	**466**	***+56%***
of which from continuing operations	*B9*				566	377	*+50%*
Net working capital	*B10*	1,550	1,414	+9.6%	1,550	1,414	*+9.6%*
Net working capital / sales	*B10*				*15%*	*14%*	*+1.5pp*
Net financial debt(2)	*B11*	**(2,605)**	**(3,146)**	***+17%***	**(5,105)**	**(5,346)**	***+4.5%***
Underlying leverage ratio	*B11*				*2.01*	*2.17*	*(15)pp*
CFROI	*B12*				***6.9%***	***6.9%***	**–**
Research & innovation	*B13*				**(352)**	**(325)**	***(8.3)%***
Research & innovation intensity	*B13*				*3.4%*	*3.2%*	*+0.2pp*

(1) Recommended dividend for 2018

(2) Underlying net debt includes the perpetual hybrid bonds, accounted for as equity under IFRS

Historical key financial data

In € million		As published				
		2014	2015[1]	2016	2017	**2018**
Income statement data						
Sales	a	10,629	11,047	11,403	10,891	11,299
Net sales	b	10,213	10,578	10,884	10,125	10,257
Underlying EBITDA	c	1,783	1,955	2,284	2,230	2,230
Underlying EBITDA margin	d	17.5%	18.5%	21.0%	22.0%	21.7%
IFRS EBIT	e	652	833	962	976	986
Underlying profit for the period	f			907	992	1,131
IFRS profit for the period	g	13	454	674	1,116	897
Underlying profit attributable to Solvay share	h		680	846	939	1,092
IFRS profit attributable to Solvay share	i	80	406	621	1,061	858
Cash flow data						
Capex	j	(987)	(1,037)	(981)	(822)	(833)
of which from continuing operations	k	(861)	(969)	(929)	(716)	(711)
Cash conversion	l = (c+k)/c	*51.7%*	*50.4%*	*59.3%*	*67.9%*	*68.1%*
Free cash flow	m	656	387	876	871	989
Free cash flow to Solvay shareholders	n	355	132	527	466	725
Balance sheet data						
Net working capital	o	1,101	1,557	1,396	1,414	1,550
Net working capital / sales	p = µ(o/a)[2]	*13.5%*	*13.4%*	*15.3%*	*13.8%*	*15.3%*
Underlying net debt[3]	q = r+s	(1,978)	(6,579)	(6,556)	(5,346)	(5,105)
Perpetual hybrid bonds	r	(1,200)	(2,200)	(2,200)	(2,200)	(2,500)
IFRS net debt	s	(778)	(4,379)	(4,356)	(3,146)	(2,605)
IFRS equity	t	6,778	9,668	9,956	9,752	10,624
Equity attributable to non(controlling interests)	v	214	245	250	113	117
Perpetual hybrid bonds in equity	u	1,194	2,188	2,188	2,188	2,486
Equity attributable to Solvay share	w = t-u-v	5,369	7,234	7,518	7,451	8,021
Underlying leverage ratio[4]	x = -q/c	*1.11*	*2.82*	*2.60*	*2.17*	*2.01*
Other key data						
CFROI	z	*6.9%*	*6.9%*	*6.3%*	*6.9%*	*6.9%*
Research & innovation	A	(287)	(320)	(350)	(325)	(352)
Research & innovation intensity	B = -A/b	*2.8%*	*3.0%*	*3.2%*	*3.2%*	*3.4%*

(1) 2015 data are not presented on pro forma basis, i.e. excude Cytec.
(2) Average of the quarters.
(3) Underlying net debt includes the perpetual hybrid bonds, accounted for as equity under IFRS.
(4) The 2018 underlying leverage ratio is calculated based on the underlying EBITDA including the discontinued operations Polyamide. The 2017 underlying leverage ratio is calculated based on the underlying EBITDA including the discontinued operations Acetow, Vinythai and Polyamide.
The 2016 underlying leverage ratio is calculated based on the underlying EBITDA including the discontinued operations Acetow and Vinythai. The 2015 underlying leverage ratio is calculated based on the underlying pro forma EBITDA, including Cytec.

The table above presents the historical figures of the Group as published at the reference date. These data have not been affected by possible subsequent restatements due to perimeter changes, IFRS/IAS standards evolution, etc.

Over the reference periods, the following main changes have occurred:

- 2012:
  - Latin American chlorovinyls activities (Indupa) presented as discontinued and assets and liabilities held for sale
- 2013:
  - European chlorovinyls activities presented as discontinued and assets held for sale;
  - Acquisition of Chemlogics, consolidated as from November 1.
- 2014:
  - Application of IFRS 11;
  - Eco Services activities presented as discontinued and assets held for sale, and divested on December 2,
- 2015:
  - European chlorovinyls activities contributed to the Inovyn joint venture (50% Solvay, 50% Ineos) on July 1;
  - Acquisition of 100% of the shares of Cytec Industries Inc. on December 9. Cytec opening balance sheet has been fully consolidated within the Solvay group as from December 31, 2015. Cytec's results and cash flows for the period between December 9 and December 31 are not material, except for acquisition-related expenses presented as Result from portfolio management and reassessment. Consequently, Cytec did not contribute to the Group's profit or cash flows in 2015.
- 2016:
  - Divestment of Solvay's share in Inovyn joint venture on July 7;
  - Acetow and Vinythai businesses presented as discontinued operations and as assets held for sale;
  - Divestment of Latin American chlorovinyls activities (Indupa) on December 27.
- 2017:
  - Vinythai transaction completed end of February;
  - Acetow transaction completed end of May;
  - Divestment of Polyamide business classified as discontinued operations and assets and liabilities held for sale at the end of September 2017.
- 2018:
  - Divestment of Polyamide business still classified as discontinued operations and assets and liabilities held for sale at the end of September 2017.

2. Preparation background

Comparability of results & reconciliation of underlying Income Statement indicators

Besides IFRS accounts, Solvay also presents underlying Income Statement performance indicators to provide a more consistent and comparable indication of Solvay's economic performance. These figures adjust IFRS figures for the non-cash Purchase Price Allocation (PPA) accounting impacts related to acquisitions, for the coupons of perpetual hybrid bonds classified as equity under IFRS but treated as debt in the underlying statements, and for other elements to generate a measure that avoids distortion and facilitates the appreciation of performance and comparability of results over time.

Alternative performance metrics (APM)

Solvay measures its financial performance using alternative performance metrics, which can be found below. Solvay believes that these measurements are useful for analyzing and explaining changes and trends in its historical results of operations, as they allow performance to be compared on a consistent basis.

- Underlying tax rate = Income taxes / (Result before taxes – Earnings from associates & joint ventures – Interests & realized foreign exchange results on the RusVinyl joint venture) – all determined on an underlying basis. The adjustment made to the denominator regarding associates and joint ventures is done because these contributions are already net of income taxes;
- Research & innovation measures the total cash effort in research and innovation, regardless of whether the costs were expensed or capitalized. It consists of research & development costs from the income statement before netting of related subsidies and royalties, and where depreciation and amortization are replaced by related capital expenditure;
  Research & innovation intensity is the ratio of research & innovation to net sales;
- Free cash flow is calculated as cash flows from operating activities (excluding cash flows linked to acquisitions or disposals of subsidiaries), and cash flows from investing activities (excluding cash flows from or related to acquisitions and disposals of subsidiaries and other investments, and excluding loans to associates and non-consolidated investments, as well as related tax elements and recognition of factored receivables);
- Free cash flow to Solvay shareholders is calculated as free cash flow after payment of net interests, coupons of perpetual hybrid bonds and dividends to non-controlling interests. This represents the cash flow available to Solvay shareholders, to pay their dividend and/or to reduce the net financial debt;
- Capital expenditure (capex) is cash paid for the acquisition of tangible and intangible assets;
- Cash conversion is a ratio used to measure the conversion of EBITDA into cash. It is defined as (Underlying EBITDA + Capex from continuing operations) / Underlying EBITDA;
- Net working capital includes inventories, trade receivables and other current receivables, netted with trade payables and other current liabilities;
- (IFRS) net debt = Non-current financial debt + Current financial debt – Cash & cash equivalents – Other financial instruments. Underlying net debt represents the Solvay share view of debt, reclassifying as debt 100% of the hybrid perpetual bonds, classified as equity under IFRS. Leverage ratio = Net debt / Underlying EBITDA of last 12 months. Underlying leverage ratio = Underlying net debt / Underlying EBITDA of last 12 months;
- Cash Flow Return On Investment measures the cash returns of Solvay's business activities. Movements in CFROI levels are relevant indicators for showing whether economic value is being added, though it is accepted that this measure cannot be benchmarked or compared with industry peers. The definition uses a reasonable estimate (management estimate) of the replacement cost of assets and avoids accounting distortions, e.g. for impairments. It is calculated as the ratio between recurring cash flow and invested capital, where:
  - Recurring cash flow = Underlying EBITDA + Dividends from associates and joint ventures – Earnings from associates and joint ventures + Recurring capex + Recurring income taxes;
  - Invested capital = Replacement value of goodwill & fixed assets + Net working capital + Carrying amount of associates and joint ventures;
  - Recurring capex is normalized at 2% of the replacement value of fixed assets net of goodwill values;
  - Recurring income tax is normalized at 30% of (Underlying EBIT – Earnings from associates and joint ventures).

Description of the operational segments

Advanced Materials

Advanced Materials segment offers a unique portfolio of high-performance polymers and composite technologies used primarily in sustainable mobility applications. Our solutions enable weight reduction and enhance performance while improving CO_2 and energy efficiency. Major markets served include next-generation mobility in automotive and aerospace, healthcare and electronics.

Specialty Polymers

With over 1,500 products, Specialty Polymers offers the widest range of high performance polymers in the world, allowing tailor-made solutions such as pushing the limits of metal replacement in the electronics, automotive, aircraft, and healthcare industries. The GBU has unparalleled expertise in three technologies: aromatic polymers, high barrier polymers, fluoropolymers.

Composite Materials

Composite Materials is a top-tier supplier to the aerospace engineered materials market known for its expertise in design materials and process engineering. We deliver optimal material solutions to address our customer's most challenging demand for new high-performance materials that reduce weight, improve aerodynamics, and ultimately lower the total part costs for customers. The business supplies composites technologies to civil and military aircraft manufacturers which comprises the majority of sales, with the balance of sales into various industrial markets.

Special Chem

Special Chem produces fluor and rare-earth formulations for automotive, semi-conductor, and lighting applications. With its industrial know-how, global presence, and R&I proximity, Special Chem has positioned itself as a strategic partner for the automotive sector as a producer of materials used in emission control catalysis and aluminum brazing, and as a producer of cleaning and polishing materials for electronics.

Silica

Silica focuses on highly dispersible silica, used primarily in fuel-efficient and performance tires. The primary focus of the business is to develop innovative solutions for global tire manufacturers.

Advanced formulations

Advanced Formulations includes a broad-based portfolio of surface chemistries focused on improving the world's resource efficiency. The segment offers customized formulations that alter liquid behavior to optimize yield while reducing environmental impact. Major markets include resource efficiency in oil & gas, mining and agriculture, as well as consumer goods, and food.

Novecare

Novecare develops and produces formulations that alter the properties of liquids. It offers solutions to the oil and gas industry using an extensive range of surface chemistries combined with applications expertise. Novecare also provides specialty solutions for certain industrial applications, agricultural, and coatings markets.

Technology Solutions

Technology Solutions is a global leader in specialty mining reagents, phosphine-based chemistry, and solutions for stabilization of polymers. Its portfolio includes world class, leading-edge technologies and unrivalled technical service and applications expertise that support our customers in developing tailor-made solutions, in particular for mining, where Solvay's products allow customers to extract metal concentrates from increasingly more complex and depleted ores.

Aroma Performance

Aroma Performance is a world's largest integrated producer of vanillin for the flavors & fragrances industries and also produces synthetic intermediates used in pharmaceuticals, agrochemicals, and electronics.

Performance Chemicals

Performance Chemicals hosts chemical intermediate businesses focused on mature and resilient markets. Solvay is a world leader in soda ash and peroxides and major markets served include building and construction, consumer goods and food. It provides resilient profitability thanks to good pricing and market dynamics, underpinned by high quality assets.

Soda Ash & Derivatives

Soda Ash & Derivatives is a world leader for the production of soda ash and sodium bicarbonate, sold primarily to the flat and container glass industries but also used in detergents, agro, and food industries. It provides resilient profitability thanks to good pricing, dynamics growing at GDP rate, underpinned by high-quality assets.

Peroxides

Solvay is a market leader in hydrogen peroxide, both in market share and technology. Hydrogen peroxide (H_2O_2) is used mainly by the paper industry to bleach pulp. Its properties are also of interest to many markets, such as chemicals, food, textiles, and the environment.

Coatis

Coatis is a provider of glycerine-based sustainable solvents solutions and specialty phenols mainly for the Latin American market. It enjoys an undisputed market leadership position in Brazil for Phenol & Derivatives used in the production of synthetic resins employed in foundries, construction, and abrasives.

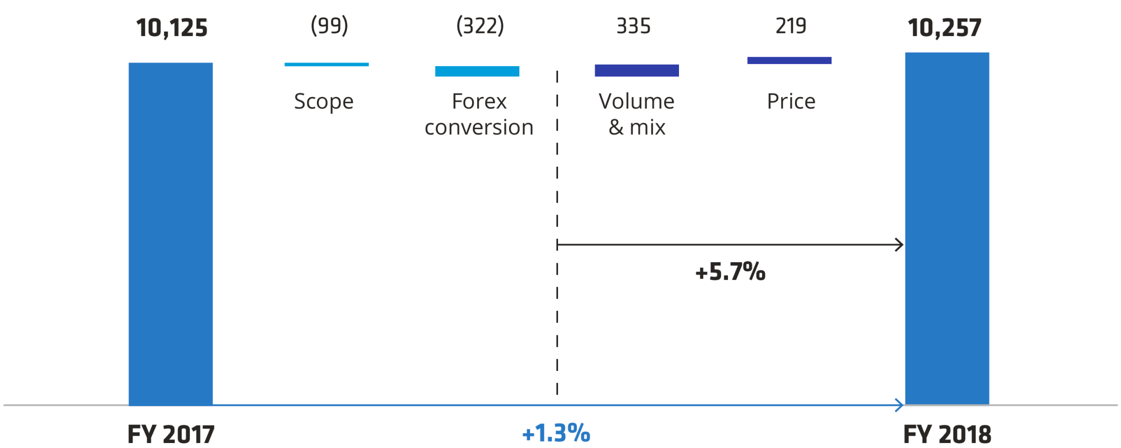
Corporate & Business Services

Corporate & Business Services includes corporate and other business services, such as Group research & innovation or energy services, whose mission is to optimize energy consumption and reduce CO_2 emissions.

3. Notes to the underlying Group figures

NOTE B1
Net sales

Net sales evolution
FY yoy net sales bridge (in €million)



Net sales were up +1.3% for the full year. Organic sales growth of +5.7% was driven by both volumes and prices, which more than offset forex conversion and scope effects.

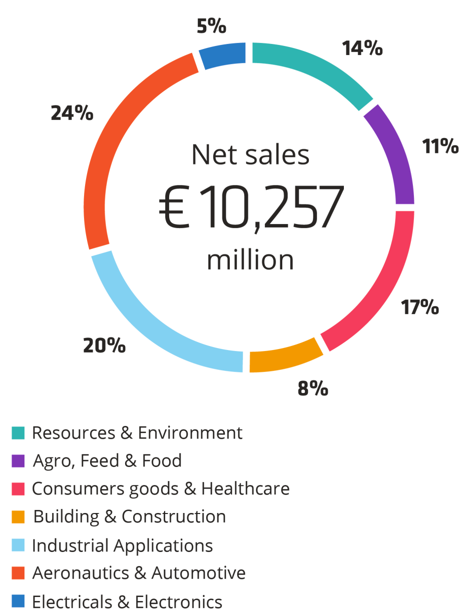
The reduction in **scope**[1] had a -1.0% effect and comprised the divestments of the polyolefin cross-linkable compounds in Advanced Materials and formulated resins businesses, as well as part of the phosphorous business in Advanced Formulations.

Forex conversion had an adverse effect of -3.2%, mainly related to the depreciation of the U.S. dollar in the first half of the year, as well as that of the Brazilian real.

Volumes were up +3.3% overall. In Advanced Materials strong growth for Solvay's polymers and composites technologies in aeronautics, automotive and healthcare, was tempered by lower demand in smart devices and fluorinated gases used in insulation. Volumes in Advanced Formulations were up across business units, although growth in the shale oil & gas stimulation market in North America declined significantly in the fourth quarter. In Performance Chemicals, higher demand for peroxides and recovery in Coatis' domestic Latin American market supported volume growth, more than compensating for slightly lower soda ash volumes at the start of the year.

Prices rose +2.2% overall, partially reflecting higher raw material costs. In Advanced Formulations, pricing strength was recovered in the first nine months but turned negative in the fourth quarter following the oil and gas decline. In Performance Chemicals increases in peroxides and the Coatis business, offset the anticipated decrease in soda ash.

Net sales by market



[1] Scope effects include acquisitions and divestments of smaller businesses not leading to the restatement of previous periods.

NOTE B2
Underlying raw material & energy costs

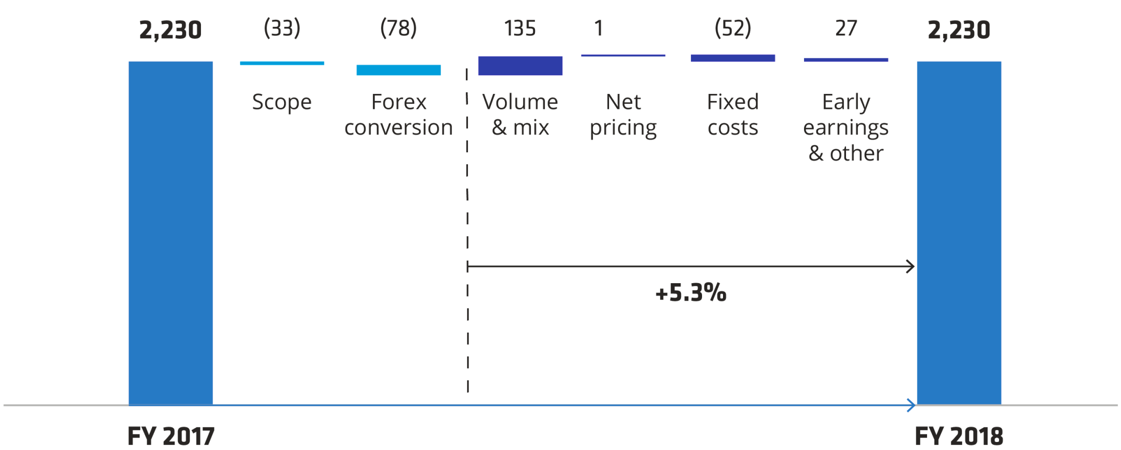
The overall raw materials expense of the Group mounted to circa € 2.8 billion in 2018 (vs. €2.5 billion in 2017). The raw materials expense can be split into several categories: crude oil derivatives for 42%, minerals derivatives for 23% (e.g. glass fiber, sodium silica, calcium silicate, phosphorus, sodium hydroxide…), natural gas derivatives for 7%, biochemicals for 12% (e.g. glycerol, guar, fatty alcohol, ethyl alcohol…) and others for 16% (composites…).

Net energy costs represented about €0.65 billion 2018 (vs €0,61 billion in 2017). Energy sources were spread over gas for 55%, coke, petcoke, coal, and anthracite for 30%, electricity for 10% and steam, fuel oil, and others for 5%. More than half of the costs were incurred in Europe (58%) followed by the Americas (24%), and Asia and the rest of the world (18%). The Group has pursued an active energy policy for many years.

On energy supply, Solvay has consistently implemented programs to reduce its energy consumption for many years. While we have industrial activities with high energy consumption, mainly in Europe (synthetic soda ash plants, peroxides), we also operate a range of industrial activities whose energy content is relatively low as a percentage of sales price, especially in the fluorinated polymers business. To reduce the Group's energy footprint Solvay has stepped up its SOLWATT energy efficiency program, which aims to continuously optimize the industrial processes involved in its energy production and supply.

NOTE B3
Underlying EBITDA

Underlying ebitda evolution
FY yoy underlying EBITDA bridge (in €million)



Underlying EBITDA was flat year on year, but grew organically by +5.3% excluding forex conversion and scope effects. Volume and mix drove the strong volume growth for the year. Growth was stronger in the first half versus the second half due to the slowdown in certain markets, including electronics and oil and gas. The underlying EBITDA margin remained solid at 22%.

Volume growth had a +6.1% positive impact on EBITDA.

Net pricing was essentially flat, demonstrating Solvay's pricing capabilities amid higher raw materials and energy prices, and an adverse transactional forex effect.

Fixed cost increases had a -2.3% effect. These reflected investments to better support continued volume growth. Operational excellence and synergies partly offset inflation.

Other elements included a higher contribution from the PVC and peroxide joint ventures amounting to half of the benefit, and a net positive effect of one-time events compared to 2017.

NOTE B4
Underlying depreciation & amortization

Amortization and depreciation charges were €(684) million in 2018, compared to €(704) million in 2017.

NOTE B5
Underlying net financial charges

In € million		FY 2018	FY 2017
Cost of borrowings		(131)	(162)
Interest on lendings & deposits		13	15
Other gains & lossess on net indebteness		(1)	(23)
Net cost of borrowings	a	**(118)**	**(170)**
Coupons on perpetual hybrid bonds	b	(112)	(111)
Interests and realized foreign exchange gains (losses) on the RusVinyl joint venture	c	(21)	(24)
Cost of discounting provisions	d	(74)	(89)
Net financial charges	f = a+b+c+d	**(326)**	**(394)**

Underlying net financial charges[1] were 17% lower, reflecting the impacts of ongoing deleveraging and optimization of the debt structure. **Discounting costs** were down from last year both for employee benefits and environmental related provisions.

NOTE B6
Underlying income taxes

In € million		FY 2018	FY 2017
Profit for the period before taxes	a	1,220	1,133
Earnings from associates & joint ventures	b	74	71
Interests and realized foreign exchange gains (losses) on the RusVinyl joint venture	c	(21)	(24)
Income taxes	d	(305)	(299)
Tax rate	e = -d/(a-b-c)	**26.1%**	**27.5%**

The 1.4 percentage point reduction of the underlying tax rate limited tax impact of the higher tax base.

NOTE B7
Underlying profit from discontinued operations

The underlying contribution from **discontinued operations** was €216 million, up 36% thanks to the strong performance of the polyamide activities that are planned to be sold. This more than compensated for the absence of contributions from Acetow, which was sold at the end of May 2017.

[1] Underlying net financial charges include the coupons on perpetual hybrid bonds (accounted as dividends under IFRS, and thereby excluded from the P&L), as well as the financial charges and realized foreign exchange losses from the RusVinyl joint venture (part of earnings from associates under IFRS, and thereby included in the IFRS EBITDA).

NOTE B8
CAPEX

In € million		FY 2018	FY 2017
Acquisition (–) of tangible assets	a	(691)	(707)
Acquisition (–) of intangible assets	b	(142)	(115)
Capex	c = a+b	**(833)**	**(822)**
Capex flow from discontinued operations	d	(122)	(105)
Capex from continuing operations	e = c-d	**(711)**	**(716)**
Underlying EBITDA	f	2,230	2,230
Cash conversion	g = (f+e)/f	**68.1%**	**67.9%**

Capex from continuing operation was €(711), closed to depreciation and amortization levels as planned.

NOTE B9
Free Cash Flow

In € million		FY 2018	FY 2017
Cash flow from operating activities	a	1,720	1,590
of which cash flow related to acquisition of subsidiaries	b	–	(36)
Cash flow from investing activities	c	(784)	84
of which capital expenditures required by share sale agreement	d	(38)	(12)
Acquisition (–) of subsidiaries	e	(12)	(44)
Acquisition (–) of investments – Other	f	(4)	(11)
Loans to associates and non-consolidated companies	g	(3)	(7)
Sale (+) of subsidiaries and investments	h	26	891
Recognition of factored receivables	j	(21)	21
Free cash flow	k = a-b+c-d-e-f-g-h-i-j	**989**	**871**
Free cash flow from discontinued operations	l	160	89
Free cash flow from continuing operations	m = k-l	**830**	**782**
Net interests paid	n	(114)	(255)
Coupons paid on pertetual hybrid bonds	o	(111)	(111)
Dividends paid to non-controlling interests	p	(39)	(39)
Free cash flow to Solvay shareholders	q = k+n+o+p	**725**	**466**
Free cash flow to Solvay shareholders from discontinued operations	r	160	89
Free cash flow to Solvay shareholders from discontinued operations	s = q-r	**566**	**377**

Free cash flow from continuing operations reached €830 million versus €782 million in 2017. The increase is largely attributable to working capital phasing, with working capital needs €58 million lower than in 2017. Net working capital over sales rose slightly to 13.7% versus 13.0% at the end of 2017. Total free cash flow was €989 million and included a strong contribution from discontinued operations.

Free cash flow to Solvay shareholders was €725 million, of which €566 million from continuing operations. The increase of +56% follows lower financing payments as a result of continued deleveraging.

NOTE B10
Net working capital

In € million		2018 December 31	2018 September 30	2018 June 30	2018 March 31	2017 December 31
Inventories	a	1,685	1,744	1,624	1,549	1,504
Trade receivables	b	1,434	1,565	1,541	1,608	1,462
Other current receivables	c	719	1,123	820	730	627
Trade payables	d	(1,439)	(1,312)	(1,289)	(1,358)	(1,330)
Other current liabilities	e	(850)	(1,140)	(889)	(953)	(848)
Net working capital	f = a+b+c+d+e	**1,550**	**1,980**	**1,808**	**1,576**	**1,414**
Sales	g	2,830	2,840	2,820	2,809	2,717
Annualized quarterly total sales	h = 4*g	11,321	11,359	11,281	11,235	10,869
Net working capital / sales	i = f / h	**13,7%**	**17.4%**	**16.0%**	**14.0%**	**13.0%**
Year average	j = μ(Q1,Q2,Q3,Q4)	15.3%				13.8%

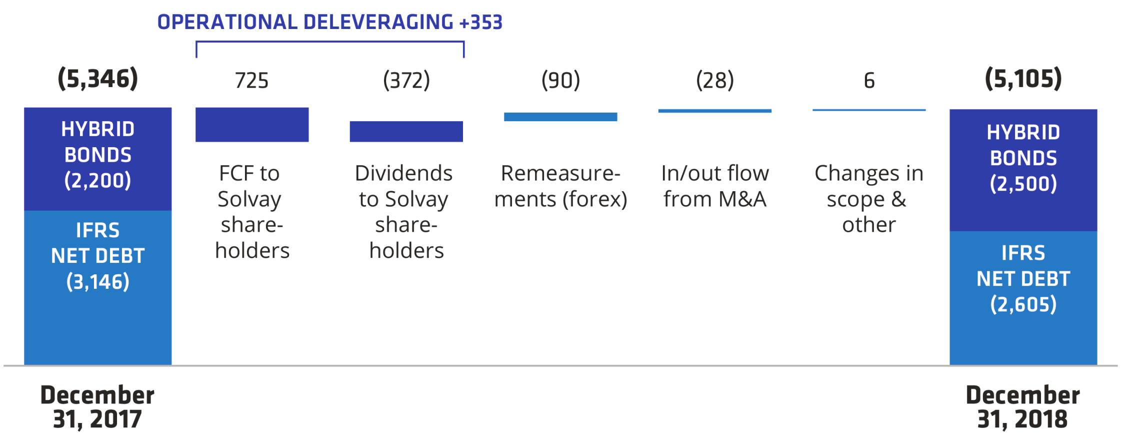
Net working capital over sales rose slightly to 13.7% versus 13.0% at the end of 2017.

NOTE B11
Underlying net debt

In € million		2018 December 31	2017 December 31
Non-current financial debt	a	(3,180)	(3,182)
Current financial debt	b	(630)	(1,044)
Gross debt	c = a+b	3,810	(4,226)
Other financial instrument receivables	d	101	89
Cash & cash equivalents	e	1,103	992
Total cash and cash equivalents	f = d+e	1,205	1,080
IFRS net debt	g = c+f	**(2,605)**	**(3,146)**
Perpetual hybrid bonds	h	(2,500)	(2,200)
Underlying net debt	i = g+h	**(5,105)**	**(5,346)**
Underlying EBITDA (last 12 months)	j	2,230	2,230
Adjustment for discontinued operations(1)	k	305	236
Adjusted underlying EBITDA for leverage calculation(1)	l = j+k	2,536	2,466
Underlying leverage ratio(1)	m = -i/l	**2.0**	**2.2**

(1) As net debt at the end of the period does not yet reflect the net proceeds to be received on the divestment of discontinued operations, whereas the underlying EBITDA excludes the contribution of discontinued operations, the underlying EBITDA is adjusted to calculate the leverage ratio. Polyamide's underlying EBITDA was added.

FY 2018 underlying net debt bridge (in €million)



Underlying net financial debt[2] reduced to €(5.1) billion, from €(5.3) billion at the start of the year, thanks to the strong operational deleveraging, bringing the underlying leverage ratio down from 2.2x to 2.0x. The dividend payments to Solvay shareholders of €(372) million were more than covered by free cash flow delivery. Remeasurements were €(90) million, attributable to the appreciation of the U.S. dollar by 4.7% over the year affecting the conversion of U.S. dollar-denominated debt. M&A activities had a net €(28) million impact.

Underlying gross financial debt was €(6.3) billion, including €(2.5) billion perpetual hybrid bonds. In June 2018 Solvay repaid €382 million on a euro-denominated bond that came to maturity. In November 2018 Solvay successfully placed a perpetual hybrid bond for €(300) million, to be used for general corporate purposes, including the possibility to refinance the existing €(700) million hybrid bond with a first call date in May 2019.

[2] Underlying net financial debt includes the perpetual hybrid bonds, accounted for as equity under IFRS.

NOTE B12
CFROI

In € million		FY 2018 As published	FY 2018 Adjustment	FY 2018 As calculated	FY 2017 As published	FY 2017 Adjustment	FY 2017 As calculated
Underlying EBIT	a	1,546		1,546	1,527		1,527
Underlying EBITDA	b	2,230		2,230	2,230		2,230
Underlying earnings from associates & joint ventures	c	74		74	71		71
Dividends received from associates & joint ventures(1)	d	25	–	25	18	–	18
Recurring capex(2)	e = -2%*l			(324)			(326)
Recurring income taxes(3)	f = -30%*(a-c)			(442)			(437)
Recurring "CFROI" cash flow data	g = b-c+d+e+f			**1,416**			**1,415**
Tangible assets	h	5,454			5,433		
Intangible assets	i	2,861			2,940		
Goodwill	j	5,173			5,042		
Replacement value of goodwill & fixed assets(4)	k = h+i+j	13,488	4,831	18,319	13,415	5,093	18,508
of which fixed assets	l			16,187			16,314
Investments in associates & joint ventures(5)	m	441	1	443	466	16	482
Net working capital(5)	n	1,550	179	1,728	1,414	111	1,525
"CFROI" invested capital	o = k+m+n			**20,490**			**20,515**
CFROI	p = g/o			**6.9%**			**6.9%**
Advanced Materials				10.0%			10.3%
Advanced Formulations				6.9%			6.7%
Performance Chemicals				8.3%			8.4%

(1) Excluding discontinued operations.
(2) Currently estimated at 2% of replacement value of fixed assets.
(3) Currently estimated at 30% of underlying EBIT.
(4) The adjustment reflects the quarterly average over the year.
(5) The adjustment reflects the difference between the estimated replacement value of goodwill and fixed assets, and the accounting value. The changes over time come from foreign exchange variations, new investments and portfolio moves.

CFROI was stable at 6.9%, well in the value creation zone, above WACC of 6.5%.

NOTE B13
Research & Innovation

In € million		FY 2018	FY 2017
IFRS research & development costs	a	(297)	(290)
Grants netted in research & development costs	b	25	26
Depreciation, amortization & impairments included in research & development costs	c	(59)	(55)
Capex in research & innovation	d	(89)	(64)
Research & innovation	e = a-b-c+d	**(352)**	**(325)**
Advanced Materials		(171)	(157)
Advanced Formulations		(97)	(85)
Performance Chemicals		(27)	(29)
Corporate & Business Services		(58)	(55)
Net sales	f	**10,257**	**10,125**
Advanced Materials		4,385	4,370
Advanced Formulations		3,057	2,966
Performance Chemicals		2,808	2,766
Corporate & Business Services		7	23
Research & Innovation intensity	g = -e/f	**3.4%**	**3.2%**
Advanced Materials		3.9%	3.6%
Advanced Formulations		3.2%	2.9%
Performance Chemicals		1.0%	1.0%

Research an innovation efforts amounted to €352 million in 2018. The global expenditure analysis clearly underlines that innovation projects are generally focused on growth (74% of total R&I efforts).

Some 84% of the Group's Research & Innovation investments are directly managed by the Global Business Units.

The Research & Innovation intensity, i.e. the ratio of Research & Innovation efforts to net sales reached 3.4%.

4. Notes to the underlying figures per segment

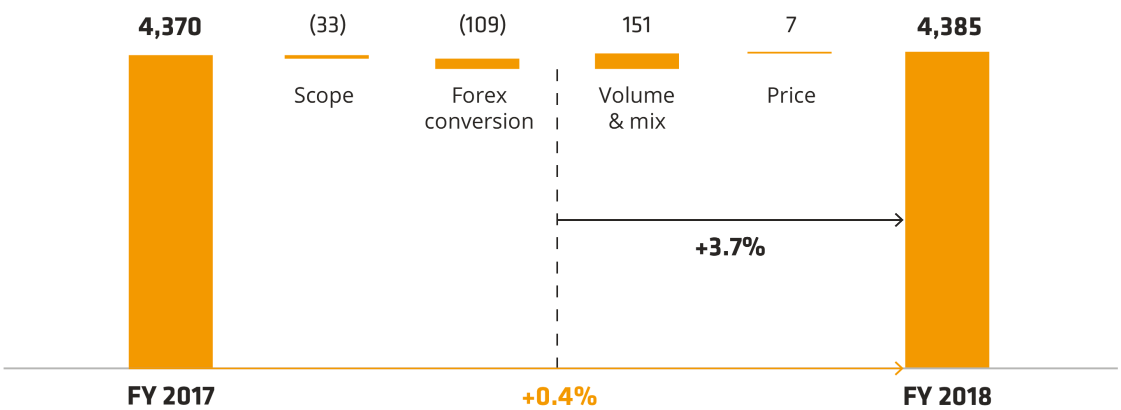
Segment overview

in € million	2018	2017	% yoy
Net sales	**10,257**	**10,125**	***+1.3%***
Advanced Materials	4,385	4,370	*+0.4%*
Advanced Formulations	3,057	2,966	*+3.1%*
Performance Chemicals	2,808	2,766	*+1.5%*
Corporate & Business Services	7	23	*(69)%*
EBITDA	**2,230**	**2,230**	**–**
Advanced Materials	1,197	1,202	*(0.4)%*
Advanced Formulations	521	524	*(0.4)%*
Performance Chemicals	729	749	*(2.7)%*
Corporate & Business Services	(218)	(244)	*+11%*
EBIT	**1,546**	**1,527**	***+1.3%***
Advanced Materials	895	896	*(0.1)%*
Advanced Formulations	381	374	*+2.1%*
Performance Chemicals	552	566	*(2.4)%*
Corporate & Business Services	(282)	(308)	*+8.5%*
Capex from continuing operations	**(711)**	**(716)**	***+0.8%***
Advanced Materials	(355)	(366)	*+3.1%*
Advanced Formulations	(148)	(130)	*(14)%*
Performance Chemicals	(149)	(152)	*+1.8%*
Corporate & Business Services	(58)	(68)	*+14%*
CFROI	**6.9%**	**6.9%**	**–**
Advanced Materials	*10.0%*	*10.3%*	*(0.2)pp*
Advanced Formulations	*6.9%*	*6.7%*	*+0.1pp*
Performance Chemicals	*8.3%*	*8.4%*	*(0.1)pp*
Research & innovation	**(352)**	**(325)**	***+8.3%***
Advanced Materials	(171)	(157)	*(8.9)%*
Advanced Formulations	(97)	(85)	*(14)%*
Performance Chemicals	(27)	(29)	*+6.5%*
Corporate & Business Services	(58)	(55)	*(5.3)%*

NOTE B14
Advanced Materials

in € million	FY 2018	FY 2017	% yoy
Net sales	**4,385**	**4,370**	***+0.4%***
Specialty Polymers	2,009	2,025	*(0.8)%*
Composite Materials	1,082	1,038	*+4.3%*
Special Chem	852	865	*(1.5)%*
Silica	442	443	*(0.1)%*
EBITDA	**1,197**	**1,202**	***(0.4)%***
EBITDA margin	*27.3%*	*27.5%*	*(0.2)pp*
EBIT	**895**	**896**	***(0.1)%***
EBIT margin	*20.4%*	*20.5%*	*(0.1)%*
Capex from continuing operations	**(355)**	**(366)**	***+3.1%***
Cash conversion	*70.4%*	*69.5%*	*+0.8pp*
CFROI	***10.0%***	***10.3%***	***(0.2)pp***
Research & innovation	(171)	(157)	*+0.1%*
Research & innovation intensity	***3.9%***	***3.6%***	***+0.3pp***

Net sales evolution
FY yoy net sales bridge (in €million)



Net sales were up +0.4% for the year due to higher volumes and mix. Organically sales rose +3.7%, excluding forex conversion and scope, driven by growth in Composite Materials, Specialty Polymers and Silica.

Specialty Polymers delivered solid volume growth in the first half of the year. Demand from healthcare and from the automotive market, where Solvay sales significantly outpaced global car production growth, was solid throughout the year but signs of weakening were observed at the end of the year. The trend toward fuel-efficiency and electrification supported superior growth across all vehicle platforms. Second half sales were flat, however, as the anticipated lower demand for smart devices offset growth in other end-markets.

Composite Materials volumes grew at a high single-digit rate throughout the full year period. Demand for new single-aisle aircrafts utilizing the LEAP engine technology, as well as for the 787 program, drove growth in commercial aircrafts. In military, the ramp-up of the F-35 Joint Strike Fighter was also a significant contributor of the volume growth.

Volumes were essentially flat in **Special Chem**, as robust demand from electronics was offset by the tougher than foreseen phase-out of fluorinated insulation blowing agents. In addition, the shift from diesel to gasoline in automotive catalysts continued to pressure the business.

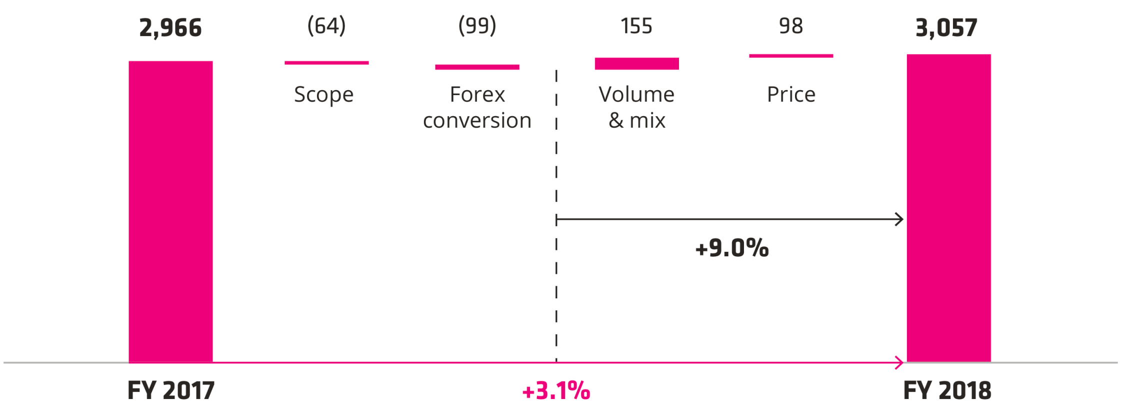
Silica sales into the fuel-efficient tire market grew in the year and prices were supportive, compensating for higher energy costs.

Underlying EBITDA was down -0.4%, but up +3.1% organically, excluding scope effects and forex conversion. Volume growth and higher prices compensated for the transactional forex effects and the increase in raw materials costs, mainly due to the surge of fluorspar prices in Special Chem. Fixed costs rose in Composite Materials reflecting a ramp up in manufacturing to support continued volume growth. The underlying EBITDA margin remained strong for the year at 27%.

NOTE B15
Advanced Formulations

in € million	FY 2018	FY 2017	% yoy
Net sales	**3,057**	**2,966**	***+3.1%***
Novecare	2,000	1,937	*+3.2%*
Technology Solutions	643	662	*(2.9)%*
Aroma Performance	414	366	*+13%*
EBITDA	**521**	**524**	***(0.4)%***
EBITDA margin	*17.1%*	*17.7%*	*(0.6)pp*
EBIT	**381**	**374**	***+2.1%***
EBIT margin	***12.5%***	***12.6%***	***(0.1)%***
Capex from continuing operations	**(148)**	**(130)**	***(14)%***
Cash conversion	*71.6%*	*75.2%*	*(3.6)pp*
CFROI	***6.9%***	***6.7%***	***+0.1pp***
Research & innovation	(97)	(85)	*(14)%*
Research & innovation intensity	***3.2%***	***2.9%***	***+0.3pp***

Net sales evolution
FY yoy net sales bridge (in €million)



Net sales were up +3.1% year on year driven by strong volumes and increased prices. Sales grew organically by +9.0% in 2018, excluding the impact from forex conversion and scope reduction.

In **Novecare,** both volumes and prices grew across multiple end-markets. The strong growth of oil and gas in the first half year of the year reduced significantly in the fourth quarter as activity levels in the shale oil & gas stimulation market in North America declined rapidly, weighing on both volumes and margins. Other end-markets including coatings, agro, and home & personal care, showed robust growth throughout the year.

Technology Solutions delivered solid volume growth in the year, with new mine wins and strong demand in phosphorus specialties and polymer additives driving volume growth.

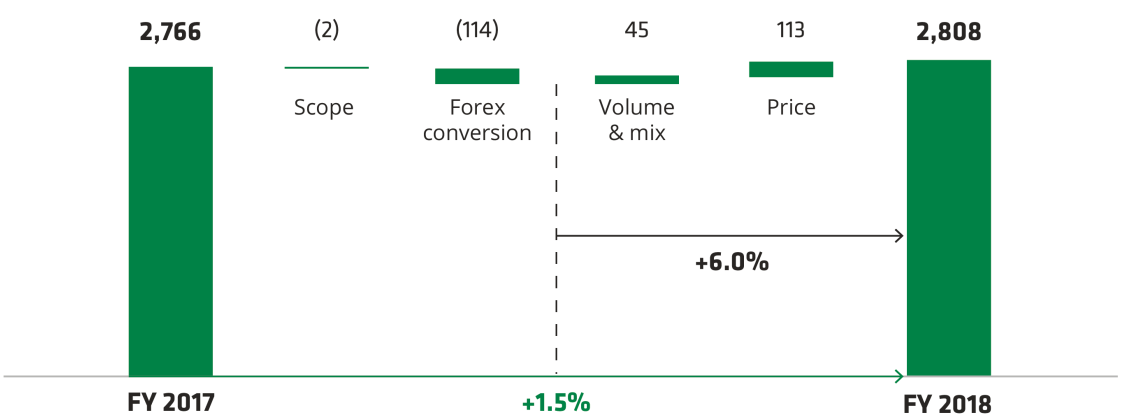
In **Aroma Performance**, volumes and prices were up significantly throughout the period, both in polymerization inhibitors and in vanillin ingredients, which benefited from the launch of new natural vanillin products.

Underlying EBITDA declined by -0.4%, but grew +8.1% organically, excluding scope effects and forex conversion, as a result of the volume and price increases across businesses. These increases more than compensated for higher raw material costs and slightly higher fixed costs. As a reminder, 2017 benefited from a one-time €17 million indemnity received for the loss of some assets in China. As a result, the underlying EBITDA margin was slightly reduced by -0.6 percentage point to 17% for the year.

NOTE B16
Performance Chemicals

in € million	FY 2018	FY 2017	% yoy
Net sales	**2,808**	**2,766**	***+1.5%***
Soda Ash & Derivatives	1,562	1,629	*(4.1)%*
Peroxides	654	600	*+8.9%*
Coatis	509	410	*+24%*
Functional Polymers	82	126	*(35)%*
EBITDA	**729**	**749**	***(2.7)%***
EBITDA margin	*26.0%*	*27.1%*	*(1.1)pp*
EBIT	**552**	**566**	***(2.4)%***
EBIT margin	*19.7%*	*20.4%*	*(0.8)%*
Capex from continuing operations	**(149)**	**(152)**	***+1.8%***
Cash conversion	*79.5%*	*79.7%*	*(0.2)pp*
CFROI	***8.3%***	***8.4%***	***(0.1)pp***
Research & innovation	(27)	(29)	*+6.5%*
Research & innovation intensity	***1.0%***	***1.0%***	***(0.1)pp***

Net sales evolution
FY yoy net sales bridge (in €million)



Net sales in the segment were +1.5% higher driven by price and volume increases, which more than offset forex conversion. Organically sales grew by +6.0% in the year, with the second half stronger than the first half.

Demand remained solid in **Soda Ash & Derivatives** throughout the year. Soda ash volumes were slightly down, mainly due to logistic issues at the start of the year. Average soda ash prices were slightly lower year on year as expected, but improved in the second half. Bicarbonate volumes grew, mainly for flue gas treatment in the U.S.

Peroxides delivered strong volume growth globally, complemented by higher prices in Asia. The contribution from the HPPO plants supported the growth.

Record results for the **Coatis business**, with double-digit sales growth driven by higher volumes and prices. Both domestic demand in Latin America and exports improved, benefiting from Brazilian real depreciation.

Functional Polymers volumes were stable overall.

Underlying EBITDA dropped -2.7% due to forex conversion. Organically it rose +1.6% thanks to volume growth in Peroxides and Coatis and a higher contribution of the PVC joint venture in Russia and the peroxide joint venture in Latin America. Net pricing was stable, as the anticipated margin squeeze in soda ash was offset by the pricing power in Peroxides and Coatis. Overall, the performance of the segment was better than anticipated, resulting in overall EBITDA margin narrowing -1.1 percentage point to 26% for the year.

NOTE B17
Corporate & Business Services

in € million	FY 2018	FY 2017	% yoy
Net sales	**7**	**23**	***(69)%***
Energy Services	-	-	*n.m.*
Other Corporate & Business Services	7	23	*(71)%*
EBITDA	**(218)**	**(244)**	***+11%***
EBIT	(282)	(308)	*+8.5%*
Capex from continuing operations	**(58)**	**(68)**	***+14%***
Research & innovation	(58)	(55)	*(5.3)%*

Underlying EBITDA costs at €(218) million were lower than in 2017. Productivity programs and low insurance claims covered by the insurance captive of the company, helped to lower fixed costs, which more than offset inflation. The contribution from Energy Services was overall flat versus the prior year.

5. Reconciliation of underlying and IFRS figures

Besides IFRS accounts, Solvay also presents underlying Income Statement performance indicators to provide a more consistent and comparable indication of Solvay's economic performance. These figures adjust IFRS figures for the non-cash Purchase Price Allocation (PPA) accounting impacts related to acquisitions, for the coupons of perpetual hybrid bonds classified as equity under IFRS but treated as debt in the underlying statements, and for other elements to generate a measure that avoids distortion and facilitates the appreciation of performance and comparability of results over time.

FY consolidated income statement

	FY 2018			FY 2017		
In € million	**IFRS**	**Adjust-ments**	**Under-lying**	IFRS	Adjust-ments	Underlying
Sales[(1)]	**11,299**	–	**11,299**	**10,984**	–	**10,984**
of which revenues from non-core activities[(1)]	1,042	–	1,042	859	–	859
of which net sales	10,257	–	10,257	10,125	–	10,125
Cost of goods sold[(1)]	(8,264)	2	(8,262)	(7,898)	2	(7,896)
Gross margin	**3,035**	**2**	**3,037**	**3,086**	**2**	**3,088**
Commercial costs	(373)	–	(373)	(400)	–	(400)
Administrative costs	(1,006)	35	(971)	(1,037)	42	(996)
Research & development costs	(297)	3	(294)	(290)	3	(288)
Other operating gains & losses	(123)	197	74	(154)	206	51
Earnings from associates & joint ventures	44	30	74	44	27	71
Result from portfolio management & reassessments	(208)	208	–	(188)	188	–
Result from legacy remediation & major litigations	(86)	86	–	(84)	84	–
EBITDA	**1,930**	**301**	**2,230**	**2,029**	**201**	**2,230**
Depreciation, amortization & impairments	(944)	260	(684)	(1,054)	350	(704)
EBIT	**986**	**560**	**1,546**	**976**	**551**	**1,527**
Net cost of borrowings	(118)	–	(118)	(201)	31	(170)
Coupons on perpetual hybrid bonds	–	(112)	(112)	–	(111)	(111)
Interests and realized foreign exchange gains (losses) on the RusVinyl joint venture	–	(21)	(21)	–	(24)	(24)
Cost of discounting provisions	(77)	3	(74)	(97)	8	(89)
Profit for the period before taxes	**791**	**429**	**1,220**	**678**	**455**	**1,133**
Income taxes	(95)	(210)	(305)	197	(496)	(299)
Profit for the period from continuing operations	**697**	**219**	**915**	**875**	**(42)**	**834**
Profit (loss) for the period from discontinued operations	201	15	216	241	(82)	159
Profit for the period	**897**	**234**	**1,131**	**1,116**	**(124)**	**992**
attributable to Solvay shareholders	858	234	1,092	1,061	(122)	939
attributable to non-controlling interests	39	–	40	56	(2)	54
Basic earnings per share (in €)	8.31		10.57	10.27		9.08
of which from continuing operations	6.37		8.48	7.97		7.59
Diluted earnings per share (in €)	8.27		10.52	10.19		9.02
of which from continuing operations	6.34		8.44	7.92		7.53

(1) The comparative figures of non-core revenues and costs of goods sold have been restated for an amount of €93 million, following a change in presentation of revenues from non-core activities

NOTE B18
IFRS EBITDA

EBITDA on an IFRS basis totaled €1,930 million, versus €2,230 million on an underlying basis. The difference of €301 million is explained by the following adjustments to IFRS results, which are done to improve the comparability of underlying results:

- €30 million in "Earnings from associates & joint ventures" for Solvay's share in the financial charges of the Rusvinyl joint venture and the foreign exchange losses on the €-denominated debt of the joint venture, following the 15% devaluation of the Russian ruble over the period. These elements are reclassified in "Net financial charges";
- €185 million to adjust for the "Result from portfolio management and reassessments", excluding depreciation, amortization and impairment elements. This result comprises €(184) million of restructuring costs, almost entirely related to the cost booked for the Group simplification plan of €(177) million;
- €86 million to adjust for the "Result from legacy remediation and major litigations", primarily environmental expenses.

NOTE B19
IFRS EBIT

EBIT on an IFRS basis totaled €986 million, versus €1,546 million on an underlying basis. The difference of €560 million is explained by the above-mentioned €301 million adjustments at the EBITDA level and €260 million of "Depreciation, amortization & impairments". The latter consist of:

- €237 million to adjust for the non-cash impact of purchase price allocation (PPA), consisting of amortization charges on intangible assets, which are adjusted in "Costs of goods sold" for €2 million, "Administrative costs" for €35 million, in "Research & development costs" for €3 million, and in "Other operating gains & losses" for €197 million;
- €23 million to adjust for the net impact of impairments, which are non-cash in nature and are reported in "Result from portfolio management and reassessments", mainly related to the impairment after the divestment of the hydrofluoric acid plant in Porto Marghera, Italy, and to the reversal of impairment on some cogeneration assets in Latin America, following improving market conditions.

NOTE B20
IFRS Net financial charges

Net financial charges on an IFRS basis were €(194) million versus €(326) million on an underlying basis. The €(131) million adjustment made to IFRS net financial charges consists of:

- €(112) million reclassification of coupons on perpetual hybrid bonds, which are treated as dividends under IFRS, and as financial charges in underlying results;
- €(21) million reclassification of financial charges and realized foreign exchange result on the €-denominated debt of RusVinyl as net financial charges. The €9 million delta with the adjustment made to EBITDA is attributed to unrealized foreign exchange losses;
- €3 million for the net impact of decreasing discount rates on the valuation of environmental liabilities in the period.

NOTE B21
IFRS Income taxes

Income taxes on an IFRS basis were €(95) million, versus €(305) million on an underlying basis. The €(210) million adjustment includes mainly:

- €(106) million to adjust for the tax impacts of the adjustments made to the underlying result before taxes (as described above);
- €(104) million to adjust for tax elements related to prior periods. These mainly relate to recognition of deferred tax assets resulting from statutory reorganization in Brazil and expected capital gain on the Polyamide divestment in 2019.

NOTE B22
IFRS Profit from discontinued operations

Discontinued operations generated a profit of €201 million on an IFRS basis and €216 million on an underlying basis. The €15 million adjustment to the IFRS profit is made for M&A costs related to the planned divestment of the polyamide activities.

NOTE B23
IFRS Profit for period

Profit attributable to Solvay share was €858 million on an IFRS basis and €1,092 million on an underlying basis. The delta of €234 million reflects the above-mentioned adjustments to EBIT, net financial charges, income taxes and discontinued operations. There was no impact from non-controlling interests.

6. Notes to the figures per share

Historical key share data

		2014	2015(1)	2016	2017	**2018**
Number of shares (in 1000 shares)						
Issued shares at end of year	a	84,701	105,876	105,876	105,876	105,876
Treasury shares at end of year	b	1,719	2,106	2,652	2,358	2,723
Shares held by Solvac	c	25,578	32,116	32,511	32,511	32,511
Outstanding shares at the end of the year	d = a-b	82,982	103,770	103,225	103,519	103,154
Average outstanding shares (basic calculation)	e	83,228	83,738	103,294	103,352	103,277
Average outstanding shares (diluted calculation)	f	83,890	84,303	103,609	104,084	103,735
Data per share (in €)						
Equity attributable to Solvay share	g = .../d(2)	64.71	69.72	72.83	71.98	77.76
Underlying profit for the period (basic)	h = .../e(2)		8.12	8.19	9.08	10.57
IFRS profit for the period (basic)	i = .../e(2)	0.96	4.85	6.01	10.27	8.31
IFRS profit for the period (diluted)	j = .../f(2)	0.96	4.81	5.99	10.19	8.27
Gross dividend(3)	k	3.40	3.30	3.45	3.60	3.75
Net dividend(3)	l = k*(1-...%)(4)	2.55	2.41	2.42	2.52	2.62
Share price data (in €)						
Highest(5)	m	129.15	141.10	112.30	132.00	120.65
Lowest(5)	n	100.15	88.01	70.52	106.30	85.44
Average(5)	o = v/u	114.35	105.74	89.32	118.69	110.07
At the end of the year	p	112.40	98.43	111.35	115.90	87.32
Underlying price/earnings	q = p/h			*13.59*	*12.76*	*8.26*
IFRS price/earnings	r = p/i	*116.59*	*20.31*	*18.52*	*11.29*	*10.51*
Gross dividend yield	s = k/p	*0.03*	*0.03*	*0.03*	*0.03*	*0.04*
Net dividend yield	t = l/p	*0.02*	*0.02*	*0.02*	*0.02*	*0.03*
Stock market data(6)						
Annual volume (in 1000 shares)	u	48,600	82,718	86,280	62,642	70,715
Annual volume (in € million)	v	5,557	9,218	7,707	7,435	7,784
Market capitalisation, end of year (in € million)	w = p*d	9,327.2	10,214.1	11,494.1	11,997.8	9,007.4
Velocity	x = u/a	*57.4%*	*78.1%*	*81.5%*	*59.2%*	*66.8%*
Velocity adjusted for free float	y = u/(a-b-c)	*84.7%*	*115%*	*122%*	*88.2%*	*100%*

(1) 2015 data are not presented on pro forma basis, i.e. exclude Cytec.
(2) The numerator can be found under the same label in the historic key financial data table in section 1 of the Business review.
(3) Recommended 2018 dividend, pending General Shareholders meeting on May 14, 2018.
(4) Belgian withholding tax applicable in year of dividend payment, i.e. the following year: 25% in 2013-2015, 27% in 2016, 30% from 2017 onward.
(5) The 2015 share price data use the share price adjusted by a factor 93.98% for the period until December 3, 2015. The adjustment reflects the distribution of rights during the capital increase completed in December 2015.
(6) The stock market data are based on all trades registered by Euronext.

NOTE B24
Earnings per share

		FY 2018	FY 2017
Profit attributable to Solvay share (in € m)			
Underlying profit for the period	a	1,092	939
Underlying profit from continuing operations	b	876	784
IFRS profit for the period	c	858	1,061
IFRS profit from continuing operations	d	657	824
Number of shares (in 1000 shares)			
Issued shares at end of year	e	105,876	105,876
Treasury shares at end of year	f	2,723	2,358
Outstanding shares at the end of the year	g = e-f	103,154	103,519
Average outstanding shares (basic calculation)	h	103,277	103,352
Average outstanding shares (diluted calculation)	i	103,735	104,084
Data per share (in €)			
Underlying profit for the period (basic)	j = a/h	10.57	9.08
Underlying profit from continuing operations (basic)	k = b/h	8.48	7.59
IFRS profit for the period (basic)	l = c/h	8.31	10.27
IFRS profit from continuing operations (basic)	m = d/h	6.37	7.97
IFRS profit for the period (diluted)	p = c/i	8.27	10.19
IFRS profit from continuing operations (diluted)	q = d/i	6.34	7.92

Underlying **earnings per share**[1] grew +16% to €10.57, including a €2.09 contribution from discontinued operations. On a continuing basis, underlying earnings per share grew +12% to €8.48, thanks to lower financial charges and the lower tax rate.

NOTE B25
Dividend

The Board of Directors decided to recommend to the General Shareholders' Meeting of May 14, 2019 the payment of a total gross dividend of €3.75 per share.

The dividend for the fiscal year 2018, 4.2 % higher than the dividend for the fiscal year 2017, is in line with the Group's dividend policy of maintaining a stable to increasing dividend whenever possible and, as far as possible, never reducing it.

Given the interim dividend of €1.44 gross per share, with 30% whithholding tax, paid on January 17, 2019, the balance of the dividend in respect of 2018, equals €2.31 gross per share, which will be paid on May 23, 2019, provided prior agreement by General Shareholders Meeting.

[1] Earnings per share basis calculation

7. Outlook 2019

In line with fourth quarter trends, Solvay anticipates supportive market conditions to continue in most key markets, though growth is likely to be moderated by conditions in automotive, electronics and oil & gas. In this context Solvay remains focused on further developing its growth platforms.

Underlying EBITDA

Solvay currently expects 2019 EBITDA to grow modestly and to be back-ended compared to €2,330 million pro forma in 2018[1].

- Except for discontinued operations, business scope effects are expected to be small in 2019;
- One-time gains in 2018 consisted mainly of €23 million synergies on Cytec post-retirement benefits, booked in Q2 2018 (mostly in Advanced Materials);
- Organic growth in the first quarter is expected broadly flat, relative to the strong 2018 performance of €558 million pro forma[1].

Free cash flow

Solvay will continue to focus on cost discipline and on deleveraging the balance sheet with continued solid operational free cash flow delivery :

- Capex discipline maintained, close to depreciation;
- Cash-out for provisions are expected temporarily higher than the €400 million run rate, with higher restructuring cash-out as the simplification plan unfolds. Provisions cash-out includes continued deleveraging of pension liabilities;
- Tax cash-out expected to increase, linked to phasing;
- Cash financial expenses expected largely flat;
- Working capital needs will depend on demand conditions at year end 2019, compared to a softer market conditions at year end 2018.

Forex sensitivities

Solvay is mostly exposed to the U.S. dollar, with the main sensitivities per US$/€0.10 change:

- EBITDA sensitivity of about €(120) million based on the average rate in 2018 of US$/€1.18, with some 2/3 on conversion and 1/3 on transaction (excluding hedging);
- Net debt sensitivity of about €120 million based on the rate at the end of 2018 of US$/€1.15.

[1] The 2018 EBITDA figures used as a comparison basis are the pro forma figures, following the implementation of IFRS 16. Growth is expressed as organic growth, i.e. excluding scope and forex conversion effects.

MANAGEMENT REPORT

EXTRA-FINANCIAL STATEMENTS

5

Extra-financial statements

This chapter supplements the information provided in the "Understanding Solvay" chapter, with a focus on high materiality aspects.

1. Overview of the consolidated results

1.1. Priority aspects

	Units	*Trends*	**2018**	2017	2016	2015	2014
Sustainable business solutions							
Product portfolio assessed	%	↘	87	88	84	88	–
Solutions	%	↗	50	49	43	33	–
Neutral	%	↘	30	31	33	39	–
Challenges	%	↘	7	8	8	16	–
Not evaluated	%	↗	13	12	16	12	–
Greenhouse gas emissions							
Greenhouse gas intensity	Kg CO_2 eq. per € EBITDA	↘	5.51	5.53	5.86	7.26	8.08
Direct and indirect CO_2 emissions (Scope 1 and 2)	Mt CO_2	↘	9.8	10	10.9	11.6	11.7
Other greenhouse gas emissions according to Kyoto Protocol (Scope 1)	Mt CO_2 eq.	↗	2.44	2.31	2.45	2.61	–
Total greenhouse gas emissions according to Kyoto Protocol (Scopes 1 and 2)	Mt CO_2 eq.	→	12.3	12.3	13.4	14.2	14.4
Other greenhouse gas emissions not according to Kyoto Protocol (Scope 1)	Mt CO_2 eq.	→	0.1	0.1	0.1	0.1	0.1
Carbon dioxide – CO_2 (Scope 1)	Mt CO_2 eq.	↗	7.96	7.92	8.43	8.76	–
Total direct greenhouse gas emissions (Scope 1)	Mt CO_2 eq.	↗	10.35	10.2	10.9	11.4	–
Total indirect CO_2 emissions – Gross market-based (Scope 2)	Mt CO_2	↘	1.9	2.1	2.5	2.8	–
Total indirect CO_2 emissions – Gross location-based (Scope 2)	Mt CO_2	↘	2.0	2.1	2.3	3	–
Indirect greenhouse gas emissions due to fuel and energy related activities (Scope 3)	Mt CO_2 eq.	→	0.7	0.7	0.8	0.8	
Indirect greenhouse gas emissions due to investments (Scope 3)	Mt CO_2 eq.	↗	1.9	1.7	0.8	2.5	–
Indirect greenhouse gas emissions due to purchased goods and services (Scope 3).	Mt CO_2 eq.	↘	5.8	6.6	7.2	7.6	–

	Units	Trends	2018	2017	2016	2015	2014
Employee health and safety							
Fatal accidents of Solvay employees and contractors	Number		0	1	1	0	2
Medical Treatment Accident Rate for Solvay employees and contractors (MTAR)	Accident per million hours worked		0.54	0.65	0.77	0.77	0.97
Medical Treatment Accident Rate for Solvay employees (MTAR)	Accident per million hours worked		0.58	0.63	0.73	0.65	0.82
Medical Treatment Accident Rate for Contractors (MTAR)	Accident per million hours worked		0.48	0.7	0.86	0.94	1.25
Lost Time Accident Rate for Solvay employees and contractors (LTAR)	Accident per million hours worked		0.65	0.65	0.76	0.75	0.98
Lost Time Accident Rate for Solvay employees (LTAR)	Accident per million hours worked		0.71	0.7	0.69	0.67	–
Lost Time Accident Rate for Contractors (LTAR)	Accident per million hours worked		0.52	0.52	0.9	0.85	–
Injuries	Number		42	50	68	66	92
Occupational illness frequency rate (short/mid-latency)	cases per one million hours worked		0.08	0.06	0.08	0.17	0.09
Total Long-latency occupational diseases	Number		12	10	20	21	17
Total Short/mid-latency occupational diseases	Number		4	3	4	9	5
Total occupational diseases	Number		16	13	23	30	22
Employee engagement and well-being							
Solvay engagement index	%		76	75	77	75	–
Coverage by collective agreement	%		100	100	87.8	77	82.2
Societal actions							
Solvay Group donations, sponsorship, and own projects	€ million		3.92	3.92	7.38	5.25	–
Employees involved in local societal actions	%		33	33	23	20	–

1.2. High materiality aspects

		Units	*Trends*	**2018**	2017	2016	2015	2014
	Energy							
✓	Primary energy consumption	Petajoules low heating value (PJ)	↘	127	130	138	175	179
	Secondary energy purchased	Petajoules low heating value (PJ)	↘	45	49	53	63	–
	Total energy sold	Petajoules low heating value (PJ)	↗	23	22	23	26	–
	Fuel consumption from non-renewable sources	Petajoules low heating value (PJ)	↗	101	100	104	107	100
	Fuel consumption from renewable sources	Petajoules low heating value (PJ)	↗	4	3	4	5	–
✓	Energy efficiency index – Baseline 100% in 2012	%	↘	93	94	94	96	99
	Air quality							
✓	Nitrogen oxides emissions – NO_x	Metric tons	↘	7,365	9,432	11,115	12,148	12,679
✓	Nitrogen oxides intensity	Kg per € EBITDA	↘	0.0033	0.0042	0.0059	0.0062	0.0071
✓	Sulfur oxides emissions – SO_x	Metric tons	↘	3,746	4,562	5,343	6,490	6,620
✓	Sulfur oxides intensity	Kg per € EBITDA	↘	0.0017	0.0021	0.0028	0.0033	0.0037
✓	Non-methane volatile organic compounds emissions – NMVOC	Metric tons	↗	5,344	5,173	4,941	6,780	7,158
✓	Non-methane volatile organic compounds intensity	Kg per € EBITDA	↗	0.0024	0.0023	0.0026	0.0035	0.004
	Water and wastewater							
✓	Freshwater withdrawal	Million m^3	↗	330	326	494	538	535
✓	Freshwater withdrawal intensity	m^3 per € EBITDA	↗	0.148	0.147	0.260	0.275	0.300
✓	Chemical Oxygen Demand (COD) emissions	Metric tons O_2	↗	6,231	5,586	7,282	8,177	9,652
✓	Chemical Oxygen Demand intensity	Kg per € EBITDA	↗	0.0028	0.0025	0.0038	0.0042	0.0054
	Waste and hazardous materials							
✓	Non-Hazardous Industrial Waste	1,000 Metric tons	↘	1,627	1,641	1,463	1,447	1,622
✓	Hazardous Industrial Waste	1,000 Metric tons	↘	94.3	99.7	189	200	194
✓	Total Industrial Waste	1,000 Metric tons	↘	1,721	1,741	1,652	1,647	1,816
✓	Industrial Hazardous Waste not treated in a sustainable way	1,000 Metric tons	↘	32.4	40.0	49.0	45.8	48.9
✓	Industrial Hazardous Waste not treated in a sustainable way intensity	Kg per € EBITDA	↘	0.0145	0.0180	0.0258	0.0234	0.0279
✓	Substances of Very High Concern (SVHC) according to REACH criteria present in products sold	Number	↘	31	35	20	20	25
✓	Completion of Analysis of Safer Alternatives program for marketed substances	%	↘	39	49	18	5	–

		Units	*Trends*	**2018**	2017	2016	2015	2014
	Diversity and inclusion							
✓	Total Headcount	Headcount	↗	24,501	24,459	27,030	26,350	25.909
✓	Percentage of women in the Group	%	→	23	23	23	22	22
✓	Senior manager	Headcount	↗	401	396	428	428	428
✓	Middle manager	Headcount	↗	2,915	2,898	3,026	2,819	2,731
✓	Junior manager	Headcount	↗	5,213	5,090	5,348	4,491	4,186
✓	Non-manager	Headcount	↘	15,972	16,075	18,228	18,612	18,564
	Solvay's workforce under 30 years old	Headcount	↗	2,800	2,765	3,242	–	–
	Solvay's workforce between 30-49 years old	Headcount	↗	13,605	13,578	15,107	–	–
	Solvay's workforce 50 years old and older	Headcount	↘	8,096	8,116	8,681	–	–
	Customer welfare							
✓	Solvay's Net Promoter Score (NPS)	%	↗	42	36	27	24	14
	Management of the legal, ethics and regulatory framework							
	Total claims made	Number	↗	88	83	65	–	–
	Total claims closed including cases for which there was insufficient information or cases that were misdirected or referred	Number	↗	81	71	62	–	–
	Unsubstantiated claims among resolved cases	Number	↘	37	38	28	–	–
	Substantiated claims among resolved cases	Number	↗	34	19	29	–	–
	Critical incident risk management							
✓	Percentage of product lines having a risk analysis updated in the last five years	%	↗	85	77	65	69	64
✓	Process safety incident rate	%	↗	1.0	0.9	0.7	0.6	0.4
✓	Medium severity incidents with environmental consequences	Number	↘	47	59	40	46	55
✓	Medium severity incidents with environmental consequences in which the limits of the operating permit were exceeded	Number	↘	12	27	26	26	–

2. Sustainability management

Sustainability management encompasses how Solvay integrates social, societal, environmental, and economic factors into its management, strategy, decision-making, and operating practices to create value that stands the test of time.

For Solvay, this means acting responsibly, innovating, generating value for our key stakeholders, and contributing broadly to science and society.

This section covers management's approach to topics in a number of key areas: the Solvay Way approach and management; the circular economy; Health, Safety and Environment management; product stewardship; Life-Cycle-Assessments; and Sustainable Portfolio Management (SPM).

Integrated thinking, or how Solvay measures value

The Group has progressively developed its approach to integrated thinking, which now involves many steps:

- Integrating the most material social and environmental key performance indicators into operational dashboards and into strategic planning, budgeting, and decision-making processes;
- Incorporating the most material financial, social, and environmental key performance indicators into Solvay's sustainable value creation model;
- Adapting Solvay's reporting to integrated reporting principles and elements of contents.

2.1. The Solvay Way, approach and management

The Solvay Way, constantly improving the way we do business

The Solvay Way is Solvay's sustainability approach. To drive improvement throughout the company, each production site conducts annual self-assessments guided by this framework. Self-assessment findings – encompassing lessons learned, best practices, strengths, and improvement opportunities – help entities measure their progress on sustainable development goals for each stakeholder group and craft improvement plans.

Definition

The Solvay Way is Solvay's sustainable development reference framework. It translates the Group's corporate social responsibility ambition and commitments into concrete actions and clear responsibilities throughout the entire organization. Through the Solvay Way, the stakeholders' expectations are integrated into the day-to-day activities and decision-making processes at every level of the organization.

Based on the materiality analysis, the Solvay Way team has developed a set of 37 practices which promote the interests of the Group's six stakeholders (Customers, Suppliers, Employees, Local Communities, the Planet, and Investors).

The Solvay Way: ten practices linked with Solvay's five priority targets for 2025

Sustainable portfolio management

2025

50%

share of sustainable solutions in the Group portfolio (vs. 2014)

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

CUSTOMERS

1 Integrating corporate social responsibility aspects in customer relationships

2 Integrating corporate social responsibility aspects in innovation projects at Global Business Unit level

3 Integrating corporate social responsibility aspects in investment and Mergers and Acquisitions projects at Global Business Unit level

People engagement

EMPLOYEES

2025

80%

Employee engagement index (vs. 2015)

8 DECENT WORK AND ECONOMIC GROWTH

4 Applying the IndustriALL Global Union agreement

5 Strenghtening performance management and employee´s development

6 Promoting well-being at work

7 Promoting diversity of teams by creating an inclusive culture

Safety

2025

- 50%

of occupational accidents with MTAR target < 0.50 (vs. 2014)

3 GOOD HEALTH AND WELL-BEING

8 Preventing work accidents and protecting employees´ health

SOLVAYway

Greenhouse Gas (GHG)

2025

-1 Mt

CO_2 eq. emissions in the Group's operations (scope 1 and 2, vs. 2017)

13 CLIMATE ACTION

7 AFFORDABLE AND CLEAN ENERGY

9 Reducing greenhouse gas emissions (Scope 1 and 2)

PLANET

Societal actions

2025

X2

Employees involved in societal actions (vs. 2015)

4 QUALITY EDUCATION

17 PARTNERSHIPS FOR THE GOALS

10 Involving employees in societal actions

COMMUNITIES

Management Approach

The Solvay Way is deployed through the Group by the leadership of all Global Business Units and Functions, and is supported by a network of more than 200 "Champions" and "Correspondents". The Solvay Way Champions ensure proper management at the business level and are supported locally at the sites by a team of Solvay Way Correspondents. Together, they play a key role in deploying the Solvay Way practices and sharing best practices and experiences. Global Business Unit presidents are accountable for managing the Solvay Way effectively across their businesses.

This network is supported by Solvay's Sustainable Development and Energy Function, which promotes experiences sharing and learning across entities.

Key performance results and outcomes are presented each year to the Executive Committee and the Board of Directors.

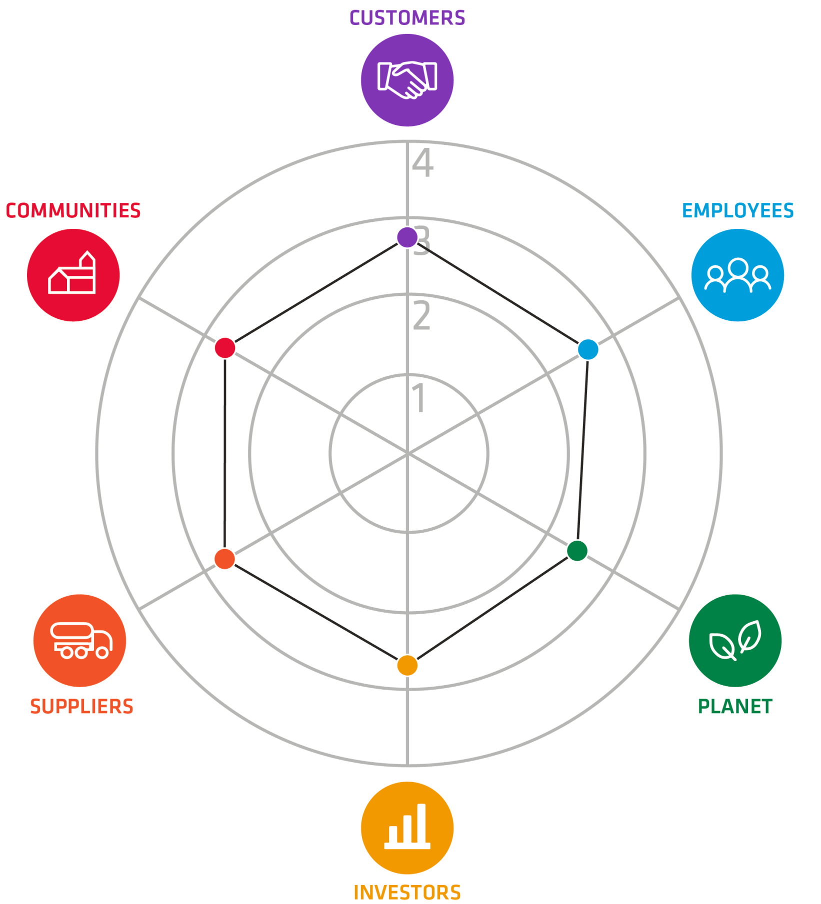
Indicators and objectives

In 2018, 47% of Solvay employees took part in projects related to Health, Safety and Environment (HSE), social causes, and local communities. This strong involvement demonstrates that employees are committed to Solvay's sustainable development ambitions.

47%	21%*
of employees involved	of improvement in CSR practices

*Progression rate is measured as a gap to mark 4 (the best level in the Solvay Way framework).

2018 Solvay Way Group profile



A practice can be applicable at a site (Research and Innovation, Industrial Campus, and Headquarters), in Global Business Units, or at Group level (Corporate Function), depending on the topic. Some practices are applicable at all levels.

2018 Key achievements

In 2018, the Group announced and implemented the Solvay Way 3.0 project in order to integrate sustainability into the operations and create a sense of purpose. This project comprised two main efforts:

- First of all, **digitizing the Solvay Way**. Using Agile methods and a user-centric approach, the Solvay Way team leveraged technologies in the Digital Studio to develop the first Solvay Way web application. The Solvay Way process can now be managed digitally, and more Solvay employees are able to join in sustainability actions and assessments;
- In addition, **the simplification and reduction of bureaucratic elements** ensure that the Global Business Units progress on their main priorities and most material aspects. Ten mandatory practices are directly related to the Group's five sustainability targets and apply to all Group entities. Each Global Business Unit can select additional practices relating to its materiality analyses and priorities. Selected practices are validated by the leadership of the Global Business Units and reviewed by the Corporate Sustainability and Energy Team. On average, Global Business Units have performed a self-assessment on 21 practices.

SOLVAYway

Wide scope of topics

For continuous improvements

PLANET	Energy – Climate change – Greenhouse gas emissions – Hazardous materials – Water and wastewater – Air quality – Biodiversity
INVESTORS	Transparency – Compliance and legal – Ethics – Systemic risk management – Strategy – Mergers and Acquisitions
EMPLOYEES	Engagement – Social dialog – Diversity and inclusion – Well-being at work – Employee experience – Health and safety – Compensation – Skills development – Human rights
COMMUNITIES	Community development – Process safety– Emergency preparedness and response
CUSTOMERS	Business solutions – Circular economy – Hazardous materials management – Corporate social responsibility in strategy and marketing
SUPPLIERS	Risk management – Supplier corporate social responsibility performance – Value creation – Partnerships along the value chain

2.2. Circular economy

Enabling the transformation to a new circular economy

Much of today's economy remains linear. But a linear system is finite: raw materials cannot be depleted indefinitely and the climate is changing dramatically. Transitioning to a circular economy offers solutions and countless opportunities.

Solvay's wants to help transform its customers' value chains. To accelerate this transformation, Solvay signed a three-year partnership agreement with the Ellen MacArthur Foundation in January 2018. Solvay is the first and only chemical company to become a Global Partner of the Foundation.

Definition

A circular economy is an emerging new economic system that is resilient and creates value sustainably; it keeps all materials recirculating constantly without wastage and without waste.

It aims to reduce the waste associated with products and services after their period of use. It is driven by the need to reduce waste volumes and by the increasing scarcity of raw materials.

Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles:

1. Design out waste and pollution;
2. Keep products and materials in use;
3. Regenerate natural systems.

Management approach

To meet growing customer demand, Solvay is developing a circular economy through:

- Ongoing innovation initiatives to design new products, materials and chemical processes with circularity in mind;
- Collaboration projects with customers to facilitate their circular business.

Solvay is taking steps and is working with customers, suppliers, and partners to identify opportunities where the Group can leverage on capabilities, in particular in the following fields:

1. Redesign products and processes by reducing the use of critical resources, resulting in recyclable products;
2. Develop new market value propositions to improve the customers' circularity;
3. Help extend the lifetime of the customers' products;
4. Help the customers reuse scarce resources;
5. Develop renewable energy solutions for the customers.

2.6. Sustainable Portfolio Management

Sustainable Portfolio Management, responsibly managing Solvay's product portfolio

Sustainable value creation is measured by Solvay's Sustainable Portfolio Management tool. It enables Solvay to make strategic decisions that steer its portfolio, support progress toward its sustainability objectives, and factor sustainability into operating decisions.

Definition

Based on the intuition that true business solutions to sustainability challenges will lead to superior growth over time, the Group has developed the Solvay Sustainable Portfolio Management tool. This innovative yet pragmatic tool identifies market signals on sustainability by assessing the business on a two-dimensional matrix:

1. The product's environmental manufacturing footprint, associated risks and opportunities, paired with a well-considered Life-Cycle-Assessment;
2. The product's potential, when in use, to benefit or pose challenges to customers, as measured by a market fact-based assessment.

With the Sustainable Portfolio Management tool, decision-makers can anticipate sustainability risks and opportunities along the entire value chain (cradle-to-grave), develop action plans, and deliver innovative solutions that balance economic, social, and environmental values.

Sustainable Portfolio Management tool assessments are reviewed completely every year in order to capture the most recent signals from the market and remain relevant. In this respect, the Sustainable Portfolio Management tool strengthens the Group's focus on the circular economy and raw material sourcing issues that are increasingly important to customers and investors, and therefore to the business.

2009	80%+	1,700+	600+	50%
SPM created	of the portfolio analyzed	Product-Application Combinations assessed	experts involved	of revenues in sustainable solutions*

*Scope: consistent with financial reporting.

Sustainability integrated into management processes

Since its implementation in 2009, the Sustainable Portfolio Management tool has been widely adopted by Solvay Global Business Units and Functions to integrate sustainability into their key processes:

- The Sustainable Portfolio Management profile is an integral part of strategic discussions between Global Business Units and the Executive Committee;
- Solvay uses the Sustainable Portfolio Management tool to evaluate mergers and acquisition projects to see if the investment is feasible in the light of Sustainable Portfolio targets;
- Investment decisions (capital expenditure above € 10 million and acquisitions) made by the Executive Committee or the Board of Directors include a sustainability aspect that involves an exhaustive Sustainable Portfolio Management analysis of the potential investment;
- All Research and Innovation projects are evaluated using Sustainable Portfolio Management;
- In Marketing and Sales, Sustainable Portfolio Management allows Solvay to engage customers on fact-based sustainability topics – such as climate change action, renewable energy, recycling, and air quality – with the goal of differentiating and creating value for Solvay and the customer.

Building a reference framework for active portfolio management

- Benchmarking and sharing best practices among peers and customers make the Sustainable Portfolio Management methodology more robust and leads to better decision-making. Solvay is a key contributor to the World Business Council for Sustainable Development's Portfolio Sustainability Assessment. The initiative sets a high standard and gives industries a common framework for its implementation, detailing a specific methodology for the chemical industry;
- Customers and industrial players see adoption of Solvay's Sustainable Portfolio Management as a powerful tool for creating value by integrating sustainability into their own strategic and operational processes.

3. Basis of preparation

Main reporting frameworks used to prepare this Annual Integrated Report

- **Global Reporting Initiative (GRI):** the GRI standards are the main reference for Solvay's sustainability reporting;
- **United Nations Global Compact:** the information provided serves as a progress report on implementation of the United Nations Global Compact's ten principles;
- **International Integrated Reporting Council (IIRC):** Solvay adheres to the principles and content elements of Integrated Reporting, as described in the "International <IR> Framework" published by the IIRC;
- **2014/95/EU:** Solvay uses the GRI Standards to comply with Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information. The Directive was transposed into Belgian law in September 2017;
- **Sustainability Accounting Standards Board (SASB):** Solvay aligns its materiality analysis with the SASB approach to prepare the SASB Materiality Map™. For more details, see the Materiality Analysis section of this chapter.

This section includes the following topics: Task Force on Climate-related Financial Disclosure, United Nations Sustainable Development Goals, reporting practices, materiality analysis, and stakeholder engagement.

3.1. Task Force on Climate-related Financial Disclosure

The Financial Stability Board Task Force on Climate-related Financial Disclosures (TCFD) developed voluntary, consistent, climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders.

The task force structured its recommendations around four themes that represent key aspects of how organizations operate: governance, strategy, risk management, and metrics and targets.

This section addresses the disclosures, with links to the relevant sections of the Annual Integrated Report, and provide a self-assessment of Solvay's level of alignment with the TCFD recommendations.

Governance

- ⊕ The Charter of Corporate Governance describes how the Board of Directors manages sustainability-related aspects and is available on the Solvay Website. The Board thus devotes at least one meeting per year to an update on trends in global sustainable development issues, including climate change risks and opportunities;
- ⊕ A Climate Risks Officer has been appointed at Executive Committee level. He is in charge of ensuring that climate-related aspects are adequately considered in the Group's strategy and operations.

Strategy

- ⊕ Long-term horizon assumptions are presented in the description of megatrends. See in particular the description of the "Resource constraints and demand for sustainability" megatrend. Medium-term assumptions (in the coming five years) are explained in the description of Solvay's main markets. Short-term assumptions (one year) are presented in the Group's outlook;
- ⊖ Climate transition risks are described in the "Risk Management" chapter. The Group has included water-related risks in climate transition risks rather than in physical risks, because elements of transition risks affect water-related risks (i.e. in legislative developments). Other climate-related physical risks are not in the Group's list of highest risks, as "physical impacts of climate change" are currently ranked as having moderate materiality. The focus in 2018 was the definition of a new greenhouse gas emissions reduction plan; climate risks and opportunities will be reviewed in 2019;
- ⊖ The Sustainable Portfolio Management methodology is used to assess sustainability-related risks and opportunities for each product in each application, with a focus on the long term. Environmental impact monetization of CO_2 emissions uses a CO_2 price of € 75 per ton, in line with 2°C scenario assumptions. This allows Solvay to have a sound understanding of the climate resilience of the majority of its products and solutions portfolio, but the Group need to extrapolate this understanding to a strategic business level. Over the coming years Solvay plans to conclude its work in this regard, to identify mitigation actions by reference to innovation priorities, capital investments, and portfolio actions, and to disclose the progress qualitatively;
- ⊖ The presentation of the Group's main risks does not include a differentiation between short, medium, and long-term horizons. Quantification of impacts is not disclosed.

Risk management

- The risk management process, the main risks, and the process used to rank them are described in the "Risk Management" chapter;
- Analysis of sustainability-related risks and opportunities is done through the Sustainable Portfolio Management methodology, for each product in each application or market, including the climate change transition risk;
- “Greenhouse gas emissions” (GHG) has been identified as a priority aspect in the Group’s materiality analysis. “Climate transition risks” has been identified as part of the Group’s main risks. Links between main risks and high materiality issues are part of the materiality analysis process. "Climate-related physical risks" has been ranked up to now as “moderate materiality aspects”;
- The Sustainable Portfolio Management tool is a mandatory requirement in key Group processes and in particular in the assessment of capital expenditures projects, Research and Innovation projects, and acquisition and divestiture projects.

Metrics and targets

- The strategic objectives used to drive sustainable value creation are described in the Solvay scorecard;
- Greenhouse gas emissions, energy consumption, and Sustainable Portfolio Management metrics and targets are reported in the “Extra-financial statements” chapter. Solvay updated its greenhouse gas emissions approach in September 2018 and has pledged to reduce greenhouse gas emissions by 1 million tons by 2025 by improving its energy efficiency and energy mix and by investing in clean technologies. In setting a concrete objective, it is among the first chemical groups to decouple its emissions from its growth;
- Greenhouse gas Scope 1 and Scope 2 emissions are fully reported. The scope of emissions reporting is consistent with financial reporting;
- Scope 3 emissions related to upstream activities are disclosed. Scope 3 emissions related to processing, use and end-of-life treatment of sold products are qualitatively assessed and potential meaningful impacts have been identified but not fully quantified, and therefore not disclosed. This does not prevent the Group from proactively engaging with customers to ensure that activities minimize emissions responsibly.

3.2. United Nations Sustainable Development Goals

In 2015, the United Nations established a set of goals to end poverty, protect the planet, and ensure prosperity for all. Each of these 17 Sustainable Development Goals (SDGs) includes specific targets to be achieved by 2030. Achieving the SDGs requires efforts by governments, the private sector, civil society, communities, and individuals.

Nine leading chemical companies, including Solvay, and two industry associations formed a dedicated working group, convened by the World Business Council for Sustainable Development (WBCSD). The group took a leadership role in piloting and refining the three-step framework described in WBCSD's SDG Sector Roadmap Guidelines.

In the context of this exercise, Solvay identified seven SDGs where the Group can have a material impact, positive or negative. The Group then integrated these seven SDGs into its materiality analysis as the official agenda of the "Planet" (Governments and NGOs) stakeholder group.

The SDGs relevant to Solvay confirmed the priorities the Group had already identified through its materiality analysis. Each topic is developed in the corresponding section of the Annual Integrated Report.

SDG 3: Employee health and safety ★
Waste and hazardous materials ⊕

SDG 7: Energy ⊕
The majority of Solvay's greenhouse gas emissions come from energy.

SDG 8: Employee engagement and well-being ★

SDG 12: Sustainable Business Solutions ★

SDG 4 and **SDG 17:** Societal actions ★
Solvay's corporate philanthropy is directed principally to educational, scientific and humanitarian endeavors around the globe. Partnerships are key to accelerating sustainable development and advancing the SDGs.

SDG 13: Greenhouse gas emissions ★

⊕ High materiality aspect ★ Priority aspect

3.3. Reporting practices

Greenhouse gas emissions reporting practices

Solvay has decided to apply the "Guidance for Accounting & Reporting Corporate Greenhouse Gas Emissions (GHG) in the Chemical Sector Value Chain" published by the World Business Council for Sustainable Development, which provides best practices for greenhouse gas accounting and reporting. By extension, other emissions are reported according to the same guidelines.

To better reflect its sustainability policy, Solvay decided to apply the market-based method to calculate CO_2 emissions associated with purchased electricity. To fully comply with Global Reporting Initiative's requirements, the following criteria (in decreasing order of priority) are applied to select the CO_2 emission factor of each electricity supply contract:

- **Energy attribute certificates** – emission factors resulting from specific instruments such as green energy certificates;
- **Contract based** – the emission factor obtained from contract agreements on specific sources for which there is no emission of specific attributes;
- **Supplier / utility emission rates** – the emission factor that is disclosed as a result of the supplier's retail mix;
- **Residual mix** – if a residual mix is unavailable, grid-average emission factors are used as a proxy;
- **Location-based** – if none of the above factors is available, it is the national emission factor published by national authorities or the International Energy Agency. Based on a World Resources Institute (WRI) recommendation, Emissions and Generation Resource Integrated Database (eGRID) emission factors published by the United States Environmental Protection Agency are used for the USA, instead of the state emission factor.

Energy reporting practices

Energy consumption components are converted into primary energy, according to the following conventions:

- Fuels, using the net calorific values;
- Steam purchased, taking into account the reference value of boiler efficiency related to the fuel used for its generation (e.g. 90% efficiency based on the net calorific value for natural gas);
- Electricity purchased, assuming an average efficiency of 39.5% for all types of power production except for nuclear power (33%), based on net calorific value (source: International Energy Agency (IEA)).

Environmental reporting practices

Environmental data are collected yearly at all Solvay industrial sites (production sites and Research and Innovation centers) and for each business separately in the case of multi-business sites. The data collection comprises substance emissions to air and water, waste production, and a series of parameters dealing with water and general environmental management.

After a thorough validation process, these data are consolidated at Group level in a manner consistent with financial reporting. In addition, the consolidated data are verified by an external auditor.

Safety reporting practices

Safety performance is measured in all entities under Solvay operational control, i.e. on sites where Solvay policies and procedures apply. Accidents are reported to a central database and classified according to time lost and severity of injuries.

Frequency rates are calculated monthly at Global Business Unit level and Group level. Performances and accident typologies are analyzed on a quarterly basis. Reports are provided to the Executive Committee and Global Business Units.

Medical Treatment Accident Rate (MTAR), Lost Time Accident Rate (LTAR), and Process Safety Rate are calculated based on million hours worked. The Group reporting guidelines for calculating hours worked (employees, contractors, and temporary workers) are being revised to ensure that the methodological approaches are more consistent across all Group entities as from 2018.

Social reporting practices

Headcount is provided for two scopes:

1. Solvay Continuous Operations includes continuous operations only and matches the financial accounts presentation;
2. Solvay Total Headcount also considers discontinued operations.

Apprentices, trainees, and students are excluded from the numbers. Headcount refers to employees that have a contract with Solvay and are classified as active, as they have a position in the organizational chart. Full Time Equivalent (FTE) corresponds to active employees times capacity utilization.

3.4. Materiality analysis

Solvay bases its sustainability priorities on a materiality analysis. This approach identifies critical economic, environmental, and social aspects with potential to significantly impact Solvay's performance and/or substantially influence stakeholders' decisions. The analysis is performed and updated each year using the Sustainability Accounting Standards Board (SASB) materiality approach.

5	8	15
Priority aspects	High materiality aspects	Moderate materiality aspects

Materiality analysis

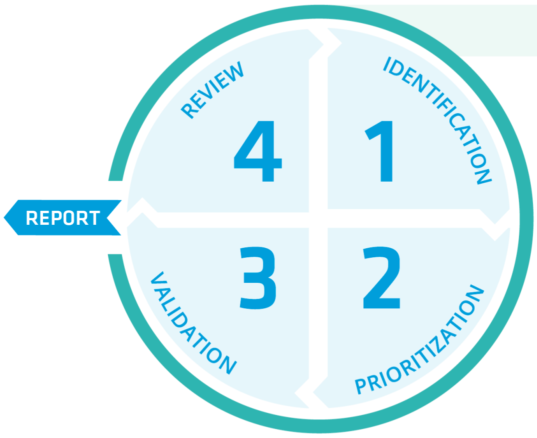
Category	Moderate materiality	High materiality
Environment	Ecological impacts	★ Greenhouse gas emissions Air quality Energy Water and wastewater Waste and hazardous materials
Social capital	Access and affordability Data security Customer privacy Selling practices and product labeling Product quality and safety	Customer welfare ★ Societal actions
Human capital	Compensation and benefits Recruitment, development and retention	★ Employee health and safety Diversity and inclusion ★ Employee engagement and well-being
Business model and innovation	Business model resilience Product packaging Supply chain management Materials sourcing and efficiency Physical impacts of climate change	★ Sustainable business solutions
Leadership and governance	Systemic risk management Regulatory capture and political influence	Critical incident risk management Management of the legal, ethics and regulatory framework

★ Priorities

Materiality analysis process

Solvay's Sustainable Development and Energy Function coordinates the analysis with an internal network of the Solvay Way Champions in the Global Business Units and Functions. Experts in each Corporate Function have reviewed the analysis of each aspect, paying particular attention to consistency with the Group's risk analysis.

Materiality analysis process



STAKEHOLDER INCLUSIVENESS | SUSTAINABILITY CONTEXT

Indirectly taken into account through:

- The exhaustive list of aspects of the SASB's "Materiality Map™";
- The "evidence of interest criteria" which includes the analysis of documents published by each stakeholder Group.

Report
Reporting on the 8 high materiality aspects and the 15 moderate materiality aspects.

1 Use of the SASB's Materiality Map™

SASB's Materiality Map™ identifies likely material sustainability aspects on an industry-by-industry basis.

2 SASB's Materiality Map™ is based on tests designed to prioritize aspects. To determine which sustainability topics were likely to be material to particular industries, SASB ran the following tests: evidence of interest, evidence of financial impact, forward looking adjustment.

The network of "the Solvay Way Champions" and internal experts for each highly material aspect were involved in the process.

3 Review the analysis by the Executive Committee and the Global Business Units and Corporate Functions leaders, give a special importance to ensure consistency with the analysis of the Group's main risks and also compare with the result of the analysis of the SASB for the chemical sector.

4 Annual review led by the Sustainable Development and Energy function

A review takes place after the report has been published, and the organization is preparing for the next reporting cycle. The findings inform and contribute to the Identification Step for the next reporting cycle.

2018 Updates

As in previous years, the vocabulary used for material aspects has been kept consistent with the SASB Materiality Map™, except in cases where the Group's Executive Committee has decided to do otherwise during the validation step in order to broaden the scope of some material aspects. This is the case for the following high materiality aspects:

- "Societal actions" includes "Community relations" from the 2018 SASB Materiality Map™;
- "Employee engagement and well-being" includes "Labor practices" and "Employee well-being" from the SASB Materiality Map™;
- "Sustainable business solutions" includes "Product design and Lifecycle Management" from the SASB Materiality Map™;
- "Management of the legal, ethics and regulatory framework" includes "Business ethics", "Competitive behavior", and "Human Rights" from the SASB Materiality Map™;
- As last year, Solvay has kept "Compensation and benefits", "Recruitment, development and retention", and "Diversity and inclusion" as three aspects, mainly because of the extent of reporting on these issues in this report.

The main change in vocabulary since last year is that the "Process accident and safety management" section has been renamed "Critical incident risk management", in alignment with the new wording in the SASB Materiality Map™.

Correspondence between the materiality analysis and the risk analysis of the Group

As described in the "Risks Management" chapter of this Annual Integrated Report, the risk analysis of Solvay is a specific process and is used as input for the materiality analysis.

All the main risks of the Group relate to high materiality aspects, except "Security" and "Cyber risks", which relate to moderate materiality aspects because the impact on daily operations is limited and is material only in the event of a malicious act.

3.5. Stakeholder engagement

2018 confirmed a trend that Solvay had already observed in 2017: an increasing focus on addressing climate change, providing customers with innovative solutions with a low environmental impact, further increasing collaboration and transparency with stakeholders.

In response to stakeholders' priorities, Solvay has focused on three main actions:

1. A new climate plan, including an absolute emissions reduction target, was published on September 24, 2018;
2. The early stages of the partnership with the Ellen MacArthur Foundation have begun. Initially, the Group is focusing on a number of flagship projects aimed at raising employee awareness of the topic;
3. The Solvay Way, Solvay's sustainability reference framework focusing on stakeholder expectations, was entirely updated in 2018. The new version is available to all employees online or as a mobile app and highlights each Global Business Unit's most material aspects.

Customers

The number of customers assessing Solvay's performance using the Ecovadis, Carbon Disclosure Project, or specific questionnaires has been increasing steadily in recent years, confirming a focus on risks and opportunities in the supply chain.

An increasing number of customers have explicitly expressed the need to provide an innovative solution in line with the circular economy principles.

Employees

Solvay's annual employee survey confirmed a growing focus on sustainable development principles and interest in the systems in place for professional development.

Employees representatives and Solvay's Board of Directors both emphasized the need to keep Solvay's workforce engaged on sustainability principles, from top management to the shop floor.

Planet – via Government and NGO

The publication of the International Panel on Climate Change 2018 special report confirmed the need to accelerate actions aimed at reducing greenhouse gas emissions and addressing climate change.

The United Nations Sustainable Goals were confirmed as the new reference for reporting on impacts on society.

The Chemical Industry is an important enabler in the move towards a restorative and regenerative circular economy.

Investors

The letter from Larry Fink (BlackRock) to CEOs at the beginning of 2018 confirmed that sustainability is now high on investors' agendas, emphasizing the need to focus on long-term value creation and building a better framework for serving all your stakeholders.

Rating agencies' questionnaires and interviews with Solvay shareholder representatives confirmed the importance of innovation, governance, ethics and transparency.

Suppliers

Supplier interviews and engagement confirmed an interest for greater collaboration on planning, goal setting, and strategic thinking.

Local communities

Interviews with local community representatives confirmed the need to contribute to local material aspects.

The importance of social media, which can transform a local issue into a global topic, was again confirmed in 2018. Some online, broadcast videos and articles inaccurately claimed that the white beach near Solvay's Rosignano, Italy plant and its clear blue water are due to contaminated waste water from the factory.

The Rosignano controversy

Notes to Business model and innovation

This section addresses the impact that environmental and social factors have on innovation and business models. It examines the way environmental and social factors are integrated into the Group's value creation processes. Those processes include resource efficiency and other innovations in the production process, product innovation, and finding ways to design, use, and dispose of products efficiently and responsibly.

NOTE S1
Sustainable business solutions

Priority

A sustainable solution is defined by Solvay's Sustainable Portfolio Management tool as a product in a given application which makes a greater social and environmental contribution to the customer performance and at the same time demonstrates a lower environmental impact in its production phase.

Indicators and objectives

Within Solvay, the Global Business Units are accountable for delivering sustainable business performance and contributing to the Group target of generating 50% of revenue from sustainable solutions by 2025.

Solvay's priority objective:

2018 mid-term

40%

to the Group sales in sustainable solutions

Baseline 2014

2025

50%

to the Group sales in sustainable solutions

Revenue breakdown by Sustainable Portfolio Management heat map categories

% of turnover	2018	2017	2016	2015
Solutions	50	49	43	33
Neutral	30	31	33	39
Challenges	7	8	8	16
Not evaluated	13	12	16	12

Solutions: to be considered as part of the "solutions", products must serve in an application that demonstrates a direct, significant, and measurable benefit (social or environmental) to society at large. They must not exhibit sustainability concerns and must have a low monetized environment manufacturing footprint compared to the value they bring to society.

Neutral: no sustainability impact, positive or negative, identified.

Challenges: a sustainability roadblock is identified, or the environmental manufacturing footprint is too high.

By the end of 2018, 50% of sales in the assessed portfolio of Product-Application Combinations qualified as "solutions", a slight improvement compared with the previous year.

Most of the progress made over the last five years has been achieved through changes to Solvay's portfolio and the natural erosion of sustainable solutions into markets standards (neutral), based on market dynamic on sustainable topics. Today, the challenge SPM faces is to maintain 50% in solutions through innovation, organic growth, investment, etc.

Sustainable Portfolio Management's comprehensive, systematic approach reveals an increasing number of new market signals on sustainability that require discussion between the business and its customers to better understand their potential business impact.

The Sustainable Portfolio Management systematic portfolio assessment is aligned with the Group's financial scope. Changes in scope during the year, as outlined in the financial report, are reflected in the Sustainable Portfolio Management scope. In 2018, the portfolio assessment was based for the first time on sales in the same reporting year, i.e. 2018.

Correlation between Sustainable Portfolio Management analysis and sales growth

Sustainable Portfolio Management is designed to identify business accelerators or obstacles with respect to sustainability in order to help Solvay's business deliver higher growth and superior sustainable value. Over the last three years, Solvay's products have experienced significantly stronger annual revenue growth rates in cases where customers and consumers are looking for products to match their social or environmental needs.

Annual volume growth rate per Sustainable Portfolio Management category:

- Solutions: +5%;
- Challenges: -5%.

(based on 2015-2017 sales with the same product, same application, and same Sustainable Portfolio Management ranking over the last three years, representing 43% of Group sales).

Notes to Environment

This chapter covers the impact of the company's operations on the environment, such as air emissions, water and wastewater, greenhouse gas emissions, and hazardous waste and substances introduced in the value chains.

How Solvay sites control their environmental footprint, in a nutshell

Environmental impacts of operations are managed through the processes and requirements embedded in the Health, Safety and Environment management systems deployed by sites in line with Solvay requirements, while hazardous substances in sold products are managed through the processes and requirements of Global Business Units' product Safety Management Systems.

While every industrial site is different, the Group's commitments remain the same:

- Reduce greenhouse gas intensity;
- Reduce air and water emission intensity;
- Perform regulatory compliance audits at all sites;
- Prevent incidents with environmental non-compliance;
- Follow up more effectively on waste and water intakes.

NOTE S2
Greenhouse gas emission

Priority

12.3 million tons

of CO_2 eq.
Total greenhouse gas emissions – Scopes 1 and 2 (Kyoto Protocol)

Definition

The greenhouse gas emissions reported by Solvay correspond to the scope of the Kyoto Protocol and comprise the following compounds or compound families: CO_2, N_2O, CH_4, SF_6, HFCs, PFCs and NF_3. To calculate their impact on climate change, greenhouse gas emissions are converted from metric tons to the CO_2 equivalent using the Global Warming Potential of each gas based on a 100-year timeframe, as published by the Intergovernmental Panel on Climate Change in its fifth assessment report.

The indicator takes into account:

- Direct emissions for each greenhouse gas released from Solvay's industrial activities (Scope 1 of Kyoto Protocol). For CO_2, the reporting of direct emissions includes emissions from the combustion of all fossil fuels as well as process emissions (e.g. thermal decomposition of carbonated products and chemical reduction of metal ores);
- Indirect CO_2 emissions related to the steam and electricity purchased from third parties and consumed internally (Scope 2 of Kyoto Protocol) For electricity purchased, indirect emissions are calculated by applying market-based methods. In 2017, electricity supply contracts were analyzed in order to determine the most appropriate CO_2 emissions factor of each site.

Management approach

The Group updated its greenhouse gas emissions approach in September 2018. Solvay is committed to reducing greenhouse gas emissions by 1 million tons no later than in 2025, by improving its energy efficiency and energy mix and by investing in clean technologies. In setting a concrete objective, it is among the first chemical groups to decouple its emissions from its growth.

Since January 1, 2016, Solvay has applied to greenhouse gas emissions an internal carbon price of € 25 per metric ton CO_2 equivalent, to take into account climate challenges in its investment decisions.

An externally verified and structured greenhouse gas emission reporting system and responses to rating agencies such as the Carbon Disclosure Project help the Group align its efforts with the magnitude of its greenhouse gas challenges.

Indicators and objectives

Greenhouse gas emissions, new target

Solvay's priority objective

2025

-1 million tons

of greenhouse gas emissions (Scope 1 and 2) in comparison with 2017

Greenhouse gas emissions – 2018 achievement

Mt CO_2 eq.	
Total greenhouse gases emissions (scopes 1 and 2) in 2018	12.3
Total greenhouse gases emissions (scopes 1 and 2) in 2017	12.3
Variation due to changes in reporting scope (structural changes)	-0.0
Variation due to changes in calculation methodology or improvements in data accuracy	-0.0
Emissions increase or reduction	-0.0

Greenhouse gas emissions intensity

kg CO_2eq. / € EBITDA	**2018**	2017	2016	2015
Greenhouse gas intensity	5.51	5.53	5.86	7.26

Scope: consistent with financial reporting.

For a given year, greenhouse gas emissions intensity reflects the amount of scope 1 and 2 emissions covered by the Kyoto Protocol included in the financial scope expressed in kg CO_2 eq. per euro of EBITDA.

In 2018, greenhouse gas intensity decreased by 0.02 kg CO_2 eq. per euro of EBITDA.

Greenhouse gas emissions

Greenhouse gas emissions (Scope 1 and 2)

		2018	2017	2016	2015
Direct and indirect CO_2 emissions (scopes 1 and 2)	Mt CO_2	9.8	10.0	10.9	11.6
Other greenhouse gases emissions according to Kyoto Protocole (scope 1)	Mt CO_2eq	2.4	2.3	2.4	2.6
Total greenhouse gases emissions according to Kyoto Protocole	Mt CO_2eq	12.3	12.3	13.4	14.2
Other greenhouse gases CO_2 emissions not according to Kyoto Protocole (scope 1)	Mt CO_2eq	0.1	0.1	0.1	0.1

Scope: consistent with financial reporting scope, including the manufacturing activities of the companies that are currently consolidated (fully or proportionately). The greenhouse gas emission of the companies in the financial scope represents 81% of the total greenhouse gas emissions of all companies in the operational scope.

Direct greenhouse gas emissions (Scope 1)

Mt CO_2 eq.	2018	2017	2016	2015
Methane – CH_4	0.88	0.90	0.81	0.85
Nitrous oxide – N_2O	0.10	0.14	0.20	0.27
Sulfur hexafluoride – SF_6	0.04	0.06	0.05	0.04
Hydro fluoro carbons – HFCs	0.06	0.14	0.05	0.05
Perfluorocarbons – PFCs	1.36	1.07	1.34	1.40
Nitrogen trifluoride – NF_3	0.0	0.0	0.0	0.0
Total other Greenhouse gas emissions according to Kyoto Protocol	**2.44**	**2.31**	**2.45**	**2.61**
Carbon dioxide – CO_2	7.96	7.92	8.43	8.76
Total direct emissions	**10.35**	**10.2**	**10.9**	**11.4**

Scope: consistent with financial reporting.

In 2018, direct CO_2 emissions were marginally higher than in 2017.

In 2018 direct other greenhouse gas emissions according to the Kyoto Protocol were 0.13 million tons CO_2 eq. higher than in 2017. This change is attributable mainly to an increase of 0,29 million tons CO_2 eq. of CF_4 emissions in Spinetta (Italia) and a decrease of 0.08 million tons CO_2 eq. of HFCs.

Total indirect CO_2 – Gross market-based (Scope 2)

Mt CO_2	2018	2017	2016	2015
Electricity purchased for consumption	1.0	1.2	1.4	1.7
Steam purchased for consumption	0.9	0.9	1.1	1.1
Total	**1.9**	**2.1**	**2.5**	**2.8**

Scope: consistent with financial reporting.

Since the implementation of the market-based method, a detailed review of emissions factors for purchased electricity covering all sites is done every year.

The decrease of 0.2 million tons of CO_2 for indirect CO_2 emissions linked to purchased electricity is explained by the start-up of the Solvay Jasper County Solar Farm in South Carolina (United States, 0.05 million tons of CO_2), improved electricity purchases with lower carbon content (0.10 million tons of CO_2), and the shutdown of the electrolysis unit in Torrelavega (Spain, 0.04 million tons of CO_2).

Indirect CO_2 emissions linked to purchased steam is stable, there were no significant changes in the steam sourcing.

Total indirect CO_2 – Gross location-based (Scope 2)

Mt CO_2	2018	2017	2016	2015
Electricity purchased for consumption	1.1	1.2	1.2	1.8
Steam purchased for consumption	0.9	0.9	1.1	1.1
Total	**2.0**	**2.1**	**2.3**	**3.0**

Scope: consistent with financial reporting.

Other indirect greenhouse gas emissions (Scope 3)

Mt CO_2 eq.	2018	2017	2016	2015
Fuel- and energy-related activities	0.7	0.7	0.8	0.8
Investments	1.9	1.7	0.8	2.5
Purchased goods and services	5.8	6.6	7.2	7.6
Business travel	0.02	0.02	0.02	0.02
Downstream transportation and distribution	0.8	0.8	1.2	1.0

Scope: consistent with financial reporting.

Due to no significant change in energy sourcing, emissions related to “Fuel and energy-related activities” remain stable. “Investments” encompasses the scope 1 and 2 emissions of the discontinued activities: 1.6 million tons of CO_2 eq. for polyamide activities.

Downstream scope 3 emissions related to processing use and end-of-life of products have been identified as significant through the Sustainable Portfolio Management assessment. Values are not disclosed yet, as some calculation assumptions are undergoing verifications.

2018 key achievements

- Solvay has continued to step up its involvement in renewable energy production on sourcing in 2018. The Solvay Jasper County Solar Farm has been commissioned in the United States of America. Wind power has been contracted in India. Works are ongoing to expand use of biomass energy on top up the assets in Brotas (Brazil), Dombasle (France), Rheinberg (Germany), with new additions in India and China. Finally, Solvay has decided to invest in a new biomass boiler in Germany, which will lower emissions by 0.2 million tons of CO_2 per year and play a significant role in meeting the Group’s commitment to reduce CO_2 emissions by 1 million tons no later than in 2025, regardless of its growth;
- The SOLWATT© energy and carbon efficiency program has delivered 0.54 million tons of emission reductions since 2014, with 1,000 actions deployed across 70 sites worldwide. New savings achieved in 2018 are estimated at 63.7 million tons of CO_2;
- In the trona mine at Green River (Wyoming, United States), partial recovery of the methane emitted during the extraction and combustion of trona has avoided emissions equivalent to 0.1 million tons of CO_2 eq. per year since 2011. Since 2012 some of the heat from combustion of the recovered methane has been used in the manufacturing process, bringing additional energy and CO_2 savings.

NOTE S3
Energy

Highly material

127 PJ
primary energy consumption

101 PJ
Fuel consumption from non-renewable sources

Definition

Solvay's energy consumption is made up of four components:

1. Non-renewable primary fuels (coal, petcoke, natural gas, fuel oil, etc.), which are used for internal production of steam, electricity, and mechanical energy, and in manufacturing processes (coke and anthracite in lime kilns, gas in dryers, etc.);
2. Renewable primary fuels (biomass);
3. Purchased steam;
4. Purchased electricity.

To comply with Global Reporting Initiative requirements, steam and electricity generated from fuels and sold to a third party are deducted from the total. Energy that is purchased and sold afterwards to a third party without any transformation is not accounted for.

Management approach

In the field of energy supply, Solvay has consistently implemented programs to reduce its energy consumption for many years. While Solvay has industrial activities such as synthetic Soda Ash plants and Peroxides – mainly in Europe – that consume large amounts of energy, it also operates a range of industrial activities whose energy content is relatively low as a percentage of the sales price, especially in the fluorinated Polymers business. The Group considers secure and competitive energy supplies to be particularly important and has taken the following strategic initiatives:

- Technological leadership in processes and high-performance industrial operations to minimize energy consumption;
- Diversification and flexible use of the different types and sources of primary energy;
- Upstream integration in steam and electricity generation (gas cogeneration, biomass or secondary fuels cogeneration, etc.);
- Periodic review of the condition of industrial sites' energy assets and connections;
- A strategy of supply coverage with long-term partnerships and medium- to long-term contracts, with price-hedging protection mechanisms when needed;
- Direct access to energy markets when possible (gas hubs, electrical grids, financial spot and futures exchanges);
- Regular forecast reports on energy and raw material price trends, which are sent to business to anticipate sales price realignments.

Solvay Energy Services optimizes energy purchasing and consumption for the Group and helps Global Business Units manage energy and greenhouse gas emissions.

Energy being a key factor for Solvay's activities, Solvay has committed itself to reducing its energy consumption by 10% (1.3% per year on average) by 2020 compared to 2012 at constant activity scope. To achieve this ambitious target, Solvay has stepped up its SOLWATT® energy efficiency program, which aims to continuously optimize the industrial processes involved in its energy production and supply.

Solvay has taken concrete steps in the form of large investments, such as the start-up of the mega hydrogen peroxide (HP) plant in Saudi Arabia and the recent replacement of two gas turbines with more efficient units, one in the Spinetta cogeneration unit (Italy) and one in the Rosignano cogeneration unit (Italy). In 2018 Solvay increased its biomass heat production by starting up a new biomass-fired boiler in Zhangjiagang (China) and investing in a new biomass boiler in Rheinberg (Germany).

SOLWATT® energy efficiency program

The Group has reduced its overall energy intensity by 6% since 2012. One of the key factors in this progress has been the SOLWATT® energy efficiency program. The improvement plan follows three approaches in parallel:

1. By developing the use of high-efficiency cogeneration plants, the Group is improving the generation efficiency of secondary energy such as steam and electricity. Two turbines were replaced with more efficient units in 2017: one in Spinetta and one in Rosignano. Electrical efficiency at those two cogeneration installations improved by 4%;
2. In 2016, the second phase of the SOLWATT® program was launched. By the end of 2018, the deployment of this second phase had covered most of the sites with significant energy consumption, representing 41% of Group energy consumption;
3. New and remodeled plants are optimized for energy consumption and generation.

In 2018, Solvay continued to disseminate technological breakthroughs to improve the overall energy efficiency of its operations.

Indicators and objectives

Energy intensity

In 2012, Solvay undertook to reduce its energy consumption by 10% (1.3% per year on average) by 2020 at constant activity scope. Its energy intensity indicator covers both primary energy from fuels (coal, petcoke, coke, anthracite, fuel-oil, natural gas, biomass, etc.) and from purchased steam and electricity.

Solvay's objective:

2020

-10%

of energy consumption at constant activity scope

Baseline 2012

Energy efficiency index – Baseline 100% in 2012

In %	2018	2017	2016	2015
Energy efficiency index	93	94	94	96

Scope: energy index at constant activity scope reflects the change in energy consumption on a comparable basis after adjusting the historical scope to take into account scope changes and making adjustments for changes in production volumes from one year to the next.

Energy consumption

In 2018, primary energy consumption was 3 PJ lower than in 2017. This variation is attributable mainly to the shutdown of the electrolysis unit in Torrelavega in Spain (1.2 PJ), a change in steam supply in Bernburg in Germany (1 PJ), and a reduction of steam consumption in Rosignano in Italy (0.7 PJ). The rest of the variation (0.1 PJ) is linked to energy savings projects and production changes.

In petajoules low heating value (PJ)	2018	2017	2016
Primary energy consumption	127	130	138

Scope: this indicator shows the primary energy consumption over a given year related to the manufacturing activities of the companies that are currently consolidated (fully or proportionately). The primary energy consumption of the companies in the financial sphere represents 82% of the total primary energy consumption of all companies in the operational sphere.

Fuel consumption from non-renewable sources

In petajoules low heating value (PJ)	2018	2017	2016	2015
Solid fuels	46	46	47	49
Liquid fuels	0.5	0.4	2	1
Gaseous fuels	55	54	55	57
Total	**101**	**100**	**104**	**107**

Scope: consistent with financial reporting.

Fuel consumption from non-renewable sources in 2018 was more stable than in 2017, and there were no significant changes in energy sourcing.

Fuel consumption from renewable sources

In petajoules low heating value (PJ)	2018	2017	2016	2015
Renewable fuel consumption	4	3	4	5

Scope: consistent with financial reporting.

Biomass consumption increased in 2018 with the startup of a new biomass-fired boiler in Zhangjiagang (China).

Secondary energy purchased for consumption

In petajoules low heating value (PJ)	2018	2017	2016	2015
Electricity	28	30	30	40
Heating	0	0	0	0
Cooling	0	0	0	0
Steam	18	20	22	23
Total secondary energy purchased	**45**	**49**	**53**	**63**

Scope: consistent with financial reporting.

In 2018, secondary energy purchased for consumption was 3 PJ lower than in 2017.

Energy sold

In petajoules low heating value (PJ)	2018	2017	2016	2015
Electricity	11	11	12	11
Heating	0	0	0	0
Cooling	0	0	0	0
Steam	12	11	12	14
Total energy sold	**23**	**22**	**23**	**26**

Scope: consistent with financial reporting.

In 2018, the sale of self-generated secondary energy to third parties increased by 1 PJ. The evolution is explained by an increase of sales of 0.7 PJ in Brotas (Brazil) and 0.4 PJ in Torrelavega (SP).

NOTE S4
Air quality

Highly material

Definition

Nitrogen oxide and sulfur oxide emissions contribute to atmospheric and freshwater acidification. Non-methane volatile organic compounds (NMVOC) emissions contribute to the formation of tropospheric ozone and summer smog. Thus, these categories of substances are material because they directly impact air quality.

Nitrogen oxide emissions from Solvay's operations result mainly from the combustion of fossil fuels such as natural gas. They are expressed as the sum of nitrogen monoxide and nitrogen dioxide, excluding Nitrous oxide (N_2O) that contributes to global warming but does not have any acidification impact.

Sulfur oxide emissions (SO_x) arise mainly from the combustion of anthracite or coal.

Non-methane volatile organic compounds are: volatile organic compounds (VOCs) with a standard boiling point below or equal to 250°C (EU Solvent Directive 1999/13/EC). NMVOCs are VOCs other than methane. Methane emissions from Solvay's mining activity at Green River (Wyoming, United States) are not included. Their impact is integrated into the greenhouse gas emission indicator.

Management approach

Air quality is managed through the Health, Safety and Environment management systems deployed by sites in line with Group requirements.

Solvay is committed to improving air quality at local and regional levels, in close cooperation with local stakeholders. In the framework of its environmental plan, Solvay focuses on the following pollutants: nitrogen oxides (NO_X), sulfur oxides (SO_X), and non-methane volatile organic compounds (NMVOC).

Indicators and objectives

Solvay's objective:

Solvay's objective:

2020	2020	2020
-50%	**-50%**	**-40%**
of nitrogen oxides emissions intensity	of sulfur oxide emissions intensity	of non-methane volatile organic compound emissions intensity

Baseline 2015

Air emissions, intensity

In kg per € EBITDA	**2018**	2017	2016	2015
Nitrogen oxides – NO_x	0.0033	0.0042	0.0059	0.0062
Sulfur oxides – SO_x	0.0017	0.0021	0.0028	0.0033
Non-methane volatile organic compounds – NMVOC	0.0024	0.0023	0.0026	0.0035

Scope: consistent with financial reporting.

Since the start of the environmental plan in 2015, the emission intensities for nitrogen oxides, sulfur oxides, and NMVOC have dropped by 47%, 49%, and 31% respectively. So, for sulfur and nitrogen oxides, over 90% of Solvay's 2020 target has already been achieved after three years. For NMVOC the figure is 75%.

Air emissions, absolute

In metric tons	2018	2017	2016	2015
Nitrogen oxides – NO_x	7,365	9,432	11,115	12,148
Sulfur oxides – SO_x	3,746	4,562	5,343	6,490
Non-methane volatile organic compounds – NMVOC	5,344	5,173	4,941	6,780

Scope: consistent with financial reporting.
Past figures have been restated to reflect the impact of methodology improvements.

Solvay's nitrogen oxide emissions went down significantly since 2017 (-2,066 tons or -22%), further closing the gap with its peers in the sector despite the energy intensive nature of the Soda Ash & Derivative Global Business Unit activity. This progress was achieved mainly on the sites at Devnya (Bulgaria, -1,032 tons or -11 %) and Torrelavega (Spain, -684 tons or -7%). In Devnya, the new Circulating Fluidized Bed (CFB) boiler installed in October 2017 reached its full potential in 2018. In Torrelavega, the improvement was obtained by injecting water into the combustion chamber of the gas-fired cogeneration unit since April 2018.

Since the start of the ongoing environmental plan (2015-2020), nitrogen oxide emissions decreased by 39% or about 13% per year. These changes have been achieved through investments in abatement technologies.

Solvay's sulfur oxide emissions have been cut by a further 816 tons since 2017, representing an additional 18% improvement. This result has been obtained thanks to the installation of a new CFB boiler in Devnya in October 2017 (-474 tons), the implementation of a new desulfurization ($DeSO_X$) unit in Torrelavega since August 2018 (-341 tons), and the increased use of low-sulfur fuels such as natural gas and biomass at the sites at Dombasle (-107 tons) and Tavaux (France, -91 tons). It is worthwhile mentioning that the existing $DeSO_X$ installation in Tavaux was also further optimized. An increase of 217 tons of SO_X was noticed at the Atequiza site (Mexico), which is attributed to an increased production of one of their products.

Since the start of the ongoing environmental plan (2015-2020), sulfur oxide emissions have decreased by 42% or about 14% per year. These changes have been achieved through investments in new burners, new desulfurization units, and optimization of existing ones.

Compared to 2017, the NMVOC emissions from the Group have slightly increased (172 tons or 3.3%). This global change is explained mainly by an increase of 100 tons (2%) at the Green River site (United States) due to normal year-to-year variations in the amount of vented mine gas and 46 tons (0.9%) at the Zhangjiagang site (China) in Aroma Performance activities. At the Spinetta site (Italy), the implementation of a regular LDAR (Leak Detection And Repair) program allowed a decrease in the R22 emissions by a factor of 4 (from 16 tons to 4.2 tons).

Since the start of the ongoing environmental plan (2015-2020), NMVOC emissions have decreased by 21% or about 7% per year. It should be noted that the majority of this reduction is due to the financial deconsolidation of the Performance Polyamides businesses, since 2017.

NOTE S5
Water and wastewater

Highly material

488	330	6,231
million m^3 Total water intake	million m^3 Freshwater withdrawal	metric tons O_2 Chemical Oxygen Demand emissions

Definition

Water management encompasses the management of water flows and water quality, from abstraction from the natural environment to water flow restitution to the same or another environmental compartment.

Freshwater withdrawal (in millions of m^3 per year) is the amount of incoming water from the public network (drinking water) and freshwater systems (rivers, lakes, etc.) as well as from groundwater sources (aquifers).

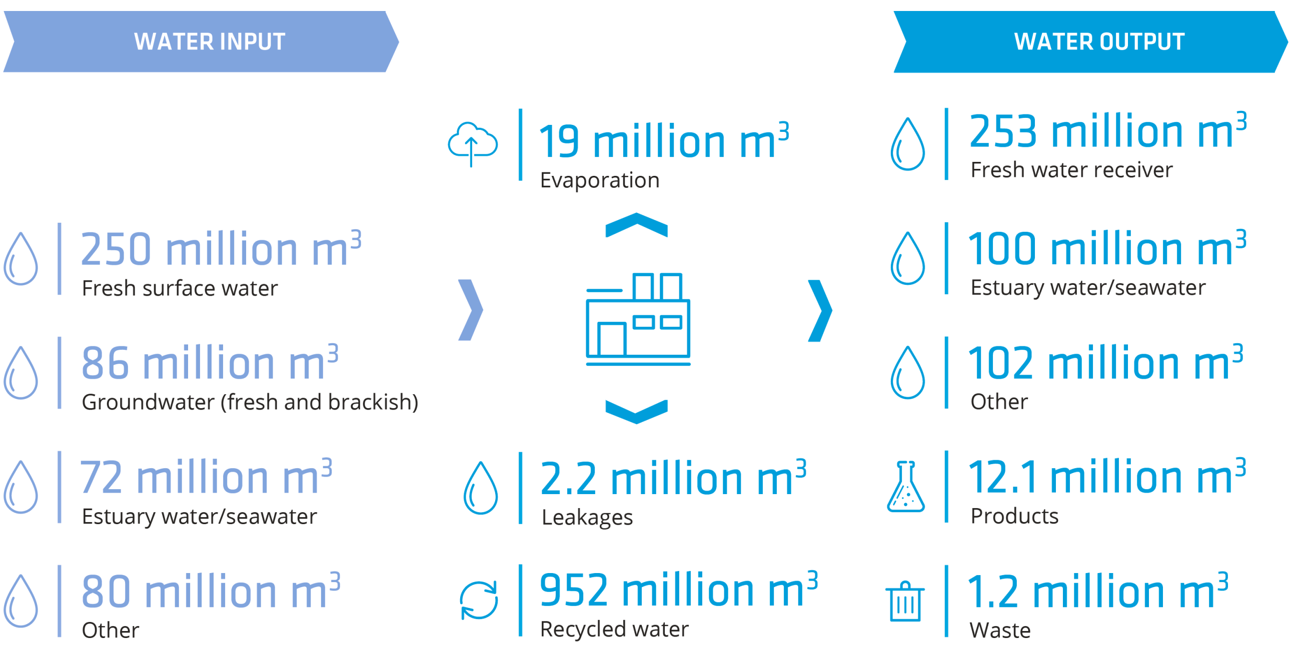
Chemical Oxygen Demand (COD) is the amount of oxygen reducing substances (mainly dissolved organic matter) discharged to aqueous receivers. COD is expressed as metric tons of oxygen per year. In addition to nitrogen and phosphorus species, Chemical Oxygen Demand also contributes to aquatic eutrophication.

Management approach

The Group has a company-wide water approach that includes a commitment to limit freshwater withdrawal and consumption, and to ensure that the quality status of the water bodies where effluents are discharged remains good, so that the impact on humans and natural biota is minimized. Solvay focuses on reducing two impacts: freshwater withdrawal and Chemical Oxygen Demand emissions.

Indicators and objectives

Overview of water flows (2018)



- In 2018, the Group's total water intake increased to 488 million m^3 (19% more than in 2017). This significant increase is due to the start-up of the mega H_2O_2 plant in Jubail (Saudi Arabia), which needs high volumes of cooling water because of the hot climate;
- 68% of the Group's total water intake in 2018 was freshwater. Compared to 2017, the freshwater contribution decreased by 12%;
- The 2018 Group's total water discharge amounts to 455 million m^3, 56% of which discharged to freshwater receptors;
- Water loss by evaporation (19 million m^3) takes place in industrial cooling towers or settling ponds;
- The recycling rate of cooling water at Group level increased to 77%, representing an improvement of 4% in comparison with 2017.

Solvay's objectives:

2020

-30%

of freshwater withdrawal intensity

Baseline 2015

2020

-30%

of Chemical Oxygen Demand emissions intensity

Freshwater withdrawal

	2018	2017	2016	2015
Intensity (m^3 per € EBITDA)	0.148	0.147	0.260	0.275
Absolute (Mm^3)	330	326	494	538

Scope: consistent with financial reporting.
Past figures have been restated to reflect the impact of methodology improvements.

The freshwater withdrawal intensity has been reduced by 46% since the start of the environmental plan, meaning that Solvay has already exceeded the 2020 target. Similarly, the Chemical Oxygen Demand emission intensity was cut by 32%, meaning that the Group has already exceeded the 2020 target in 2018.

It should be noted that the majority of these reductions are due to the financial deconsolidation of the Performance Polyamides business since 2017.

Since the start of the ongoing environmental pan (2015-2020), the freshwater withdrawal from the plants has decreased by 39% (or about 13% per year).

The freshwater withdrawal of the Group in 2018 was only 4 million m^3 (1.1%) greater than in 2017 . This increase of 4 million m^3 is the resultant effect of many small increases and decreases at individual sites, making it difficult to identify any major event. This global augmentation is in line with the total production volume increase of the Group (1.7%).

It is, however, worth mentioning that, thanks to a restoration program of the water distribution network delivering water to the Salindres site (France), water leakages have been reduced significantly. This resulted in a 19% reduction of the freshwater intake at this site, despite a 24% increase in production volumes.

Water emissions (COD)

	2018	2017	2016	2015
Intensity (kg per € EBITDA)	0.0028	0.0025	0.0038	0.0042
Absolute (metric tons O_2)	6,231	5,586	7,282	8,177

Scope: consistent with financial reporting.
Past figures have been restated to reflect the impact of methodology improvements.

The Chemical Oxygen Demand releases from the Group were 645 tons or 12% greater than in 2017. This global change is due to a significant production increase at the Vernon site (United States), resulting in an additional 379 tons of Chemical Oxygen Demand (7%), and also due to the biological treatment plant at the Baton Rouge site (United States) being upset by a prolonged and unusual freeze, responsible for another 154 tons of COD (3%).

It should be noted that 1,358 tons of the Chemical Oxygen Demand Solvay declared for 2018 (around 22%) is due to third parties (typically plants which formerly belonged to the Group), from which Solvay is treating the effluents in its biological wastewater treatment plants (WWTP).

Since the start of the ongoing environmental plan (2015-2020), the Chemical Oxygen Demand emissions have decreased by 24% (or about 8% per year).

NOTE S6
Waste and hazardous materials

Highly material

Definition

Reported industrial waste includes hazardous waste and non-hazardous waste, both resulting from manufacturing and Research and Innovation activities, including packaging and maintenance waste. Solvay's waste reduction objective focuses on Hazardous Industrial Waste not treated in a sustainable way, meaning that it is landfilled or incinerated without energy recovery.

The value of this indicator is strongly related to the amount of Hazardous Industrial Waste (HIW); i.e. any decrease in the amount of Hazardous Industrial Waste (HIW) will also diminish the waste key performance indicator.

Regarding hazardous materials put on the market, the focus is on Substances of Very High Concern (SVHC) and on the substitution process. The Solvay reference list for Substances of Very High Concern SVHCs (S-SVHC and SRA Reference list) was established in 2015 with three categories (black, red, and yellow lists) to characterize substances' level of risk management and control:

- Blacklist S-SVHCs: already undergoing a regulatory process of phasing-out with a known deadline in at least one country or zone, or a restriction for Solvay relevant uses;
- Red list S-SVHCs: currently included in regulatory lists of substances that could enter into a process of special authorization or restriction in the medium-term;
- Yellow list SRAs: substances requiring specific attention, i.e. substances under scrutiny by authorities, NGOs, scientists, and industries due to their current hazardous properties or potential effects.

Management approach

For industrial waste and particularly hazardous waste, the focus is on switching to more sustainable pathways that avoid landfilling or incineration without energy recovery, and promoting material or thermal recovery.

As regards sold products, in the framework of evolving legislations, particular effort goes into improving the knowledge of the conditions under which products are used, so as to assess any associated risks at the use level. The preparation of product Safety Data Sheets (SDS) for all the 18,000 products and the success in the REACH registrations reflect Solvay's management approach to ensuring worldwide product knowledge management. For hazardous substances, Solvay has a strategy to decrease their use in value chains and to maintain consistent and robust safety information on hazardous substances handled in sites. Solvay sites keep their SVHC inventories up to date. Risk studies for all SVHCs put on the market are underway and substances are replaced with safer alternatives where possible.

Indicators and objectives

Waste

Solvay's objective:

2020

-30%

intensity of Industrial Hazardous Waste not treated in a sustainable way

Baseline 2015

Waste production, intensity

In kg per € EBITDA	2018	2017	2016	2015
Industrial Hazardous Waste not treated in a sustainable way	0.0145	0.0180	0.0258	0.0234

Scope: consistent with financial reporting.

Since the start of the ongoing environmental plan (2015-2020), the intensity for HIW not treated in a sustainable way has decreased by 38%, meaning that the 2020 target has already been achieved. It should be noted that the majority of this reduction is due to the financial deconsolidation of the Performance Polyamides business since 2017.

The amount of HIW not treated in a sustainable way was 7.6 kt (19%) lower than in 2017. This significant reduction came from the following plants: Tavaux (-2.7 kt or 6.8%), Saint-Fons (France, -1.3 kt or -3.3%), Rosignano (Italy, -1.1 kt or -2.7%) and Panoli (India, -0.5 kt or -1.3%).

In Tavaux, the reduction is mainly the result of the reconsideration of PVDC latex as Non-Hazardous Industrial Waste (NIHW), and of a production slow-down for one their refrigerants. The decrease in Saint-Fons is due to the fact that the HIW elimination from a previous production unit was finalized at the end of 2017. The apparent diminution in Rosignano can be attributed to the fact that some waste streams had not been expressed as dry matter for the reporting year 2017. Finally, for Panoli, the decrease comes from a lower production rate for one of their polymers.

Waste production, absolute

In 1,000 metric tons	**2018**	2017	2016	2015
Non-Hazardous Industrial Waste	1,627	1,641	1,463	1,447
Hazardous Industrial Waste	94.3	99.7	188.6	200.3
Total Industrial Waste	1,721	1,741	1,651	1,648
Industrial Hazardous Waste not treated in a sustainable way	32.4	40.0	49.0	45.8

Scope: consistent with financial reporting.
Past figures have been restated to reflect the impact of methodology improvements.

Solvay's Hazardous Industrial Waste (HIW) represents only 5.5% of its total industrial waste.

The HIW from the Group was 5.4 kt (-5.4%) lower than in 2017. The biggest reductions were observed on the sites of Tavaux (-3.6 kt), Panoli (-2.3 kt), Rosignano (-1.2 kt), Halifax (-1.2 kt), Torrelavega (- 0.7 kt) and Marietta (-0.5 kt); whereas increases have been identified at Linne-Herten (1.7 kt) and Salindres (1 kt). The inclusion of the new hydrogen peroxide plant in Jubail (Saudi Arabia) also resulted in an additional amount of 1.4 kt HIW.

Excluding eventual scope changes of the Group, the order of magnitude of the observed year-to-year variations (+/-5%) in waste volume is not uncommon and linked to some waste specific issues, often beyond the sphere of influence such as: turn-around operations, regulatory changes in waste classifications, problems with waste treatment companies, changes in market demand for by-products, etc.

The Group has not set any target on the amount of HIW in its environmental plan, although Solvay's ambition remains to decrease the volumes wherever possible through excellence programs (such as the ongoing ones in Ospiate and Zhenjiang Feixiang).

Solvay's Non Hazardous Industrial Waste (NHIW) accounts for 94.5% of its total industrial waste.

Compared to 2017, the NHIW decreased slightly (-13.5 kt, but only representing a decrease of -0.8%). Around 29% of this waste is currently being recycled through material and/or energy recovery.

At Spinetta (Italy) NHIW could be reduced thanks to a project whereby the sludge generated during an effluent treatment step was transformed into a commercial product rather than being landfilled, contributing to the circular economy. This commercialization started in September 2017 and will reach its full potential in 2019 with a total NHIW reduction of about 15 kt.

Since 2015, the NHIW at Group level increased by 180 kt (+12.4%), which is mainly linked to production volume increases from the Soda Ash & Derivatives Global Business Unit, resulting in +110 kt NHIW, and the Special Chem business, resulting in +56 kt NHIW.

Safer alternatives for marketed products

Solvay's objective:

2020

100%

risk assessment and analysis of available safer alternatives for marketed products containing S-SVHCs

Solvay Substances of Very High Concern (SVHC) found in products sold

	2018	2017	2016
All SVHCs[1]	31	35	20
Percentage of completion of Analysis of Safer Alternatives program for marketed products[2]	39% (50 out of 128 required assessments)	49% (28 out of 57 required assessments)	18% (9 out of 49 required assessments)
Of which effective replacement	32% (16/50)	32% (9/28)	

(1) According to EU REACH Authorization list (annex XIV) and EU REACH Candidate list. SVHCs manufactured by or forming part of the composition of products sold by Solvay worldwide. REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals.

(2) Analysis of Safer Alternatives for potential substitution for an SVHC. A substance may be present in more than one marketed product.

Analysis of safer alternatives (ASA) are planned for a total of 128 combinations of products/applications. The change in the number of SVHC and required ASA between 2017 and 2018 is due to changes in legislation and incorporation of Cytec's products in Solvay's substitution program.

Of the 50 analyses of safer alternatives completed as of December 31, 2018:

- 16 have led to effective replacement: SVHC substitution or reduction below required threshold, or production stopped;
- 18 are ongoing (alternative identified and discussed with customers to be implemented);
- 16 have no available alternatives (no substitute available or not allowed by regulations or not requested due to the application in the final product).

Notes to Human Capital

This section addresses the management of Solvay's human resources as a key asset for delivering long-term value. It includes factors that affect employee productivity, such as employee engagement and diversity, as well as the attraction and retention of employees. It also addresses labor relations management, and it covers the way the Group manages the health and safety of its employees.

NOTE S7
Employee health and safety

Definitions

Occupational health

Solvay monitors cases of recordable occupational diseases in order to identify unsatisfactory working conditions, and tracks an Occupational Illness Frequency Rate according to GRI requirements. An indicator measures progress in deploying a robust process for risk-based medical surveillance at sites by checking whether every site:

- Ensures that the medical teams in charge of medical surveillance have access to individual risk data;
- Has medical surveillance in place;
- Carries out a robust and systematic industrial hygiene assessment.

Regarding exposure to chemicals, in addition to the industrial hygiene assessment, Solvay will use, when applicable, human biomonitoring as an efficient complementary tool for checking exposure to specific chemicals, and one that integrates all routes of exposure of the person concerned.

Industrial hygiene

Systematically assessing and managing workers' potential exposure to hazardous chemical agents and to ergonomic and physical risks are key to Solvay's approach to protecting health. The number of sites that have an active industrial hygiene assessment program reflects progress in risk management. In order to optimize risk data management and the subsequent deployment of corrective measures, Solvay is deploying a dedicated database and monitoring the sites which are using the tool. A key component of Solvay's industrial hygiene program is the availability of exposure limits for all chemicals handled in the Group. The number of Solvay Acceptable Exposure Limits (SAELs) is also monitored.

Occupational safety

One of Solvay's five 2025 priority targets is a continuous improvement in Solvay employee safety. A focus is put not only on the number of accidents but also on the severity of their outcomes as measured by the Medical Treatment Accident Rate (MTAR). This indicator is independent of national legislations which may influence the Lost Time Accident Rate (LTAR) indicator.

- **Medical Treatment Accident Rate:** number of work accidents leading to medical treatment other than first aid per million working hours;
- **Lost Time Accident Rate:** number of work accidents with lost time (away from work) of more than one day per million working hours.

Management approach

Occupational health

Solvay monitors the occupational Health of its employees in order to:

- Ensure a medical surveillance of the personnel that is risk-based;
- Complement industrial hygiene risk assessments;
- Define additional preventive actions accordingly.

Every case of occupational disease is investigated: the occurrence of an occupational disease case may reflect historical, recent, or current inadequate working conditions that need to be improved. A network of occupational physicians at Group level supports the sites and the Global Business Units and guides local medical teams. Advanced risk-based medical surveillance is promoted and monitored throughout the Group. To do so, Solvay adapts each employee's periodic medical surveillance to their individual health risk profile. Risk profiles are created as part of Solvay's industrial hygiene program.

Industrial hygiene

The Industrial Hygiene program encompasses:

- Comprehensive chemicals inventories carried out at site level, with a special focus on SVHCs with potentially detrimental health impacts;
- The definition of occupational exposure limits for all chemicals handled in operations;
- Solvay Acceptable Exposure Limits developed in case of insufficient or outdated official limits. In general, for chemicals the occupational exposure banding approach is used to determine acceptable exposure levels when there are no established national or International Occupational Exposure Limits. This occupational exposure banding approach gives a simple, quick, and easy-to-understand hazard ranking;
- Critical Tasks Exposure Screening: this screening helps sites quickly identify situations where exposure to chemicals may require special attention and additional control measures. If needed, it triggers a more detailed risk assessment to characterize potentially critical situations. A key feature of Critical Tasks Exposure Screening is empowering participation by shop-floor staff, resulting in better final "appropriation" of corrective measures by these employees;
- Deployment of the Global tool for industrial hygiene management (SOCRATES), giving widespread, easy access to all methods, tools, and databases.

Occupational safety

Within the framework of the management systems in place for Health, Safety and Environment (93% of sites have a management system encompassing safety management, in line with Group requirements), several courses of action are being pursued with the goal of further reducing the MTAR and LTAR and preventing any high-severity accident:

- Strict compliance with the Solvay Life Saving Rules introduced in 2016: a set of eight rules specific to dangerous activities, which apply to everybody in the Group;
- Risk analysis of critical tasks in the workplace;
- Sharing of good practices and lessons drawn from accidents and near misses;
- Involvement of personnel in improvement actions and achievement of individual safety objectives;
- Continuous reinforcement of the Solvay Safety Culture and safety leadership by managers.

Indicators and objectives

Health indicators

Occupational Illness Frequency Rate (OIFR)

	2018	2017
OIFR (short/mid-latency recognized cases) per million hours worked	0.08	0.06

The Occupational Illness Frequency Rate (OIFR) is the number of recognized short/mid-latency Occupational diseases cases per one million hours worked.

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety and health performance for its employees. This represents 289 sites including manufacturing, Research and Innovation, administrative and closed sites. The figures were consolidated on December 31, 2018; some of them may have changed compared to data displayed in previous reports because any new information received from Solvay's sites is taken into account systematically, even if they are related to events that had arisen in the previous years.

Long and short/mid-latency recognized occupational diseases

	2018	2017	2016
Long-latency occupational diseases (Asbestos benign dis., Asbestos cancers, Other cancers)			
In Europe	12	10	20
In the rest of the word	0	0	0
Total Long-latency occupational diseases	**12**	**10**	**20**
Short/mid-latency occupational diseases (Hearing disorders, Musculoskeletal diseases, Other non-carcinogenic dis)			
In Europe	4	1	2
In the rest of the world	0	2	2
Total Short/mid-latency occupational diseases	**4**	**3**	**4**
Total occupational diseases	**16**	**13**	**23**

Long-latency Occupational diseases are work-related cancers or other diseases that can arise several decades after exposure. They are usually linked to exposures in the remote past that are no longer prevailing today. Short/mid-latency Occupational diseases are non-carcinogenic diseases which appear a few months or years after the occupational exposure to a causal agent (e.g. noise, ergonomic stressors, chemicals, etc.).

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety and health performance for its employees. This represents 289 sites including manufacturing, Research and Innovation, administrative and closed sites. The figures were consolidated on December 31, 2018; some of them may have changed compared to data displayed in previous reports because any new information received from Solvay's sites is taken into account systematically, even if they are related to events that had arisen in the previous years.

Monitoring occupational diseases is key to improving employee health. But the reported figures do not accurately reflect the measures in place in the field in terms of health protection and occupational disease prevention because most recognized cases are long-latency diseases. The number of recorded occupational diseases varies significantly between regions and countries, depending on the process defined in national systems: some countries have a longer list of reportable diseases, in others the official health bodies recognize illnesses at a higher rate or provide compensation (which encourages claims); in others, employers are less systematically informed of cases. These differences explain why most of the cases reported here are in European countries (e.g. France).

Solvay's objective:

2020

100%

of manufacturing and Research and Innovation sites with advanced risk-based medical surveillance

Advanced risk-based medical surveillance

In %	2018	2017
Manufacturing and Research and Innovation sites with advanced medical surveillance	37	23

Scope: all Solvay manufacturing and Research and Innovation sites (excluding joint ventures).

35 sites are currently performing human biomonitoring of exposure. Human biomonitoring of exposure involves measuring the concentration of a substance or its metabolites in human fluids (such as urine or blood). Human biomonitoring of exposure can be used to assess exposure to specific chemicals. Unlike monitoring the atmospheric presence of certain contaminants in work spaces, human biomonitoring of exposure detects what has really been absorbed by the human body via all exposure pathways (inhalation, skin penetration, etc.) and under different working conditions (physical effort, etc.). Human biomonitoring of exposure helps to verify whether protective measures are effective. It is particularly useful for substances that penetrate the skin, have a systemic effect, or accumulate in the body.

Human biomonitoring of exposures

Number of sites	2018	2017
Sites performing the human biomonitoring of exposures	35	35

Occupational safety indicators

Fatal accidents

Headcount	2018	2017	2016	2015
Solvay employees	0	0	0	0
Contractors	0	1	1	0

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety performance. This represents 289 sites including manufacturing, Research and Innovation, administrative, and a series of closed sites with limited activities, and covers Solvay employees and contractors working on sites.

Solvay's priority objective:

2025

0.5

Halve the number of accidents involving medical treatment to reach an MTAR of 0.5

Baseline 2014

Occupational accidents with medical treatment at Group sites (MTAR)

Accident per million hours worked	2018	2017	2016	2015
Solvay employees and contractors	0.54	0.65	0.77	0.77
Solvay employees	0.58	0.63	0.73	0.65
Contractors	0.48	0.7	0.86	0.94

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety performance. This represents 289 sites including manufacturing, Research and Innovation, administrative, and closed sites, covers Solvay employees and contractors working on sites.

Occupational accidents with lost time at Group sites (LTAR)

Accident per million hours worked	2018	2017	2016	2015
Solvay employees and contractors	0.65	0.65	0.76	0.75
Solvay employees	0.71	0.7	0.69	0.67
Contractors	0.52	0.52	0.9	0.85

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety performance. This represents 289 sites including manufacturing, Research and Innovation, administrative, and closed sites, covers Solvay employees and contractors working on sites.

Thanks to the adoption of Group minimum requirements relating to each of the eight Solvay Life Saving Rules, to lessons drawn in the area of contractor management after the fatal accidents in 2017 in Devnya, and to safety leadership training sessions, the number of Medical Treatment Accidents decreased significantly from 50 in 2017 to 42 in 2018, resulting in an MTAR of 0.65 in 2017 and 0.54 in 2018. Moreover, no fatal accident occurred in 2018.

The results with respect to lost time accidents are stable, with 50 accidents resulting in an LTAR of 0.65, on a par with 2017. The main reason that there were more Lost Time Accidents than Medical Treatment Accidents was the number of low severity accidents that required no medical treatment, but which led to lost time.

Occupational accidents – Nature of injuries

	2018	2017
Trauma – fracture	19	23
Wound – cut	10	18
Burn – heat	4	3
Burn – chemical	4	3
Wound	2	1
Trauma	2	1
Multiple injuries	1	1
Total	42	50

Scope: all sites under Solvay's operational control for which the Group manages and monitors safety performance. This represents 289 sites including manufacturing, Research and Innovation, administrative, and closed sites, covers Solvay employees and contractors working on sites.

40% of the injuries that occurred involved hands or fingers. In 2018, Solvay focused on actions to prevent such injuries by sharing best practices and raising awareness through training. As a result, the number of such injuries was 20% lower in 2018 than in the previous two years.

2018 Key achievements

Solvay has made progress on its journey towards "Creating Safety", an innovative approach introduced in 2017 at top management level. 17 sites have already carried out "Safety Climate" or similar assessments to understand the status of their safety culture. Sites have been training employees and contractors on risk awareness and safety leadership. Several Global Business Unit and Function leadership teams have held training sessions with consultants Paul Balmert and Andrew Sharman. These types of sessions help create a common vision for what the company wants to achieve in terms of creating safety, as opposed to merely striving to prevent accidents.

NOTE S8
Employee engagement and well-being

Priority

Solvay pursues comprehensive initiatives and processes to cultivate and assess the engagement and well-being of its employees, including personal development, rewards and recognition, an inclusive culture, and work-life balance. The Group also considers that engagement is fostered by freedom of association and collective bargaining.

Employee engagement

Definition

Employee engagement is the level of commitment, passion, and loyalty a worker has toward his/her work and the company. The Group believes that engagement increases performance through higher productivity and employee retention. Five factors have an impact on employee engagement: pride, quality of work environment, overall satisfaction, motivation, and attachment to the company. Solvay also considers that engagement is fostered by fair labor practices and well-being at work.

Management approach

Employee engagement is measured through a worldwide annual survey measuring the engagement of Solvay's employees and the factors leading to engagement. This enables the Group to identify strengths and areas where the working environment and employee experience can be improved. The survey results are assessed across various scopes – at Group, Global Business Unit, Function, and site level, as well as for each team manager with at least five respondents on his/her team. Across the Group, this represents a clear and intentional commitment by leaders and managers to improve engagement and support the well-being of their employees.

Indicators and objectives

1 annual survey

20,769 responses

48 questions

76% Engagement index

The Group 2025 target is an engagement index of 80%. This index is used as a yardstick to decide which actions are needed in areas such as personal development, rewards and recognition, an inclusive culture, and work-life balance.

Solvay's priority objective:

2025

80%

Solvay engagement Index

In %	2018	2017	2016	2015
Solvay engagement index	76	75	77	75

Scope: consistent with financial reporting.

In 2018, Solvay assessed its workforce engagement via the "Global Census Survey", a detailed questionnaire of 48 questions. In addition to engagement questions, the survey had two main areas of focus: the Solvay's transformation journey (topics such as change management and key behaviors) and the employer value proposition (learning, rewards, recognition, well-being, etc.). As in 2017, the roll-out was done entirely digitally.

Engagement remains strong within the Group. Pride in working for Solvay has increased considerably in comparison with 2017. Key dimensions such as Sustainability, Safety, Innovation, and Customer Focus are all present among the top scoring items, showing that they are well embedded within Solvay. The top three show that perception of these topics is stable. However, Solvay faces challenges in areas such as recognition, agility, and digital solutions.

- + Proud to work for Solvay;
- + Overall satisfaction;
- − Recognition.

Labor relations

100%

of employees covered by collective agreement*

*Due to the Solvay Care collective Agreement with the global employee representative body, the Solvay Global Forum, which covers all employees.

Solvay believes that a trusting, constructive relationship with employees and their representatives forms the basis for fair labor practices. This relationship is built on the Group's commitment to respecting employees' fundamental human rights and guaranteeing their social rights.

Management approach

Labor relations are managed at different levels.

Solvay Global Forum

In 2015 Solvay created a global employee representative body, the Solvay Global Forum, composed of eight employee representatives from the seven main countries where Solvay operates. This Forum meets with the Executive Committee once a year, in Brussels, during a one-week session. Video conferences are held quarterly, bringing together the Solvay Global Forum and the Group's top management to comment on and discuss the quarterly results of the Group, and to keep everyone informed of the main new projects.

The main topics discussed in 2018 were:

- The yearly negotiation of the Global Performance Sharing plan, which entitles each Group employee to a share of the Group's EBITDA, and which also includes sustainability criteria (progress on the Solvay Way annual self-assessment);
- Solvay's plans to simplify its organization, published in March 2018, were disclosed and discussed with the Solvay Global Forum before implementation, including redundancies and mitigation;
- The establishment of an Employees' Share Scheme has been discussed with the Solvay Global Forum. Discussion for future implementation are ongoing.

European Works Council

Solvay and its European Works Council (EWC) have been in permanent dialog for more than 20 years. In 2018, the EWC met on two occasions in a plenary session. The sustainable development EWC commission met on two occasions and the EWC Secretariat met eleven times with senior Group management, allowing these representative bodies to be part of Solvay's evolution. Subject matters receiving particular attention were Mergers and Acquisitions (notably the divestment of the Polyamides activities); restructuring issues, including the simplification plan; developments in Group employment and working conditions; and strategy and sustainable development issues.

The main topics discussed with the Sustainable Development Commission of the European Works Council in 2018 included the five priority targets of the Group, the health and safety plan, the human rights due diligence process in Solvay, the well-being at work policy, and the results of the Group's sustainability performance assessment by extra-financial rating agencies.

The IndustriALL Global Union Framework Agreement

On December 17, 2013, Solvay signed a Corporate Social and Environmental Agreement for the whole Group with IndustriALL Global Union. This Agreement is based on International Labor Organization standards and the principles of the United Nations Global Compact. It is a tangible expression of Solvay's determination to ensure that basic labor rights and the Group's social standards in the areas of Health, Safety and Environmental protection are respected at all of its sites.

In February 2017, Solvay took that collaboration one step further by renewing its Global Framework Agreement with IndustriALL Global Union, reinforcing its commitment by adding new social projects, such as societal actions and the protection of mental safety in the workplace.

Every year, IndustriALL Global Union representatives meet Solvay employees to check on compliance in the field, with two assessment missions taking place at two different sites. One mission measures the results of the Group's safety policy. The second examines the application of the agreement, which, in particular, formally covers the following health and safety aspects:

- Ensuring good working conditions;
- Managing risk as a daily concern;
- Defining demanding internal policies and their strict application;
- Improving safety performance and regular monitoring of both Solvay's and contractors' employees;
- Ensuring healthy working conditions for all, regardless of the job they perform and its associated risks.

In 2018, the two assessment missions took place in the United Kingdom and Germany. IndustriAll Global Union paid particular attention to Solvay's behavior-based employee safety approach and its potential limits.

To ensure all employees comply with the IndustriALL Global Union Agreement, it has been integrated as an employee practice in the Solvay Way framework.

Minimum notice periods regarding operational changes

Some of the collective bargaining agreements specify notice periods for consultation and negotiation. The Global Framework Agreement concluded between Solvay and IndustriALL Global Union includes a provision that employees and unions (where applicable) must be informed in advance of any restructuring plans. In some of the collective bargaining agreements, a notice period and provisions for consultation and negotiation may be required.

Employee Representation Indicator

Trade unions are present at a majority of Solvay sites around the world. Union membership is estimated at 20% in Europe, 30% in South America, 10% in North America, and 70% in Asia.

Minimum social coverage standard for all employees worldwide

Named "Solvay Cares", this initiative, set up through an agreement with employee representative bodies, perpetuates the pioneering social vision of Ernest Solvay, who introduced forms of social security at the Group he founded more than 150 years ago.

Solvay Cares will be fully deployed in the first half of 2019 and aims to provide four major benefits:

1. Full income protection during parental leave, with 14 weeks for the mother and one week for the co-parent; and full income protection of one week during adoption;
2. A minimum coverage of 75% of medical fees in the event of hospitalization or severe illness;
3. Disability insurance in the event of lasting incapacity;
4. Life insurance with coverage for the family or partner.

Well-being at work

Definition

For Solvay, well-being at work is a holistic concept which relates to all aspects of the quality of working life that ensure workers are safe, physically and mentally healthy, satisfied, engaged, and efficient. It contributes to a culture of recognition and support, to work-life balance, to employees' growth and development, and to good communication and collaboration. The well-being indicator for Solvay's workforce is measured via the yearly "Solvay Engagement Survey". Four questions in the employee survey relate to perceived well-being at work.

Management approach

Responsibility for the well-being program is assigned to the Head of Group Industrial Relations and Social Innovation, with the support of a multidisciplinary Corporate Committee on Well-being at Work. This Committee was set up in October 2016 and meets monthly. It includes occupational physicians and psychologists, Human Resources, Health, Safety and Environment, and sustainable development experts.

An important step in the current well-being program is to develop competencies in stress prevention and to implement positive behaviors within the Group. The Committee has developed dedicated training material for managers and for local teams that directly support well-being and has created e-learning videos to raise awareness among all employees. Manager training started with the Executive Committee and the leadership council in September 2017. Since March 2018, nine training sessions for managers have taken place in six countries. Feedback from participants, who appreciated the concrete examples of action, has been excellent. Sessions are led by external psychologists. Other sessions are planned for 2019.

Solvay's network of occupational physicians and psychologists will increasingly examine the root causes of professional burnout. Since May 2018, Solvay physicians in Italy, Germany, Spain, Portugal, United Kingdom, Brazil, India, and Mexico have adopted the burnout observatory approach already implemented in France and Belgium, and further deployment is expected in 2019. The aim of the burnout observatory is to take stock of the magnitude of the issue at Solvay, and to identify the main risk factors in order to define preventive actions. So far, the main risk factors identified are workload, time pressure, lack of work-life balance, lack of recognition, lack of hierarchy support, difficult relationships at work, and the impact of organizational changes.

Training for the burnout observatory has already been attended by physicians covering:

- 37% of sites (60 / 164 sites);
- 55% of employees (14,726 / 26,865 headcount).

Burnout cases were reported in 2018 to the Comex, including a description of the circumstances that can lead to burnout and ways to prevent it. The Corporate Committee on well-being at work is developing tools to assess excessive workload and to include well-being in change management.

A full section of the Solvay Way framework, which Solvay entities use to perform annual self-assessments and define improvement plans, is dedicated to well-being, while the yearly Solvay Engagement survey explores employee perceptions of well-being at work. This encourages sites to develop local well-being programs and assess stress risks. Well-being is one of the management aspects examined during the annual visits organized with IndustriAll Global Union.

2018 examples of regional initiatives

The well-being program is being strengthened in Asia and Latin America. In Brazil, several initiatives were taken in 2018, including the training of employees on well-being at work by the occupational health physician, and training by an external expert to raise site managers' awareness of burnout. In China, a collaboration between the Chinese human resources teams and the country medical officer was organized in order to ensure the deployment of a common strategy for well-being at work, including managerial training, training of local support staff on well-being at work, and employee awareness.

The Chalampé site in France has employed an exemplary approach to addressing well-being in the context of the change management that accompanied a major reorganization of shift work arrangements at the site.

NOTE S9
Diversity and inclusion

Highly material

24,501*	100	23%
Headcount	nationalities	women

*Scope: consistent with financial reporting.

Definition

Solvay defines diversity as all of the ways in which individuals are different, whether visible or not. Diversity includes more than gender, nationality, age, disability, ethnic origin, and sexual orientation. It includes thought and belief, culture, education, and background. In a business environment, it also includes corporate culture.

Inclusion means valuing and respecting difference, recognizing the unique contributions that many different types of individuals can make, and creating a working environment that maximizes every employee's potential. The Group sees this approach as a way to enhance its performance in its role as employer. It is convinced that its approach will ultimately improve the overall performance of its workforce, and has therefore made diversity and inclusion a performance lever and a growth enabler.

Management approach

Commitments and policy

Solvay commits itself to equal opportunities and encourages diversity and inclusion at every level of employment in the company. This commitment is grounded in Solvay's principles of ethical behavior, respect for people, customer focus, empowerment, and teamwork.

Diversity and inclusion are championed at the highest level in the organization by the Board of Directors, the Executive Committee and the Leadership Council. Each Global Business Unit and Function entity management team is responsible for putting this commitment into practice. To reflect business objectives and cultural context, business, regional, and local leaders set specific and relevant objectives within the Group diversity and inclusion framework. Strategies and action plans have to be locally owned and driven by entity, region, and country to take into consideration local laws, customs, and priorities.

At Group level, four areas of focus in terms of diversity receive specific attention and monitoring to ensure consistent improvement across the organization:

1. Improving the gender mix at all levels of the organization;
2. Leveraging the generational mix to optimize learning, knowledge, and experience;
3. Developing national and cultural talent that mirrors growth opportunities;
4. Enriching the team mix by leveraging experiences and backgrounds.

Diversity of the Board of Directors

The composition of the Board of Directors fulfills the duties imposed on it by Article 518 of the Companies Code.

6 of 16

Board members are women

Indicators and objectives

Actions in 2018 actions continued and built upon the efforts begun in 2017 with the aim of further

- Ensuring leadership commitment and accountability;
- Fostering diversity and inclusion awareness;
- Reviewing human resources processes: recruiting, retention, and advancement.

As in 2017, awareness was fostered through diversity and inclusion workshops in various regions and business entities, through Solvay Way assessments, and country-specific actions crafted in response to the local context.

A review of human resources processes focused on talent acquisition by offering guidance on candidate sourcing and selection.

Training and development programs have been focusing on initiatives such as raising awareness about inclusive behaviors and targeted development programs for female managers and for Asian talents, among others.

Solvay's objective:

2020

20%

of senior executive positions held by women

Gender diversity by employee category

Percentage of headcount	2018	2017
Women in senior management	15%	16%
Women in middle management	25%	24%
Women in junior management	33%	32%
Women in non-managerial positions	20%	21%
Total	**23%**	**23%**

Scope: consistent with financial reporting.

Age Group by employee category

Percentage of headcount	2018	2017
Senior management	**401**	**396**
Percentage under 30 years old	0%	0%
Percentage between 30-49 years old	28%	29%
Percentage 50 years old and older	72%	71%
Middle management	**2,915**	**2,898**
Percentage under 30 years old	0%	0%
Percentage between 30-49 years old	49%	48%
Percentage 50 years old and older	51%	52%
Junior management	**5,213**	**5,090**
Percentage under 30 years old	10%	11%
Percentage between 30-49 years old	64%	63%
Percentage 50 years old and older	26%	26%
Non-managerial	**15,972**	**16,075**
Percentage under 30 years old	14%	14%
Percentage between 30-49 years old	55%	55%
Percentage 50 years old and older	31%	31%

Scope: consistent with financial reporting.

Solvay's workforce by age

	2018	2017
Under 30 years old	2,800	2,765
Between 30-49 years old	13,605	13,578
50 years old and older	8,096	8,116
Total headcount	**24,501**	**24,459**

Scope: consistent with financial reporting.

According to the above table, the age structure is currently:

- 33% older than 50;
- 55% between the ages of 30 and 49;
- 12% younger than 30.

Notes to Social Capital

This chapter on social capital discusses Solvay's perceived role in society, i.e. expectations of what Solvay will contribute to society in return for its social license to operate. It addresses the management of relationships with key outside stakeholders, such as customers, local communities, the public, and the government.

NOTE S10
Customer welfare

Highly material

42%

Net Promoter Score®

Definition

The Net Promoter Score® is the indicator used to measure customer loyalty, for each Global Business Unit. The metric was developed by (and is a registered trademark of) Fred Reichheld, Bain & Company, and Satmetrix. Scores are consolidated at the Group level through a revenue-based weighted average.

The Net Promoter Score® is calculated based on responses to a single question: How likely is it that you would recommend our company, product, service to a friend or colleague? The scoring for this answer is based on a 0 to 10 scale. Those who respond with a score of 9 to 10 are called Promoters and are considered likely to exhibit value-creating behaviors, such as buying more, remaining customers for longer, and making more positive referrals to other potential customers. Those who respond with a score of 0 to 6 are labeled Detractors, and they are believed to be less likely to exhibit the value-creating behaviors. Responses of 7 and 8 are labeled Passives, and their behavior falls between Promoters and Detractors. The Net Promoter Score® is calculated by subtracting the percentage of customers who are Detractors from the percentage of customers who are Promoters.

The Net Promoter System® is the methodology used to systematically assess customer satisfaction by promoting a culture of customer feedback and developing active listening skills at every point customers come into contact with Solvay, from account managers to customer service employees, and including technical support as well as business development managers. The objective is to go far beyond "just a score" towards a deep transformation of the Group by fostering a much more customer-centric culture.

The Net Promoter System® is structured around two pillars to gather insights from customers at both the strategic and operational levels. The objective of the first and more strategic pillar is to identify and further reinforce the areas where the Group truly stands out against the competition in order to raise customer loyalty and accelerate growth.

The second and more operational pillar captures how the customers perceive the offer from a day-to-day perspective. Those key insights trigger tangible action plans – both account-specific and at business unit level – to bring Solvay closer to the customers and better serve them by delivering more suitable and efficient services.

Management approach

Since 2014, each Global Business Unit has run a customer satisfaction survey at least once every two years to check their strategic alignment with the trends in their business environment. The aim is to identify and select the right areas for the Global Business Unit to focus on, so as to foster differentiation and accelerate growth. The Net Promoter System® has been selected as a key indicator of customer loyalty; it is measured at Global Business Unit and Group level and published annually. The Group's Net Promoter Score® increased steadily from 14% in 2014 to 40% in 2018 because Solvay came to understand customer needs and priorities better and implemented action plans at the business unit level. In 2018, Solvay decided to bring the "Voice of the Customer" approach to the next level by launching a new initiative (the Net Promoter System®) to change the work habits of the Group's entire frontline population across all business units and geographies.

The insights gathered from the customers will systematically trigger action plans to adapt the value proposition so Solvay can better serve them and accelerate its growth.

A pilot program of the Net Promoter System® was conducted in the Global Business Unit Specialty Polymers.

Indicators and objectives

In 2018, Solvay made substantial progress, with a Net Promoter Score® of 42%, exceeding the original 2020 objective set a few years ago by implementing action plans and follow-up programs across the entire Group.

In %	**2018**	2017	2016
Solvay's Net Promoter Score (NPS)	42	36	27

»

"The pilot program of the Net Promoter System", by Michael Finelli, President of Global Business Unit Specialty Polymers

By listening to our customers, we create value for our customers and thereby create value for Solvay. This is why we moved to the Net Promoter System®, which is different from the regular Net Promoter Score®.

How does it work? We compile a market Net Promoter Score®, but we collect much more qualitative information from the customer about why they scored us as they did. The overall idea is to turn that information into "episodes", creating a continuous process of feedback with the customer to investigate and solve the issues.

We engage all parts of the organization: customer service, supply chain, technical support, and Research and Development (R&D) if necessary. Depending on what the "episode" is, we engage that part of the organization directly with the customer in a continuous way.

This is the best way to put "customer centricity" into practice.

NOTE S11
Societal actions

Priority

Today, value creation is a collaborative effort both within the company and between the company and its stakeholders. The Group aims to strengthen its commitment by facilitating employee involvement in projects that serve society and by offering Solvay's expertise to regions where the Group operates. Disclosure of Solvay's indirect economic impact is provided in this section.

33%	€ 3.919 million
of employees involved in local societal actions	Solvay Group donations, sponsorships and own projects

70% of the industrial sites have a working group – composed of the site manager, human resource manager, and employee representatives – that defines the major issues facing the region and what relevant societal actions the site will take.

Local societal actions

Definition

A local societal action is a volunteer activity developed by a site in collaboration with associations, governmental initiatives, or NGOs, with the aim of improving the human condition and contributing to local communities. It should address one of the four domains identified by Solvay:

1. Science;
2. Education and youth employability;
3. Environment;
4. Solidarity and philanthropy.

Responsibilities and resources

Each site is invited to design its own local societal action plan in accordance with the principles of the Solvay Way framework and the needs of surrounding communities. Guidelines are provided to the sites, inviting them to start by designating a working group to update the site's plans annually in pursuit of continuous improvement.

- The site manager is accountable for implementation, developing the societal action plan, and securing funding;
- The site Human Resources manager offers support, by proposing actions with stakeholders, and documentation, by counting the employees involved;
- The industrial relations officer is a promoter who provides advice on aligning societal actions with stakeholder needs and Group guidelines, coordinates national initiatives, and communicates information among sites;
- The Solvay Way Correspondent acts as a reporter, ensuring compliance with Group rules, proposing actions, making site-level assessments, and recording and relaying information;
- Employee representatives are volunteer ambassadors They actively contribute to and participate in the working groups and propose actions.

Indicators and objectives

Societal Actions are not subject to assurance procedures, as the reporting process is being recalibrated to strengthen data quality.

Solvay's priority objective:

2025

40%

of employees involved in societal actions

In % of headcount	2018	2017	2016
Employees involved in local societal actions	33	33	23

Number of employees that participated at least in one societal action in 2018 (even if they are no long present at the company on December 31, 2018) divided by the headcount on December 31, 2018.

Examples of local initiatives

- For the last two years, the Brussels Solvay Campus has been building a partnership with the Solidarité Grands Froids Association, which helps poor people survive in the streets and emergency centers of Belgium. Several departments organized specific actions benefiting the association: fundraising and collecting clothes, medicines, bandages, and toys. Motivated teams of Solvay volunteers went on site to sort the donations;
- Sao Paulo Campus Site: Fourteen Brazil-based colleagues, members of the Specialty Polymers Global Business Unit and representatives from human resources, Solvay business services, marketing, and communications, took twenty children from the Reviver Recica NGO out for a day of learning and fun at the Catavento Science Museum in Sao Paulo. The NGO is a center that helps socially integrate children and teenagers, voluntarily assisting juveniles in vulnerable situations by promoting prevention, rehabilitation, and integration into community life;
- In 2019, Solvay will launch the Solvay Award for outstanding local societal actions to recognize, share, and promote best practices. Interested sites will present their best practices with respect to societal actions. A jury will bring together representatives from diverse Global Business Units and regions: site managers, Human Resources managers, industrial relations officers, the Solvay Way Champions, employee representatives, and NGO representatives.

Corporate citizenship and philanthropy

Management approach

250	80
Requests for financial support	Funded projects

Solvay aims to connect its philanthropic effort with the Group's areas of expertise and support causes where its products or activities can deliver added value.

In 1923, Solvay created the Ernest Solvay Fund to honor the founder of the Company, who died the year before. Today, the majority of Solvay's corporate philanthropy goes through the Ernest Solvay Fund, managed by the independent King Baudouin Foundation.

Solvay concentrates its philanthropic and funding efforts at corporate level on science promotion, education, and youth employability, and in some circumstances it supports humanitarian initiatives in response to certain disasters and/or situations where the products or services are of particular value.

Major projects

The International Solvay Institutes for Physics and Chemistry

The Solvay Institutes were founded by Ernest Solvay in 1912 to support and develop curiosity-driven research in physics, chemistry, and associated fields with the purpose of "enlarging and deepening the understanding of natural phenomena".

The central activity of the Institutes is the periodic organization of the celebrated Solvay Conferences on Physics and Chemistry ("Conseils de Physique Solvay" and "Conseils de Chimie Solvay"). To complement this support for fundamental science, the Group organizes open workshops on specific selected topics, international chairs, colloquia, and an international doctoral school.

In addition to these activities, the Solvay Institutes promote the popularization of science by organizing the annual Solvay public lectures devoted to today's biggest scientific challenges.

In 2018, Solvay supported a new initiative from the Institutes: "The New Horizons Solvay Lectures", given by young scientists who have already made a name for themselves and attained some stature in their field. They deliver one general interest lecture at the Solvay Institutes on their current research and the challenges they see for their discipline, and then a second complementary lecture at another Belgian university. Lectures are encouraged whenever possible, as are scientific discussions with a range of Belgian research groups working in similar fields.

Examples of Group science educational and social projects

- **CERN (CH):** Solvay supports the Non-Member State Summer Student Program, giving hundreds of students the chance to get hands-on experience in the sciences each year. The eight-week Summer Student Program gives undergraduate students in physics, computing and engineering a unique opportunity to join in the day-to-day work of research teams and become familiar with the processes and technologies used on site;
- **Learn Education** is Thailand's leading educational technology social enterprise. It provides an innovative, online blended learning approach to engage students through culturally relevant material and lessens overworked teachers' workloads. Since 2011, it has helped more than 25,000 students and 200 teachers.

Group Strategic Partnerships

Ellen MacArthur Foundation

In January 2018, Solvay and the Ellen MacArthur Foundation signed a three-year Global Partner agreement that gives the Group an opportunity to make a difference in accelerating the transition to a circular economy in the chemicals sector.

World Alliance for efficient technologies

Solvay joined the World Alliance for Efficient Solutions, created by Solar Impulse founder Bertrand Piccard, to promote efficient technologies, processes, and systems that help improve the quality of life on earth. Alliance members include start-ups, companies, institutions, and organizations.

By combining the forces of governments, corporations, and international institutions, the Alliance will amplify their ability to share experiences and create synergies in order to develop and implement concrete solutions to reach environmental and health targets.

Business programs for social needs

Sustainable Guar Initiative, or how we do inclusive business

7,340	1,529	864	59,000+
farmers registered in the program	women impacted by the program	kitchen gardens planted	trees planted

Solvay is the world's leading producer of guar derivatives. Since 2015, Solvay has been spearheading a large-scale development initiative to make guar cultivation more sustainable while boosting the incomes of the farmers who produce it. Guar is a drought-resistant legume grown in semi-arid areas, predominantly in India. Rajasthan accounts for approximately 70% of the country's production.

In collaboration with L'Oreal and Henkel, two strategic customers active in Personal Care, and with the support of the NGO TechnoServe, more than 7,000 farmers in Bikaner were trained over four years, and more than 860 kitchen gardens were developed in 36 villages.

The initiative's primary objective is to encourage sustainable and climate-smart agriculture, thereby increasing farmers' revenues through good guar cultivation practices for seed selection, seed treatment, sowing, and pest management.

The initiative also empowers women through specific training on hygiene, health, and nutrition:

- Fostering better nutritional practices by growing vegetables in kitchen gardens in a region where the traditional diet is very limited;
- Improving health and hygiene practices for themselves and their children.

Lastly, the initiative focuses on agroforestry, with more than 59,000 trees planted to fight sand movement and soil erosion in the fields. The outcome means guar farmers can earn a better living, global buyers can obtain higher quality guar, and the market can benefit from improved supply security.

Notes to Leadership and Governance

This chapter covers regulatory compliance, risk management, safety management, conflicts of interest, anticompetitive behavior, corruption, bribery, and business complicity with human rights violations.

NOTE S12
Management of the legal, ethics, and regulatory framework

Highly material

Management of the legal, ethics, and regulatory framework encompasses business ethics – human rights, anti-corruption, and non-discrimination – and anti-competitive behavior.

Commitments and policies

Solvay's Code of Conduct

Solvay's Code of Conduct and the policies and procedures adopted to enhance good governance apply to all employees wherever they are located. In addition:

- Third parties are expected to act within the framework of the Code of Conduct;
- All critical suppliers must confirm that they adhere to the principles set out in the Solvay Supplier code;
- Majority-owned joint ventures are held to the Solvay Code of Conduct or to a separate code adopted based on similar principles.

Gifts, Entertainment and Anti-Bribery policy

Solvay's Code of Conduct expressly states that the Group prohibits bribery in any form. Solvay and its employees do not use gifts or entertainment to gain competitive advantage. Facilitation payments are not permitted by Solvay. Disguising gifts or entertainment as charitable donations is equally a violation of the Code of Conduct. The Code is supported by a more detailed policy on gifts, entertainment and anti-bribery. Solvay is a member of Transparency International Belgium.

The Group employs an internal tracking system to record gifts and entertainment that exceed the acceptable reasonable value applicable in each region and requires manager approval for accepting or giving them. The use of the Gift and Entertainment Tracking System ("GETS") is part of Solvay's Internal Audit review process.

Human rights in business policy

Solvay's Human Rights in Business Policy, published on Solvay's website, sets forth Solvay's commitment to respecting human rights and acting with due diligence to avoid any infringement of human rights or any adverse impact on or abuses of such rights. The policy emphasizes Solvay's commitments to its stakeholders (its employees, its business partners, the communities and environment in which it operates, and children).

Solvay has a Global Human Rights Committee (GHRC) to oversee implementation of the policy, ensure compliance, and monitor the Group's performance in meeting its commitments. Members of the Global Human Rights Committee include the heads of the following Solvay business service activities and / or their delegates: Legal and Compliance, Human Resources, Purchasing and Supply Chain Excellence, Industrial, Internal Audit and Risk Management, and Sustainable Development. The GHRC is chaired by the Group General Counsel, who is the head of Legal and Compliance. Members of Solvay's Global Business Units and other business service activities contribute to the work of the GHRC on an ad hoc basis, as necessary.

The GHRC provides an annual written summary of its activities (including key performance indicator results) to the Executive Committee before the Group's annual report is issued, and it also validates the human rights reporting made in conjunction with the issuance of that report. Upon request, the Chair of the GHRC may be called upon to provide an Annual Integrated Report to the Audit Committee.

Solvay is also a pilot participant in the Belgium Commission for Children's Rights and Business Principles.

Competition Law policy

Solvay's goal is to conduct business ethically and not to enter into any business arrangements that eliminate or distort competition. Solvay is committed to developing and maintaining a culture of compliance to keep Solvay and its people on the right side of the law. Solvay has a formal Competition Law policy that stresses the importance of strict adherence to all competition laws. This formal Competition Law policy was approved by Solvay's Executive Committee and is published on the intranet, to which all Solvay's employees have access. Any violation of this policy may result in disciplinary action, subject to and in conformity with applicable laws.

Resources and responsibilities

A Compliance organization under the leadership of the Group General Counsel enhances a Group-wide culture based on ethics and compliance.

Regional Compliance Officers serve in all four zones where the Group operates. Every Solvay Global Business Unit and Function appoints Compliance Liaisons to enhance adherence to compliance objectives and to instill a commitment to compliance throughout Solvay.

As for competition law, Solvay has dedicated resources within the Legal Function responsible for the implementation of the Competition Law Compliance Program. They are in charge of providing competition law advice and guidance, as well as deploying effective and regular communication and training on competition law-related subjects.

Implementation of the competition law policy

Solvay has put in place a Competition Compliance Program that propagates a zero tolerance approach towards competition law infringements. As part of its Competition Compliance Program, Solvay provides a competition law tool kit on its intranet that includes up-to-date guidelines on specific areas of competition law, including guidance on dealing with competitors, information exchange in Mergers and Acquisitions transactions, swaps, price announcements, vertical relationships, and so on.

To minimize cartel risks, Solvay has put in place a computer-based system that tracks all contacts that relevant employees have with competitors through a managerial approval procedure.

Grievance mechanisms

Employees are encouraged to report suspected violations or concerns through various internal avenues, including management, Human Resources, Legal & Compliance, and Internal Audit.

A Group-wide Speak Up program is in place and overseen by the Audit Committee of the Board of Directors. An external third-party helpline active 24 hours a day, 365 days a year allows employees to ask questions, raise concerns, or file reports.

The following chart shows the types of claims from January, 2018 until February, 2019 through Solvay's Speak Up program:

Solvay's Speak Up program

Number of claims	2018	2017
Misconduct or Inappropriate Behavior	30	26
Discrimination including harassment and retaliation	20	15
Conflict of Interest	10	7
Computer, Email, Internet	3	1
Environmental, Health or Safety Law	2	6
Accounting or Auditing	1	2
Anti-Bribery	0	2
Confidentiality/Misappropriation	1	2
International Trade Compliance	0	0
Substance Abuse	1	1
Theft	4	3
Violence or Threat	5	2
Other	11	16
Total	**88**	**83**

Through the Speak Up program, any concern regarding a breach is investigated by the Ethics and Compliance Function. In keeping with its commitment to transparency, the Speak Up tool is used to report progress on the investigations and is used to communicate the results of investigations directly to the reporters upon conclusion. Posters and an online brochure are available to employees and advertise the web address and toll-free numbers to access this tool in their regions. The Board's Audit Committee oversees the running of Speak Up.

88	81	34	37
Total claims made	Total claims closed*	Substantiated claims among resolved cases	Unsubstantiated claims among resolved cases

* Includes cases for which there was insufficient information or cases that were misdirected or referred.

Resolved Cases	No Action	Policy Review	Training	Discipline	Termination	Resignation
Substantiated	0%	21%	0%	44%	26%	9%
Unsubstantiated	92%	0%	5%	3%	0%	0%

Communication and training

Solvay's Code of Conduct

Code of Conduct training (live training and web-based training) is organized to ensure understanding and to address behavioral risks such as anti-trust, anti-bribery and corruption, and human rights abuses. Specific anti-corruption training is tailored to management and other personnel in sensitive positions (sales, procurement, industrial development, etc.). Special campaigns to maintain and/or enhance the level of awareness within the Group are identified and adopted annually.

Anti-trust

Solvay has a concrete Action Plan designed to mitigate the specific risks the Group has identified. It has been in force since 2003 and is updated yearly. In 2018, this action plan includes a new onboarding antitrust training session successfully completed by 369 recruits in relevant areas, as well as Contacts with Competitors Tracking System (CCTS) training for 822 individuals and additional tailored face-to-face training sessions for 134 high-risk individuals.

Annual Internal Audits check to make sure the Action Plan is being implemented effectively.

Anti-Corruption

A new web-based anti-bribery and anti-corruption training course was introduced in 2018 to supplement the live training program. With the help of this program, Anti-Bribery and anti-corruption training increased significantly in 2018: approximately 2,400 employees in sensitive business positions received the training, roughly double the number of employees previously trained on this topic. Additionally, anti-bribery and anti-corruption topics are still offered as part of the Code of Conduct training that is mandatory for all employees.

Human Rights

In 2018, the Group continued to develop its Human Rights in Business Policy plan. As part of this initiative, a new Human Rights video was introduced to the Leadership Council to provide an overview of Solvay's actions and human rights strategy going forward. The video was also used to spur discussion on the topic at the 2018 Annual Sustainable Development Convention among approximately 75 leaders engaged in various aspects of sustainability within the Group. Throughout the year, the Group conducted human rights training for plant managers globally by connecting with them at their annual regional meetings, and Solvay will continue to increase its outreach and training in 2019.

NOTE S13
Critical incident risk management

Highly material

Definition

Indicators monitored for Process Safety Management System are aligned with OSHA (United States Occupational Safety and Health Administration) definitions. Indicators used to monitor Process Incidents (PSI) are aligned with International Council of Chemical Associations (ICCA) standards. Reported process incidents with environmental consequences are monitored and classified according to defined criteria: quantity of spilled material, consequences on site or off site, damage to the immediate vicinity, fish kills, and severity (medium, high, and catastrophic). The overall management of historical soil contamination can be monitored via the many environmental provisions.

Management approach

Solvay's approach to preventing process incidents is based on the 14 OSHA items of Process Safety Management System, with special attention paid to Process Hazard Analysis. Risk analysis forms the backbone of risk control. This risk analysis covers existing, new, or modified installations. Quantified risk analysis is a best practice among industrial companies: standardized risk analysis makes it possible to quantify the risk level of every possible accident scenario, combining severity and probability factors.

The incident rate (PSI rate) is monitored and benchmarked with peers. Each incident is analyzed according to ICCA standards (International Council of Chemical Associations) and corrective actions are taken, with a focus on incidents with operating permit exceedance.

The corporate "Environmental Rehabilitation" department is dedicated to overseeing the management of closed sites and addressing environmental liabilities resulting from historical soil contamination at all concerned sites. An Enterprise Risk Management approach is followed, backed by clear governance that combines a local approach (team management) with a global team (through initiatives). The aim is to significantly reduce Solvay's environmental liabilities and obligations and to effectively address and remediate environmental liabilities on operating sites.

Indicators

Risk analysis program

Solvay's objective:

2020

100%

of product lines having a risk analysis updated in the past five years

Risk analysis of production lines

In %	2018	2017
Product lines having a risk analysis updated in the past five years	85	77

Scope: the consolidated data for process safety risk analysis covers 131 sites out of a total about 152 operational sites including Research and Innovation centers with significant chemical process risks – excluding mines, careers, and laboratories with lower risks.

The risk analysis program makes it possible to identify major accident scenarios and take the necessary preventive measures to control the level of risk and keep it acceptable. Solvay uses tiered risk analysis methods and adapts them to the level of potential hazard of every process at every Global Business Unit.

The increase reflects the deployment of the assessment program started in 2015 and to be achieved by 2020. In 2016 and 2017, most of the progress was due to the deployment of the simplified method – called PRAMAPOR – for material and processes with low potential hazards.

Process incidents

Process incidents classified according to severity

	2018	2017
High-severity process incidents with environmental consequence (*)	0	0
Medium-severity process incidents with environmental consequences (*)	47	59
… with operating permit exceedance	12	27
… without permit exceedance	35	32
Process safety incident rate (**)	1	0.9

(*) Process incidents with environmental consequences are being monitored and classified according to several criteria: quantity of material spilled, consequences on site or off site, damage to the immediate vicinity, fish kills, and severity (medium, high, and catastrophic).

(**) Number of process Incidents per 100 full time employee (employees and contractors, assuming 2,000 hours of work/worker/year): Solvay's process incident rate (PSI rate) is consistent with the method proposed by the International Council of Chemical Associations (ICCA).

Scope: the consolidated data for process safety incidents covers 107 sites out of a total about 153 operational sites including Research and Innovation centers with significant chemical process risks – excluding mines, careers, and laboratories with lower risks.

No high incidents with environmental consequences, or catastrophic-severity incidents were reported for 2018, meaning there was no accidental event with long-term damage off site for the environment. Solvay's target is to avoid any high severity incident and to reduce the incident rate for medium severity incidents. In 2018, 47 incidents with environmental consequences were reported and, among those, 12 processes were associated with releases above operating limits. The Group has followed up on each incident to ensure adequate actions are taken to avoid recurrence.

The indicators Process Safety Management System (PSM) relative to the implementation of management system consistent with the Solvay Cares Management System (SCMS) is not consolidated at Group level anymore. Sites may now implement safety management system using other references than SCMS and in particular OSHA 18001, ISO 14001, etc. The internal control procedures based on the Solvay Cares Mangement System are no more effective as of 2018.

MANAGEMENT REPORT

FINANCIAL STATEMENTS

6

Financial statements

1. Consolidated financial statements

Solvay (the "Company") is a public limited liability company governed by Belgian law and quoted on Euronext Brussels and Euronext Paris. The principal activities of the Company, its subsidiaries, joint operations, joint ventures, and associates (jointly the "Group") are described in note F1 Revenue and segment information.

On February 26, 2019, the Board of Directors authorized the consolidated financial statements for issuance. They have been prepared in accordance with IFRS accounting policies as endorsed by the European Union, as disclosed hereinafter.

Main events and changes in consolidation scope during the year

On November 15, 2017, Solvay agreed to sell its US facility in Charleston, South Carolina, and the phosphorus derivatives-based products made at the plant to German specialty chemicals company Lanxess. The products at the site are used primarily as intermediates in plastic additives, flame retardants, and agricultural applications. The business represents sales of approximately € 65 million. Transaction was completed on February 8, 2018 for US$ 68 million, leading to a net capital gain before tax of € 22 million. Employees at the site were transferred.

On March 15, 2018, Solvay announced it had agreed to sell its Porto Marghera plant, which produces hydrofluoric acid, to Alkeemia, part of the Italian Fluorsid Group. The hydrofluoric acid is utilized by Solvay as a base chemical for the production of selected specialty polymers. This divestment is in line with Solvay Specialty Polymers' strategy to focus on specialties, where technology and innovation make the difference, to improve the sustainability of its productions. Fluorsid Group is one of the key players in the hydrofluoric acid and derivatives market at an international level. Alkeemia acquired Solvay Specialty Polymers' Porto Marghera branch of activities, and the employees at the site have been transferred. The sale was closed on June 1, 2018. In connection with the disposal, an impairment loss of € (23) million has been recognized in the first quarter of 2018.

On March 29, 2018, Solvay announced it is taking a new step in its transformation, putting its customers at the core of its organization to enhance its long-term growth as an advanced materials and specialty chemicals company. Solvay announced plans to simplify its organization, which needs to be adapted to its portfolio – now strongly focused on high-performance materials and tailored solutions – as well as to its changing customer base. The Group launched the relevant information/consultation procedures with employee representatives. These procedures were completed at the end of June. The Group is committed to supporting employees throughout this transformation while limiting job losses as much as possible. The simplification of the organization should lead to around 600 net redundancies, mainly in functional activities. The concentration of the R&I and support activities would involve the transfer to Lyon and Brussels, over four years, of about 500 employees who can rely on comprehensive support from the Group to help them relocate. In connection with the announced transformation, a restructuring provision has been recognized, with a net profit or loss impact of € (177) million. On top of this provision, other costs were already incurred in 2018 for an amount of € (8) million.

On October 16, 2018, Solvay announced that the divestment of its polyamide business to BASF is moving forward, as BASF has offered remedies involving part of the assets originally included in the scope of the acquisition, to address the competition concerns the European Commission has raised following an in-depth Phase II investigation. The European Commission examined these remedies and submitted them to market testing before completing its review procedure. The assets concerned by the remedies include innovation capabilities and manufacturing assets of Solvay's polyamide intermediate and engineering plastics business in Europe. The activities included in the proposed remedy scope are able to compete as successful stand-alone businesses under third party ownership. For BASF and Solvay this was a further step towards obtaining European Commission clearance for their agreement; this was obtained in January 2019. Both companies will continue to run their businesses separately until completion of the transaction, which is expected in the second part of 2019 after all remaining closing conditions will have been fulfilled.

On November 27, 2018, Solvay successfully issued a perpetual hybrid bond for an aggregate nominal amount of € 300 million, to be used for general corporate purposes, including the possibility to refinance the existing € 700 million hybrid bond with a first call date in May 2019. The € 300 million hybrid bond has a first call date on March 4, 2024 and a coupon of 4.25% until this date, with a reset every five years thereafter. The hybrid bond ranks junior to all senior debt and is classified as equity (and accordingly, coupons will be deducted from equity in accordance with IFRS).

Main events and changes in consolidation scope in prior year

On January 4, 2017, Solvay agreed to sell its formulated resins business to Altana AG's Elantas PDG Inc. Under the agreement, Solvay's Global Business Unit Technology Solutions divested the business line, which generated sales of € 17 million in 2016. The divestment included the formulated resins product portfolio, the manufacturing and R&D facility based in Olean, New York, USA, and all associated technical, commercial, and administrative staff. Completion of the transaction was subject to customary closing conditions, including antitrust approvals, and occurred on June 1, 2017. The assets of the business were presented as assets held for sale until completion of the transaction, which had no material impact on the result in the period.

On February 1, 2017, Solvay announced the acquisition of Energain™ Li-ion high voltage technology from DuPont for € 13 million. Energain™ technology and formulations enlarge Solvay Special Chem Global Business Unit's existing portfolio of high performance salts and additives for electrolytes and strengthen its capabilities to develop further innovative high-voltage solutions for Li-ion batteries.

On February 23, 2017, Solvay completed the divestment of its 58.77% stake in its Thai subsidiary, Vinythai PCL (Emerging Biochemicals), to Japanese company AGC Asahi Glass. The assets and liabilities of the business were presented as assets held for sale and associated liabilities as from December 2016, following the announcement of the intended divestment. The transaction was based on a total enterprise value of 16.5 billion Thai baht (€ 435 million), and triggered a capital gain of € 24 million, recognized in discontinued operations.

On March 24, 2017, Solvay signed a definitive agreement to sell its 25.1% shares in National Peroxide Limited (BOM:500298) to the Wadia Group, a conglomerate of corporate India and promoter shareholder of National Peroxide Limited. The transaction was closed in March with a capital gain of € 13 million.

On March 30, 2017, Solvay signed a definitive agreement to sell its polyolefin cross-linkable compounds business in Italy to family-owned group Finproject SpA. Based in Roccabianca, Parma, the business makes compounds that are used in applications in the wire and cable industry and the pipe industry, generating sales of € 82 million in 2016. Finproject is a leading manufacturer of injection molded foam, polyolefin-based compounds and PVC compounds. The transaction was subject to customary closing conditions and closed on June 8, 2017. The assets of the business were presented as assets held for sale until completion of the transaction, which triggered a capital gain of € 43 million.

On May 31, 2017, Solvay completed the divestment of its cellulose acetate tow business, Acetow, to private equity funds managed by Blackstone. The assets and liabilities of the business were presented as assets held for sale and associated liabilities as from December 2016, following the announcement of the intended divestment. The transaction was based on an enterprise value of around € 1 billion, resulting in a net financial debt reduction of € 734 million and a capital gain of € 180 million recognized in discontinued operations, subject to post-closing adjustments.

Solvay deconsolidated its investment in Venezuela triggered by the political situation in the country, and recognized a loss of € 72 million, related mainly to the € (60) million recycling of currency translation differences, in the second quarter of 2017.

On July 5, 2017, Solvay agreed to sell its 50% stake in Dacarto Benvic to its joint venture partner who will become the sole owner of the Brazilian PVC compounder. The transaction led to an impairment of € (5) million in the second quarter and € (8) million of currency translation differences recycling and was completed on September 14, 2017.

On September 19, 2017, Solvay announced that it had entered into a binding agreement with German chemical company BASF for the sale of its Polyamides business. The business planned for divestment has been reclassified to assets and liabilities held for sale and discontinued operations at the end of the third quarter of 2017. As a result of the discontinuation, the retained Latin American polyamide business incurred an impairment of € (91) million recognized at the end of September 2017. This impairment is expected to be more than compensated by the capital gain on the transaction at the closing.

On September 21, 2017, Solvay launched a cash tender offer to repurchase bonds on the following issuances:

- Senior US$ 400 million debt at 3.5% due in 2023;
- Senior US$ 250 million debt at 3.95% due in 2025; and
- Senior € 500 million debt at 4.625% due in 2018.

On September 28, 2017, Solvay published the final results of the repurchase operation related to the aforementioned issuances. It committed to repurchasing 51% of the outstanding aggregate principal amount of the US$ 400 million senior bonds due in 2023 for a total amount of US$ 204 million, 34.6% of the outstanding aggregate principal amount of the US$ 250 million senior bonds due in 2025 for a total amount of US$ 87 million, and 23.6% of the outstanding aggregate principal amount of the € 500 million senior bonds due in 2018 for a total amount of € 118 million. The repurchase was closed on October 2, 2017 and resulted in an expense of € (25) million of which an accretion (acceleration) amounting to € (10) million and premiums amounting to € (15) million.

On November 7, 2017, Solvay completed the acquisition of European Carbon Fiber GmbH ("ECF"), a German producer of high-quality "precursor" for large-tow (50K) polyacrylonitrile (PAN) carbon fibers.

Consolidated income statement

In € million	Notes	2018	2017
Sales	(F1)	**11,299**	**10,984**
of which revenue from non-core activities	(F3)	1,042	859
of which net sales		10,257	10,125
Cost of goods sold		(8,264)	(7,898)
Gross margin		**3,035**	**3,086**
Commercial costs		(373)	(400)
Administrative costs		(1,006)	(1,037)
Research and development costs		(297)	(290)
Other operating gains and losses	(F4)	(123)	(154)
Earnings from associates and joint ventures	(F25)	44	44
Results from portfolio management and reassessments	(F5)	(208)	(188)
Results from legacy remediation and major litigations	(F5)	(86)	(84)
EBIT		**986**	**976**
Cost of borrowings	(F6)	(131)	(172)
Interest on loans and short term deposits	(F6)	13	15
Other gains and losses on net indebtedness	(F6)	(1)	(44)
Cost of discounting provisions	(F6)	(77)	(97)
Profit for the year before taxes		**791**	**678**
Income taxes	(F7)	(95)	197
Profit for the year from continuing operations		**697**	**875**
Profit for the year from discontinued operations	(F8)	201	241
Profit for the year	(F9)	**897**	**1,116**
attributable to:			
Solvay share		858	1,061
non-controlling interests		39	56
Basic earnings per share from continuing operations (€)		6.37	7.97
Basic earnings per share from discontinued operations (€)		1.94	2.29
Basic earnings per share (€)	(F10)	8.31	10.27
Diluted earnings per share from continuing operations (€)		6.34	7.92
Diluted earnings per share from discontinued operations (€)		1.93	2.28
Diluted earnings per share (€)	(F10)	8.27	10.19

The comparative figures of revenue from non-core activities and costs of goods sold have been restated for an amount of € 93 million, following a change in the presentation of revenues from non-core activities.

Moreover, in the 2017 Annual Report, commercial and administrative costs were presented in aggregate.

Consolidated statement of comprehensive income

In € million	Notes	2018	2017
Profit for the year		**897**	**1,116**
Other comprehensive income			
Recyclable components			
Gains and losses on available-for-sale financial assets	*(F11)*		(1)
Gains and losses on hedging instruments in a cash flow hedge	*(F11)*	(47)	15
Currency translation differences – Subsidiaries and joint operations	*(F11)*	255	(790)
Currency translation differences – Associates and joint ventures	*(F11)*	(34)	(40)
Non recyclable components			
Gains and losses on equity instruments measured at fair value through other comprehensive income	*(F11)*	3	
Remeasurements of the net defined benefit liability	*(F11)*	26	95
Income tax relating to recyclable and non recyclable components	*(F11)*	1	37
Other comprehensive income, net of related tax effects	*(F11)*	**204**	**(684)**
Comprehensive income for the year		**1,101**	**433**
attributable to:			
Solvay share		1,058	412
non-controlling interests		43	20

Consolidated statement of cash flows

The amounts below include both continued and discontinued operations.

In € million	Notes	2018	2017
Profit for the year		897	1,116
Adjustments to profit for the year			
Depreciation, amortization and impairments	*(F12)*	944	1,152
Earnings from associates and joint ventures	*(F25)*	(44)	(44)
Other non operating and non cash items	*(F13)*	(12)	(179)
Additions and reversals of provisions	*(F16)*	315	216
Net financial charges		198	302
Income tax expense/income	*(F14)*	175	(131)
Changes in working capital	*(F15)*	(148)	(216)
Use of provisions	*(F16)*	(395)	(408)
Dividends received from associates and joint ventures	*(F25)*	25	18
Income taxes paid (including income taxes paid on sale of investments)	*(F14)*	(235)	(237)
Cash flow from operating activities		**1,720**	**1,590**
of which cash flow related to acquisition or sale of subsidiaries and excluded from Free Cash Flow			*(36)*
Acquisition (–) of subsidiaries	*(F17)*	(12)	(44)
Acquisition (–) of investments – Other	*(F17)*	(4)	(11)
Loans to associates and non-consolidated companies		(3)	(7)
Sale (+) of subsidiaries and investments	*(F17)*	26	891
Acquisition (–) of property, plant and equipment	*(F17)*	(691)	(707)
of which capital expenditures required by share sale agreement and excluded from Free Cash Flow		*(38)*	*(12)*
Acquisition (–) of intangible assets	(F17)	(142)	(115)
Sale (+) of property, plant and equipment and intangible assets	*(F17)*	42	75
of which cash flow related to the sale of real estate in the context of restructuring/dismantling/remediation		*9*	*12*
Dividends from equity instruments measured at fair value through other comprehensive income			2
Changes in non-current financial assets			(1)
Cash flow from investing activities		**(784)**	**84**
Proceeds from perpetual hybrid bond issuance	*(F31)*	298	
Acquisition (–)/sale (+) of treasury shares	*(F33)*	(22)	(14)
Increase in borrowings	*(F36)*	2,444	1,692
Repayment of borrowings	*(F36)*	(2,993)	(2,584)
Changes in other current financial assets	*(F36)*	(25)	(27)
Interests paid		(114)	(255)
Coupons paid on perpetual hybrid bonds	*(F31)*	(111)	(111)
Dividends paid		(411)	(396)
Other	*(F18)*	123	13
Cash flow from financing activities		**(811)**	**(1,684)**
Net change in cash and cash equivalents		**126**	**(10)**
Currency translation differences		(14)	(52)
Opening cash balance		992	1,054
Closing cash balance	*(F36)*	1,103	992

Consolidated cash flows from discontinued operations

In € million	Notes	2018	2017
Cash flow from operating activities		244	183
Cash flow from investing activities		(122)	(105)
Cash flow from financing activities		(1)	(1)
Net change in cash and cash equivalents	*(F19)*	**120**	**77**

The cash flow from investing activities of discontinued operations excludes the proceeds linked to the divestments of Acetow and Emerging Biochemicals in 2017.

Consolidated statement of financial position

In € million	Notes	2018	2017
ASSETS			
Intangible assets	*(F20)*	2,861	2,940
Goodwill	*(F21)*	5,173	5,042
Property, plant and equipment	*(F22)*	5,454	5,433
Equity instruments measured at fair value through other comprehensive income(1)	*(F35)*	51	44
Investments in associates and joint ventures	*(F25)*	441	466
Other investments	*(F26)*	41	47
Deferred tax assets	*(F7)*	1,123	1,076
Loans and other assets	*(F35)*	282	346
Non-current assets		**15,427**	**15,394**
Inventories	*(F28)*	1,685	1,504
Trade receivables	*(F35)*	1,434	1,462
Income tax receivables		97	100
Other financial instruments	*(F35)*	101	89
Other receivables	*(F29)*	719	627
Cash and cash equivalents	*(F36)*	1,103	992
Assets held for sale	*(F30)*	1,434	1,284
Current assets		**6,574**	**6,057**
Total assets		**22,000**	**21,451**
EQUITY & LIABILITIES			
Share capital	*(F31)*	1,588	1,588
Reserves		8,920	8,051
Non-controlling interests	*(F32)*	117	113
Total equity		**10,624**	**9,752**
Provisions for employee benefits	*(F34)*	2,672	2,816
Other provisions	*(F34)*	883	793
Deferred tax liabilities	*(F7)*	618	600
Financial debt	*(F36)*	3,180	3,182
Other liabilities		121	180
Non-current liabilities		**7,474**	**7,571**
Other provisions	*(F34)*	281	281
Financial debt	*(F36)*	630	1,044
Trade payables	*(F35)*	1,439	1,330
Income tax payables		114	129
Dividends payables		154	147
Other liabilities	*(F37)*	850	848
Liabilities associated with assets held for sale	*(F30)*	435	349
Current liabilities		**3,902**	**4,128**
Total equity & liabilities		**22,000**	**21,451**

(1) Label has been changed from "Available-for-sale financial assets" to "Equity instruments measured at fair value through other comprehensive income" following IFRS 9 application. Comparative figures are identical to those published in the 2017 Annual Report.

Consolidated statement of changes in equity

						Equity attributable to equity holde
In € million	*Notes*	Share capital	Share pre-miums	Treasury shares	Perpetual hybrid bonds	Retained earnings
Balance at December 31, 2016		**1,588**	**1,170**	**(274)**	**2,188**	**5,899**
Profit for the year						1,061
Items of other comprehensive income	*(F11)*					0
Comprehensive income						***1,061***
Cost of stock options						10
Dividends						(363)
Coupons of perpetual hybrid bonds						(111)
Acquisition (–)/sale of treasury shares				(7)		(7)
Increase/decrease (–) through changes in ownership interests in subsidiaries that result in loss of control						(34)
Balance at December 31, 2017		**1,588**	**1,170**	**(281)**	**2,188**	**6,454**
IFRS 9 adoption						(5)
Balance at January 1, 2018		**1,588**	**1,170**	**(281)**	**2,188**	**6,449**
Profit for the year						858
Items of other comprehensive income	*(F11)*					0
Comprehensive income						***858***
Perpetual hybrid bonds issuance	*(F31)*				298	
Cost of stock options						9
Dividends						(378)
Coupons of perpetual hybrid bonds						(111)
Acquisition (–)/sale of treasury shares				(18)		(4)
Other						11
Balance at December 31, 2018		**1,588**	**1,170**	**(299)**	**2,486**	**6,834**

(1) Label has been changed from “Available-for-sale financial assets” to “Equity instruments measured at fair value through other comprehensive income” following IFRS 9 application. Comparative figures are similar to those published in the 2017 Annual Report.

In 2017 the € (117) million reduction in equity related mainly to non-controlling interest following the completion of the Emerging Biochemicals divestment.

of the parent						
	Revaluation reserve (fair value)					
Currency translation differences	Equity instruments measured at FVOCI[1]	Cash flow hedges	Defined benefit pension plan	Total reserves	Non-controlling interests	Total equity
(39)	**8**	**(5)**	**(828)**	**8,117**	**250**	**9,956**
				1,061	56	1,116
(795)	(3)	22	128	(648)	(35)	(684)
(795)	***(3)***	***22***	***128***	***412***	***20***	***433***
				10		10
				(363)	(41)	(404)
				(111)		(111)
				(14)		(14)
		0	34	1	(117)	(116)
(834)	**5**	**16**	**(665)**	**8,051**	**113**	**9,752**
				(5)		(5)
(834)	**5**	**16**	**(665)**	**8,046**	**113**	**9,747**
				858	39	897
217	4	(42)	22	200	4	204
217	***4***	***(42)***	***22***	***1,058***	***43***	***1,101***
				298		298
				9		9
				(378)	(40)	(418)
				(111)		(111)
				(22)		(22)
		0	8	19	1	19
(618)	**9**	**(26)**	**(635)**	**8,920**	**117**	**10,624**

2. Notes to the consolidated financial statements

IFRS general accounting policies

1. Basis of preparation

This information was prepared in accordance with European Regulation (EC) 1606/2002 on the application of international accounting standards dated July 19, 2002. The Group's consolidated financial statements for the year ended December 31, 2018 were prepared in accordance with IFRS (International Financial Reporting Standards) as published by the International Accounting Standards Board (IASB), and endorsed by the European Union.

The accounting standards applied in the consolidated financial statements for the year ended December 31, 2018 are consistent with those used to prepare the consolidated financial statements for the year ended December 31, 2017, except for the adoption of new Standards effective as of January 1, 2018, which are discussed hereinafter. The Group has not early adopted any other Standard, interpretation or amendment that has been issued but is not yet effective.

Standards, interpretations, and amendments applicable for the first time in 2018

As of January 1, 2018, the Group applied, for the first time, IFRS 9 *Financial Instruments* and IFRS 15 *Revenue from Contracts with Customers*.

IFRS 9 Financial Instruments

As from January 1, 2018, the Group no longer applies IAS 39 *Financial Instruments: Recognition and Measurement*. IFRS 9 is applicable for annual periods beginning on or after January 1, 2018, and brings together all three aspects of the accounting for financial instruments: classification and measurement, impairment, and hedge accounting. Except for hedge accounting, retrospective application is required, but providing comparative information is not compulsory. For hedge accounting, the requirements are generally applied prospectively, with some limited exceptions.

The Group adopted IFRS 9 on January 1, 2018, and did not restate comparative information.

Overall, there is no significant impact on the Group's statement of financial position and equity. The Group observed an increase in the loss allowance resulting in a negative impact on equity as discussed below. In addition, the Group has implemented changes in classification of certain financial instruments.

Impairment

IFRS 9 requires the Group to recognize expected credit losses on all of its trade receivables: the Group applies the simplified approach and recognizes lifetime expected losses on all trade receivables, using the provision matrix in order to calculate the lifetime expected credit losses for trade receivables as required by IFRS 9, using historical information on defaults adjusted for the forward looking information. Impacts related to debt securities, loans, financial guarantees, and loan commitments provided to third parties, as well as cash and cash equivalents, are immaterial. The impact on the trade receivable allowances is as follows, while the impact on the Group's equity (net of deferred taxes of € 1 million) amounts to € (5) million:

	Allowances on trade receivable
Carrying amount as of December 31, 2017 – IAS 39	(49)
Remeasurement – From incurred to expected loss model	(6)
Carrying amount as of January 1, 2018 – IFRS 9	(55)

Classification and measurement

The application of the classification and measurement requirements of IFRS 9 does not have a significant impact on the Group's consolidated statement of financial position or equity. It will continue measuring at fair value all financial assets previously held at fair value. The equity shares in non-listed companies, previously presented as available-for-sale financial assets, are intended to be held for the foreseeable future. The Group applies the option to present fair value changes in OCI, and therefore the application of IFRS 9 does not have a significant impact. The fair value gains or losses accumulated in OCI will no longer be subsequently reclassified to profit or loss, which is different from the previous treatment. Loans as well as trade receivables are held to collect contractual cash flows and give rise to cash flows representing solely payments of principal and interest. Thus, the Group will continue to measure those financial assets at amortized cost under IFRS 9. The effect of applying IFRS 9's classification and measurement requirements on financial assets is as follows:

Financial assets

	IAS 39 December 31, 2017	Transition to IFRS 9		IFRS 9 January 1, 2018	At date of transition
	Carrying amount	Reclassifications	Remeasurements	**Carrying amount**	Impact on retained earnings[1]
Loans and receivables (including cash and cash equivalents, trade receivables, loans and other current and non-current assets except pension fund surpluses)	2,870	(2,870)			
Financial assets measured at amortized cost		2,870	(6)	2,864	(5)
Available-for-sale financial assets	44	(44)			
Equity instruments measured at fair value through other comprehensive income		44		44	

(1) Net of deferred tax assets

Regarding financial liabilities, the Group did not make any reclassifications or remeasurements.

Hedge accounting

In accordance with IFRS 9's transition provisions for hedge accounting, the Group applies the IFRS 9 hedge accounting requirements prospectively from the date of initial application on January 1, 2018. The Group's qualifying hedging relationships in accordance with IAS 39 in place as at January 1, 2018 also qualify for hedge accounting in accordance with IFRS 9 and were therefore regarded as continuing hedging relationships. No rebalancing of any of the hedging relationships was necessary on January 1, 2018.

Further details are provided in note F35 *Financial instruments and financial risk management*.

IFRS 15 Revenue from Contracts with Customers

IFRS 15 supersedes IAS 11 *Construction Contracts*, IAS 18 *Revenue* and related interpretations and it applies to all revenue arising from contracts with customers, unless those contracts are in the scope of other Standards. The new Standard establishes a five-step model to account for revenue arising from contracts with customers. Under IFRS 15, revenue is recognized at an amount that reflects the consideration to which the Group expects to be entitled in exchange for transferring goods or services to a customer.

The Group adopted IFRS 15 on January 1, 2018, using the modified retrospective approach.

Sale of goods

As the Group is in the business of selling chemicals, contracts with customers generally concern the sale of goods. As a result, revenue recognition generally occurs at a point in time when control of the chemicals is transferred to the customer, generally on delivery of the goods.

Distinct elements

The revenue of the Group consists mainly of sales of chemicals, which qualify as separate performance obligations. Value-added services – mainly customer assistance services – corresponding to Solvay's know-how are rendered predominantly over the period that the corresponding goods are sold to the customer. At transition date, the Group did not have a more than insignificant adjustment compared to its previous practice.

Variable consideration

Some contracts with customers provide trade discounts or volume rebates. In accordance with IAS 18, the Group recognized revenue from the sale of goods measured at the fair value of the consideration received or receivable, net of returns and allowances, trade discounts, and volume rebates. Trade discounts and volume rebates give rise to variable consideration under IFRS 15, and are required to be estimated at contract inception. IFRS 15 requires the estimated variable consideration to be constrained to prevent overstatement of revenue. The Group assessed individual contracts to determine the estimated variable consideration and related constraints. At transition date, the Group did not have a more than insignificant adjustment compared to its previous practice on its retained earnings.

Moment of recognition of revenue

The Group sells its chemicals to its customers, (a) directly, (b) through distributors, and (c) with the assistance of agents. The Group analyzed whether the moment control of the goods passes, as described in IFRS 15, would result in a different moment to recognize the revenue. At transition date, the Group did not have a more than insignificant adjustment compared to its previous practice.

Presentation and disclosure requirements

IFRS 15 provides presentation and disclosure requirements, which are more detailed than under previous IFRSs. The presentation requirements represent a change from previous practice and increase the volume of disclosures required in the Group's financial statements. The Group has analyzed those disclosure requirements, including the need for policies, procedures, and internal controls necessary to collect and disclose the required information.

Further details are provided in note F1 *Revenue and segment information*.

Standards, interpretations, and amendments applicable for the first time in 2019

IFRS 16 Leases

IFRS 16 sets out the principles for the recognition, measurement, presentation, and disclosure of leases and requires lessees to account for all leases under a single on-balance sheet model, similar to the accounting for finance leases under IAS 17. At the commencement date of a lease, lessees will recognize a lease liability (i.e. a liability to make lease payments), and a right-of-use asset (i.e. an asset representing the right to use the underlying asset over the lease term). The right-of-use asset will be depreciated over the term of the lease, unless the lease transfers ownership of the underlying asset to Solvay at the end of the lease. In latter case, it will be depreciated over the useful life of the underlying asset. Interest expense will be recognized on the lease liability. The lease liability will be remeasured upon the occurrence of certain events (e.g. a change in the lease term or a change in future lease payments resulting from a change in index). Such remeasurements of the lease liability will generally be recognized as an adjustment to the right-of-use asset. Lessor accounting under IFRS 16 *Leases* is substantially unchanged from previous accounting under IAS 17 *Leases*. Finally, disclosure requirements under IFRS 16 *Leases* are more extensive when compared with IAS 17 *Leases*.

In 2018, as part of its preparation of IFRS 16 *Leases*, the Group continued its implementation efforts and undertook an extensive review of its operating lease contracts, challenging the non-cancellable period of the leases, especially with respect to buildings. It developed processes, IT tools, and internal controls so to ensure IFRS 16 compliance.

The Group will apply IFRS 16, using the modified retrospective approach and will exclude services from its lease liabilities. On January 1, 2019, the right-of-use assets was measured at an amount equal to the respective lease liabilities, adjusted by the amount of any prepaid or accrued lease payments relating to that lease recognized in the consolidated statement of financial position immediately before January 1, 2019.

The Group used the practical expedient available on transition to IFRS 16 related to onerous contracts, adjusting the right-of-use assets at January 1, 2019 by the amount of any provision for onerous leases recognized in the consolidated statement of financial position immediately before January 1, 2019. Such positively impacted the retained earnings as of January 1, 2019 by € 8 million.

It also used the practical expedient not to reassess whether a contract is or contains a lease. Accordingly, the definition of a lease in accordance with IAS 17 and IFRIC 4 will continue to apply to those leases entered into or modified before January 1, 2019. However, the new definition in IFRS 16 will not significantly change the scope of contracts that meet the definition of a lease for the Group.

As of January 1, 2019, lease liabilities recognized in accordance with IFRS 16 *Leases* amount to € 433 million (excluding those that are part of liabilities associated with non-current assets held for sale, in this case Polyamides). Leased assets relate mainly to buildings, transportation equipment, and industrial equipment. The expected repayments of operating lease liabilities during 2019, which will no longer be recognized as an operating lease expense as was the case in accordance with IAS 17 *Leases* but rather as a repayment of lease liabilities, amount to € 95 million. Depreciation and finance expense in 2019 are expected to increase by € 94 million and € 16 million respectively. See note F23 *Leases* for more information on existing operating leases.

No significant impacts are expected where the Group is currently a lessee under a finance lease, or where the Group is currently a lessor.

IFRIC 23 Uncertainty over Income Tax Treatment

The interpretation addresses the accounting for income taxes when tax treatments involve uncertainty that affects the application of IAS 12 *Income Taxes* and does not apply to taxes or levies outside the scope of IAS 12 *Income Taxes*, nor does it specifically include requirements relating to interest and penalties associated with uncertain tax treatments. The interpretation specifically addresses the following:

- whether an entity considers uncertain tax treatments separately;
- the assumptions an entity makes about the examination of tax treatments by taxation authorities;
- how an entity determines taxable profit (tax loss), tax bases, unused tax losses, unused tax credits and tax rates; and
- how an entity considers changes in facts and circumstances.

An entity must determine whether to consider each uncertain tax treatment separately or together with one or more other uncertain tax treatments. The approach that better predicts the resolution of the uncertainty should be followed. The interpretation is effective for annual reporting periods beginning on or after January 1, 2019, but certain transition reliefs are available. The Group applies the interpretation since its effective date, but did not identify a more than immaterial impact on its consolidated financial statements, including presentation.

Other standards, interpretations and amendments applicable for the first time in 2019 are not expected to have a material impact on the Group's consolidated financial statements.

Standards, interpretations, and amendments applicable for the first time after 2019

Other Standards, interpretations, and amendments applicable for the first time after 2019 are not expected to have a more than insignificant impact on the Group's consolidated financial statements.

2. Basis of measurement and presentation

The consolidated financial statements are presented in millions of euros, which is also the functional currency of the parent company.

The preparation of the financial statements requires the use of estimates and assumptions that have an impact on the application of accounting policies and the measurement of amounts recognized in the financial statements. The areas for which the estimates and assumptions are material with respect to the consolidated financial statements are presented in the section *Critical accounting judgments and key sources of estimation uncertainty*.

3. Principles of consolidation

3.1. Consolidation scope

3.1.1. General

The consolidated financial statements incorporate the financial statements of the Company, and:

- entities controlled by the Company (including through its subsidiaries) and that hence qualify as subsidiaries (see 3.1.2. below);
- arrangements over which the Company (including through its subsidiaries) exercises joint control, and that qualify as joint operations (see 3.1.3. below);
- arrangements over which the Company (including through its subsidiaries) exercises joint control, and that qualify as joint ventures (see 3.1.4. below);
- entities over which the Company (including through its subsidiaries) has significant influence and that hence qualify as associates (see 3.1.4. below).

Where necessary, adjustments are made to the financial statements of the investees so as to align their accounting policies with those of the Group.

In accordance with the principle of materiality, certain companies which are not of a significant size have not been included in the consolidation scope. Companies are deemed not to be significant when, during two consecutive years, they do not exceed any of the three following thresholds in terms of their contribution to the Group's accounts:

- sales of € 30 million;
- total assets of € 15 million;
- headcount of 150 persons.

Companies that do not meet these criteria are, nevertheless, consolidated where the Group believes that they have a potential for rapid development, or where they hold shares in other companies that are consolidated based on the above criteria.

In the aggregate, the non-consolidated companies have an immaterial impact on the consolidated financial statements of the Group.

The full list of companies can be obtained at the Company's head office.

3.1.2. Investments in subsidiaries

A subsidiary is an entity over which the Group has control. Control is achieved when the Group has (a) power over an investee, (b) exposure, or rights, to variable returns from its involvement with the investee, and (c) the ability to use its power over the investee to affect the amount of the investor's returns. To assess whether the Group has control, potential voting rights are taken into account. Subsidiaries are fully consolidated. The results of subsidiaries acquired or disposed of during the year are included in the consolidated income statement from the effective date of acquisition and up to the effective date of disposal.

Intra-group transactions, balances, income, and expenses are eliminated on consolidation.

Non-controlling interests in subsidiaries are presented separately from the Group's equity. Non-controlling interests are initially measured, either at fair value (full goodwill method), or at the non-controlling interests' proportionate share in the recognized amounts of the acquiree's identifiable net assets (proportionate goodwill method). The choice of measurement is made on an acquisition-by-acquisition basis. Subsequent to the acquisition, the carrying amount of non-controlling interests is the amount of those interests at initial recognition plus the non-controlling interests' share of subsequent changes in equity. Total comprehensive income is attributed to non-controlling interests even if this results in the non-controlling interests having a deficit balance.

Changes in the Group's equity interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions. The carrying amounts of the Group's interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiary. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized directly in equity.

When the Group loses control of a subsidiary, the profit or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest, and (ii) the previous carrying amount of the assets (including goodwill) and liabilities of the subsidiary and any non-controlling interests. Amounts previously recognized in other comprehensive income in relation to the subsidiary are accounted for (*i.e.* reclassified to profit or loss or transferred directly to retained earnings) in the same manner as would be required if the relevant assets or liabilities were disposed of. The fair value of any investment retained in the former subsidiary at the date when control is lost is considered to be the fair value on initial recognition for subsequent accounting in accordance with IFRS 9 *Financial Instruments* or, when applicable, the cost on initial recognition of an investment in an associate or joint venture in accordance with IAS 28 *Investments in Associates and Joint Ventures*.

3.1.3. Investments in joint operations

A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets, and obligations for the liabilities, relating to the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about relevant activities require the unanimous consent of the parties sharing control. In its consolidated financial statements, the Group recognizes its share of the joint operations' assets, liabilities, revenue, and expenses, based on its ownership interest in the joint operations.

3.1.4. Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence and that is neither a subsidiary nor an interest in a joint arrangement. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about relevant activities require the unanimous consent of the parties sharing control.

The results, assets, and liabilities of associates and joint ventures are incorporated in the consolidated financial statements using the equity method of accounting, except when the investment is classified as held for sale, in which case it is accounted for in accordance with IFRS 5 *Non-current Assets Held for Sale and Discontinued Operations*. Under the equity method, on initial recognition, investments in associates and joint ventures are recognized in the consolidated statement of financial position at cost, and the carrying amount is adjusted for post-acquisition changes in the Group's share of the net assets of the associate or joint venture, less any impairment of the value of individual investments. Losses of an associate or joint venture in excess of the Group's interest in that associate or joint venture (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate or joint venture) are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate or joint venture.

Any excess of the cost of acquisition over the Group's share of the net fair value of the identifiable assets and (contingent) liabilities of the associate or joint venture recognized at the date of acquisition is goodwill. The goodwill is included within the carrying amount of the investment and is assessed for impairment as part of that investment.

Where a Group entity transacts with an associate or joint venture of the Group, gains and losses are eliminated to the extent of the Group's interest in the relevant associate or joint venture.

4. Foreign currencies

The individual financial statements of each Group entity are prepared in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the consolidated financial statements, the results and financial position of each Group entity are expressed in euros (EUR), which is the presentation currency of the Group's consolidated financial statements.

In preparing the financial statements of the individual entities, transactions in currencies other than the entities' functional currency are recognized at the exchange rates prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are translated at the closing rate. Non-monetary items carried at fair value that are denominated in foreign currencies are translated at the rate when the fair value was measured. Non-monetary items that are measured in terms of historical cost in a foreign currency are not translated at the closing rate.

Exchange differences are recognized in profit or loss in the period in which they arise except for:

- exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur in the foreseeable future (therefore forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income under "currency translation differences"; and
- exchange differences on transactions entered into in order to hedge certain foreign currency risks (see note F35 *Financial instruments and financial risk management* for hedge accounting policies).

The main exchange rates used are:

		Year-end rate		Average rate	
		2018	2017	**2018**	2017
1 Euro =					
Brazilian Real	BRL	4.4399	3.9789	4.3073	3.6050
Yuan Renminbi	CNY	7.8650	7.8112	7.8064	7.6278
Pound Sterling	GBP	0.8949	0.8875	0.8847	0.8766
Indian Rupee	INR	79.9766	76.5611	80.7322	73.5188
Japanese Yen	JPY	125.8730	135.0098	130.3953	126.6917
Korean Won	KRW	1,278.2047	1,284.1248	1,298.8877	1,276.6749
Mexican Peso	MXN	22.5201	23.6551	22.7042	21.3273
Russian Ruble	RUB	79.7633	69.4061	74.0579	65.9317
US Dollar	USD	1.1456	1.1995	1.1809	1.1294

5. Government grants

Government grants are not recognized until there is reasonable assurance that the Group will comply with the conditions attaching to them and that the grants will be received.

Government grants relating to the purchase of property, plant, and equipment are deducted from the cost of those assets. They are recognized in the consolidated statement of financial position at their expected value at the moment of initial recognition. The grant is recognized in profit or loss over the depreciation period of the underlying assets as a reduction of depreciation expense.

Other government grants are recognized as income on a systematic basis over the periods in which the related costs, which they are intended to compensate, are recognized. Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Group with no future-related costs are recognized in profit or loss in the period in which they become receivable.

Critical accounting judgments and key sources of estimation uncertainty

1. Critical accounting judgments

Classification as held for sale

Assets are classified as held for sale if their carrying amount will be recovered through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the asset is available for immediate sale in its present condition. Amongst other conditions, management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification. However, in some cases, an asset may remain classified as held for sale for a period exceeding one year if it remains unsold due to events or circumstances beyond the Group's control.

Polyamides

On September 19, 2017, Solvay announced that it had entered into a binding agreement with German chemical company BASF for the sale of its Polyamides business. In this context, management concluded that the conditions to classify the business as held for sale and as a discontinued operation were met as of that date. In particular, management considers the Polyamides business as a separate major line of business and expects the transaction to be completed during the second half of 2019.

Under the proposed terms of the agreement, the transaction is based on an enterprise value of € 1.6 billion. The expected net cash proceeds are estimated to be around € 1.1 billion. As a result of the discontinuation, the retained Latin American polyamide business incurred an impairment of € (91) million recognized at the end of September 2017. This impairment is expected to be more than compensated by the capital gain on the transaction at the closing.

Further details are provided in note F30 *Assets held for sale*.

2. Key sources of estimation uncertainty

Impairment

The Group performs annual impairment tests on (groups of) CGUs to which goodwill has been allocated, and each time there are indicators that their carrying amount might be higher than their recoverable amount. This analysis requires management to estimate the future cash flows expected to be generated by the CGUs and a suitable discount rate in order to calculate present value.

Further details are provided in note F27 *Impairment of property, plant and equipment, intangible assets, and equity method investees*.

Income taxes

Deferred tax assets

The carrying amount of the deferred tax assets is reviewed at each reporting date. The carrying amount of a deferred tax asset is reduced to the extent that it is no longer probable that the Group will earn sufficient taxable profits against which the deductions can be utilized. Any such reduction is reversed to the extent that it becomes probable that sufficient taxable profits will be available.

Deferred tax assets other than tax loss carryforwards are analyzed on a case-by-case basis, taking into account all relevant facts and circumstances. For example, a zero taxable profit, after deducting the amounts paid to retirees under a defined benefit plan and for which a deductible temporary difference existed, can justify the recognition of the underlying deferred tax assets.

Recognition of deferred tax assets for tax loss carryforwards requires a positive taxable profit during the year that enables the utilization of tax losses that originated in the past. Because of uncertainties inherent to predicting such positive taxable profit, recognition of deferred tax assets from tax loss carryforwards is based on a case-by-case analysis, which is usually based on five-year profit forecasts, except with respect to any financial company for which ten-year financial profit forecasts are considered highly predictable and are consequently used.

The corporate tax reporting team, which has the overview of the Group deferred tax positions, is involved in assessing deferred tax assets.

Further details are provided in note F7.B. *Deferred taxes in the consolidation statement of financial position*.

Tax reform in the United States

The enactment of the tax reform in the United States at the end of 2017 necessitated key estimates in the 2017 financial reporting. These estimates were reviewed when needed with no material impact except for the partial reversal of the one-time transitional tax on unremitted earnings accrued in 2017 (€ 31 million), resulting from the move from a global to a territorial taxation system.

New guidance issued by the Internal Revenue Service ("IRS") relating to the US tax reform could be issued in 2019 and trigger a review, if applicable to the Group, of some estimates at year-end 2018.

Further details are provided in note F7.B. *Deferred taxes in the consolidation statement of financial position*.

Provisions

Restructuring provision for the Group's simplification plan

On March 29, 2018, Solvay announced it is taking a new step in its transformation, putting its customers at the core of its organization to enhance its long-term growth as an advanced materials and specialty chemicals company. In connection with the announced transformation, a restructuring provision has been recognized, with a net profit or loss impact of € (177) million. The estimate of the provision is based on the number and the cost of redundancy and relocation packages that the Group expects to pay. It is inherently subject to uncertainty and is monitored by the Human Resources department, in close cooperation with the Finance department.

Defined benefit obligations – General

The actuarial assumptions used in determining the defined benefit obligations at December 31, as well as the annual cost, can be found in note F34 *Provisions*. All main employee benefits plans are assessed annually by independent actuaries. Discount rates and inflation rates are defined centrally by management. The other assumptions (such as future salary increases and expected rates of medical care cost increases) are defined at a local level. All plans are supervised by the Group's central Human Resources department with the help of a central actuary to check the reasonableness of the results and ensure consistency in reporting.

Further details are provided in note F34.A. *Provisions for employee benefits.*

Defined benefit obligations – Guaranteed Minimum Pensions (GMP) equalization in the United Kingdom

On October 26, 2018, the High Court in the United Kingdom issued its long-awaited judgment as to whether GMP benefits had to be equalized between men and women and, if so, how this could be achieved. The High Court judged that the equalization applied only for the period 1990-1997, consistent with the European Court ruling in 1990 that occupational pension plans were required to treat men and women equally. In 1997 GMP was abandoned. As there is no unique method on how to equalize GMPs for men and women following this judgment, together with their actuaries, entities in the United Kingdom are currently assessing how to apply this decision.

Based on preliminary estimates, in line with advice from its external actuaries, the best estimate of the impact on Solvay's defined benefit obligations amounts to € (16) million, and has been recognized in IFRS operating expenses. Any future changes to the calculations will be considered actuarial gains and losses.

Environmental provisions

Environmental provisions are managed and coordinated jointly by the Environmental Rehabilitation department and the Finance department. In the case of environmental impacts stemming from historical production activities, generally no provision is recognized for remediation works beyond 20 years due to the inherent high level of uncertainty as to whether there will be any obligation after the lapse of this period.

The forecasts of expenses are discounted to their present value. The discount rates fixed by geographical area correspond to the average risk-free rate on 10-year government bonds. These rates are set annually by the Finance department and can be revised based on the evolution of economic parameters of the country involved. To reflect the passage of time, the provisions are increased each year at the discount rates described above.

Further details are provided in note F34.B. *Provisions other than for employee benefits.*

Provisions for litigations

Any significant litigation (tax and other, including threat of litigation) is reviewed by Solvay's in-house lawyers with the support, when appropriate, of external counsels at least every quarter. This review includes an assessment of the need to recognize provisions and/or remeasure existing provisions together with the Finance department and the Insurance department.

Further details are provided in note F34.B. *Provisions other than for employee benefits.*

Non-IFRS (Underlying) metrics

Besides IFRS accounts, the Group also presents underlying income statement performance indicators. The objective is to generate a measure that avoids distortion and facilitates the appreciation of performance and comparability of results over time.

See Glossary for definitions of adjustments (IFRS vs Underlying metrics) and Business Review for more information and reconciliation with IFRS figures.

Notes to the consolidated income statement

Preliminary comment: consistent with the presentation in the consolidated income statement, the notes to the consolidated income statement as presented hereinafter do not include the consolidated income statement impacts from discontinued operations that are presented on a separate line. Those are disclosed in note F8 *Discontinued operations*.

NOTE F1
Revenue and segment information

Accounting policy

As explained in the basis of preparation, the Group adopted IFRS 15 on January 1, 2018 using the modified retrospective approach. Hereinafter are disclosed the accounting policies applied in 2018 (IFRS 15 *Revenue from Contracts with Customers*). For accounting policies applied in 2017 (IAS 18 *Revenue*), reference is made to the 2017 Annual Report. Transition impacts have been discussed in the Basis of preparation.

IFRS 15 establishes a five-step model to account for revenue arising from contracts with customers:

- identify the contract;
- identify the performance obligations;
- determine the transaction price;
- allocate the transaction price to the performance obligations in the contract; and
- recognize revenue when or as the Group satisfies a performance obligation.

Under IFRS 15, revenue is recognized at an amount that reflects the consideration to which the Group expects to be entitled in exchange for transferring goods or services to a customer.

Sale of goods: Contracts can be short-term (including those based only on a purchase order) or long-term, some have minimum off-take requirements. As the Group is in the business of selling chemicals, contracts with customers generally concern the sale of goods. As a result, revenue recognition generally occurs at a point in time when control of the chemicals is transferred to the customer, generally on delivery of the goods.

Distinct elements: a good or service that is promised to a customer is distinct if both of the following criteria are met: (a) the customer can benefit from the good or service either on its own or together with other resources that are readily available to the customer (i.e. the good or service is capable of being distinct); and (b) the Group's promise to transfer the good or service to the customer is separately identifiable from other promises in the contract (i.e. the promise to transfer the good or service is distinct within the context of the contract).

The revenue of the Group consists mainly of sales of chemicals, which qualify as separate performance obligations. Value-added services – mainly customer assistance services – corresponding to Solvay's know-how are rendered predominantly over the period that the corresponding goods are sold to the customer.

Variable consideration: some contracts with customers provide trade discounts or volume rebates. Trade discounts and volume rebates give rise to variable consideration under IFRS 15, and are required to be estimated at contract inception and subsequently at each reporting date. IFRS 15 requires the estimated variable consideration to be constrained to prevent overstatement of revenue.

Moment of recognition of revenue: revenue is recognized when (or as) the Group satisfies a performance obligation by transferring a promised good or service (i.e. an asset) to a customer. An asset is transferred when (or as) the customer obtains control of that asset. Substantially all revenue stems from performance obligations satisfied at a point in time, i.e. the sale of goods. Revenue recognition for those takes into account the following:

- the Group has a present right to payment for the asset;
- the customer has legal title to the asset;
- the Group has transferred physical possession of the asset;
- the customer has the significant risks and rewards of ownership of the asset (in this respect, Incoterms are considered); and
- the customer has accepted the asset.

The Group sells its chemicals to its customers, (a) directly, (b) through distributors, and (c) with the assistance of agents. When the Group delivers a product to distributors for sale to end customers, the Group evaluates whether that distributor has obtained control of the product at that point in time. No revenue is recognized upon delivery of a product to a customer or distributor if the delivered product is held on consignment. Indicators of consignment inventory include:

- the product is controlled by the Group until a specified event occurs, such as the sale of the product to a customer of the distributor or until a specified period expires;
- the Group is able to require the return of the product or transfer the product to a third party (such as another distributor); and
- the distributor does not have an unconditional obligation to pay for the product (although he might be required to pay a deposit).

Agents facilitate sales and do not purchase and resell the goods to the end customer.

Products sold to customers generally cannot be returned, other than for performance deficiencies. Customer acceptance clauses are in many cases a formality that would not affect the Group's determination of when the customer has obtained control of the goods.

Revenue from services is recognized in the period in which those services were rendered.

Warranties: warranties provide a customer with assurance that the related product will function as the parties intended because it complies with agreed-upon specifications. Substantially all warranties do not provide the customer with a service in addition to the assurance that the product complies with agreed-upon specifications, and are hence accounted for in accordance with IAS 37 *Provisions, Contingent Liabilities, and Contingent Assets*.

An **Operating Segment** is a component of the Group that engages in business activities from which it may earn revenues and incur expenses, whose operating results are regularly reviewed by the entity's chief operating decision maker, and for which discrete financial information is available. The Solvay Group's chief operating decision maker is the Chief Executive Officer.

General

Solvay is organized into four Operating Segments:

- Advanced Materials offers high-performance materials for multiple applications primarily in the automotive, aerospace, electronics, and health markets. In particular, it provides sustainable mobility solutions, reducing weight and improving CO_2 and energy efficiency;
- Advanced Formulations serves primarily the consumer goods, agro and food, and energy markets. It offers customized specialty formulations that impact surface chemistry and alter liquid behavior, to optimize efficiency and yield, while minimizing the environmental impact;
- Performance Chemicals operates in mature and resilient markets and has leading positions in chemical intermediates. Success is based on economies of scale and state-of-the-art production technology. It serves mainly the consumer goods and food markets;
- Corporate & Business Services includes corporate and other business services, such as the Research & Innovation Center, and energy services.

See the Business Review for more information on Operating Segments and GBUs figures.

External net sales by cluster

In € million	2018	2017
Advanced Materials	**4,385**	**4,370**
Specialty Polymers	2,009	2,025
Composite Materials	1,082	1,038
Silica	442	443
Special Chem	852	865
Advanced Formulations	**3,057**	**2,966**
Novecare	2,000	1,937
Technology Solutions	643	662
Aroma Performance	414	366
Performance Chemicals	**2,808**	**2,766**
Soda Ash & Derivatives	1,562	1,629
Peroxides	654	600
Coatis	509	410
Functional Polymers	82	126
Corporate & Business Services	**7**	**23**
CBS and NBD	7	23
Total	**10,257**	**10,125**

Sales by market

Sales by market are presented in the Business Review, see note B1.

Net sales by country and region

The sales disclosed below are allocated based on the customers' location.

In € million	2018	%	2017	%
Belgium	153	1%	156	2%
Germany	727	7%	716	7%
Italy	444	4%	444	4%
France	402	4%	383	4%
Netherlands	105	1%	112	1%
United Kingdom	279	3%	303	3%
Spain	191	2%	210	2%
European Union – other	501	5%	478	5%
European Union	**2,802**	**27%**	**2,803**	**28%**
Europe – Other	**103**	**1%**	**98**	**1%**
United States	3,001	29%	2,921	29%
Canada	160	2%	159	2%
North America	**3,161**	**31%**	**3,079**	**30%**
Brazil	681	7%	709	7%
Mexico	193	2%	176	2%
Latin America – other	234	2%	200	2%
Latin America	**1,108**	**11%**	**1,084**	**11%**
Australia	100	1%	104	1%
China	942	9%	912	9%
Hong Kong	77	1%	108	1%
India	191	2%	170	2%
Indonesia	105	1%	104	1%
Japan	357	3%	365	4%
Russia	62	1%	79	1%
Saudi Arabia	110	1%	88	1%
South Korea	279	3%	264	3%
Thailand	177	2%	181	2%
Turkey	73	1%	65	1%
Other	610	6%	621	6%
Asia and rest of the world	**3,083**	**30%**	**3,060**	**30%**
Total	**10,257**	**100%**	**10,125**	**100%**

Information per segment

2018 In € million Income statement items	Advanced Formulations	Advanced Materials	Performance Chemicals	Corporate & Business Services	Group Total
Net sales (including the inter-segment sales)	3,060	4,386	2,831	7	10,283
Inter-segment sales	(3)		(23)		(26)
Net sales	3,057	4,385	2,808	7	10,257
Revenue from non-core activities	19	33	312	678	1,042
Gross margin	787	1,474	737	37	3,035
Depreciation and amortization	264	435	198	47	944
Earnings from associates and joint ventures	5	10	27	1	44
Underlying EBITDA[(1)]	*521*	*1,197*	*729*	*(218)*	*2,230*
EBIT					**986**
Net financial charges					(195)
Income taxes					(95)
Profit for the year from discontinued operations					201
Profit for the year					**897**

(1) Underlying EBITDA is a key performance indicator followed by management and includes other elements than those presented above (see Business Review section – 5. Reconciliation of underlying with IFRS figures).

2018 In € million Statement of financial position and other items	Advanced Formulations	Advanced Materials	Performance Chemicals	Corporate & Business Services	Group Total
Capital expenditures (continuing operations)	148	355	149	58	711
Capital expenditures (discontinued operations)			122		122
Investments (continuing operations)		12		4	16
Working capital					
Inventories	446	900	326	13	1,685
Trade receivables	396	535	482	21	1,434
Trade payables	345	437	381	275	1,439

Capital expenditures relate to property, plant, and equipment and to intangible assets.

Investments include acquisitions of subsidiaries and other investments (joint operations, joint ventures, and associates).

2017 In € million Income statement items	Advanced Formulations	Advanced Materials	Performance Chemicals	Corporate & Business Services	Group Total
Net sales (including the inter-segment sales)	2,972	4,371	2,797	23	10,163
Inter-segment sales	(6)	(2)	(31)		(38)
Net sales	2,966	4,370	2,766	23	10,125
Revenue from non-core activities	26	47	159	627	859
Gross margin	764	1,514	761	46	3,086
Depreciation and amortization	280	432	263	79	1,054
Earnings from associates and joint ventures	8	10	27		44
Underlying EBITDA[(1)]	*524*	*1,202*	*749*	*(244)*	*2,230*
EBIT					**976**
Net financial charges					(298)
Income taxes					197
Profit for the year from discontinued operations					241
Profit for the year					**1,116**

(1) Underlying EBITDA is a key performance indicator followed by management and includes other elements than those presented above (see Business Review section – 5. Reconciliation of underlying with IFRS figures).

2017 In € million Statement of financial position and other items	Advanced Formulations	Advanced Materials	Performance Chemicals	Corporate & Business Services	Group Total
Capital expenditures (continuing operations)	130	366	152	68	716
Capital expenditures (discontinued operations)			105		105
Investments (continuing operations)		28		28	56
Working capital					
Inventories	403	802	288	10	1,504
Trade receivables	410	546	430	76	1,462
Trade payables	327	411	324	268	1,330

Capital expenditures relate to property, plant, and equipment and to intangible assets.

Investments include acquisitions of subsidiaries and other investments (joint operations, joint ventures, and associates).

Non-current assets, and capital expenditures and investments, by country and region (continuing operations)

	Non-current assets				Capital expenditures and investments			
In € million	**2018**	**%**	2017	%	**2018**	**%**	2017	%
Belgium	304	2%	376	3%	(51)	7%	(24)	3%
Germany	402	3%	413	3%	(33)	5%	(41)	5%
Italy	581	4%	592	4%	(74)	10%	(87)	11%
France	2,906	21%	2,875	21%	(111)	15%	(124)	16%
United Kingdom	207	1%	211	2%	(28)	4%	(51)	7%
Spain	140	1%	138	1%	(15)	2%	(23)	3%
European Union – other	304	2%	318	2%	(20)	3%	(24)	3%
European Union	**4,844**	**35%**	**4,923**	**35%**	**(332)**	**46%**	**(374)**	**49%**
Europe – other		**0%**	**3**	**0%**	**1**	**0%**		**0%**
United States	7,239	52%	7,057	51%	(249)	34%	(265)	34%
Canada	176	1%	180	1%	(11)	2%	(8)	1%
North America	**7,415**	**53%**	**7,237**	**52%**	**(261)**	**36%**	**(273)**	**35%**
Brazil	256	2%	257	2%	(30)	4%	(27)	3%
Latin America – other	36	0%	27	0%	(8)	1%	(2)	0%
Latin America	**292**	**2%**	**284**	**2%**	**(38)**	**5%**	**(29)**	**4%**
Russia	168	1%	187	1%		0%		0%
Thailand	123	1%	124	1%	(6)	1%	(5)	1%
China	579	4%	604	4%	(41)	6%	(54)	7%
South Korea	123	1%	135	1%	(8)	1%	(12)	2%
India	234	2%	214	2%	(35)	5%	(18)	2%
Singapore	42	0%	44	0%	(1)	0%	(1)	0%
Japan	18	0%	17	0%	(2)	0%	(1)	0%
Egypt		0%	4	0%		0%		0%
Other	184	1%	196	1%	(3)	0%	(5)	1%
Asia and rest of the world	**1,470**	**10%**	**1,525**	**11%**	**(96)**	**13%**	**(96)**	**12%**
Total	**14,022**	**100%**	**13,971**	**100%**	**(727)**	**100%**	**(772)**	**100%**

Non-current assets are those other than deferred tax assets, loans, and other assets. Capital expenditures and investments include acquisitions of property, plant, and equipment, intangible assets, investments in subsidiaries and other investments (joint operations, joint ventures, and associates). Both exclude discontinued operations.

NOTE F2
Consolidated income statement by nature

In € million	Notes	2018	2017
Net sales	*(F1)*	10,257	10,125
Revenue from non-core activities	*(F3)*	1,042	859
Raw materials, utilities and consumables used		(5,344)	(4,984)
Changes in inventories		165	132
Personnel expenses		(2,229)	(2,275)
Wages and direct social benefits		*(1,634)*	*(1,621)*
Employer's contribution for social insurance		*(307)*	*(313)*
Pensions and insurance benefits		*(105)*	*(161)*
Other personnel expenses		*(182)*	*(179)*
Amortization, depreciation and impairment	(F12)	(944)	(1,054)
Other variable logistics expenses		(716)	(658)
Other fixed expenses		(923)	(980)
Addition and reversal of provisions (excluding employee benefit provisions)	*(F31)*	(263)	(93)
Operating lease expenses	*(F24)*	(101)	(94)
M&A costs and gains and losses on disposals	*(F5)*	(3)	(45)
Earnings from associates and joint ventures	*(F25)*	44	44
EBIT		**986**	**976**
Cost of borrowings	*(F6)*	(131)	(172)
Interest on loans and short term deposits	*(F6)*	13	15
Other gains and losses on net indebtedness	*(F6)*	(1)	(44)
Cost of discounting provisions	*(F6)*	(77)	(97)
Profit for the year before taxes		**791**	**678**
Income taxes	*(F7)*	(95)	197
Profit for the year from continuing operations		**697**	**875**
Profit for the year from discontinued operations	*(F8)*	201	241
Profit for the year	*(F9)*	**897**	**1,116**
attributable to:			
Solvay share		858	1,061
non-controlling interests		39	56

NOTE F3
Revenue from non-core activities

This revenue primarily comprises commodity and utility trading transactions and other revenue, considered not to correspond to Solvay's know-how and core business. The increase in 2018 is related mainly to increased sales of excess electricity to the grid following purchases from a new cogeneration unit in Italy.

NOTE F4
Other operating gains and losses

In € million	2018	2017
Start-up and preliminary study costs	(11)	(12)
Capital gains/losses on sales of property, plant and equipment and intangible assets	22	19
Net foreign exchange gains and losses	(4)	(9)
Amortization of intangible assets resulting from PPA	(197)	(206)
Cytec post-retirement medical obligations reduction	24	37
Other	43	16
Other operating gains and losses	**(123)**	**(154)**

NOTE F5
Results from portfolio management and reassessments, legacy remediation and major litigations

Accounting policy

Results from portfolio management and reassessments include:

- gains and losses on the sale of subsidiaries, joint operations, joint ventures, and associates that do not qualify as discontinued operations;
- acquisition costs of new businesses;
- gains and losses on the sale of real estate not directly linked to an operating activity;
- restructuring charges driven by portfolio management and reassessment, including impairment losses resulting from the shutdown of an activity or a plant; and
- impairment losses resulting from testing of CGUs.

Results from legacy remediation and major litigations include:

- the remediation costs not generated by on-going production facilities (shut-down of sites, discontinued productions, previous years' pollution); and
- the impact of significant litigations.

Results from portfolio management and reassessments

In € million	2018	2017
Restructuring costs and impairment	(205)	(143)
M&A costs and gains and losses on disposals	(3)	(45)
Results from portfolio management and reassessments	**(208)**	**(188)**

Results from legacy remediation and major litigations

In € million	2018	2017
Major litigations	(25)	(16)
Remediation costs and other costs related to non-ongoing activities	(60)	(69)
Results from legacy remediation and major litigations	**(86)**	**(84)**

In 2018:

- restructuring costs and impairment relate primarily to:
  - the Group simplification restructuring program (€ (185) million);
  - impairments related to the Porto Marghera divestment (€ (23) million) and to other non-performing assets (€ (16) million);
  - reversal of impairment relating to a cogeneration asset in Brazil (€ 22 million).
- M&A costs and gains and losses on disposals relate mainly to:
  - the capital gain on the disposal of the phosphorus derivatives business (€ 22 million);
  - the estimated expense relating to the Guaranteed Minimum Pensions equalization (€ (14) million) between 1990 and 1997 for Rhodia and Cytec legacies, prior to their acquisition; and
  - the capital loss on the disposal of the Soda Ash business in Egypt (€ (7) million).

In 2017:

- restructuring costs and impairment related to:
  - the closure of sites in China and Korea (€ (13) million);
  - the closure of sites of the Soda Ash business (€ (23) million);
  - impairment with respect to Polyamides retained assets (€ (91) million).
- M&A costs and gains and losses on disposals:
  - the deconsolidation of the Venezuelan entity (€ (72) million, of which € (60) million for CTA recycling);
  - the gain on the Cross Linkable Compound business divestment (€ 43 million); and
  - the loss on the disposal of Dacarto Benvic (€ (13) million).

NOTE F6
Net financial charges

Accounting policy

Interest on borrowings is recognized in costs of borrowings as incurred, with the exception of borrowing costs directly attributable to the acquisition, construction, and production of qualifying assets (see note F22 *Property, Plant and Equipment*).

Net foreign exchange gains or losses on financial items and changes in fair value of derivative financial instruments related to net indebtedness are presented in "Other gains and losses on net indebtedness", with the exception of changes in fair value of derivative financial instruments that are hedging instruments in a cash flow hedge relationship, and which are recognized on the same line as the hedged item, when the latter affects profit or loss.

In € million	2018	2017
Cost of borrowings	(131)	(172)
Interest on loans and short term deposits	13	15
Other gains and losses on net indebtedness	(1)	(44)
Net cost of borrowings	**(118)**	**(201)**
Cost of discounting provisions	(74)	(89)
Impact of change of discount rate on provisions	(3)	(8)
Net financial charges	**(194)**	**(298)**

Details are included in note F36 *Net indebtedness.*

The decrease of the net cost of borrowings is explained mainly by:

- the lower cost of borrowing, following (a) the repayment at maturity (June 2018) of the remaining outstanding amount of the EMTN bond (€ 382 million), already partially early repaid (€ 118 million) in 2017, and (b) the partial early repayment of the two $ Cytec bonds in 2017. The cost of borrowing in 2017 included one-off accretion costs (acceleration) linked to the early repayment for € (10) million; and
- the reduction in other gains and losses on net indebtedness from € (44) million for the year ended December 31, 2017 to € (1) million for the year ended December 31, 2018, resulting mainly from (a) the further optimization of Solvay subsidiary capital structure and swap needs and (b) the one-off premiums incurred in 2017 (€ (15) million) relating to the early repayment of the above-mentioned bonds.

The decrease of cost of discounting provisions relates to post-employment benefits (€ 8 million) and to environmental provisions (€ 12 million) and is explained mainly by the evolution of the applicable discount rates (see also note F34 *Provisions*).

NOTE F7
Income taxes

Accounting policy

Current taxes

The current tax payable is based on taxable profit of the year. Taxable profit differs from profit as reported in the consolidated income statement because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The Group's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

Deferred taxes

Deferred tax is recognized for temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and their corresponding tax bases used in the computation of taxable profit.

Deferred tax assets are generally recognized for all deductible temporary differences, to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized.

Deferred tax liabilities are generally recognized for all taxable temporary differences.

No deferred tax liabilities are recognized following the initial recognition of goodwill. In addition, no deferred tax assets or liabilities are recognized with respect to the initial recognition of an asset or liability in a transaction which is not a business combination and affects neither accounting profit nor taxable profit.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries, joint operations, joint ventures, and associates, except where the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future.

The carrying amount of the deferred tax assets is reviewed at each reporting date. The carrying amount of a deferred tax asset is reduced to the extent that it is no longer probable that the Group will earn sufficient taxable profits against which the deductions can be utilized. Any such reduction is reversed to the extent that it becomes probable that sufficient taxable profits will be available.

Deferred tax assets other than tax loss carryforwards are analyzed on a case-by-case basis, taking into account all relevant facts and circumstances. For example, a zero taxable profit, after deducting the amounts paid to retirees under a defined benefit plan and for which a deductible temporary difference existed, can justify the recognition of the underlying deferred tax assets. Recognition of deferred tax assets for tax loss carryforwards requires a positive taxable profit during the year that enables the utilization of tax losses that originated in the past. Because of uncertainties inherent to predicting such positive taxable profit, recognition of deferred tax assets from tax loss carryforwards is based on a case by case analysis, which is usually based on five-year profit forecasts, except with respect to any financial company for which ten-year financial profit forecasts are considered highly predictable and are consequently used.

The corporate tax reporting team, which has the overview of the Group deferred tax positions, is involved in assessing deferred tax assets.

Further details are provided in note F7.B.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the period in which the liability is settled or the asset is realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

Current tax assets and liabilities are offset when there is a legally enforceable right to set off the recognized amounts and when the Group intends to settle its current tax assets and liabilities on a net basis.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to set off current tax assets against current tax liabilities, and when they relate to income taxes levied by the same taxation authority and the Group intends to settle its current tax assets and liabilities on a net basis.

Current and deferred taxes for the period

Current and deferred taxes for the period are recognized as an expense or income in profit or loss, except when they relate to items that are recognized outside profit or loss (whether in other comprehensive income or directly in equity), in which case the tax is also recognized outside profit or loss, or when they arise from the initial accounting for a business combination. In the case of a business combination, the tax effect is taken into account in the accounting for the business combination.

F7.A. Income taxes

The tax income 2017 (€ 197 million) resulted mainly from the change in tax rates in the United States, from the statutory reorganization in France and from other one-offs.

In € million	2018	2017	
Current taxes related to current year(1)	(158)	(170)	a)
Provisions for tax litigations	4	16	b)
Other current taxes related to prior years	30	(37)	c)
Current taxes	**(124)**	**(191)**	
Changes in unrecognized deferred tax assets	88	126	d)
Deferred tax income on amortization of PPA step-ups	50	63	e)
Deferred tax impact of changes in the nominal tax rates	(2)	155	f)
Deferred taxes related to prior years	2	57	g)
Other deferred taxes(1)	(109)	(12)	h)
Deferred taxes	**30**	**389**	
Income taxes recognized in the consolidated income statement	**(95)**	**197**	
Income taxes on items recognized in other comprehensive income	**1**	**37**	

(1) The Underlying tax expense includes mainly part of the Current taxes related to current year and part of the Other deferred income taxes, as well as the tax impact on the perpetual hybrids bonds classified as equity under IFRS. See Business Review for reconciliation.

Main comments regarding the current taxes

The current taxes relating to current year (item a) in the previous table) decreased slightly (€ 12 million).

The other current taxes relating to prior years (item c) in the previous table) are impacted mainly by the 2017 accrual for the one-time tax on unremitted earnings resulting from the US tax reform enacted at year-end 2017 (€ (33) million). This accrual was reversed in 2018 (€ 31 million) following the application of new IRS guidance in 2018.

Main comments regarding the deferred taxes

(see column "Recognized in income statement" in the table in section F7.C. – *Deferred taxes in the consolidated statement of financial position* for changes in deferred taxes by nature)

- Changes in unrecognized deferred tax assets (item d) in the previous table):
  - In 2017, this change amounted to € 126 million resulting from the statutory reorganization in France (€ 202 million) and from other net de-recognitions for deferred tax assets related to tax losses carried forward in different countries for € (78) million;
  - In 2018, this change amounts to € 88 million resulting mainly from the statutory reorganization in Brazil (€ 38 million) and from the expected capital gain on the Polyamides divestment in 2019 (€ 67 million).
- The deferred tax impact of changes in the nominal tax rates (item f) in the previous table):
  - In 2017, the income of € 155 million resulted mainly from the changes in the nominal tax rates enacted in the United States.
- The deferred taxes related to prior years (item g) in the previous table):
  - In 2017, the deferred tax income due to the reversal of valuation allowances in Italy after the positive outcome of a tax litigation (€ 17 million) and from various true-ups on deferred taxes in different countries (€ 40 million).
- Other deferred taxes (item h) in the previous table):
  - In 2017, the other deferred income taxes (€ (12) million) included:
    - deferred taxes income on "Results from portfolio management and reassessments, legacy remediation, and major litigations" (see note F5 *Results from portfolio management and reassessments, legacy remediation, and major litigations* for pre-tax net expense) for € 75 million;
    - the utilization of tax losses carried forward for € (26) million;
    - other net increase and reversal of other temporary differences for € (61) million.
  - In 2018, the other deferred income taxes (€ (109) million) included:
    - deferred taxes income on "Results from portfolio management and reassessments, legacy remediation and major litigations" (see note F5 *Results from portfolio management and reassessments, legacy remediation, and major litigations* for pre-tax net expense) for € 56 million;
    - the utilization of tax losses carried forward for € (99) million;
    - other net increase and reversal of other temporary differences for € (66) million.

New guidance relating to the US tax reform could be issued in 2019 and trigger a review, if applicable to Solvay, of some estimates at year-end 2018.

F7.B. Reconciliation of the income tax expense

The effective income tax expense has been reconciled with the theoretical tax expense obtained by applying to the pre-tax profit of each Group entity the nominal tax rate prevailing in the country in which it operates.

In € million	2018	2017	
Profit for the year before taxes	791	678	
Earnings from associates and joint ventures	43	44	
Profit for the year before taxes excluding earnings from associates and joint ventures	**748**	**634**	
Reconciliation of the tax charge			
Total tax charge of the Group entitites computed on the basis of the respective local nominal rates	(201)	(169)	
Weighted average nominal rate	27%	27%	
Tax effect of changes in nominal tax rates	(2)	155	a)
Changes in unrecognized deferred tax assets	88	126	b)
Tax effect of permanent differences	9	61	c)
Gains and losses with no tax expense and income	7	(1)	
US taxes disconnected from profit for the year before taxes	(21)		d)
Provisions for tax litigations	4	16	
Other tax effect of current and deferred tax adjustments related to prior years	32	21	e)
Tax effect on distribution of dividends	(11)	(11)	
Effective tax income (charge)	**(95)**	**197**	
Effective tax rate	**12%**	**(29%)**	

The weighted average nominal rate was stable at 27% in 2018 and in 2017. A decrease of (4)% results from the US tax rate reduction to 21%. This decrease has been offset by:

- higher earnings before taxes in Brazil at a higher nominal tax rate (34%) which impacts the weighted nominal tax rate by +1.5%;
- change of mix in taxable profits which impacts the weighted nominal tax rate by +2.5%.

The significant change in effective tax rate from (29)% in 2017 to 12% in 2018 results mainly from:

- The deferred tax impact of changes in the nominal tax rates (see comments on item f) in section F.7.A. *Income taxes*);
- The changes in unrecognized deferred tax assets (see comments on item d) in section F.7.A. *Income taxes*);
- The tax impact of decreased permanent differences in 2018 versus 2017 for € (52) million mainly due to the impact of non-taxable capital gains in 2017;
- The impact of the US tax reform in 2018 (€ (21) million) on various taxes disconnected from the earnings before taxes (including the US Base Erosion and Anti-Abuse Tax (BEAT));
- The other tax effects of current and deferred tax adjustments relating to prior years (see comments on items c) and g) in section F.7.A. *Income taxes*).

F7.C. Deferred taxes in the consolidated statement of financial position

2018 In € million	Opening balance	Recognized in income statement	Recognized in other compre-hensive income	Exchange rate effect	IFRS 9	Transfer to asset held for sale	Other	Closing balance
Temporary differences								
Tax losses (gross amount)	2,083	2		1			2	2,088
Of which unrecognized tax losses	(1,737)	8						(1,729)
Employee benefits obligations	599	(41)	(1)	1		(7)	(1)	549
Provisions other than employee benefits	188	63		1				252
Property, plant and equipment and intangible assets	(810)	14		(29)		24		(801)
Goodwill	15							15
Tax credits[1]	159	(126)						32
Assets held for sale		13					(13)	
Other[2]	(20)	96	2		2	4	16	101
Total (net amount)	**476**	**30**	**1**	**(26)**	**2**	**20**	**4**	**505**
Deferred tax assets in the consolidated statement of financial position	1,076							1,123
Deferred tax liabilities in the consolidated statement of financial position	(600)							(618)
(1) Of which reversal of US foreign tax credits due to reversal of one-time tax	123	(123)						
(2) Of which reversal of US one-time tax	(123)	123						

The net deferred tax assets at year-end 2018 amount to € 505 million.

At year-end 2018, the total deferred tax assets on losses amounts to € 2,088 million of which € 1,729 million are not recognized. The recognized amount is € 359 million.

The deferred tax assets/liabilities on other temporary differences at year-end 2018 relate mainly to:

- Employee benefits obligations for € 549 million;
- Provisions for € 252 million (mainly remediation);
- Property, plant and equipment and intangible assets for € (801) million of which € (474) million for step-ups of intangible assets resulting from Purchase Price Allocations (Rhodia and Cytec);
- Other items (€ 101 million) of which:
  - € (51) million for deferred tax liabilities on unremitted earnings of which € 20 million were not recognized because the Group controls the timing of the reversal of the temporary differences and it is probable that they will not reverse in the foreseeable future;
  - € 133 million for other temporary differences (inventories, 2018 disallowed interest in the United States due to the latest guidance for the tax reform, etc.).

With the enactment of the US tax reform at the end of 2017, a one-time tax on unremitted earnings was recognized together with foreign tax credits in the income statement for € 123 million. Based on the 2017 tax return filed in 2018, these foreign tax credits have been utilized.

Recognized deferred tax assets, for which utilization depends on future taxable profits in excess of the profit arising from the reversal of existing taxable temporary differences within entities that have suffered a tax loss in either current or preceding year in the related tax jurisdiction, amount to € 745 million. This recognition is justified by favorable expectations as to future taxable profits.

2017 In € million	Opening balance	Recognized in income statement	Recognized in other compre-hensive income	Exchange rate effect	Acquisition/ disposal	Transfer to asset held for sale	Other	Closing balance
Temporary differences								
Tax losses (gross amount)	2,679	(579)		(15)	(10)	(1)	10	2,083
Of which unrecognized tax losses	(2,235)	498						(1,737)
Employee benefits obligations	435	160	33	(20)	2	(9)	(2)	599
Provisions other than employee benefits	244	(36)		(19)				188
Property, plant and equipment and intangible assets	(1,246)	325		129	(38)	18	1	(810)
Goodwill	15							15
Tax credits	35	131		(7)				159
Assets held for sale		14					(14)	
Other	55	(125)	4	(2)	34	13	2	(20)
Total (net amount)	**(19)**	**389**	**37**	**66**	**(12)**	**21**	**(4)**	**476**
Deferred tax assets in the consolidated statement of financial position	890							1,076
Deferred tax liabilities in the consolidated statement of financial position	(909)							(600)

F7.D. Other information

For the majority of the Group's tax loss carryforwards, no deferred tax assets have been recognized. The unrecognized tax losses are located mainly in countries where they can be carried forward indefinitely.

The tax loss carryforwards generating deferred tax assets are given below by expiration date.

In € million	2018	2017
Within 1 year	19	16
Within 2 years	18	15
Within 3 years	6	22
Within 4 years	18	20
Within 5 or more years	202	331
No time limit	1,037	930
Total of tax losses carried forward which have generated recognized deferred tax assets	**1,302**	**1,334**
Tax losses carried forward for which no deferred tax assets were recognized	6,916	7,044
Total of tax losses carried forward	**8,217**	**8,378**

The tax losses carryforwards (€ 1,302 million) have generated deferred tax assets for € 359 million. In 2017, the tax loss carryforwards (€ 1,334 million) had generated deferred tax assets for € 346 million.

NOTE F8
Discontinued operations

Accounting policy

A discontinued operation is a component of the Group which the Group has disposed of or which is classified as held for sale (see note F30 *Assets held for sale*), and which:

- represents a separate major line of business or geographical area of operations;
- is part of a single coordinated plan to dispose of a separate major line of business or geographical area of operations; or
- is a subsidiary acquired exclusively with a view to resale.

A component of the Group consists of operations and cash flows, which can be clearly distinguished, operationally and for financial reporting purposes, from the rest of the Group.

In the consolidated statement of comprehensive income, the consolidated statement of cash flows, and disclosures discontinued operations are re-presented for prior periods.

2018 In € million	Polyamides	Other	Total
Net sales	1,563		1,563
EBIT	288	(4)	284
Financial result	(3)		(3)
Tax	(80)		(80)
Profit (loss) from discontinued operations	**205**	**(5)**	**201**
attributable to Solvay share	205	(5)	201

Polyamides EBIT includes M&A costs for € (18) million.

The € (5) million in the column Other refer to post-closing adjustments related to the disposal of Acetow.

2017 In € million	Polyamides	Acetow	Emerging Biochemicals	Other	Total
Net sales	1,558	204	41		1,803
EBIT	121	220	25	(54)	311
Financial result	(3)	(1)			(4)
Tax	(60)	(6)			(67)
Profit (loss) from discontinued operations	**58**	**213**	**25**	**(54)**	**241**
attributable to:					
Solvay share	58	213	20	(54)	237
non-controlling interests			4		4

The € (54) million in the column Other resulted mainly from post-closing warranties relating to the disposal of the Pharma business and the adjustment for the Indupa purchase price.

The EBIT for Polyamides includes M&A costs and impairment on intangible assets for € (45) million. The EBIT for Acetow included the capital gain for € 180 million. The EBIT for Emerging Biochemicals included the capital gain for € 24 million.

NOTE F9
Profit for the year

Profit for the year amounts to € 897 million as against € 1,116 million in the previous year. See previous notes for explanations on the main variations.

NOTE F10
Earnings per share

Accounting policy

The basic earnings per share are obtained by dividing profit for the year by the weighted average number of ordinary shares outstanding during the reporting period. The weighted average number of ordinary shares excludes the treasury shares held by the Group over the reporting period.

The diluted earnings per share are obtained by dividing profit for the year, adjusted for the effects of dilutive potential ordinary shares, by the weighted average number of ordinary shares, also adjusted by the number of dilutive potential ordinary shares attached to the issuance of share options.

The number of dilutive potential ordinary shares is calculated for the weighted average number of share options outstanding during the reporting period as the difference between the average market price of ordinary shares during the reporting period and the exercise price of the share option. Share options have a dilutive effect only when the average market price is above the exercise price (share options are "in the money").

For the purpose of calculating diluted earnings per share, there were no adjusting elements to the profit for the year (Solvay share).

Basic and diluted amounts per share for discontinued operations are presented in the consolidated income statement.

Number of shares (in thousands)	2018	2017
Weighted average number of ordinary shares (basic)	103,277	103,352
Dilution effect of subscription rights	459	733
Weighted average number of ordinary shares (diluted)	103,735	104,084

	2018		2017	
	Basic	Diluted	Basic	Diluted
Profit for the year (Solvay share) including discontinued operations (in € thousands)	858,032	858,032	1,060,922	1,060,922
Profit for the year (Solvay share) excluding discontinued operations (in € thousands)	657,378	657,378	823,962	823,962
Earnings per share (including discontinued operations) (in €)	8.31	8.27	10.27	10.19
Earnings per share (excluding discontinued operations) (in €)	6.37	6.34	7.97	7.92

Full data per share, including dividend per share, can be found in the Business Review section.

The average market price during 2018 was € 110.21 per share (2017: € 118.56 per share). The following share options were out of the money, and therefore antidilutive for the period presented, but could potentially dilute basic earnings per share in the future (see note F33 *Share-based payments*):

Antidilutive share options	Date granted	Exercise price (in €)	Number of share options granted	Number of share options outstanding
Share option plan 2015	25/2/2015	114.51	346,617	346,617
Share option plan 2017	23/2/2017	111.27	316,935	316,935
Share option plan 2018–1	27/2/2018	113.11	400,704	400,704
Total			**1,064,256**	**1,064,256**

Notes to the consolidated statement of comprehensive income

NOTE F11
Consolidated statement of comprehensive income

Accounting policy

In accordance with IAS 1 *Presentation of Financial Statements*, the Group elected to present two statements, i.e. a consolidated income statement immediately followed by a consolidated statement of comprehensive income. The components of other comprehensive income (OCI) are presented before related tax effects with one amount shown for the aggregate amount of income tax relating to those components. Tax impacts are further disclosed in this note.

Presentation of the tax effect relating to each item of other comprehensive income

Note: the below table presents the total other comprehensive income items for the aggregate of the shares of Solvay and the non-controlling interests.

	2018			2017		
In € million	**Before-tax amount**	**Tax expense(–)/ income (+)**	**Net-of-tax amount**	Before- tax amount	Tax expense(–)/ income (+)	Net-of-tax amount
Recyclable components						
Gains and losses on available-for-sale financial assets				(1)	(2)	(3)
Effective portion of gains and losses on hedging instruments in a cash flow hedge	(61)	5	(57)	49	6	55
Recycling to the income statement	14		14	(33)		(33)
Gains and losses on hedging instruments in a cash flow hedge (see note F35)	**(47)**	**5**	**(42)**	**15**	**6**	**22**
Currency translation differences arising during the year	241		241	(893)		(893)
Recycling of currency translations differences relating to foreign operations disposed of in the year	13		13	118		118
Other movement of currency translation differences (NCI) relating to foreign operations disposed of in the year				(24)		(24)
Currency translation differences - Subsidiaries and joint operations	***255***		***255***	***(799)***		***(799)***
Currency translation differences arising during the year	(34)		(34)	(40)		(40)
Recycling of currency translations differences relating to foreign operations disposed of in the year				9		9
Currency translation differences - Associates and joint ventures	***(34)***		***(34)***	***(31)***		***(31)***
Currency translation differences	**220**		**220**	**(830)**		**(830)**
Non recyclable components						
Gains and losses on equity instruments measured at fair value through other comprehensive income	3		4			
Remeasurements of the net defined benefit liability (see note F34)	26	(4)	22	95	32	127
Other comprehensive income	**203**	**1**	**204**	**(721)**	**37**	**(684)**

In 2017 taxes in other comprehensive income included adjustments resulting from tax reforms and the statutory reorganization in France that impacted the balance of deferred taxes relating to actuarial gains and losses on defined benefit pension plans.

Currency translation differences

Accounting policy

For the purpose of presenting consolidated financial statements at the end of each reporting period, the assets and liabilities of the Group's foreign operations are expressed in euros using closing rates. Income and expense items are translated at the average exchange rates for the period, except when the impact of applying the average rate is materially different from applying the spot rate at the date of the respective transactions, in which case the latter is applied. Exchange differences arising, if any, are recognized in other comprehensive income as "currency translation differences".

Currency translation differences are reclassified from equity to profit or loss, on:

- a disposal of the Group's entire interest in a foreign operation, or a partial disposal involving loss of control over a subsidiary that includes a foreign operation. In this case, all of the accumulated exchange differences in respect of that operation attributable to the Group are reclassified to profit or loss. Any exchange differences that have previously been attributed to non-controlling interests are derecognized, but they are not reclassified to profit or loss;
- a partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation, when the retained interest is a financial asset. In this case, all of the accumulated exchange differences in respect of that operation attributable to the Group are reclassified to profit or loss;
- a partial disposal of an interest in a joint venture or an associate that includes a foreign operation and that continues to be accounted for as a joint venture or an associate. In this case, a proportionate share of the accumulated exchange differences is reclassified to profit or loss.

In the case of a partial disposal of a subsidiary (*i.e.* no loss of control) that includes a foreign operation, the proportionate share of accumulated exchange differences is reattributed to non-controlling interests and is not recognized in profit or loss.

In the case of (a) a capital decrease of a subsidiary without loss of control, or (b) a capital decrease of an equity method investee or a joint operation without modification of the share of equity interest held in that investee, no accumulated exchange differences are reclassified from equity to profit or loss.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated into the Group's presentation currency at the closing rate.

The total currency translation gains amount to € 220 million in 2018, and include:

- € 207 million currency translation gain, of which € 202 million for the Group's share; and
- the recycling of € 13 million currency translation loss relating mainly to the sale of Soda Ash business in Egypt, of which € 15 million for the Group's share.

The € 207 million currency translation gains are linked to the revaluation of the US dollar (€ 289 million) and to the devaluation of the Brazilian real (€ (30) million), the Chinese renminbi (€ (24) million), and the Russian ruble (€ (25) million), against the euro.

The total currency translation losses amounted to € (830) million in 2017, and included:

- € (932) million currency translation losses, of which € (921) million for the Group's share;
- the recycling of € 126 million currency translation loss related mainly to the sale of Acetow (€ 27 million) and Emerging Biochemicals (€ 26 million) and the deconsolidation of the investment in Venezuela (€ 60 million); and
- the derecognition of € (24) million currency translation gains for Emerging Biochemicals non-controlling interests.

The € (932) million currency translation losses are linked to the devaluation of the US dollar (€ (811) million), the Brazilian real (€ (45) million), the Saudi Arabia riyal (€ (30) million), and the Russian ruble (€ (17) million), against the euro.

Notes to the consolidated statement of cash flows (continuing and discontinued operations)

NOTE F12
Depreciation, amortization and impairments

In 2018 total depreciation, amortization and impairment losses amount to € 944 million, of which:

- straight-line depreciation and amortization of € 921 million for continuing operations including:
  - cost of goods sold (€ 548 million);
  - administrative costs (€ 97 million);
  - research and development costs (€ 59 million);
  - other (€ 217 million), including € 197 million for PPA amortization (see note F4 *Other operating gains and losses*).
- net impairment loss of € 23 million for continuing operations (see note F5 *Results from portfolio management and reassessments, legacy remediation and major litigations*).

In 2017 total depreciation, amortization, and impairment losses amounted to € 1,152 million, of which:

- straight-line depreciation and amortization of € 954 million for continuing operations including:
  - cost of goods sold (€ 552 million);
  - administrative costs (€ 106 million);
  - research and development costs (€ 55 million);
  - other (€ 241 million), including € 206 million for PPA amortization (see note F4 *Other operating gains and losses*).
- net impairment loss of € 100 million for continuing operations (see note F5 *Results from portfolio management and reassessments, legacy remediation and major litigations*); and
- € 98 million for discontinued operations, including € 69 million for straight-line depreciation and amortization (including PPA) related to Polyamides.

NOTE F13
Other non operating and non cash items

The other non-operating and non-cash items for 2018 (€ (12) million) mainly include the results related to the disposal of the phosphorus-derivatives business (€ (22) million) and of the Soda Ash business in Egypt (€ 7 million).

The other main non-operating and non-cash items for 2017 (€ (179) million) include the result relating to the disposal of Acetow (€ (180) million), Cross-Linkable Compound (€ (43) million), and Emerging Biochemicals (€ (23) million), and the loss relating to the deconsolidation of the Venezuelan subsidiary (€ 72 million).

NOTE F14
Income taxes

In 2018

Income tax expense amounts to € 175 million, of which € 95 million for continuing operations.

Income tax paid amounts to € 235 million, of which € 211 million for continuing operations.

In 2017

Income tax expense amounted to € 131 million, of which € 197 million for continuing operations.

Income tax paid amounted to € 237 million, of which € 199 million for continuing operations.

Taxes are discussed in note F7 *Income taxes.*

NOTE F15
Changes in working capital

In € million	2018	2017
Inventories	(239)	(141)
Trade receivables	60	(137)
Trade payables	98	60
Other receivables/payables	(68)	2
Changes in working capital	**(148)**	**(216)**
Of which discontinued operations	(39)	(50)

See comments in the Business Review section.

NOTE F16
Additions, reversals and use of provisions

In 2018:

- additions and reversals on provisions amount to € 315 million and include the provision relating to the Group's transformation restructuring program (€ 177 million);
- use of provisions amounts to € (395) million, of which € (5) million for discontinued operations.

See note F34 *Provisions* for more information.

In 2017:

- additions and reversals on provisions amounted to € 216 million;
- use of provisions amounted to € (408) million, of which € (22) million for discontinued operations, mainly Polyamides.

NOTE F17
Cash flows from investing activities – acquisition/disposal of assets and investments

2018 In € million	Acquisitions	Disposals	Total
Subsidiaries	(12)	26	14
Other	(4)		(4)
Total investments	(16)	26	10
Property, plant and equipment/Intangible assets	(833)	42	(791)
Total	**(849)**	**69**	**(781)**

2017 In € million	Acquisitions	Disposals	Total
Subsidiaries	(44)	891	846
Other	(11)		(11)
Total investments	(55)	891	836
Property, plant and equipment/Intangible assets	(822)	75	(746)
Total	**(877)**	**966**	**89**

In 2018

The acquisition of subsidiaries (€ (12) million) relates to post-acquisition payments of Cytec.

The disposal of subsidiaries (€ 26 million) relates mainly to the phosphorus derivative business for € 54 million, the Soda Ash business in Egypt for € 10 million, M&A costs for Polyamides divestment for € (20) million. The balance is composed of amounts paid or received for prior years' disposals without impact on the 2018 income statement (deferred payment for purchase of BASF shares in Solvin for € (22) million and Cross-Linkable Compound for € 4 million).

The acquisition of property, plant and equipment and intangible assets (€ (833) million) relates to various projects:

- Corporate: investment in Material Science Application Center in Brussels (Belgium);
- Soda Ash & Derivatives: refurbishment of a cogeneration unit in Bernburg (Germany);
- Special Chem: new eH_2O_2 plant in Rosignano (Italy) and in Zhengiang (China);
- Specialty Polymers: new production unit dedicated to Polyethersulfone (PESU) in Panoli (India);
- Specialty Polymers: Polyvinylidene Fluoride (PVDF) capacity increase in Tavaux (France);
- Technology Solutions: doubling of production capacity of hindered amine light stabilizers (HALS) in Willow Island (USA).

In 2018, the cash in from disposal of property, plant, and equipment relates to the sale of real estate (€ 27 million), mainly following restructuring initiatives or changes in portfolio and cash in from disposal of intangible assets related to the sale of customer lists (€ 15 million). In 2017 the cash in from disposal of property, plant, and equipment related mainly to the sale of real estate, following relocalization of our plants in Korea, restructuring initiatives, or changes in portfolio.

In 2017

The acquisition of subsidiaries (€ (44) million) related mainly to the acquisition of European Carbon Fiber GmbH (€ (16) million), Energain (€ (13) million), and post-acquisition payments relating to Cytec (€ (17) million).

The disposal of subsidiaries (€ 891 million) related mainly to the disposal of Acetow (€ 734 million), Emerging Biochemicals (€ 180 million), Cross-Linkable Compound (€ 62 million), and Formulated Resin (€ 38 million). The balance was composed mainly of amounts paid for prior years' disposals without impact on the 2017 income statement (Inovyn (€ (79) million), BASF (€ (22) million), and Indupa (€ (19) million).

The acquisition of property, plant and equipment and intangible assets (€ (822) million) related to various projects:

- Composite Materials: expansion of adhesive capacity in Wrexham (United Kingdom);
- Peroxides: construction of a 60Kt H_2O_2 plant at Zhengiang (China);
- Special Chem: new eH_2O_2 plant in Rosignano (Italy) and in Zhengiang (China);
- Specialty Polymers: investment in Fluorelastomers and PVDF in Changshu (China);
- Specialty Polymers: investment in Polyetheretherketone (PEEK) capacity (United States);
- Specialty Polymers: new production unit dedicated to Polyethersulfone (PESU) in Panoli (India).

NOTE F18
Other cash flows from financing activities

The other cash flows from financing activities (€ 123 million in 2018 and € 13 million in 2017) relate mainly to the receipt of margin calls on hedging instruments as part of Energy Services' activities (€ 137 million in 2018 and € 17 million in 2017). The strong increase in 2018 is due to the increase of the CO_2 emission rights price throughout the year (from € 8 per ton at the end of 2017 to € 25 per ton at the end of 2018).

For trading in futures of different commodities (CO_2, power, gas, and coal), Energy Services uses brokers. These deals are subject to margin calls. To cover the credit risk of the counterparty, brokers pay a margin call to Solvay in case the instrument is in the money for Solvay. Vice versa if the instrument is out of the money for Solvay, Solvay pays a margin call to the brokers. The margin calls are presented as part of financial debt (see note F36 *Net indebtedness*). Cash flows from margin calls are recognized as financing cash flows that fluctuate with the fair value of the instrument. The actual settlement of these commodity derivatives is net of margin calls and the gross amount (including margin calls that are reclassified from financing cash flows) is recognized in operating cash flows.

NOTE F19
Cash flow from discontinued operations

The 2018 cash flow from discontinued operations (€ 120 million) relates to Polyamides.

The 2017 cash flow from discontinued operations (€ 77 million) resulted mainly from the total cash flow of Polyamides (€ 67 million) and Acetow (€ 15 million).

Notes to the consolidated statement of financial position

NOTE F20
Intangible assets

Accounting policy

General

An intangible asset is an identifiable non-monetary asset without physical substance. It is identifiable when it is separable, *i.e.* is capable of being separated or divided from the Group, or when it arises from contractual or other legal rights. An intangible asset shall be recognized if, and only if:

a. it is probable that the expected future economic benefits that are attributable to the asset will flow to the Group; and
b. the cost of the asset can be measured reliably.

Intangible assets acquired or developed internally are initially measured at cost. The cost of an acquired intangible asset comprises its purchase price, import duties, and non-refundable purchase taxes, after deducting trade discounts and rebates, and any directly attributable cost of preparing the asset for its intended use. Subsequent expenditure on intangible assets is capitalized only if it is probable that it will increase the future economic benefits associated with the specific asset. Other expenditure is recognized in profit or loss as incurred.

After initial recognition, intangible assets are measured at cost less accumulated amortization and impairment losses, if any.

Intangible assets are amortized on a straight-line basis over their estimated useful lives, which do not exceed the contractual period, if any. The estimated useful lives, residual values, and amortization methods are reviewed at each year end, and any changes in estimates are accounted for prospectively.

Patents and trademarks	2-20 years
Software	3-5 years
Development expenditures	2-5 years
Customer relationships	5-29 years
Other intangible assets – Technologies	5-20 years

Amortization expense is included in the consolidated income statement within cost of goods sold, administrative costs, research and development costs, and other operating gains and losses.

The asset is tested for impairment if (a) there is a trigger for impairment, and (b) annually for projects under development (see note F27 *Impairment of property, plant, and equipment, intangible assets, and equity method investees).*

Intangible assets are derecognized from the consolidated statement of financial position on disposal or when no future economic benefits are expected from their use or disposal. The gain or loss arising from the derecognition of an intangible asset is recognized in profit or loss at the moment of derecognition.

Research and Development costs

Research costs are recognized in profit or loss in the period in which they are incurred.

Development costs are capitalized if, and only if, all the following conditions are fulfilled:

- the cost of the asset can be reliably measured;
- the technical feasibility of the product has been demonstrated;
- the product or process will be placed on the market or used internally;
- the assets will generate future economic benefits (a potential market exists for the product or, where it is to be used internally, its future utility has been demonstrated); and
- the technical, financial, and other resources required to complete the project are available.

Development costs comprise employee expenses, the cost of materials and services directly attributable to the projects, and an appropriate share of directly attributable fixed costs including, and where applicable, borrowing costs. The intangible assets are amortized as from the moment they are available for use, *i.e.* when they are in the location and condition necessary for them to be capable of operating in the manner intended by management. Development costs which do not satisfy the above conditions are recognized in profit or loss as incurred.

Patents, trademarks, and customer relationships

Those intangible assets have been acquired mainly through business combinations. Customer relationships consist of customer lists.

Other intangible assets

Other intangible assets include mainly technology acquired separately or in a business combination.

In € million	Development costs	Patents and trademarks	Customer relationships	Other intangible assets	Total
Gross carrying amount					
At December 31, 2016	**292**	**1,742**	**2,172**	**789**	**4,995**
Additions	69	11		35	115
Disposals and closures	(30)	(15)		(7)	(51)
Increase through business combinations		11			11
Currency translation differences	(8)	(132)	(199)	(70)	(410)
Other	9	31		(18)	22
Transfer to assets held for sale	(47)	(60)	(85)	(11)	(204)
At December 31, 2017	**285**	**1,588**	**1,888**	**717**	**4,479**
Additions	88	19		35	142
Disposals and closures	(6)	(5)		(5)	(16)
Increase through business combinations				5	5
Currency translation differences	2	34	68	18	122
Other	2	25		(28)	(1)
Transfer to assets held for sale	1			1	2
At December 31, 2018	**372**	**1,661**	**1,956**	**743**	**4,731**
Accumulated amortization					
At December 31, 2016	**(84)**	**(629)**	**(423)**	**(260)**	**(1,395)**
Amortization	(37)	(121)	(160)	(54)	(372)
Impairment		(18)		(12)	(31)
Disposals and closures	30	15		6	50
Currency translation differences	1	30	16	26	74
Other	(5)	6		(2)	(1)
Transfer to assets held for sale	20	37	75	3	135
At December 31, 2017	**(74)**	**(680)**	**(492)**	**(293)**	**(1,539)**
Amortization	(36)	(110)	(135)	(49)	(330)
Impairment	(2)				(3)
Disposals and closures	6	5		5	16
Currency translation differences		(5)	(10)	(8)	(23)
Other		2	(4)	14	12
Transfer to assets held for sale		(1)		(3)	(4)
At December 31, 2018	**(105)**	**(790)**	**(640)**	**(335)**	**(1,871)**
Net carrying amount					
At December 31, 2016	208	1,113	1,750	529	3,600
At December 31, 2017	211	908	1,396	424	2,940
At December 31, 2018	**266**	**872**	**1,315**	**408**	**2,861**

Intangibles relate mainly to the intangibles acquired through the acquisitions of Rhodia and Cytec. The average remaining useful life of Rhodia's assets is four years, and that of Cytec's assets is 14 years.

Impairments recognized in 2017 related to discontinued operations.

NOTE F21
Goodwill and business combinations

Accounting policy

General

Acquisitions of subsidiaries are accounted for using the acquisition method. The consideration for each acquisition is measured at the aggregate of the fair values (at the date of acquisition) of assets transferred and liabilities incurred or assumed, and equity instruments issued by the Group in exchange for control of the acquiree. Acquisition-related costs are recognized in profit or loss as incurred.

Where applicable, the consideration for the acquisition includes any asset or liability resulting from a contingent consideration arrangement, measured at its acquisition-date fair value. Subsequent changes in such fair values are adjusted against the cost of acquisition where they qualify as measurement period adjustments (see below). All other subsequent changes in the fair value of contingent consideration classified as an asset or liability are accounted for in accordance with relevant IFRSs, generally through profit or loss.

Where a business combination is achieved in stages, the Group's previously held interests in the acquired entity are remeasured to fair value at the acquisition date (*i.e.* the date the Group obtains control) and the resulting gain or loss, if any, is recognized in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified to profit or loss, where such treatment would be appropriate if that interest were disposed of.

The acquiree's identifiable assets, liabilities, and contingent liabilities that meet the conditions for recognition under IFRS 3 *Business Combinations* are recognized and measured at their fair value at the acquisition date, except that:

- deferred tax assets or liabilities, and liabilities or assets related to employee benefit arrangements, are recognized and measured in accordance with IAS 12 *Income Taxes,* and IAS 19 *Employee Benefits*, respectively;
- liabilities or equity instruments relating to the replacement by the Group of an acquiree's share-based payment awards are measured in accordance with IFRS 2 *Share-based Payment*; and
- assets (or disposal groups) that are classified as held for sale in accordance with IFRS 5 *Non-current Assets Held for Sale and Discontinued Operations* are measured in accordance with that Standard.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period (see paragraph below), or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed as of the acquisition date that, if known, would have affected the amounts recognized as of that date.

The measurement period is the period from the date of acquisition to the date the Group obtains complete information about facts and circumstances that existed as of the acquisition date, and does not exceed twelve months.

Goodwill

Goodwill arising in a business combination is recognized as an asset at the date that control is obtained (the acquisition date). Goodwill is measured as the excess of the sum of:

a. the consideration transferred;

b. the amount of any non-controlling interests in the acquiree; and

c. in a business combination achieved in stages, the acquisition date fair value of the previously held equity interest in the acquiree

over the share acquired by the Group in the fair value of the entity's identifiable net assets at the acquisition date.

Goodwill is not amortized but is tested for impairment on an annual basis, and more frequently if any impairment triggers are identified.

For the purpose of impairment testing, goodwill is allocated to each of the Group's cash-generating units (or groups of cash-generating units) in accordance with IAS 36 *Impairment of Assets*.

A cash-generating unit (CGU) is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other group(s) of assets.

These tests consist of comparing the carrying amount of the assets or (groups of) CGUs with their recoverable amount. The recoverable amount of an asset, a (group of) CGU(s) is the higher of its fair value less costs to sell and its value in use. If the recoverable amount of the CGU is less than its carrying amount, the impairment loss is allocated to reducing firstly the carrying amount of any goodwill allocated to the unit and then the other assets of the unit pro rata. on the basis of the carrying amount of each asset in the unit. An impairment loss recognized on goodwill shall not be reversed in a subsequent period.

Assets held for sale include their related goodwill.

On disposal of an operation within a CGU to which goodwill has been allocated, the goodwill associated with the operation disposed of is included in the determination of the profit or loss on disposal. It is measured on the basis of the relative values of the operation disposed of and the portion of the CGU retained, unless another method better reflects the goodwill associated with the operation disposed of.

Goodwill – overview

In € million	Total
Net carrying amount	
At December 31, 2016	**5,679**
Disposals	(35)
Currency translation differences	(421)
Transfer to assets held for sale	(180)
At December 31, 2017	**5,042**
Currency translation differences	139
Other	(8)
At December 31, 2018	**5,173**

In 2018 the change in goodwill is explained by the currency translation differences relating mainly to goodwill expressed in US dollars.

In 2017, the change in goodwill was explained by:

- the disposal of a part of the Performance Chemicals segment following the divestment of Acetow (€ (35) million);
- currency translation differences relating mainly to goodwill expressed in US dollars; and
- the transfer of goodwill relating mainly to Polyamides (€ (173) million) and Phosphorus Derivatives (€ (7) million) to assets held for sale.

Goodwill by CGU

Goodwill acquired in a business combination is allocated to the CGU or groups of CGUs (Operating Segments) that are expected to benefit from that business combination.

In € million	2017						2018		
	At beginning of the period	Adjust-ments	Transfer to assets held for sale	Acqui-sitions and divest-ments	Currency trans-lation differ-ences	At the end of the period	**Adjust-ments**	**Currency trans-lation differ-ences**	**At the end of the period**
Groups of CGUs (Operating segments)									
Advanced Formulations	192	2				194			194
Advanced Materials	493					493			493
Performance Chemicals	124		(3)	(35)		86			86
Cash-generating units									
Composite Materials	1,447				(181)	1,266	(8)	61	1,319
Novecare	1,335				(104)	1,231		33	1,264
Technology Solutions	1,037		(7)		(127)	903		43	947
Special Chem	227	(2)				225			225
Polyamides	170		(170)						
Specialty Polymers	184				(7)	178		1	179
Soda Ash and Derivatives	162					162			162
Coatis	82					82			82
Silica	72					72			72
Aroma Performance	49					49			49
Energy Services	50					50			50
Hydrogen Peroxyde Europe	20				1	21			21
Hydrogen Peroxyde Mercosul	14					14			14
Hydrogen Peroxyde Nafta	8				(1)	7			7
Hydrogen Peroxyde Asia	10					11			11
PVC Mercosur	1				(1)				
Total goodwill	**5,679**		**(180)**	**(35)**	**(421)**	**5,042**	**(8)**	**139**	**5,173**

Business combinations

Energain

On February 1, 2017, Solvay announced the acquisition of Energain™ Li-Ion high voltage technology from DuPont for € 13 million. Energain™ technology and formulations enlarge Solvay Special Chem Global Business Unit's existing portfolio of high performance salts and additives for electrolytes and strengthen its capabilities to develop further innovative high-voltage solutions for Li-ion batteries. The identified net assets acquired amounted to € 13 million and related mainly to intangible assets.

European Carbon Fiber GmbH

On November 7, 2017, Solvay completed the acquisition of European Carbon Fiber GmbH ("ECF"), a German producer of high-quality "precursor" for large-tow (50K) polyacrylonitrile (PAN) carbon fibers for € 16 million. The identified assets acquired amounted to € 22 million and related mainly to tangible assets, less deferred tax liabilities of € 6 million.

NOTE F22
Property, plant and equipment

Accounting policy

General

Property, plant, and equipment are tangible items that:

- are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes; and
- are expected to be used during more than one period.

The items of property, plant, and equipment owned by the Group are recognized as property, plant, and equipment when the following conditions are satisfied:

- it is probable that the future economic benefits associated with the asset will flow to the Group;
- the cost of the asset can be measured reliably.

Items of property, plant, and equipment are initially measured at cost. The cost of an item of property, plant, and equipment comprises its purchase price and any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. If applicable, the cost comprises borrowing costs during the construction period.

After initial recognition, items of property, plant, and equipment are measured at cost less accumulated depreciation and impairment losses, if any.

Items of property, plant, and equipment are depreciated on a straight-line basis over their estimated useful lives. The components of an item of property, plant, and equipment with different useful lives are depreciated separately. Land is not depreciated. The estimated useful lives, residual values, and depreciation methods are reviewed at each year end, and any changes in estimates are accounted for prospectively.

Buildings	30-40 years
IT equipment	3-5 years
Machinery and equipment	10-20 years
Transportation equipment	5-20 years

Depreciation expense is included in the consolidated income statement within cost of goods sold, administrative costs, and R&D costs.

The asset is tested for impairment if there is a trigger for impairment (see note F27 *Impairment of property, plant, and equipment, intangible assets, and equity method investees*).

Items of property, plant, and equipment are derecognized from the consolidated statement of financial position on disposal or when no future economic benefits are expected from their use or disposal. The gain or loss arising from the derecognition of an item of property, plant, and equipment is recognized in profit or loss at the moment of derecognition.

Subsequent expenditure

Subsequent expenditure related to items of property, plant, and equipment is capitalized only if it is probable that it will increase the future economic benefits associated with the specific asset. Other expenditure is recognized in profit or loss as incurred. Subsequent expenditure incurred for the replacement of a component of an item of property, plant, and equipment is recognized as an asset only if it satisfies the recognition criteria mentioned above. The carrying amount of replaced items is derecognized.

Repair and maintenance costs are recognized in the consolidated income statement as incurred.

Regarding its industrial activity, Solvay incurs expenditure for major repairs over several years for most of its sites. The purpose of this expenditure is to maintain certain installations in proper working order without altering their useful life. This expenditure is considered a specific component of the item of property, plant, and equipment and is depreciated over the period during which the economic benefits are expected to be obtained, *i.e.* the interval between major repairs.

Dismantling and restoration costs

Dismantling and restoration costs are included in the cost of an item of property, plant, and equipment if the Group has a legal or constructive obligation to dismantle or restore. They are depreciated over the useful life of the items to which they pertain.

Generally, Solvay's obligation to dismantle and/or restore its operating sites is likely to arise only upon the discontinuation of a site's activities. A provision for dismantling discontinued sites or installations is recognized if there is a legal obligation (due to a request or injunction from the relevant authorities), or if there is no technical alternative to dismantling, so to ensure the safety compliance of the discontinued sites or installations.

Borrowing costs

Borrowing costs directly attributable to the acquisition, construction, or production of qualifying assets, which are assets that necessarily take a substantial period of time to get ready for their intended use or sale, are added to the cost of those assets until such time as the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

All other borrowing costs are recognized in profit or loss in the period in which they are incurred.

In € million	Land and buildings	Fixtures and equipment	Other tangible assets	Property, plant and equipment under construction	Total
Gross carrying amount					
At December 31, 2016	**3,237**	**10,929**	**409**	**916**	**15,492**
Additions	80	241	16	352	689
Disposals and closures	(34)	(266)	(22)	(1)	(322)
Increase through business combinations		22	(1)		21
Currency translation differences	(149)	(594)	(21)	(46)	(808)
Other	64	451	17	(551)	(19)
Transfer to assets held for sale	(354)	(1,422)	(20)	(86)	(1,882)
At December 31, 2017	**2,844**	**9,362**	**380**	**585**	**13,171**
Additions	15	123	12	547	697
Disposals and closures	(29)	(216)	(14)		(259)
Increase through business combinations	1				1
Currency translation differences	19	78	1	4	102
Other	43	255	26	(429)	(106)
Transfer to assets held for sale	(2)	(31)	1	(53)	(86)
At December 31, 2018	**2,889**	**9,571**	**405**	**654**	**13,519**
Accumulated depreciation					
At December 31, 2016	**(1,543)**	**(7,181)**	**(297)**		**(9,020)**
Depreciation	(99)	(517)	(36)		(652)
Impairment	(43)	(56)			(99)
Reversal of impairment			2		2
Disposals and closures	31	265	22		318
Currency translation differences	56	341	14		411
Other	19	(30)	2		(10)
Transfer to assets held for sale	220	1,076	16		1,312
At December 31, 2017	**(1,359)**	**(6,101)**	**(278)**		**(7,737)**
Depreciation	(96)	(462)	(35)		(592)
Impairment	(10)	(31)	(1)		(41)
Reversal of impairment		22			22
Disposals and closures	26	211	14		250
Currency translation differences	(6)	(34)			(41)
Other	33	67			101
Transfer to assets held for sale	8	(34)	(1)		(27)
At December 31, 2018	**(1,404)**	**(6,361)**	**(301)**		**(8,065)**
Net carrying amount					
At December 31, 2016	1,695	3,748	112	916	6,472
At December 31, 2017	1,485	3,261	102	585	5,433
At December 31, 2018	1,486	3,210	104	654	5,454

The line "Other" mainly includes changes following portfolio transactions and reclassification of property, plant, and equipment under construction to the appropriate categories when they are ready for intended use.

Cash flows relating to major investments are disclosed in note F17 Cash flows from investing activities - acquisition/disposal of assets and investments.

NOTE F23
Leases

Accounting policy

General

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards incidental to ownership. All other leases are classified as operating leases.

Agreements not in the legal form of a lease contract are analyzed in accordance with IFRIC 4 *Determining whether an Arrangement contains a Lease* to determine whether or not they contain a leasing contract to be accounted for in accordance with IAS 17 *Leases*.

Finance leases – lessee

On commencement of the lease, assets held under finance leases are initially recognized as assets of the Group at their fair value, or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the consolidated statement of financial position as a finance lease obligation.

Assets held under finance leases are depreciated over their expected useful lives on the same basis as owned assets or, where shorter, the term of the lease.

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to produce a constant periodic rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Group's general policy on borrowing costs (see above). Contingent rentals arising under finance leases are recognized as expenses in the periods in which they are incurred.

Operating leases – lessee

Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognized as a liability. The aggregate benefit of incentives is recognized as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

Finance leases

In € million	2018	2017
Net carrying amount of finance leases		
Land and buildings	2	2
Fixtures and equipment	32	33
Total	**34**	**35**

Assets leased under a finance lease are items of property, plant, and equipment.

Finance lease obligations

	Minimum lease payments	
In € million	2018	2017
Amounts payable under finance leases:		
Within one year	6	9
In years two to five inclusive	23	28
Beyond five years	61	72
Less future finance charges	(54)	(64)
Present value of minimum lease payments of finance leases	**36**	**46**
Amount due for settlement within 12 months	**6**	**9**
Amount due for settlement after 12 months	**84**	**101**

The future finance charges are related to a 20-year contract on a cogeneration asset with high interest rate.

Operating lease obligations

In € million	2018	2017
Total minimum lease payments under operating leases recognized in the consolidated income statement	101	94

In € million	2018	2017
Within one year	95	84
In years two to five inclusive	226	226
Beyond five years	171	141
Total of future minimum lease payments under non-cancellable operating leases (undiscounted)	**491**	**450**

Operating leases are related primarily to buildings and transportation equipment (mainly railcars). The lease commitments reported at the end of each year exclude those from discontinued operations.

In preparation for IFRS 16 implementation, the future minimum lease payments have been reviewed and:

- exclude non-lease components;
- include amounts due related to extension options when it is reasonably certain to exercise the options. This pertains mainly to buildings; and
- exclude future minimum lease payments for assets with a commencement date in a subsequent year (€ 0 million, and € 67 million at the end of 2018, and 2017, respectively).

NOTE F24
Joint operations

The list of joint operations is available in the note F43 *List of companies included in the consolidation scope*.

- Soda Ash & Derivatives operations/interests in Devnya (Bulgaria), 75% held by Solvay and comprising the following legal entities:
  - Solvay Sodi AD;
  - Solvay Sisecam Holding AG.
- Hydrogen Peroxide Propylene Oxide (HPPO) operations/interests in Zandvliet (Belgium), Map Ta Phut (Thailand), and the HPPO plant in the Kingdom of Saudi Arabia, all 50% held by Solvay and comprising the following legal entities:
  - BASF Interox H_2O_2 Production NV;
  - MTP HP JV C.V.;
  - MTP HP JV Management B.V.;
  - MTP HP JV (Thailand) Ltd.; and
  - Saudi Hydrogen Peroxide Co.
- Interests in Butachimie (France), 50% held by Solvay, included in Polyamides discontinued operations.

NOTE F25
Investments in associates and joint ventures

The list of associates and joint ventures is available in note F43 *List of companies included in the consolidation scope.*

The associates and joint ventures not classified as held for sale/discontinued operations are accounted for under the equity method of accounting.

	2018			2017		
In € million	Associates	Joint ventures	Total	Associates	Joint ventures	Total
Investments in associates and joint ventures	15	426	441	23	443	466
Earnings from associates and joint ventures	3	41	44	3	41	44

Investments in associates

In € million	2018	2017
Carrying amount at January 1	**23**	**24**
Profit for the year	3	3
Dividends received	(1)	(2)
Impairment	(9)	
Currency translation differences		(1)
Transfer to assets held for sale		(1)
Carrying amount at December 31	**15**	**23**

The tables below present the summary of the statement of financial position and income statement of the associates as if they were proportionately consolidated.

In € million	2018	2017
Statement of financial position		
Non-current assets	**16**	**22**
Current assets	**18**	**17**
Cash and cash equivalents	6	5
Non-current liabilities	**3**	**3**
Non-current financial debt	2	2
Current liabilities	**16**	**14**
Current financial debt	4	4
Investments in associates	**15**	**23**
Income statement		
Sales	36	34
Depreciation and amortization	(1)	(1)
Interest on loans and short term deposits	1	1
Profit for the year from continuing operations	**2**	**2**
Profit for the year	**2**	**2**
Total comprehensive income	**2**	**1**
Dividends received	**1**	**1**

Investments in joint ventures

In € million	2018	2017
Carrying amount at January 1	**443**	**473**
Disposal		(19)
Capital increase		3
Profit for the year	41	41
Dividends received	(24)	(16)
Currency translation differences	(34)	(39)
Carrying amount at December 31	**426**	**443**

In 2018, the currency translation differences relate mainly to the devaluation of the Russian ruble, of the Brazilian real, and of the Indian rupee, against the euro.

In 2017, the disposal related to the sale of Dacarto Benvic. The currency translation differences related mainly to the devaluation of the Russian ruble and the Brazilian real against the euro.

The tables below present the summary of the statement of financial position and income statement of the material joint ventures as if they were proportionately consolidated.

2018 In € million	Rusvinyl OOO	Peroxidos do Brasil Ltda	Solvay & CPC Barium Strontium	Shandong Huatai Interox Chemical Co. Ltd	Hindustan Gum & Chemicals Ltd	EECO Holding and subsidiaries	Cogeneration Rosignano
Ownership interest	50.0%	69.4%	75.0%	50.0%	50.0%	33.3%	25.4%
Operating Segment	Performance Chemicals	Performance Chemicals	Advanced Materials	Performance Chemicals	Advanced Formulations	Corporate & Business Services	Corporate & Business Services
Statement of financial position							
Non-current assets	**352**	**47**	**11**	**7**	**6**	**17**	**9**
Current assets	**53**	**43**	**45**	**5**	**152**	**28**	**4**
Cash and cash equivalents	23	19	9	3	125	2	1
Non-current liabilities	**189**	**4**	**12**		**4**	**8**	
Non-current financial debt	160	2				8	
Current liabilities	**50**	**18**	**15**	**3**	**9**	**33**	**9**
Current financial debt	36	4				33	8
Investments in joint ventures	**167**	**67**	**30**	**9**	**145**	**4**	**4**
Income statement							
Sales	183	73	80	20	40	6	3
Depreciation and amortization	(22)	(4)	(1)	(1)	(1)	(2)	(1)
Cost of borrowings	(17)					(2)	
Interest on loans and short-term deposits		1			7	1	
Income taxes	(1)	(6)	(3)	(1)	(2)		
Profit for the year from continuing operations	**5**	**19**	**9**	**3**	**5**	**1**	
Profit for the year	**5**	**19**	**9**	**3**	**5**	**1**	
Other comprehensive income	(25)	(4)	1		(7)		
Total comprehensive income	**(19)**	**14**	**10**	**3**	**(2)**		
Dividends received		**13**	**8**	**2**	**2**		

Other comprehensive income comprises mainly the currency translation differences.

2017 In € million	Rusvinyl OOO	Peroxidos do Brasil Ltda	Solvay & CPC Barium Strontium	Shandong Huatai Interox Chemical Co. Ltd	Hindustan Gum & Chemicals Ltd	EECO Holding and subsidiaries	Cogeneration Rosignano	Other
Ownership interest	50.0%	69.4%	75.0%	50.0%	50.0%	33.3%	25.4%	
Operating Segment	Performance Chemicals	Performance Chemicals	Advanced Materials	Performance Chemicals	Advanced Formulations	Corporate & Business Services	Corporate & Business Services	
Statement of financial position								
Non-current assets	**423**	**43**	**11**	**8**	**7**	**15**	**9**	
Current assets	**45**	**48**	**42**	**4**	**154**	**16**	**3**	
Cash and cash equivalents	13	27	8	2	137	4		
Non-current liabilities	**226**	**6**	**12**		**4**	**10**		
Non-current financial debt	197	4				10		
Current liabilities	**55**	**20**	**13**	**4**	**9**	**18**	**7**	
Current financial debt	38	4				17	7	
Investments in joint ventures	**186**	**65**	**28**	**8**	**148**	**3**	**4**	
Income statement								
Sales	171	75	75	11	42	5		
Depreciation and amortization	(25)	(3)	(1)	(1)	(1)	(1)		
Cost of borrowings	(21)					(1)		
Interest on loans and short-term deposits		2			10			
Income taxes	(1)	(8)	(3)		(3)			
Profit for the year from continuing operations	**4**	**19**	**9**	**1**	**7**			**2**
Profit for the year	**4**	**19**	**9**	**1**	**7**			**2**
Other comprehensive income	(15)	(11)	(1)	(1)	(9)			
Total comprehensive income	**(10)**	**8**	**8**		**(2)**			**2**
Dividends received		**9**	**6**	**1**	**1**			

Other comprehensive income comprises mainly the currency translation differences.

NOTE F26
Other investments

Accounting Policy

In accordance with the concept of materiality, certain companies which are insignificant have not been included in the consolidation scope. They are measured at cost and tested for impairment on an annual basis, which is considered a good proxy of their fair value. For more information, refer to *Principles of consolidation*.

In € million	2018	2017
Carrying amount at January 1	**47**	**54**
Disposals	(2)	(1)
Capital increase	1	
Changes of consolidation method	(2)	
Impairments	(3)	(6)
Other		(1)
Carrying amount at December 31	**41**	**47**

The line "Changes in consolidation method" includes entities that are no longer below materiality thresholds and that start being accounted for as subsidiaries, joint operations, joint ventures, or associates.

NOTE F27
Impairment of property, plant and equipment, intangible assets, and equity method investees

Accounting policy

General

At the end of each reporting period, the Group reviews whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). Where it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the CGU to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are allocated to individual CGUs, or otherwise they are allocated to the smallest group of CGUs for which a reasonable and consistent allocation basis can be identified.

The recoverable amount is the higher of the fair value less costs to sell and the value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate. Future cash flows are adjusted for risks not incorporated into the discount rate.

If the recoverable amount of an asset (or CGU) is estimated to be less than its carrying amount, the carrying amount of the asset (or CGU) is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss.

Where an impairment loss subsequently reverses, the carrying amount of the asset (or CGU) is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined (net of amortization or depreciation) had no impairment loss been recognized for the asset (or CGU) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

Assets other than non-current assets held for sale

In accordance with IAS 36 *Impairment of Assets*, the recoverable amount of property, plant, and equipment, intangible assets, CGUs or groups of CGUs, including goodwill, and equity method investees corresponds to the higher of their fair value less costs of disposal and their value in use. The latter equals the present value of the future cash flows expected to be derived from each asset, CGU or group of CGUs, and equity method investees and is determined using the following inputs:

- business plan approved by management based on growth and profitability assumptions, taking into account past performances, forecast changes in the economic environment, and expected market developments. Such business plan generally covers five years, unless management is confident that projections over a longer period are reliable;
- consideration of a terminal value determined based on the cash flows obtained by extrapolating the cash flows of the last years of the business plan referred to above, affected by a long-term growth rate deemed appropriate for the activity and the location of the assets;
- discounting of expected cash flows at a rate determined using the weighted average cost of capital formula.

Discount rate

The discount rate is estimated based on an extensive benchmarking with peers, so as to reflect the return investors would require if they were to choose an investment in the underlying assets. The weighted average cost of capital used to discount future cash flows was set at 6.2% in 2018 (6.7% in 2017). The discount rate decrease in 2018 is related to the change in the country-risk premium component, which is for 2018 the weighted average country premium (based on invested capital weight) instead of taking into account only the Belgian risk premium as in 2017.

Long-term growth rates

In 2018 and 2017, the long-term growth rate was set at 2%, except for Aroma Performance, for which a 1% rate was set. The growth rates are consistent with the long-term average market growth rates for the respective CGUs and the countries in which they operate.

Other key assumptions are specific to each CGU (energy price, volumes, margin, etc.).

No impairment loss for fully consolidated CGUs in 2018

The impairment tests performed at CGU level at December 31, 2018 and 2017 did not lead to any impairment of assets, as the recoverable amounts of the (groups of) CGUs were higher than their carrying amounts. More specifically, the difference between the (groups of) CGUs' value in use and their carrying amount (headroom) represents in all cases more than 10% of their carrying amount. As such, for those CGUs or groups of CGUs, a reasonable change in a key assumption on which the recoverable amount of the CGUs or groups of CGUs is based would not result in an impairment loss for the related CGUs or groups of CGUs.

Impairment test 2018 – Sensitivities for Composite Materials

Composite Materials is a CGU that formed part of the Cytec acquisition at year-end 2015 (Operating Segment: Advanced Materials). This CGU has a carrying amount of € 3.3 billion, including goodwill of € 1.3 billion (see note F21 *Goodwill and business combinations*). The headroom for Composite Materials (being the difference between the value in use based on discounted cash flows and the carrying amount) is close to € 0.7 billion, or close to 20% of the carrying amount.

The expected cash flows for Composite Materials reflect the strong demand drivers and a portion only of Management's expectations and plans related to Excellence programs that aim to improve industrial effectiveness and maximize the conversion of sales growth into EBITDA and cash flow progression. In compliance with IFRS, expected cash flows for Composite Materials take into account only the impact of Excellence programs that have been approved by Management and that are being carried out.

The headroom of this CGU is sensitive to change in assumptions related to discount rate and long-term growth. Under the sensitivities below, this headroom remains positive, although below 10% of the carrying amount.

	in € billion	
Assumptions: Discount rate = 6.2% Long term growth rate = 2%	Impact on recoverable amount	Revised headroom
Sensitivity to discount rate –0,5%	0.6	1.3
Sensitivity to discount rate +0,5%	(0.4)	0.3
Sensitivity to long term growth rate –1%	(0.6)	0.1
Sensitivity to long term growth rate +1%	1.0	1.8

The table below shows the break-even analysis for the headroom of Composite Materials:

Discount rate		Long term growth rate	
Base rate	Break-even rate	Base rate	Break-even rate
6.2%	7.1%	2.0%	0.8%

Reversal of impairment for a cogeneration asset in Brazil

In 2018 following improved market conditions, the impairment loss related to the Brazilian electricity cogeneration asset that was recognized in 2016 has been reversed (€ 22 million – Operating Segment: Corporate and Business Services) – also see note F5 *Results from portfolio management and reassessments, legacy remediation and major litigations.*

Results of impairment tests for CGUs under joint control

RusVinyl is a Russian joint venture in chlorovinyls (Operating Segment: Performance Chemicals) in which Solvay holds a 50% equity interest and Sibur holds the other 50% equity interest.

The recoverable amount of the investment has been estimated based on a dividend discount model taking into account the latest business plan. It is highly sensitive to the RUB/€ exchange rate. This rate impacts the carrying amount of the investment, the foreign currency losses on the euro denominated debt, and consequently the distributable earnings potential. The impairment test confirms that the value-in-use (based on dividend discount model) is in line with the carrying amount.

Impairment 2017

Impairment losses have been recognized in 2017 with respect to the retained Latin American assets in the Polyamides business (€ 91 million).

NOTE F28
Inventories

Accounting policy

Cost of inventories includes the purchase, conversion, and other costs incurred in bringing the inventories to their present location and condition. The cost of inventories is determined by using the weighted average cost or first-in, first-out (FIFO) method. Inventories having a similar nature and use are measured using the same cost formula.

Inventories are measured at the lower of the purchasing cost (raw materials and merchandise), production cost (work in progress and finished goods), and net realizable value. Net realizable value represents the estimated selling price, less all estimated costs of completion and the estimated costs necessary to make the sale.

CO_2 emission rights

With respect to the mechanism set up by the European Union to encourage manufacturers to reduce their greenhouse gas emissions, carbon dioxide (CO_2) emission rights were granted free of charge to the Group. The Group is also involved in the Clean Development Mechanism (CDM) under the Kyoto protocol. Under these projects, the Group has deployed facilities in order to reduce greenhouse gas emissions at the relevant sites in return for Certified Emission Reductions (CER).

In the absence of any IFRS regulating the accounting treatment of CO_2 emission rights, the Group applies the Trade/Production model, according to which CO_2 emission rights are presented as inventories if they will be consumed in the production process or as derivatives if they are held for trading. Energy Services is involved in CO_2 instrument trading, arbitrage, and hedging activities. The net income or expense from these activities is recognized in "other operating gains and losses" (a) for the industrial component, where Energy Services sells the excess CO_2 emission rights generated by Solvay or where a Group deficit is recognized, as well as (b) for the trading component, where Energy Services acts as a trader/broker with respect to those CO_2 emission rights.

In light of its centralized CO_2 emission rights' portfolio management, for emission rights that are substitutable between subsidiaries, the Group's financial statements reflect the Group's net position. If this net position is negative, a provision is recognized, measured based on the market price of the CO_2 emission rights at reporting date.

In € million	2018	2017
Finished goods	1,083	975
Raw materials and supplies	654	568
Work in progress	22	24
Total	**1,759**	**1,567**
Write-downs	(74)	(63)
Net total	**1,685**	**1,504**

NOTE F29
Other receivables (current)

In € million	2018	2017
VAT and other taxes	351	266
Advances to suppliers	81	69
Financial instruments – operational	162	153
Insurance premiums	30	24
Loan receivables	14	13
Receivables on assets disposal	3	3
Other	77	99
Other current receivables	**719**	**627**

Financial instruments – operational include held for trading and cash flow hedge derivatives (see note F35.A. *Overview of financial instruments*).

NOTE F30
Assets held for sale

Accounting policy

A disposal group is a group of assets to be disposed of, by sale or otherwise, together as a group in a single transaction, and liabilities directly associated with those assets that will be transferred in the transaction. The group includes goodwill acquired in a business combination if the group is a cash-generating unit to which goodwill has been allocated, or if it is an operation within such a cash-generating unit.

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the asset (or disposal group) is available for immediate sale in its present condition. For a sale to be highly probable, management should be committed to a plan to sell the asset (or disposal group), an active program to locate a buyer and complete the plan should be initiated, the asset (or disposal group) should be actively marketed at a price which is reasonable in relation to its current fair value, the sale should be expected to be completed within one year from the date of classification, and actions required to complete the plan should indicate that it is unlikely that significant changes to the plan will be made or that the plan will be withdrawn.

When the Group is committed to a sale plan involving loss of control of a subsidiary, all of the assets and liabilities of that subsidiary are classified as held for sale when the criteria described above are met, regardless of whether the Group will retain a non-controlling interest in its former subsidiary after the sale.

Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount and their fair value less costs to sell. Any excess of the carrying amount over the fair value less costs to sell is recognized as an impairment loss. Depreciation of such assets is discontinued as from their classification as held for sale. Prior period consolidated statements of financial position are not restated to reflect the new classification of a non-current asset (or a disposal group) as held for sale.

In € million	2018 Polyamides
Operating Segment	**Performance Chemicals**
Property, plant and equipment	670
Goodwill	173
Intangible assets	71
Investments	1
Deferred tax assets	32
Inventories	249
Trade receivables	200
Other assets	39
Assets held for sale	***1,434***
Provisions	75
Deferred tax liabilities	72
Other non-current liabilities	10
Trade payables	217
Income tax payables	12
Other liabilities	48
Liabilities associated with assets held for sale	***435***
Net carrying amount of the disposal group	**999**
Included in other comprehensive income	
Currency translation differences	21
Defined benefit plans	(3)
Other comprehensive income	**17**

In € million	2017 Polyamides	Phosphorus Derivatives	Acetow	Total
Operating Segment	**Performance Chemicals**	**Adanced Formulations**	**Performance Chemicals**	
Property, plant and equipment	557	13		569
Goodwill	173	7		180
Intangible assets	68			68
Investments	1			1
Deferred tax assets	17			17
Inventories	178	8		186
Trade receivables	219		17	236
Other assets	26			26
Assets held for sale	***1,239***	***28***	***17***	***1,284***
Provisions	74			74
Deferred tax liabilities	38			38
Other non-current liabilities	2			2
Trade payables	186			186
Income tax payables	4			4
Other liabilities	45			45
Liabilities associated with assets held for sale	***349***			***349***
Net carrying amount of the disposal group	**890**	**28**	**17**	**935**
Included in other comprehensive income				
Currency translation differences	21			21
Defined benefit plans	(3)			(3)
Other comprehensive income	**19**			**19**

NOTE F31
Equity

Accounting policy

Share capital

Ordinary shares are classified as equity.

Incremental costs directly attributable to the issuance of new share capital are directly recognized in equity as a deduction, net of tax, from the equity issuance proceeds.

Reserves

The reserves include:

- treasury shares;
- perpetual hybrid bonds that qualify as equity in the absence of any unavoidable contractual obligation to repay the principal and interest of the perpetual hybrid bonds (no maturity, interest is payable annually but can be deferred indefinitely at the issuer's discretion);
- retained earnings;
- currency translation differences from the consolidation process relating to the translation of the financial statements of foreign operations prepared in a non-euro functional currency to the euro presentation currency;
- the impacts of the fair value remeasurement of equity instruments measured at fair value through other comprehensive income;
- the impacts of the fair value remeasurement of financial instruments documented as hedging instruments in cash flow hedges;
- actuarial gains and losses related to defined benefit plans.

Non-controlling interests

Those represent the share of non-controlling interests in the net assets and comprehensive income of subsidiaries of the Group, and corresponds to the interests in subsidiaries that are not held by the Company or its subsidiaries.

Perpetual hybrid bonds

To strengthen its capital structure, Solvay issued undated deeply subordinated perpetual bonds ("perpetual hybrid bonds") of respectively € 1.2 billion (€ 1,194 million net of issuance costs) in 2013 following the acquisition of Chemlogics, € 1.0 billion (€ 994 million net of issuance costs) in 2015 for the financing of the acquisition of Cytec, and € 300 million (€ 298 million net of issuance costs) in November 2018.

All perpetual hybrid bonds are classified as equity in the absence of any unavoidable contractual obligation to repay the principal and interest of the perpetual hybrid bonds, specifically:

- no maturity, yet the issuer has a call option at every reset date to redeem the instrument;
- at the option of the issuer, interest payments can be deferred indefinitely.

The coupons related to the perpetual hybrid bonds are recognized as equity transactions and are deducted from equity upon declaration (see consolidated statement of changes in equity):

- amounting to € 57 million in 2018 (€ 57 million in 2017) for the 2013 € 1.2 billion issuance (€ 700 million NC5.5 at 4.199% and € 500 million NC10 at 5.425%);
- amounting to € 55 million in 2018 (€ 55 million in 2017) for the 2015 € 1.0 billion issuance (€ 500 million NC5.5 at 5.118% and € 500 million NC8.5 at 5.869%).

Should Solvay have elected not to pay any interests to the perpetual hybrid bond holders, then any payment of dividends to the ordinary shareholders or repayment of ordinary shares would trigger a contractual obligation to pay previously unpaid interests to the perpetual hybrid bond holders.

Tax impacts relating to the perpetual hybrid bonds are recognized directly in equity.

Number of shares (in thousands)

	2018	2017
Shares issued and fully paid at January 1	105,876	105,876
Shares issued and fully paid at December 31	105,876	105,876
Treasury shares held at December 31	2,723	2,558

NOTE F32
Non-controlling interests (continuing operations)

The amounts disclosed below are fully consolidated amounts and do not reflect the impacts from elimination of intragroup transactions.

At the end of 2018 the following three subsidiaries have non-controlling interests totaling € 89 million (out of a total of € 117 million).

2018 In € million	Zhejiang Lansol	Solvay Special Chem Japan	Solvay Soda Ash
Non-controlling ownership interest	45%	33%	20%
Statement of financial position			
Non-current assets	23	18	304
Current assets	42	21	28
Non-current liabilities	3	1	13
Current liabilities	23	2	23
Income statement			
Sales	62	67	321
Profit for the year	11	5	142
Other comprehensive income	(1)	2	1
Total comprehensive income	**10**	**7**	**143**
Dividends paid to non-controlling interests		2	32
Share of non-controlling interest in the profit for the year	5	2	28
Accumulated non-controlling interests	17	12	60

At the end of 2017 the following three subsidiaries have non-controlling interests totaling € 84 million (out of a total of € 113 million).

2017 In € million	Zhejiang Lansol	Solvay Special Chem Japan	Solvay Soda Ash
Non-controlling ownership interest	45%	33%	20%
Statement of financial position			
Non-current assets	20	17	305
Current assets	31	24	25
Non-current liabilities	3	1	12
Current liabilities	19	5	25
Income statement			
Sales	44	64	361
Profit for the year	5	8	166
Other comprehensive income	(1)	(3)	22
Total comprehensive income	**4**	**6**	**188**
Dividends paid to non-controlling interests		2	34
Share of non-controlling interest in the profit for the year	2	3	33
Accumulated non-controlling interests	13	12	59

NOTE F33
Share-based payments

Accounting policy

Solvay has set up compensation plans, including equity-settled and cash-settled share-based compensation plans.

In its equity-settled plans, the Group receives services as consideration for its own equity instruments (namely through the issuance of share options). The fair value of services rendered by employees in consideration of the granting of equity instruments represents an expense. This expense is recognized on a straight-line basis in the consolidated income statement over the vesting periods relating to these equity instruments with the recognition of a corresponding adjustment in equity. The fair value of services rendered is measured based on the fair value of the equity instruments on the grant date. It is not subsequently remeasured. At each reporting date, the Group re-estimates the number of share options likely to vest. The impact of the revised estimates is recognized in profit or loss against a corresponding adjustment in equity.

In its cash-settled plans, the Group acquires services by incurring a liability to transfer to its employees rendering those services amounts that are based on the price (or value) of equity instruments (including shares or share options) of the Group (namely through the issuance of performance share units). The fair value of services rendered by employees in consideration of the granting of share-based payments represents an expense. This expense is recognized on a straight-line basis in the consolidated income statement over the vesting periods relating to these share-based payments with the recognition of a corresponding adjustment in liabilities. At each reporting date, the Group re-estimates the number of options likely to vest, with the impact of the revised estimates recognized in profit or loss. The Group measures the services acquired and the liability incurred at the fair value of the liability. Until the liability is settled, the Group remeasures the fair value of the liability at the end of each reporting period and at the date of settlement, with any changes in fair value recognized in profit or loss for the period.

Stock Option Plan

As every year since 1999, in 2018 the Board of Directors renewed the share option plan offered to executive staff (52 beneficiaries) with a view to involving them more closely in the long-term development of the Group. The plan is an equity-settled share-based plan. The majority of the managers involved subscribed to the options offered to them in 2018 with an exercise price of € 113.11 for the first plan and € 108.38 for the second plan, representing the average stock market price of the share for the 30 days prior to the offer.

At the end of December 2018, the Group held 2,722,761 treasury shares, which have been deducted from consolidated shareholders' equity.

Share options	**2018–2**	**2018–1**	2017	2016	2015	2014
Number of share options granted and still outstanding at December 31, 2017			316,935	759,023	346,617	378,506
Granted share options	72,078	400,704				
Forfeitures of rights and expiries						
Share options exercised						(18,152)
Number of share options at December 31, 2018	72,078	400,704	316,935	759,023	346,617	360,354
Share options exercisable at December 31, 2018					346,617	360,354
Exercise price (in €)	108.38	113.11	111.27	75.98	114.51	101.14
Fair value of options at measurement date (in €)	20.81	19.10	23.57	17.07	24.52	22.79

Share options	2013	2012	2011	2010	2007	2006	2005
Number of share options granted and still outstanding at December 31, 2017	371,161	456,349	91,164	83,490	69,122	67,423	47,061
Granted share options							
Forfeitures of rights and expiries				(2,130)			(32,238)
Share options exercised	(3,990)	(51,390)	(28,683)	(81,360)	(1,064)	(2,702)	(14,823)
Number of share options at December 31, 2018	367,171	404,959	62,481	0	68,058	64,721	0
Share options exercisable at December 31, 2018	367,171	404,959	62,481	0	68,058	64,721	0
Exercise price (in €)	104.33	83.37	61.76	71.89	90.97	102.53	91.45
Fair value of options at measurement date (in €)	20.04	21.17	12.73	14.64	17.56	19.92	10.77

	2018		2017	
	Number of share options	**Weighted average exercise price**	Number of share options	Weighted average exercise price
At January 1	2,986,850	97.90	3,312,784	93.30
Granted during the year	472,782	112.39	316,935	111.27
Forfeitures of rights and expiries during the year	(34,368)	90.24	(7,292)	67.99
Exercised during the year	(202,164)	78.58	(635,577)	80.97
At December 31	3,223,101	101.32	2,986,850	97.90
Exercisable at December 31	1,674,361		1,563,211	

In 2018, the share options resulted in an expense of € 9 million, which was calculated by third parties according to the Black-Scholes model, and recognized in the consolidated income statement as part of administrative costs.

The valuation of the first stock option plan of 2018 is based on:

- the price of the underlying asset (Solvay share): € 116.15 at February 27, 2018;
- the time outstanding until the option maturity: exercisable from January 1, 2022 until February 27, 2026, taking into account the fact that some of them will be exercised before the option maturity;
- the option exercise price: € 113.11;
- the risk-free return: 0.76% (on average);
- the volatility of the underlying yield, estimated based on the option price: 21.00%; and
- a dividend yield of 2.85%.

The valuation of the second stock option plan of 2018 is based on:

- the price of the underlying asset (Solvay share): € 112.65 at July 30, 2018;
- the time outstanding until the option maturity: exercisable from January 1, 2022 until July 30, 2026, taking into account the fact that some of them will be exercised before the option maturity;
- the option exercise price: € 108.38;
- the risk-free return: 0.63% (on average);
- the volatility of the underlying yield, estimated based on the option price: 20.80%; and
- a dividend yield of 2.91%.

Weighted average remaining contractual life:

In years	2018	2017
Share option plan 2005	0.0	1.0
Share option plan 2006	1.0	2.0
Share option plan 2007	2.0	3.0
Share option plan 2010	0.0	1.0
Share option plan 2011	1.0	1.9
Share option plan 2012	1.1	2.1
Share option plan 2013	2.2	3.2
Share option plan 2014	3.2	4.2
Share option plan 2015	4.2	5.2
Share option plan 2016	5.2	6.2
Share option plan 2017	6.2	7.2
Share option plan 2018 – 1	7.2	–
Share option plan 2018 – 2	7.6	–

Performance Share Units Plan (PSU)

Since 2013, the Board of Directors renewed a yearly Performance Share Unit Plan, offered to executive staff with the objective of involving them more closely in the development of the Group, making this part of the long-term incentive policy. All the managers involved subscribed the PSU offered to them in 2018 at a grant price of € 113.11. The Performance Share Units is a cash-settled share-based plan through which beneficiaries will obtain a cash benefit based on the Solvay share price, as well as performance conditions and accrued dividends.

Each plan has a three-year vesting period, after which a cash settlement will take place, if vesting conditions have been met.

Performance share units	Plan 2018	Plan 2017
Number of PSU	215,567	222,746
Grant date	27/02/2018	23/02/2017
Acquisition date	01/01/2021	01/01/2020
Vesting period	31/03/2018 to 31/12/2020	31/03/2017 to 31/12/2019
Performance conditions	40% of the initial granted PSUs are subject to the Underlying EBITDA YoY growth % over 3 years (2018, 2019, 2020)	40% of the initial granted PSUs are subject to the Underlying EBITDA YoY growth % over 3 years (2017, 2018, 2019)
	40% of the initial granted PSUs are subject to the CFROI YoY % variation over 3 years (2018, 2019, 2020)	40% of the initial granted PSUs are subject to the CFROI YoY % variation over 3 years (2017, 2018, 2019)
	20% of the initial granted PSUs are subject to the GHG Intensity reduction target at the end of the accounting period ending December 31, 2020	20% of the initial granted PSUs are subject to the GHG Intensity reduction target at the end of the accounting period ending December 31, 2019
Validation of performance conditions	By the Board of Directors	By the Board of Directors

In 2018 the impact on the consolidated income statement regarding PSU (net of hedging) amounts to € 15 million, as against € 21 million in 2017. The carrying amount of the PSU liability at the end of 2018 amounts to € 44 million, as against € 58 million at the end of 2017.

NOTE F34
Provisions

In € million	Employee benefits	Restructuring	Environment	Litigation	Other	Total
At December 31, 2017	**2,816**	**62**	**702**	**129**	**180**	**3,890**
Additions	77	198	60	21	35	390
Reversals of unused amounts	(26)	(10)	(14)	(12)	(14)	(76)
Uses	(218)	(64)	(76)	(16)	(21)	(395)
Increase through discounting	54		22	1		78
Remeasurements	(33)					(33)
Currency translation differences	7		(3)	(3)	2	3
Disposals	(1)					(2)
Transfer to liabilities associated with assets held for sale					(2)	(1)
Other	(6)	(1)		1	(12)	(18)
At December 31, 2018	**2,671**	**185**	**691**	**121**	**168**	**3,836**
Of which current provisions		95	97	8	81	281

The use (cash-out) of € 395 million includes € 390 million for continuing operations, of which € 213 million for employee benefits, € 64 million for restructuring plans, and € 76 million for environmental items. The line "increase through discounting" includes € 74 million for increase at constant discount rate and an amount of € 4 million relating to change of discount rate.

The deleveraging corresponds to the net difference between:

1. cash out (use for € (395) million) on the one hand; and
2. the sum of the net accruals for new provisions (€ 315 million, being additions less reversals of unused amounts) and the increase through discounting (€ 74 million) at constant discount rate on the other hand.

The deleveraging of Solvay provisions amounts to € 6 million. This amount is lower than in previous years due to the impact of the Group's simplification plan launched in 2018, for which a provision of € 177 million has been recognized.

The deleveraging of employee benefits obligations amounts to € 113 million, a trend which is explained by the fact that most plans have been closed to new entrants.

Management expects provisions (other than employee benefits) to be used (cash outlays) as follows:

In € million	Up to 5 years	Between 5 and 10 years	Beyond 10 years	Total
Provisions for environment	317	117	258	691
Provisions for litigation	112	9		121
Provisions for restructuring and other	312	26	15	353
At December 31, 2018	**741**	**151**	**272**	**1,165**

F34.A. Provisions for employee benefits

Accounting policy

General

The Group's employees are offered various post-employment benefits, other long-term employee benefits, and termination benefits as a result of legislation applicable in certain countries, contractual agreements entered into by the Group with its employees or constructive obligations.

The post-employment benefits are classified as defined contribution or defined benefit plans.

Defined contribution plans

Defined contribution plans involve the payment of fixed contributions to a separate entity and release the employer from any subsequent obligation, as this separate entity is solely responsible for paying the amounts due to the employee. The expense is recognized when an employee has rendered services to the Group during the period.

Defined benefit plans

Defined benefit plans concern all plans other than defined contribution plans and include:

- post-employment benefits: pension plans, other post-employment obligations and supplemental benefits such as post-employment medical plans;
- other long-term employee benefits: long-service benefits granted to employees according to their seniority in the Group;
- termination benefits such as early pension plans.

Taking projected final salaries into account on an individual basis, post-employment benefits are measured by applying a method (projected unit credit method) using assumptions involving discount rate, life expectancy, turnover, wages, annuity revaluation, and medical cost inflation. The assumptions specific to each plan take into account the local economic and demographic contexts.

The discount rates are interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms to maturity approximating the terms of the related pension obligation.

The amount recognized under post-employment obligations corresponds to the difference between the present value of future obligations and the fair value of the plan assets funding the plan, if any. If this calculation gives rise to a deficit, an obligation is recognized in liabilities. Otherwise, a net asset limited to the lower of the surplus in the defined benefit plan and the present value of any future plan refunds or any reduction in future contributions to the plan is recognized.

The defined benefit cost consists of service cost and net interest expense (based on discount rate) on the net liability or asset, both recognized in profit or loss, and remeasurements of the net liability or asset, recognized in other comprehensive income.

Service cost consists of current service cost, past service cost resulting from plan amendments or curtailments, and settlement gains or losses.

The interest expenses arising from the reverse discounting of the benefit obligations, the financial income on plan assets (determined by multiplying the fair value of the plan assets by the discount rate), as well as interest on the effect of the asset ceiling are recognized on a net basis in the net financial charges (cost of discounting of provisions).

Remeasurements of the net liability or asset consist of:

- actuarial gains and losses on the benefit obligations arising from experience adjustments and/or changes in actuarial assumptions (including the effect of changes in the discount rate);
- the return on plan assets (excluding amounts in net interest) and changes in the limitation of the net asset recognized.

Other long-term and termination benefits are accounted for in the same way as post-employment benefits but remeasurements are fully recognized in the net financial charges during the period in which they occur.

The actuarial calculations of the main post-employment obligations and other long-term benefits are performed by independent actuaries.

Overview

In € million	2018	2017
Post-employment benefits	2,490	2,635
Other long-term benefits	132	132
Termination benefits	50	49
Total employee benefits	**2,671**	**2,816**

Post-employment benefits

A. Defined contribution plans

For defined contribution plans, Solvay pays contributions to publicly or privately administered pension funds or insurance companies. For 2018, the expense amounts to € 58 million as against € 55 million for 2017.

B. Defined benefit plans

Defined benefit plans can either be funded via outside pension funds or insurance companies ("funded plans") or financed within the Group ("unfunded plans").

The net liability results from the net of the provisions and the asset plan surplus.

In € million	2018	2017
Provisions	2,490	2,635
Asset plan surplus	(5)	(14)
Net liability	**2,485**	**2,622**
Operational expense	31	31
Finance expense	51	62

The operating expense includes current service cost for € 47 million.

B.1. Management of risks

Over recent years, the Group has reduced its exposure to defined benefit plan obligations stemming from future services by converting existing plans into pension plans with a lower risk profile (hybrid plans, cash balance plans, and defined contribution plans) or by closing them to new entrants.

Solvay continuously monitors its risk exposure, focusing on the following risks:

Asset volatility

Equity instruments, even though expected to outperform corporate bonds in the long-term, create volatility and risk in the short-term. To mitigate this risk, the allocation to equity instruments is monitored using Assets and Liabilities Management techniques, to ensure it remains appropriate given the long-term objectives of the Group and of the respective schemes.

Changes in bond yields

A decrease in corporate bond yields will increase the carrying amount of the plan's liabilities. For funded schemes this impact will be offset partially by an increase in the fair value of the plan assets.

Inflation risk

The defined benefit obligations are linked to inflation, and higher inflation will lead to higher liabilities (although, in most cases, caps on the level of inflationary increases are in place to protect against extreme inflation). A limited part of the assets are either unaffected by or only loosely correlated with inflation, meaning that an increase in inflation will also increase the plans' liabilities.

Life expectancy

The majority of the schemes' obligations are to provide benefits for the life of the member. Increases in life expectancy will therefore increase the plans' liabilities.

Currency risk

This risk is limited, as major plans in foreign currency are funded and most of their assets are denominated in the currency in which benefit payments will take place.

Regulatory risk

For partly or fully unfunded plans, the Group is exposed to the risk of external funding following regulatory constraints. This should not impact the defined benefit obligation but could expose the Group to a potential significant cash outlay.

For more information about Solvay Group risk management, refer to the "Management of risks" section of the present document.

B.2. Description of obligations

The provisions have been set up to cover post-employment benefits granted by most Group companies, in line either with local rules and customs or with established practices which generate constructive obligations.

The largest post-employment plans in 2018 are in the United Kingdom, France, the United States, Germany, and Belgium. These five countries represent 94% of the total defined benefit obligations.

2018 In € million	Defined benefit obligations	In %	Recognized plan assets	Net liability	In %	Ratio plan assets on defined benefit obligations
United Kingdom	1,530	31%	1,124	406	16%	73%
United States	1,271	25%	981	290	12%	77%
France	1,021	20%	1	1,020	41%	0%
Germany	520	10%	0	520	21%	0%
Belgium	385	8%	242	143	6%	63%
Other countries	294	6%	188	106	4%	64%
Total	**5,022**	**100%**	**2,536**	**2,485**	**100%**	**51%**

2017 In € million	Defined benefit obligations	In %	Recognized plan assets	Net liability	In %	Ratio plan assets on defined benefit obligations
United Kingdom	1,645	31%	1,220	425	16%	74%
United States	1,371	25%	1,056	315	12%	77%
France	1,085	20%	6	1,079	41%	1%
Germany	552	10%	0	552	21%	0%
Belgium	393	8%	247	147	6%	63%
Other countries	303	6%	198	105	4%	65%
Total	**5,349**	**100%**	**2,727**	**2,622**	**100%**	**51%**

It is worth highlighting that unfunded plans – mainly in Germany and France – account for 62% of the 2018 net liability. See comments by countries below.

United Kingdom

Solvay sponsors a few defined benefit plans in the United Kingdom; the largest one is the Rhodia Pension Fund. This is a final salary funded pension plan, with entitlement to accrue a percentage of salary per year of service. It was closed to new entrants in 2003 and replaced by a defined contribution plan.

Broadly, about 8% of the liabilities are attributable to current employees, 27% to former employees, and 65% to current pensioners.

The Fund functions and complies with UK legislation under a large regulatory framework. The Pensions Regulator has a risk-based approach to regulation and a code of practice which provides practical guidance to trustees and employers of defined benefit schemes on how to comply with the scheme funding requirements. In accordance with UK legislation, the Fund is subject to Scheme Specific Funding which requires that pension plans are funded prudently.

The UK Rhodia Pension Fund is governed by a Board of Trustees. They manage the Fund with prudent and fair judgment. The Trustees determine the liabilities used for Statutory Funding Objectives based on prudent actuarial and economic assumptions. Any shortfall or deficit once these liabilities have been deducted from the Fund's assets must be reduced by additional contributions and in a time frame determined in accordance with the employer's ability to pay and the strength of covenant or contingent security being offered by the employer.

The Rhodia Pension Fund is subject to a triennial valuation cycle for funding purposes. This valuation is performed by the scheme actuary in line with UK regulations and is discussed between the Trustees and the sponsoring employer to agree the valuation assumptions and a funding plan. The last completed valuation was as at January 1, 2018 which established a fixed contribution rate of pensionable pay for active members plus a deficit recovery plan which aims to fund the scheme's technical provisions over a period of time. Recovery contributions have been increased so that the plan is expected to be fully funded by the end of 2027 in accordance with local regulations. Under IFRS the plan is expected to be fully funded around 2024.

The guarantee provided by Solvay (£ 550 million) is based on local regulations and exceeds the recognized liability (€ 406 million) – See note F39 *Contingent liabilities and financial guarantees*.

France

Solvay sponsors various defined benefit plans in France. The largest plans are the French compulsory retirement indemnity plan and two closed and one open top hat plans.

The main plan is for all former Rhodia current and retired employees who contributed to the plan prior to its closure in the 1970s. It offers a full benefit guarantee based on the end-of-career salary. This plan is unfunded and approximately 98% of the liabilities are attributable to current pensioners.

In accordance with French legislation, adequate guarantees have been provided.

United States

As of year-end 2018 Solvay sponsored five different defined benefit pension plans in the United States (two qualified plans and three non-qualified plans). A qualified plan is an employer-sponsored retirement plan that qualifies for special tax treatment under Section 401(a) of the Internal Revenue Code. At this moment all defined benefit plans are closed to new entrants; newly hired employees are eligible to participate in a defined contribution plan. Note that the two qualified defined benefit pension plans are funded while the three non-qualified defined benefit pension plans are unfunded. The qualified plans make up the vast majority of the pension liabilities as of December 31, 2018.

Solvay's plans are in compliance with local laws regarding audited financial statements, governmental filings, and Pension Benefit Guaranty Corporation insurance premiums where applicable. The plans are reviewed and monitored locally by fiduciary committees for purposes of plan investments and administrative matters.

For the US qualified plans, Solvay's contributions take into account minimum (tax-deductible) funding requirements and maximum tax deductible contributions, both regulated by the tax authorities.

Certain eligible participants may elect to receive their pension in a single lump sum payment instead of a monthly payment.

Broadly, about 27% of the liabilities are attributable to current employees, 9% to former employees for whom benefit payments have not yet commenced, and 64% to current pensioners.

In 2018, in the United States Solvay contributed to two multiemployer pension plans under collective bargaining agreements that cover certain of its union-represented employees. Each of the multiemployer plans is a defined benefit pension plan. None of the multiemployer plans provides an allocation of its assets, liabilities, or costs among contributing employers. None of the multiemployer plans provides sufficient information to permit Solvay, or other contributing employers, to account for the multiemployer plan as a defined benefit plan. Accordingly, the company accounts for its participation in each of the multiemployer plans as if they were a defined contribution plan. For multiemployer plans, during 2018 and 2017, the annual contributions paid are less than € 1 million.

Germany

Solvay sponsors various defined benefit plans in Germany. The largest plans are a closed final-pay plan and an open cash balance plan. As is common in Germany, all plans are unfunded. Broadly, about 62% of the liabilities are attributable to current pensioners.

Belgium

Solvay sponsors two defined benefit plans in Belgium. These are funded pension plans. The plan for executives has been closed since the end of 2006, and the plan for the white and blue collars has been closed since 2004. The past service benefits provided under these plans continues to be adapted each year considering annual salary increase and inflation ("Dynamic management"). In accordance with market practice in Belgium, because of favorable retirement lump sum taxation most benefits are paid as lump sum.

Furthermore, Solvay sponsors two open defined contribution plans, classified as defined benefit plans for accounting purposes due to the minimum guarantees explained below. These are funded pension plans: the plan for executives opened at the beginning of 2007 and the plan for white and blue collars opened at the beginning of 2005. There are four different investment funds – ranging from "Prudent" to "Dynamic" – in which participants may choose to invest their contributions However, regardless of their choices, Belgian law stipulates that the employer must guarantee a return on employer contribution and on personal contribution, thereby creating a potential liability for the Group. Since 2016 the return has been fixed at 1.75% for both types of contributions, at the minimum of the range provided by law since January 1, 2016 (1.75% to 3.75%). For these plans Solvay has € 127 million of plan assets at December 31, 2018, and paid € 8 million of contributions during 2018. At the end of 2018 net liability recognized in the consolidated statement of financial position concerning these plans is not material.

Solvay's plans are administered through the Solvay Pension Fund, which operates in compliance with local laws regarding minimum funding, investments principles, audited financial statements, governmental filings, and governance principles. The Pension Fund is managed through a General Assembly and a Board of Directors delegating day-to-day activities to an operational Committee.

Solvay sponsors a few other smaller pension plans. All these plans are insured.

Other plans

The majority of the obligations relate to pension plans. In some countries (mainly the United States), there are also post-employment medical plans, which represent 5% of the total defined benefit obligation.

B.3. Financial impacts

Changes in net liability

In € million	2018	2017
Net amount recognized at beginning of period	**2,622**	**2,936**
Net expense recognized in P&L – Defined benefit plans	82	93
Actual employer contributions/direct actual benefits paid	(196)	(203)
Acquisitions and disposals	(8)	7
Remeasurements before impact of asset ceiling	(25)	(93)
Change in the effect of the asset ceiling limit on remeasurements	(1)	(2)
Reclassifications	4	(2)
Currency translation differences	7	(72)
Transfer to (liabilities associated with) assets held for sale		(43)
Net amount recognized at end of period	**2,485**	**2,622**

Remeasurements before impact of asset ceiling in the amount of € (25) million comprise:

- the negative return on plan assets (excluding interests reported in income statement) for € 184 million;
- increase in discount rates (€ (195) million) mainly in the United States, United Kingdom, and Eurozone;
- increase in inflation rate (€ 32 million) for France; and
- other remeasurements due to changes in the other financial assumptions, demographic and experience effects (€ (47) million).

Net expense

In € million	2018	2017
Current service costs	**47**	**51**
Past service costs (including curtailments)	(26)	(31)
Service costs	**20**	**20**
Interest cost	135	154
Interest income	(84)	(93)
Net interest	**51**	**62**
Administrative expenses paid	**11**	**12**
Net expense recognized in P&L – Defined benefit plans	**82**	**93**
Remeasurements recognized in other comprehensive income	**(26)**	**(95)**

The service costs and administrative expenses of these benefit plans are recognized within cost of sales, commercial and administrative costs, research & development costs or operating gains and losses and results from legacy remediation, and the net interest is recognized as a finance expense.

In 2018 the Group's current service costs amount to € 47 million, of which € 31 million relate to funded plans and € 16 million relate to unfunded plans. Past service costs include mainly favorable impacts reflecting the amendment of post-retirement healthcare and death benefit plan in the United States (€ 24 million), a curtailment effect (€ 15 million) mainly in France and in Belgium, compensated by an unfavorable impact of the UK guarantee minimum pension for € 16 million (see Key sources of estimation uncertainty).

In 2017 the Group's current service costs amounted to € 51 million, of which € 34 million related to funded plans and € 17 million related to unfunded plans. Past service costs include favorable impacts reflecting the amendment of post-retirement healthcare and death benefit plan in the United States (€ 37 million).

Net liability

In € million	2018	2017
Defined benefit obligations – Funded plans	3,200	3,402
Fair value of plan assets at end of period	(2,542)	(2,733)
Deficit for funded plans	**658**	**669**
Defined benefit obligations – Unfunded plans	1,822	1,947
Deficit/Surplus (–)	**2,481**	**2,616**
Amounts not recognized as asset due to asset ceiling (recognized in other comprehensive income)	5	6
Net liability (asset)	**2,485**	**2,622**
Provision recognized	2,490	2,635
Asset recognized	(5)	(14)

Changes in defined benefit obligations

In € million	2018	2017
Defined benefit obligation at beginning of period	**5,349**	**5,739**
Current service costs	47	51
Past service costs (including curtailments)	(26)	(31)
Interest cost	135	154
Employee contributions	4	4
Settlements	(8)	(14)
Acquisitions and disposals (–)	(8)	7
Remeasurements in other comprehensive income	(209)	113
Actuarial gains and losses due to changes in demographic assumptions	*(45)*	*(23)*
Actuarial gains and losses due to changes in financial assumptions	*(139)*	*106*
Actuarial gains and losses due to experience	*(26)*	*30*
Actual benefits paid	(296)	(300)
Currency translation differences	29	(310)
Reclassification and other movements	4	
Transfer from/to (liabilities associated with) assets held for sale	2	(64)
Defined benefit obligation at end of period	**5,022**	**5,349**
Defined benefit obligations – Funded plans	3,200	3,402
Defined benefit obligations – Unfunded plans	1,822	1,947

Changes in the fair value of plan assets

In € million	2018	2017
Fair value of plan assets at beginning of period	**2,733**	**2,811**
Interest income	84	93
Remeasurements in other comprehensive income	(185)	206
Employer contributions	196	203
Employee contributions	4	4
Administrative expenses paid	(11)	(12)
Settlements	(8)	(14)
Actual benefits paid	(296)	(300)
Currency translation differences	23	(238)
Reclassification and other movements		2
Transfer from/to (liabilities associated with) assets held for sale	1	(21)
Fair value of plan assets at end of period	**2,542**	**2,733**
Actual return on plan assets	(101)	299

In 2018 the total return on plan assets, i.e. including interest income, amounts to € (101) million against € 299 million in 2017.

In 2018, the Group's cash contributions (including direct benefits payments) amount to € 196 million, of which € 95 million of contributions to funds and € 101 million of direct benefits payments.

The Group's cash contributions (including direct benefit payments) for 2017 amounted to € 203 million, of which € 108 million of contributions to funds and € 95 million of direct benefits payments.

Except for any significant change in the regulatory environment (see "regulatory risk" above), the Group's cash contributions in 2019 are expected to approximate € 190 million.

Categories of plan assets

	2018		2017	
	Quoted	**Non quoted**	Quoted	Non quoted
Equity	36%	0%	40%	0%
Bonds				
Investment Grade	55%	0%	50%	0%
Non Investment Grade	2%	0%	6%	0%
Properties	1%	0%	1%	0%
Cash and cash equivalents	2%	0%	2%	0%
Derivatives				
Structured debt (LDI)	0%	0%	1%	0%
Other derivatives	0%	0%	1%	0%
Others	3%	0%	0%	0%
Total	**100%**	**0%**	**100%**	**0%**

With respect to the invested assets, it should be noted that these assets do not contain any direct investment in Solvay Group shares or in property or other assets occupied or used by Solvay. This does not prevent Solvay shares from being included in mutual investment fund type investments.

Changes in asset ceiling

In € million	2018	2017
Effect of the asset ceiling limit at beginning of period	**6**	**8**
Change in the effect of the asset ceiling limit on remeasurements	(1)	(2)
Effect of the asset ceiling limit at end of period	**5**	**6**

Actuarial assumptions used in determining the liability

Some of the retirement plans that Solvay has in place provide annuity payments that are adjusted on a regular basis to mitigate the effects for cost of living increases.

The salary growth assumption is used to determine what will be the salary at the end of the career of the individuals, as the defined benefit plans take into account the last salary of the individuals. This assumption includes impacts of both inflation and merit increases.

The pension growth assumption defines the expected future adjustments for these annuity payments. The plan defines how these annuity payments will be adjusted and might be linked to inflation. Pension growth assumptions mainly apply for the defined benefit retirement plans in the United Kingdom, France, and Germany.

Inflation assumption is presented separately as salary growth and pension growth assumptions encompass more variables than inflation.

	Eurozone		United Kingdom		United States	
In %	**2018**	2017	**2018**	2017	**2018**	2017
Discount rates	1.75	1.50	2.75	2.50	4.00	3.50
Expected rates of future salary increases	1.75 – 4.00	1.75 – 4.00	2.15 – 3.25	2.15 – 3.25	3.00 – 3.75	3.00 – 3.75
Inflation	1.75 – 2.00	1.50 – 1.75	3.25	3.25	2.25	2.25
Expected rates of pension growth	0.00 – 2.00	0.00 – 1.75	3.10	3.05	NA	NA

Actuarial assumptions used in determining the annual cost

	Eurozone		United Kingdom		United States	
In %	**2018**	2017	**2018**	2017	**2018**	2017
Discount rates	1.50	1.50	2.50	2.75	3.50	4.00
Expected rates of future salary increases	1.75 – 4.00	1.75 – 4.00	2.15 – 3.25	2.40 – 3.50	3.00 – 3.75	3.00 – 3.75
Inflation	1.50 – 1.75	1.50 – 2.00	3.25	3.50	2.25	2.25
Expected rates of pension growth	0.00 – 1.75	0.00 – 1.75	3.10	3.30	NA	NA

Actuarial assumptions regarding future mortality are based on recent country-specific mortality tables. These assumptions translate at January 1, 2018 into an average remaining life expectancy in years for a pensioner retiring at age 65:

In years	United Kingdom	United States	Belgium	France	Germany
Retiring at the end of the reporting period					
Male	21	20	18	24	20
Female	23	22	21	28	24
Retiring 20 years after the end of the reporting period					
Male	22	21	18	27	22
Female	24	23	21	31	26

In some countries such as United Kingdom and United States, the mortality assumptions reflect actual scheme experience and/or Solvay's expectations in terms of future mortality improvements.

The actuarial assumptions used in determining the employee benefits obligation at December 31 are based on the following employee benefits liabilities durations:

	Eurozone	United Kingdom	United States
Duration in years	12.0	15.9	10.7

Sensitivities on the defined benefits obligation for the post-employment benefits

Each sensitivity amount is calculated assuming that all other assumptions are held constant. It should be noted that economic factors and conditions often affect multiple assumptions simultaneously.

Sensitivity to a change of percentage in the discount rates:

In € million	0.25% increase	0.25% decrease
Eurozone	(58)	60
United Kingdom	(57)	60
United States	(32)	33
Others	(6)	6
Total	**(153)**	**159**

Sensitivity to a change of percentage in the inflation rates:

In € million	0.25% increase	0.25% decrease
Eurozone	54	(52)
United Kingdom	40	(39)
United States		
Others	5	(4)
Total	**99**	**(95)**

Sensitivity to a change of percentage in salary growth rates:

In € million	0.25% increase	0.25% decrease
Eurozone	15	(14)
United Kingdom	3	(3)
United States	2	(1)
Others	1	(1)
Total	**21**	**(19)**

Sensitivity to a change of one year on mortality tables - The table shows impacts when the age of all beneficiaries increases or decreases by one year:

In € million	Age correction +1 year	Age correction –1 year
Eurozone	(78)	80
United Kingdom	(57)	58
United States	(29)	30
Others	(7)	8
Total	**(171)**	**176**

F34.B. Provisions other than for employee benefits

Accounting policy

General

Provisions are recognized when (a) the Group has a present obligation (legal or constructive) as a result of a past event, (b) it is probable that the Group will be required to settle the obligation, and (c) a reliable estimate can be made of the amount of the obligation.

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. Where the effect of the time value of money is material, the amount is the present value of expenditures required to settle the obligation. Impacts of changes in discount rates are generally recognized in the financial result.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, a receivable is recognized as an asset if it is virtually certain that reimbursement will be received if the Group settles the obligation.

Onerous contracts

An onerous contract is a contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it. Present obligations arising from onerous contracts are recognized and measured as provisions.

Restructurings

A restructuring provision is recognized when the Group has developed a detailed formal plan for the restructuring and has, by starting to implement the plan or announcing its main features to those affected by it, raised a valid expectation in those affected that it will carry out the restructuring. The measurement of a restructuring provision includes only the direct expenditures arising from the restructuring, which are those amounts that are both necessarily entailed by the restructuring and not associated with the ongoing activities of the entity.

Environmental liabilities

Twice a year Solvay analyzes all its environmental risks and the corresponding provisions. Solvay measures these provisions to the best of its knowledge of applicable regulations, the nature and extent of the pollution, clean-up techniques, and other available information.

Restructuring provisions

These provisions amount to € 185 million, as against € 62 million at the end of 2017.

The main provisions at the end of 2018 relate to the Group's simplification program announced in March 2018 (€ 160 million).

Environmental provisions

These provisions amount to € 691 million at the end of 2018, as against € 702 million at the end of 2017, and pertain to:

- mines and drilling operations to the extent that legislation and/or operating permits in relation to quarries, mines, and drilling operations contain requirements to pay compensation to third parties. Most of these provisions, based on local expert advice, can be expected to be used over a 1-20 year horizon and amount to € 140 million;
- the dismantling of the last mercury electrolysis activities, which should be completed by the end of 2019. The remaining provisions related to those activities will be used for the management of contamination of soils and groundwater, mostly over the next 20 years;
- lime dikes (settling ponds related mainly to soda ash plants), dump at sites and third party dump sites (linked to several industrial activities). These provisions have a horizon of 1 to 20 years; and
- various types of pollution (organic, inorganic) coming from miscellaneous chemical productions; these provisions mainly cover discontinued activities or closed plants. Most of these provisions have a horizon of 1 to 20 years.

The estimated amounts are discounted based on the probable date of settlement, and are adjusted periodically to reflect the passage of time.

Provisions for litigation

Provisions for litigation refer to tax and legal exposures. They amount to € 121 million at the end of 2018 as against € 129 million at the end of 2017. The balance at the end of 2018 relates to tax risks (€ 52 million) and legal claims (€ 69 million).

Other provisions

Other provisions relate to the shutdown or disposal of activities and amount to € 168 million, as against € 180 million at the end of 2017.

NOTE F35
Financial instruments and financial risk management

Accounting policy

As explained in the basis of preparation, the Group adopted IFRS 9 *Financial Instruments* on January 1, 2018 using the modified retrospective approach. Hereinafter are disclosed the accounting policies applied in 2018 (IFRS 9 *Financial Instruments*). For accounting policies applied in 2017 (IAS 39 *Financial Instruments: Recognition and Measurement*), refer to the 2017 Annual Report. Transition impacts have been discussed in the basis of preparation.

2018 – IFRS 9 Financial Instruments

General

Financial assets and liabilities are first recognized when Solvay becomes a party to the contractual provisions of the instrument.

Amortized cost is the amount at which the financial asset or financial liability is measured at initial recognition minus the principal repayments, plus or minus the cumulative amortization, using the effective interest method of any difference between that initial amount and the maturity amount and, for financial assets, adjusted for any loss allowance. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial asset or financial liability to the gross carrying amount of a financial asset or to the amortized cost of a financial liability. When calculating the effective interest rate, the Group estimates the expected cash flows by considering all the contractual terms of the financial instrument (for example, prepayment, extension, call, and similar options) but does not consider the expected credit losses. The calculation includes all fees and points paid or received between parties to the contract that are an integral part of the effective interest rate, transaction costs, and all other premiums or discounts.

Financial assets

Trade receivables are initially measured at their transaction price if they do not contain a significant financing component, which is the case for substantially all trade receivables. Other financial assets are initially measured at fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset.

A financial asset is classified as current when the cash flows expected to flow from the instrument mature within one year.

All recognized financial assets will subsequently be measured at either amortized cost or fair value under IFRS 9 *Financial Instruments*. Specifically:

- a debt instrument that (i) is held within a business model whose objective is to collect the contractual cash flows and (ii) has contractual cash flows that are solely payments of principal and interest on the principal amount outstanding is measured at amortized cost (net of any write down for impairment), unless the asset is designated at fair value through profit or loss (FVTPL) under the fair value option;
- a debt instrument that (i) is held within a business model whose objective is achieved both by collecting contractual cash flows and selling financial assets and (ii) has contractual terms that give rise, on specified dates, to cash flows that are solely payments of principal and interest on the principal amount outstanding is measured at fair value through other comprehensive income (FVTOCI), unless the asset is designated at FVTPL under the fair value option;
- all other debt instruments are measured at FVTPL;
- all equity investments are measured in the consolidated statement of financial position at fair value, with gains and losses recognized in profit or loss except that if an equity investment is not held for trading, nor contingent consideration recognized by an acquirer in a business combination, an irrevocable election can be made at initial recognition to measure the investment at FVTOCI, with dividend income recognized in profit or loss. This classification is determined on an instrument-by-instrument basis. Equity instruments in non-listed companies previously classified as available-for-sale in accordance with IAS 39 *Financial Instruments: Recognition and Measurement* are now classified and measured as equity instruments measured at FVTOCI. Upon derecognition, the cumulative gains or losses previously recognized in other comprehensive income are reclassified to retained earnings. The Group elected to classify irrevocably its non-listed investments existing as of December 31, 2017 under this category, as it intends to hold these investments for the foreseeable future.

For instruments quoted in an active market, the fair value corresponds to a market price (level 1). For instruments that are not quoted in an active market, the fair value is determined using valuation techniques including reference to recent arm's length market transactions or transactions involving instruments which are substantially the same (level 2), or discounted cash flow analysis including, to the greatest possible extent, assumptions consistent with observable market data (level 3). However, in limited circumstances, cost of equity instruments may be an appropriate estimate of their fair value. That may be the case if insufficient more recent information is available to measure fair value, or if there is a wide range of possible fair value measurements and cost represents the best estimate of fair value within that range.

Impairment of financial assets

The impairment loss of a financial asset measured at amortized cost is calculated based on the expected loss model, representing the weighted average of credit losses with the respective risks of a default occurring as the weight. Expected credit losses are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Group expects to receive, discounted at an approximation of the original effective interest rate.

For trade receivables that do not contain a significant financing component (i.e. substantially all trade receivables), the loss allowance is measured at an amount equal to lifetime expected credit losses. Those are the expected credit losses that result from all possible default events over the expected life of those trade receivables, using a provision matrix that takes into account historical information on defaults adjusted for the forward-looking information per customer. The Group considers a financial asset in default when contractual payments are 60 days past due. However, in certain cases, the Group may also consider a financial asset to be in default when internal or external information indicates that the Group is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Group. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

Impairment losses are recognized in the consolidated income statement, except for debt instruments measured at fair value through other comprehensive income. In this case, the allowance is recognized in other comprehensive income.

Financial liabilities

Financial liabilities are initially measured at fair value minus, in the case of a financial liability not at fair value through profit or loss, transaction costs that are directly attributable to the issue of the financial liability. Subsequently, they are measured at amortized cost, except for:

- financial liabilities at fair value through profit or loss. Such liabilities, including derivatives that are liabilities, are subsequently measured at fair value;
- financial guarantee contracts. After initial recognition, guarantees are subsequently measured at the higher of the expected losses and the amount initially recognized.

Derivative financial instruments

A derivative financial instrument is a financial instrument or other contract within the scope of IFRS 9 *Financial Instruments* with all three of the following characteristics:

- its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating, credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the "underlying");
- it requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors;
- it is settled at a future date.

The Group enters into a variety of derivative financial instruments (forward, future, option, collars, and swap contracts) to manage its exposure to interest rate risk, foreign exchange rate risk, and commodity risk (mainly energy and CO_2 emission rights price risks).

As explained above, derivatives are initially recognized at fair value at the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in income or expense, unless the derivative is designated and effective as a hedging instrument. The Group designates certain derivatives as hedging instruments of the exposure to variability in cash flows with respect to a recognized asset or liability or a highly probable forecast transaction that could affect profit or loss (cash flow hedges).

A derivative with a positive fair value is recognized as a financial asset whereas a derivative with a negative fair value is recognized as a financial liability. Derivative instruments (or portions of them) are presented as non-current assets or non-current liabilities if the remaining maturity of the underlying settlements is more than twelve months after the reporting period. Other derivative instruments (or portions of them) are presented as current assets or current liabilities.

Hedge accounting

The Group designates certain derivatives and embedded derivatives, in respect of interest rate risk, foreign exchange rate risk, Solvay share price risk, and commodity risk (mainly energy and CO_2 emission rights price risks), as hedging instruments in a cash flow hedge relationship.

At the inception of the hedge relationship, there is a formal designation and documentation of the hedging relationship and the Group's risk management objective and strategy for undertaking the hedge. So to apply hedge accounting: (a) there is an economic relationship between the hedged item and the hedging instrument, (b) the effect of credit risk does not dominate the value changes that result from that economic relationship, and (c) the hedge ratio of the hedging relationship is the same as that resulting from the quantity of the hedged item that the Group actually hedges and the quantity of the hedging instrument that the Group actually uses to hedge that quantity of hedged item.

The requirement under (a) above that an economic relationship exists means that there is an expectation that the value of the hedging instrument and the value of the hedged item will systematically change in opposite direction in response to movements in either the same underlying (or underlyings that are economically related in such a way that they respond in a similar way to the risk that is being hedged).

Cash flow hedges

The effective portion of changes in the fair value of hedging instruments that are designated in a cash flow hedge is recognized in other comprehensive income.

The gain or loss relating to the ineffective portion is recognized immediately in profit or loss.

As long as cash flow hedge qualifies, the hedging relationship is accounted for as follows:

a. The separate component of equity associated with the hedged item (cash flow hedge reserve) is adjusted to the lower of the following (in absolute amounts):
   i) the cumulative gain or loss on the hedging instrument from inception of the hedge; and
   ii) the cumulative change in fair value (present value) of the hedged item (i.e. the present value of the cumulative change in the hedged expected future cash flows) from inception of the hedge.
b. The portion of the gain or loss on the hedging instrument that is determined to be an effective hedge (i.e. the portion that is offset by the change in the cash flow hedge reserve calculated in accordance with (a)) is recognized in other comprehensive income.
c. Any remaining gain or loss on the hedging instrument (or any gain or loss required to balance the change in the cash flow hedge reserve calculated in accordance with (a)) is hedge ineffectiveness that is recognized in profit or loss.
d. The amount that has been accumulated in the cash flow hedge reserve in accordance with (a) is accounted for as follows:
   i) if a hedged forecast transaction subsequently results in the recognition of a non-financial asset or a non-financial liability, the Group removes that amount from the cash flow hedge reserve and includes it directly in the initial cost or other carrying amount of the asset or the liability. This is not a reclassification adjustment and hence it does not affect other comprehensive income;
   ii) for cash flow hedges other than those covered by (i), that amount is reclassified from the cash flow hedge reserve to profit or loss as a reclassification adjustment in the same period or periods during which the hedged expected future cash flows affect profit or loss (for example, in the periods that interest income or interest expense is recognized or when a forecast sale occurs);
   iii) however, if that amount is a loss and the Group expects that all or a portion of that loss will not be recovered in one or more future periods, it immediately reclassifies the amount that is not expected to be recovered into profit or loss as a reclassification adjustment.

Most hedged items are transaction-related. The time value of options, forward elements of forward contracts, and foreign currency basis spreads of financial instruments that are hedging the items affect profit or loss at the same time as those hedged items.

Hedge accounting is discontinued prospectively when the hedging relationship (or a part of a hedging relationship) ceases to meet the qualifying criteria (after taking into account any rebalancing of the hedging relationship, if applicable). This includes instances when the hedging instrument expires or is sold, terminated, or exercised.

When the Group discontinues hedge accounting for a cash flow hedge it accounts for the amount that has been accumulated in the cash flow hedge reserve as follows:

- If the hedged future cash flows are still expected to occur, that amount remains in the cash flow hedge reserve until the future cash flows occur. However, if that amount is a loss and the Group expects that all or a portion of that loss will not be recovered in one or more future periods, it immediately reclassifies the amount that is not expected to be recovered into profit or loss as a reclassification adjustment;
- If the hedged future cash flows are no longer expected to occur, that amount is immediately reclassified from the cash flow hedge reserve to profit or loss as a reclassification adjustment. A hedged future cash flow that is no longer highly probable to occur may still be expected to occur.

The following table presents the financial instruments by category, split into current and non-current assets and liabilities.

In € million	2018 Carrying amount	2018 Classification	2017 Carrying amount	2017 Classification
Non-current assets – Financial instruments	**328**		**376**	
Available-for-sale financial assets			44	Available-for-sale
Equity instruments measured at fair value through other comprehensive income	51	Financial assets measured at fair value through other comprehensive income		
Loans and other non-current assets (excluding pension fund surpluses)	277	Financial assets measured at amortized cost	332	Loans and receivables
Current assets – Financial instruments	**2,801**		**2,695**	
Trade receivables	1,434	Financial assets measured at amortized cost	1,462	Loans and receivables
Other financial instruments	101		89	
Other marketable securities >3 months	68	Financial assets measured at amortized cost	56	Loans and receivables
Currency swaps	1	Held for trading	4	Held for trading
Other current financial assets	32	Financial assets measured at amortized cost	28	Loans and receivables
Financial instruments – Operational	162		153	
Held for trading	151	Held for trading	130	Held for trading
Derivative financial instruments designated in a cash flow hedge relationship	12	Cash-flow hedge	23	Cash-flow hedge
Cash and cash equivalents	1,103	Financial assets measured at amortized cost	992	Loans and receivables
Total assets – Financial instruments	**3,128**		**3,071**	
Non-current liabilities – Financial instruments	**3,301**		**3,362**	
Financial debt	3,180		3,182	
Bonds	2,937	Financial liabilities measured at amortized cost	2,856	Financial liabilities measured at amortized cost
Other non-current debts	208	Financial liabilities measured at amortized cost	282	Financial liabilities measured at amortized cost
Long-term finance lease obligations	35	Finance lease liabilities measured at amortized cost	44	Finance lease liabilities measured at amortized cost
Other liabilities	121	Financial liabilities measured at amortized cost	180	Financial liabilities measured at amortized cost
Current liabilities – Financial instruments	**2,416**		**2,652**	
Financial debt	630		1,044	
Short-term financial debt (excluding finance lease obligations)	616	Financial liabilities measured at amortized cost	1,015	Financial liabilities measured at amortized cost
Currency swaps	12	Held for trading	27	Held for trading
Short-term finance lease obligations	1	Finance lease liabilities measured at amortized cost	2	Finance lease liabilities measured at amortized cost
Trade payables	1,439	Financial liabilities measured at amortized cost	1,330	Financial liabilities measured at amortized cost
Financial instruments – Operational	194		130	
Held for trading	151	Held for trading	123	Held for trading
Derivative financial instruments designated in a cash flow hedge relationship	43	Cash-flow hedge	7	Cash-flow hedge
Dividends payables	154	Financial liabilities measured at amortized cost	147	Financial liabilities measured at amortized cost
Total liabilities – Financial instruments	**5,717**		**6,014**	

F35.A. Overview of financial instruments

The following table gives an overview of the carrying amount of all financial instruments by category as defined by IFRS 9 *Financial Instruments* and IAS 39 *Financial Instruments: Recognition and Measurement*.

In € million	2018 Carrying amount	2017 Carrying amount
Fair value through profit or loss		
Held for trading (financial instruments – operational – see note F29)	151	130
Held for trading (other financial instruments – see note F36, table Changes in financial debt)	1	4
Derivative financial instruments designated in a cash flow hedge relationship (see note F29)	**12**	**23**
Financial assets measured at amortized cost		
Financial assets measured at amortized cost (including cash and cash equivalents, trade receivables, loans and other current/non-current assets except pension fund surpluses)	2,914	2,870
Available-for-sale financial assets (IAS 39)		**44**
Financial assets measured at fair value through other comprehensive income		
Equity instruments measured at fair value through other comprehensive income (IFRS 9)	51	
Total financial assets	**3,128**	**3,071**
Fair value through profit or loss		
Held for trading (financial instruments – operational – see note F37)	(151)	(123)
Held for trading (financial debt – see note F36, table Changes in financial debt)	(12)	(27)
Derivative financial instruments designated in a cash flow hedge relationship (see note F37)	**(43)**	**(7)**
Financial liabilities measured at amortized cost		
Financial liabilities measured at amortized cost (including long-term financial debt, other non-current liabilities, short-term financial debt and trade liabilities, excluding finance lease liabilities)	(5,321)	(5,663)
Dividends payable	(154)	(147)
Finance lease obligations (see note F36, section Changes in financial debt)	(36)	(46)
Total financial liabilities	**(5,717)**	**(6,014)**

The category "Held for trading" only contains derivative financial instruments that are used for management of foreign currency risk, interest rate risk, energy and CO_2 emission rights price risks, index and Solvay share price, but which have not been documented as hedging instruments (hedge accounting under IFRS 9 *Financial Instruments*). Equity instruments measured at fair value through OCI pertain to Solvay's New Business Development (NBD) activity: the Group has built a Corporate Venturing portfolio which is made up of direct investments in start-up companies and of investments in venture capital funds. If the Group does not have significant influence or joint control, the investments are measured at fair value according to the valuation guidelines published by the European Private Equity and Venture Capital Association, and impacts are recognized through OCI.

F35.B. Fair value of financial instruments

Valuation techniques and assumptions used for measuring fair value

Accounting policy

Quoted market prices are available for financial assets and financial liabilities with standard terms and conditions that are traded on active markets. The fair values of derivative financial instruments are equal to their quoted prices, if available. If such quoted prices are not available, the fair value of the financial instruments is determined based on a discounted cash flow analysis using the applicable yield curve derived from quoted interest rates matching maturities of the contracts for non-optional derivatives. Optional derivatives are measured at fair value based on option pricing models, taking into account the present value of probability-weighted expected future payoffs, using market reference formulas.

The fair values of other financial assets and financial liabilities are determined in accordance with generally accepted pricing models based on discounted cash flow analysis.

Fair value of financial instruments measured at amortized cost

	2018		2017		
In € million	Carrying amount	Fair value	Carrying amount	Fair value	Fair value level
Non-current assets – Financial instruments	**277**	**277**	**332**	**332**	
Loans and other non-current assets (except pension fund surpluses)	277	277	332	332	2
Non-current liabilities – Financial instruments	**(3,301)**	**(3,396)**	**(3,362)**	**(3,550)**	
Bonds	(2,937)	(3,032)	(2,856)	(3,044)	1
Other non-current debts	(208)	(208)	(282)	(282)	2
Other liabilities	(121)	(121)	(180)	(180)	2
Long-term finance lease obligations	(35)	(35)	(44)	(44)	2

The carrying amounts of current financial assets and liabilities are estimated to reasonably approximate their fair values, such in light of short terms to maturity.

Financial instruments measured at fair value in the consolidated statement of financial position

The table "Financial instruments measured at fair value in the consolidated statement of financial position" provides an analysis of financial instruments that, subsequent to their initial recognition, are measured at fair value, grouped in Levels 1 to 3 based on the degree to which the fair value is observable. Financial instruments classified as held for trading and as hedging instruments in cash flow hedges are mainly grouped in Levels 1 and 2. They are measured at fair value based on forward pricing and swap models using present value calculations. The models incorporate various inputs including foreign exchange spot and interests rates of the respective currencies, currency basis spreads between the respective currencies, interest rate curves, and forward rate curves of the underlying commodity. The equity instruments measured at fair value through OCI fall within Level 3 and are measured based on a discounted cash flow approach.

In accordance with the Group internal rules, the responsibility for measuring the fair value level resides with (a) the Treasury department for the non-energy derivative financial instruments and the non-derivative financial liabilities, (b) the Sustainable Development and Energy department for the energy derivative financial instruments, and (c) the Finance department for non-derivative financial assets.

Financial instruments measured at fair value in the consolidated statement of financial position

In € million	2018			
	Level 1	Level 2	Level 3	Total
Held for trading	**63**	**89**		**152**
Foreign currency risk		3		3
Energy risk	39	82		121
CO_2 risk	24			24
Solvay share price		1		1
Index		3		3
Cash flow hedges		**12**		**12**
Foreign currency risk		5		5
Energy risk		6		6
CO_2 risk		1		1
Equity instruments measured at fair value through other comprehensive income			**51**	**51**
New Business Development			51	51
Total (assets)	**63**	**100**	**51**	**215**
Held for trading	**(70)**	**(93)**		**(163)**
Foreign currency risk		(11)		(11)
Interest rate risk		(4)		(4)
Energy risk	(47)	(67)		(114)
CO_2 risk	(23)	(3)		(26)
Solvay share price		(6)		(6)
Index		(3)		(3)
Cash flow hedges		**(43)**		**(43)**
Foreign currency risk		(15)		(15)
Energy risk		(18)		(18)
CO_2 risk		(2)		(2)
Solvay share price		(7)		(7)
Total (liabilities)	**(70)**	**(136)**		**(206)**

In € million	2017			
	Level 1	Level 2	Level 3	Total
Held for trading	**39**	**95**		**134**
Foreign currency risk		5		5
Energy risk	31	81		112
CO_2 risk	8	1		9
Solvay share price		8		8
Cash flow hedges	**1**	**22**		**23**
Foreign currency risk		17		17
Energy risk		3		3
CO_2 risk	1			1
Solvay share price		3		3
Available-for-sale financial assets			**44**	**44**
New Business Development			44	44
Total (assets)	**40**	**118**	**44**	**201**
Held for trading	**(22)**	**(128)**		**(151)**
Foreign currency risk		(24)		(24)
Interest rate risk		(5)		(5)
Energy risk	(21)	(96)		(117)
CO_2 risk	(2)	(1)		(3)
Solvay share price		(1)		(1)
Cash flow hedges	**0**	**(6)**		**(7)**
Foreign currency risk		(2)		(2)
Interest rate risk		(1)		(1)
Energy risk		(4)		(4)
Total (liabilities)	**(23)**	**(135)**		**(158)**

Movements during the period

Reconciliation of level 3 fair value measurements of financial assets and liabilities

	2018		
	At fair value through profit or loss	**At fair value through other comprehensive income**	
In € million	**Derivatives**	**Equity instruments**	**Total**
Opening balance at January 1		**44**	**44**
Total gains or losses			
Recognized in other comprehensive income		3	3
Acquisitions		9	9
Capital decreases		(5)	(5)
Closing balance at December 31		**51**	**51**

	2017		
	At fair value through profit or loss	Available-for-sale	
In € million	Derivatives	Shares	Total
Opening balance at January 1	**1**	**44**	**45**
Total gains or losses			
Recognized in the income statement	(1)	(3)	(4)
Recognized in other comprehensive income		(2)	(2)
Acquisitions		9	9
Disposals		(4)	(4)
Closing balance at December 31	**0**	**44**	**44**

Income and expenses of financial instruments recognized in the consolidated income statement and in other comprehensive income

In € million	2018	2017
Recognized in the consolidated income statement		
Recycling from OCI of derivative financial instruments designated in a cash flow hedge relationship		
Foreign currency risk	(12)	19
Energy risk	(3)	7
CO_2 risk	1	(1)
Changes in the fair value of financial instruments held for trading		
Energy risk	20	6
CO_2 risk	5	1
Recognized in the gross margin	**11**	**32**
Recycling from OCI of derivative financial instruments designated in a cash flow hedge relationship		
Solvay share price		2
Changes in the fair value of financial instruments held for trading		
Solvay share price	(13)	4
Gains and losses (time value) on derivative financial instruments designated in a cash flow hedge relationship		
Foreign currency risk	3	4
Foreign operating exchange gains and losses	(4)	(9)
Recognized in other operating gains and losses	**(14)**	**0**
Recycling from OCI of derivative financial instruments designated in a cash flow hedge relationship		
Foreign currency risk		2
Recognized in results from portfolio management and reassessments		**2**
Net interest expense	(117)	(157)
Other gains and losses on net indebtedness (excluding gains and losses on items not related to financial instruments)		
Foreign currency risk	(2)	(6)
Interest element of swaps	5	(20)
Others	1	(13)
Recognized in charges on net indebtedness	**(114)**	**(196)**
Total recognized in the consolidated income statement	**(117)**	**(162)**

The foreign currency loss of € (12) million recognized in gross margin is the result of the recycling of gains and losses of derivative financial instruments designated in a cash flow hedge relationship on highly probable sales.

The change in fair value of financial instruments held for trading resulting in a gain of € 20 million and recognized in gross margin is due mainly to the price increase of gas and electricity in 2018. The loss of € (13) million recognized in other operating gains and losses is the result of the change in fair value of equity swaps for long-term incentives.

Income and expenses on financial instruments recognized in other comprehensive income include the following:

	Foreign currency risk		Interest rate risk		Commodity risk		Risk on Solvay share price		Total	
In € million	**2018**	2017	**2018**	2017	**2018**	2017	**2018**	2017	**2018**	2017
Balance at January 1	**15**	**(7)**	**(1)**	**(1)**	**(2)**	**2**	**3**	**5**	**15**	**0**
Recycling from other comprehensive income of derivative financial instruments designated in a cash flow hedge relationship	12	(26)			2	(6)		(2)	14	(34)
Effective portion of changes in fair value of cash flow hedge	(38)	47	1		(14)	2	(9)	(1)	(61)	49
Balance at December 31	**(12)**	**15**	**0**	**(1)**	**(13)**	**(2)**	**(7)**	**3**	**(32)**	**15**

The recycling from OCI (foreign currency risk) of € 12 million is explained by the result of the recycling of gains of derivative financial instruments designated in cash flow hedge relationship on highly probable sales.

F35.C. Capital management

See 2 *Capital, shares and shareholders* in respect of capital in the Corporate Governance Statement chapter of this report.

The Group manages its funding structure with the objective of safeguarding its ability to continue as a going concern, optimizing the return for shareholders, maintaining an investment-grade rating, and minimizing the cost of debt.

The capital structure of the Group consists of equity (including perpetual hybrid bonds (see note F31 *Equity*)) and of net debt (see note F36 *Net indebtedness*). Perpetual hybrid bonds are nevertheless considered as debt in the Group's underlying metrics.

Besides the statutory minimum equity funding requirements that apply to the Company's subsidiaries in the different countries, Solvay is not subject to any additional legal capital requirements.

The Treasury department reviews the capital structure on a ongoing basis under the authority and the supervision of the Chief Financial Officer. As appropriate, the Legal department is involved to ensure compliance with legal and contractual requirements.

F35.D. Financial risk management

The Group is exposed to market risks from movements in foreign exchange rates, interest rates, and other market prices (energy prices, CO_2 emission rights prices, and equity prices). The Group's senior management oversees the management of these risks and is supported by the Treasury department (non-commodity risks) and Solvay Sustainable Development and Energy department, which advise on financial risks and the appropriate financial risk governance framework for the Group. Both departments provide assurance to the Group's senior management that the Group's financial risk activities are governed by appropriate policies and procedures and that financial risks are identified, measured, and managed in accordance with the Group's policies and risk objectives. The Solvay Group uses derivative financial instruments to hedge clearly identified foreign exchange, interest rate, index, energy price, and CO_2 emission rights price risks (hedging instruments). All derivative activities for risk management purposes are carried out by specialist teams that have the appropriate skills, experience, and supervision. However, the required criteria to apply hedge accounting are not met in all cases.

Furthermore, the Group is exposed to liquidity risks and credit risks.

The majority of derivative hedging instruments held by the Group mature in less than one year.

Foreign currency risks

The Group is a multi-specialty chemical company with operations worldwide and hence undertakes transactions denominated in foreign currencies. As a consequence, the Group is exposed to exchange rate fluctuations. In 2018, the Group was exposed mainly to US dollar, Chinese yuan, Brazilian real, Mexican peso, and Japanese yen.

To mitigate its foreign currency risk, the Group has defined a hedging policy that is based essentially on the principles of financing its activities in local currency and hedges the transactional exchange risk at the time of invoicing (risk which is certain). The Group constantly monitors its activities in foreign currencies and hedges, where appropriate, the exchange rate exposures on expected cash flows.

Exchange rate exposures are managed within approved policy parameters utilizing forward foreign exchange contracts or other derivatives like currency options.

In the course of 2018 the EUR/USD exchange rate moved from 1.1995 at the start of January to 1.1455 at the end of December. In the course of 2017 the EUR/USD exchange rate moved from 1.0538 at the start of January to 1.1995 at the end of December.

EBITDA sensitivity to the US dollar is about € 120 million per (0.10) US$/€ fluctuation, of which 2/3 on conversion and 1/3 on transaction, the latter being mostly hedged.

At the end of 2018, a strengthening of the US dollar vs EUR would increase the net debt by approximately € 129 million per 0.10 US$/€ fluctuation. Conversely, a weakening of the US dollar vs EUR would decrease the net debt by approximately € 108 million per 0.10 US$/€ fluctuation.

At the end of 2017, a strengthening of the US dollar vs EUR would increase the net debt by approximately € 146 million per 0.10 US$/€ fluctuation. Conversely, a weakening of the US dollar vs EUR would decrease the net debt by approximately € 123 million per 0.10 US$/€ fluctuation.

The Group's currency risk can be split into two categories: translation and transactional risk.

Translation risk

The translation exchange risk is the risk affecting the Group's consolidated financial statements relating to investees operating in a currency other than the EUR (the Group's presentation currency).

During 2018 and 2017, the Group did not hedge the currency risk of foreign operations.

Transactional risk

The transactional risk is the exchange risk linked to a specific transaction, such as a Group company buying or selling in a currency other than its functional currency.

To the largest extent possible, the Group manages the transactional risk on receivables and borrowings centrally; it is managed locally when centralization is not possible.

The choice of borrowing currency depends mainly on the opportunities offered by the various markets. This means that the selected currency is not necessarily that of the country in which the funds will be invested. Nonetheless, operating entities are financed essentially in their functional currencies.

In emerging countries it is not always possible to borrow in local currency, either because funds are not available in local financial markets, or because the financial conditions are too onerous. In such a situation the Group has to borrow in a different currency. Nevertheless, the Group considers opportunities to refinance its borrowings in emerging countries with local currency debt.

Derivatives are initially recognized at fair value at the date a derivative contract is entered into and are classified into the two categories described below:

Held for trading

The transactional risk is managed either by spot or forward contracts. Unless documented as hedging instruments (see above), those contracts are classified as held for trading.

At the end of 2018, the notional amounts held for trading fluctuated by € 267 million. This evolution is explained mainly by continuous cash centralization efforts (in foreign currencies to be swapped) and internal restructuring activity.

The following table details the notional amounts of the Group's derivatives contracts outstanding at the end of the period:

	Notional amount[1]		Fair value assets		Fair value liabilites	
In € million	**2018**	2017	**2018**	2017	**2018**	2017
Held for trading	138	(129)	3	5	(11)	(24)
Total	**138**	**(129)**	**3**	**5**	**(11)**	**(24)**

(1) Long/(short) positions (if the foreign exchange transaction does not involve EUR currency, both notionals are presented net)

Cash flow hedge

The Group uses derivatives to hedge identified foreign exchange rate risks. It documents those as hedging instruments unless it hedges a recognized financial asset or liability when generally no cash flow hedge relationship is documented. Most hedges are transaction-related.

At the end of 2018 for future exposure, the Group had mainly hedged forecast sales (short position) in a nominal amount of US$ 852 million (€ 744 million) and JP¥ 12,713 million (€ 101 million). Almost all cash flow hedges that exist at the end of December 2018 will be settled within the next 12 months and will impact profit or loss during that period.

The following table details the notional amounts of Solvay's derivatives contracts outstanding at the end of the period:

Notional amounts net

2018	Notional amount of the instrument[1]	Notional amount of the hedged item[1]	Percentage of exposure hedged	Average hedge exchange rate per risk category	Cash flow hedge reserve	Fair value of the hedging instrument	
Cash flow hedges – Forecasted sales and purchases[3]					Equity	Assets	Liabilities
	In € million				In € million		
JPY/EUR	(71)	(104)	68%	129.52	(2)	0	(2)
JPY/USD	(30)	(53)	57%[2]	109.32	0	0	0
USD/BRL	(142)	(244)	58%[2]	3.94	(1)	3	(2)
USD/CNY	(128)	(283)	45%[2]	6.71	(3)	0	(3)
USD/EUR	(408)	(501)	81%	1.18	(8)	0	(8)
USD/MXN	(47)	(86)	55%[2]	20.78	1	1	0
USD/THB	(19)	(35)	54%[2]	32.54	0	0	0
Total	**(845)**	**(1,305)**			**(12)**	**5**	**(15)**

(1) Long/(short) positions

(2) In compliance with Group Treasury Policy the percentage of hedged exposure will reach the progressive minimum compliance level of 60% in Q1 2019

(3) The hedging instruments are located in the line item: "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

2017	Notional amount of the instrument[1]	Notional amount of the hedged item[1]	Percentage of exposure hedged	Average hedge exchange rate per risk category	Cash flow hedge reserve	Fair value of the hedging instrument	
Cash flow hedges – Forecasted sales and purchases[3]					Equity	Assets	Liabilities
	In € million				In € million		
JPY/EUR	(67)	(89)	76%	128.35	3	3	
JPY/USD	(37)	(59)	63%	110.63	0	0	
USD/BRL	(83)	(188)	44%[2]	3.35	(2)	0	(1)
USD/CNY	(103)	(176)	59%[2]	6.71	2	2	
USD/EUR	(288)	(505)	57%[2]	1.17	10	11	(1)
Total	**(579)**	**(1,016)**			**15**	**17**	**(2)**

(1) Long/(short) positions

(2) In compliance with Group Treasury Policy the percentage of hedged exposure has reached the progressive minimum compliance level of 60% in Q1 2018

(3) The hedging instruments are located in the line item: "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

Interest rate risks

See the Financial risk in the Management of risks section of this report for additional information on the interest rate risk management.

Interest rate risk is managed at Group level.

The Group is exposed to interest rate risk because entities in the Group borrow funds at both fixed and floating interest rates. Interest rate risk is managed at Group level by maintaining an appropriate mix between fixed and floating rate borrowings.

Interest rate exposure by currency is summarized below (note that financial debts for which floating interest rates are hedged by interest rate swaps and cross-currency interest rate swaps are presented under fixed rate financial debt):

In € million	At December 31, 2018			At December 31, 2017		
Currency	Fixed rate	Floating rate	Total	Fixed rate	Floating rate	Total
Financial debt						
EUR	(1,709)	(60)	(1,769)	(2,122)	(106)	(2,228)
USD	(1,731)	(12)	(1,744)	(1,649)	(24)	(1,673)
SAR	(112)	0	(112)	(116)	(17)	(133)
THB	(13)	(13)	(27)	(16)	(18)	(34)
BRL	(16)	(1)	(17)	(20)	(1)	(21)
CNY	(81)	0	(82)	(98)	0	(98)
Other	(27)	(32)	(59)	(2)	(37)	(39)
Total	**(3,690)**	**(120)**	**(3,810)**	**(4,024)**	**(202)**	**(4,226)**
Cash and cash equivalents						
EUR		391	391		237	237
USD		382	382		352	352
CAD		7	7		100	100
THB		17	17		34	34
SAR		4	4		16	16
BRL		67	67		67	67
CNY		77	77		54	54
KRW		32	32		23	23
JPY		38	38		33	33
Other		89	89		77	77
Total		**1,103**	**1,103**		**992**	**992**
Other financial instruments						
CNY		67	67		57	57
EUR		17	17		26	26
SAR		15	15		0	0
Other		3	3		6	6
Total		**101**	**101**		**89**	**89**
Total	**(3,690)**	**1,085**	**(2,605)**	**(4,024)**	**878**	**(3,146)**

At the end of 2018, around € 3.7 billion of the Group's gross debt was at fixed-rate, including mainly:

- Senior EUR Notes for a total of € 1,250 million maturing in 2022 and 2027 (carrying amount of € 1,241 million);
- Remaining part of the Senior Bonds 2023 of US$ 400 million (carrying amount of € 165 million);
- Remaining part of the Senior Bonds 2025 of US$ 250 million (carrying amount of € 140 million);
- Senior US$ Notes for a total of US$ 1,600 million (carrying amount of € 1,392 million);
- Belgian Treasury notes (commercial papers) for a total of € 246 million maturing within the year (carrying amount of € 246 million).

The impact of interest rate volatility at the end of 2018 in comparison with 2017 is as follows:

	Sensitivity to a +100 bp movement in EUR market interest rates		Sensitivity to a (100) bp movement in EUR market interest rates	
In € million	**2018**	2017	**2018**	2017
Profit or loss	(1)	(1)	1	1

The sensitivity to interest rates' volatility remains stable at the end of 2018 compared to 2017. The floating rate debt is very limited and part of it is hedged by interest rate swaps and cross-currency interest rate swaps reducing even more its volatility.

	Notional amount		Fair value assets		Fair value liabilites	
In € million	**2018**	2017	**2018**	2017	**2018**	2017
Held for trading	109	122			(4)	(6)
Total	**109**	**122**			**(4)**	**(6)**

The fair value of € (4) million reported under "held for trading" is explained mainly by a cross currency swap contracted in May 2017 to mitigate the volatility (forex and interest rate) of the external financing set up for our HPPO joint operation (Saudi Hydrogen Peroxide Company) 50/50 with Sadara in Saudi Arabia (notional amount € 104 million at 50%).

2018 In € million (except where indicated)	Notional amount of the instrument(1)	Notional amount of the hedged item(1)	Percentage of exposure hedged	Hedge interest rate per risk category	Cash flow hedge reserve	Fair value of the hedging instrument	
					Equity	Assets	Liabilities
Cash flow hedges – Floating rate debt	(13)	(26)	50%	Pay Fix 3.125% Receive THBFIX6M			
Total	**(13)**	**(26)**					

(1) The hedging instruments are located in the line item: "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

(2) The hedged item is located in the line items: "Non-current and current financial debt" in the consolidated statement of financial position.

2017 In € million (except where indicated)	Notional amount of the instrument(1)	Notional amount of the hedged item(1)	Percentage of exposure hedged	Hedge interest rate per risk category	Cash flow hedge reserve	Fair value of the hedging instrument	
					Equity	Assets	Liabilities
Cash flow hedges – Floating rate debt	(16)	(32)	50%	Pay Fix 3.125% Receive THBFIX6M	(1)		(1)
Total	**(16)**	**(32)**			**(1)**		**(1)**

(1) The hedging instruments are located in the line item: "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

(2) The hedged item is located in the line items: "Non-current and current financial debt" in the consolidated statement of financial position.

Other market risks

Energy price risks

The Group purchases a large portion of its coal, gas, and electricity needs in Europe and the United States, based on fluctuating liquid market indices. In order to reduce the cost volatility, the Group has developed a policy for exchanging variable price for fixed price through derivative financial instruments. Most of these hedging instruments can be documented as hedging instruments of the underlying purchase contracts. Purchases of physical energy at fixed price contracts that qualify as "own use" contracts (not derivatives) constitute a natural hedge, and are not included in this note. Similarly, the Group's exposure to CO_2 price is hedged partly by forward purchases of European Union Allowance (EUA), which either can be documented as hedging instruments, or qualify as own use contracts.

Finally some exposure to gas-electricity or coal-electricity spreads may arise from the production of electricity on Solvay sites (mostly from cogeneration units in Europe), which can be hedged by forward purchases and forward sales or optional schemes. In this case, cash flow hedge accounting is applied.

Energy Services

Financial hedging of energy and CO_2 emission rights price risks is managed centrally by Energy Services on behalf of the Group entities.

Energy Services also carries out trading transactions with respect to energy and CO_2, for which the residual price exposure is maintained close to zero.

The following tables detail the notional principal amounts and fair values of energy and CO_2 derivative financial instruments outstanding at the end of the reporting period:

In € million (except where indicated)	Notional amount of the instrument[1]		Notional amount of the instrument (in units)			Fair value of the instrument – Asset		Fair value of the instrument – Liability	
Held for trading	**2018**	2017	**2018**	2017		**2018**	2017	**2018**	2017
Coal	15	14	120,000	258,000	Tons	2	4	(2)	(4)
Power	613	421	15,850,229	11,827,898	MWh	87	63	(85)	(63)
Standard Quality Gas	416	453	18,962,646	14,659,141	MWh	32	46	(27)	(43)
CO_2	45	32	5,594,159	5,266,000	Tons	24	8	(26)	(10)
Total	**1,089**	**920**				**145**	**121**	**(140)**	**(120)**

(1) The hedging instruments are located in the line item "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

The amounts presented in the tables hereafter include hedging needs of GBUs of the Group that sourced through Energy Services, and not the full Group energy hedging needs.

2018 In € million (except where indicated)	Notional amount of the instrument(1)	Notional amount of the instrument (in units)		Notional amount of the hedged item	Notional amount of the hedged item (in units)		Percentage of exposure hedged	Average hedge price per risk category		Cash flow hedge reserve	Fair value of the instrument – Asset	Fair value of the instrument – Liability
Cash flow hedge												
Benzene	7	9,088	Tons	43	50,000	Tons	18%	796	EUR/ ton			
Coal	17	252,000	Tons	54	624,800	Tons	40%	77	USD/ ton	2	2	
Power	104	1,765,121	MWh	104	1,765,000	MWh	100%	59	EUR/ MWh	(8)	2	(10)
Standard Quality Gas	129	6,904,347	MWh	210	13,938,999	MWh	50%	19	EUR/ MWh	(7)	3	(10)
Total	**257**			**411**						**(13)**	**7**	**(20)**

(1) The hedging instruments are located in the line item "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

2017 In € million (except where indicated)	Notional amount of the instrument(1)	Notional amount of the instrument (in units)		Notional amount of the hedged item	Notional amount of the hedged item (in units)		Percentage of exposure hedged	Average hedge price per risk category		Cash flow hedge reserve	Fair value of the instrument – Asset	Fair value of the instrument – Liability
Cash flow hedge												
Coal	16	195,000	Tons	116	1,315,201	Tons	15%	84	USD/ ton	2	1	
Power	13	235,900	MWh	22	400,960	MWh	59%	47	EUR/ MWh	(8)		
Standard Quality Gas	48	3,522,016	MWh	103	3,663,973	MWh	96%	12	EUR/ MWh	(7)	3	(5)
CO_2	27	7,208,000	Tons	67	8,383,346	Tons	86%	8	EUR/ ton			
Total	**104**			**308**						**(13)**	**4**	**(5)**

(1) The hedging instruments are located in the line item "Other Receivables" and "Other Liabilities" in the consolidated statement of financial position.

Performance Share Units Plan (PSU) risk on Solvay share price

In order to neutralize the volatility of the Solvay share price which will impact the debt valuation relating to the PSUs (with related employer charges), the Group entered into equity swaps.

2018 In € million (except where indicated)	Notional amount of the instrument[(1)]	Notional amount of the instrument (number of PSUs)	Notional amount of the hedged item[(2)]	Notional amount of the hedged item (number of PSUs)[(2)]	Percentage of exposure hedged	Hedged strike price per risk category (in €)	Cash flow hedge reserve	Fair value of the hedging instrument	
							Equity	Assets	Liabilities
Cash flow hedges – PSU Solvay share price									
PSU Plan 2017 – Solvay share price (forecast)	(8)	260,470	(9)	288,863	90%	111.95	(2)		(2)
PSU Plan 2018 – Solvay share price (forecast)	(16)	246,255	(18)	279,853	88%	113.10	(5)		(5)
Total	**(24)**	**506,725**	**(27)**	**568,716**			**(7)**		**(7)**

(1) The hedging instruments (equity swaps) are located in the line item: "Other receivables" and "Other liabilities" in the consolidated statement of financial position.

(2) Including social charges

2017 In € million (except where indicated)	Notional amount of the instrument[(1)]	Notional amount of the instrument (number of PSUs)	Notional amount of the hedged item[(2)]	Notional amount of the hedged item (number of PSUs)[(2)]	Percentage of exposure hedged	Hedged strike price per risk category (in €)	Cash flow hedge reserve	Fair value of the hedging instrument	
							Equity	Assets	Liabilities
Cash flow hedges – PSU Solvay share price									
PSU Plan 2016 – Solvay share price (forecast)	(7)	166,235	(9)	209,394	79%	82.30	2	2	
PSU Plan 2017 – Solvay share price (forecast)	(22)	260,470	(25)	298,982	87%	111.95	1	1	
Total	**(29)**	**426,705**	**(34)**	**508,376**			**3**	**3**	

(1) The hedging instruments (equity swaps) are located in the line item: "Other receivables" and "Other liabilities" in the consolidated statement of financial position.

(2) Including social charges

Credit risk

See the Financial risk in the Management of risks section of this report for additional information on the credit risk management.

The Group continuously monitors the credit risk of important business partners.

The Group engages in transactions only with financial institutions with a good credit rating. The Group monitors and manages exposures to financial institutions within approved counterparty credit limits and credit risk parameters in order to mitigate the risk of default.

The Group recognizes expected credit losses on all of its trade receivables: it applies the simplified approach and recognizes lifetime expected losses on all trade receivables, using a provision matrix in order to calculate the lifetime expected credit losses for trade receivables, using historical information on defaults adjusted for the forward-looking information.

The Group classifies the customers and their related receivables in various rating classes, based on the risks' grading attributed to the customers and on the ageing balance of receivables. As such, for all receivables overdue fewer than six months, the Group considers percentages within a range between 0.01% and 4.56%, depending on the rating class. For all receivables overdue in excess of six months, the Group considers a rate of 50% or of 100%, depending on the rating class. The customer's grading is reviewed annually for customers assessed as low risk profile, and every six months for customers assessed as higher risk profile.

There is no significant concentration of credit risk at Group level because the receivables' credit risk is spread over a large number of customers and markets.

The ageing of trade receivables, financial instruments – operational, loans, and other non-current assets is as follows:

2018 In € million	Total	Credit-impaired	With expected loss allowance, not credit-impaired not past due	less than 30 days past due	between 30 and 60 days past due	between 60 and 90 days past due	more than 90 days past due
Trade receivables	1,486	52	1,297	112	9	3	12
Trade receivables – allowance	(52)	(49)	(2)				(1)
Trade receivables – net	**1,434**	**3**	**1,296**	**112**	**9**	**3**	**11**
Financial instruments – operational	**162**		**162**				
Loans and other non-current assets	344	152	192				
Loans and other non-current assets – allowance	(62)	(62)					
Loans and other non-current assets – net	**282**	**89**	**192**				
Total	**1,878**	**92**	**1,650**	**112**	**9**	**3**	**11**

2017 In € million	Total	Credit-impaired	Not credit-impaired not past due	less than 30 days past due	between 30 and 60 days past due	between 60 and 90 days past due	more than 90 days past due
Trade receivables	1,510	51	1,246	135	16	3	10
Trade receivables – allowance	(49)	(49)					
Trade receivables – net	**1,462**	**3**	**1,246**	**135**	**16**	**3**	**10**
Financial instruments – operational	**153**		**153**				
Loans and other non-current assets	405	147	197	3			
Loans and other non-current assets – allowance	(59)	(59)					
Loans and other non-current assets – net	**346**	**87**	**197**	**3**			
Total	**1,961**	**90**	**1,596**	**138**	**16**	**3**	**10**

The table below presents the allowances on trade receivables:

In € million	2018	2017
Carrying amount at January 1, before IFRS 9 adoption	**(49)**	**(53)**
IFRS 9 adoption	(6)	
Carrying amount at January 1, after IFRS 9 adoption	**(55)**	**(53)**
Additions	(12)	(13)
Uses	3	5
Reversal of impairments	10	10
Currency translation differences	2	3
Transfer to assets held for sale	(1)	(2)
Other	1	1
Carrying amount at December 31	**(52)**	**(49)**

Liquidity risk

See the Financial risk in the Management of risks section of this report for additional information on the liquidity risk management.

Liquidity risk relates to Solvay's ability to service and refinance its debt (including notes issued) and to fund its operations.

This depends on its ability to generate cash from operations and not to over-pay for acquisitions.

The Finance Committee gives its opinion on the appropriate liquidity risk management for the Group's short, medium and long-term funding and liquidity management requirements.

The Group manages liquidity risk by maintaining adequate reserves, banking facilities, and reserve borrowing facilities, by continuously monitoring forecast and actual cash flows, and by matching the maturity profiles of financial assets and liabilities.

The Group staggers the maturities of its financing sources over time in order to limit the amounts to be refinanced each year.

The following tables detail the Group's remaining contractual maturity for its financial liabilities with contractual repayment periods.

The tables have been prepared using the discounted cash flows of financial liabilities, based on the earliest date on which the Group can be required to pay.

The following tables present discounted amounts (carrying amounts):

2018 In € million	Total	Within one year	In year two	In years three to five	Beyond five years
Outflows of cash:					
Trade liabilities	1,439	1,439			
Dividends payables	154	154			
Financial instruments – operational	194	194			
Other non-current liabilities	121		37	85	
Current financial debt	630	630			
Non-current financial debt	3,180		799	1,011	1,369
Total	**5,717**	**2,416**	**836**	**1,096**	**1,369**

2017 In € million	Total	Within one year	In year two	In years three to five	Beyond five years
Outflows of cash:					
Trade liabilities	1,330	1,330			
Dividends payables	147	147			
Financial instruments – operational	130	130			
Other non-current liabilities	180		124	39	17
Current financial debt	1,044	1,044			
Non-current financial debt	3,182		94	1,592	1,497
Total	**6,014**	**2,652**	**218**	**1,631**	**1,514**

The following tables present undiscounted amounts (nominal value):

2018 In € million	Total	Within one year	In year two	In years three to five	Beyond five years
Outflows of cash:					
Trade liabilities	1,439	1,439			
Dividends payables	154	154			
Financial instruments – operational	194	194			
Other non-current liabilities	121		37	85	
Current financial debt	630	630			
Non-current financial debt	3,205		802	1,024	1,381
Total	5,743	2,416	838	1,108	1,381
Interests on non-current financial debt(1)	577	108	103	209	157
Total outflows of cash	**6,320**	**2,524**	**942**	**1,317**	**1,538**

(1) and on short term portion of the non-current financial debt

2017 In € million	Total	Within one year	In year two	In years three to five	Beyond five years
Outflows of cash:					
Trade liabilities	1,330	1,330			
Dividends payables	147	147			
Financial instruments – operational	130	130			
Other non-current liabilities	180		124	39	17
Current financial debt	1,044	1,044			
Non-current financial debt	3,213		94	1,602	1,517
Total	6,045	2,652	218	1,641	1,534
Interests on non-current financial debt(1)	691	121	104	250	216
Total outflows of cash	**6,736**	**2,773**	**323**	**1,890**	**1,750**

(1) and on short term portion of the non-current financial debt

The Group has access to the following instruments:

- an amount of € 246 million (as against € 400 million at the end of 2017) was issued from the Belgian Treasury Bill program (out of € 1.5 billion (as against € 1 billion in 2017) subsequent to the 2018 update of the program). The US commercial paper program in an amount of US$ 500 million was unused at the end of 2018 as well as the end of 2017. The two programs are covered by back-up credit lines;
- A € 2 billion syndicated credit facility maturing in 2023 (with a further extension option to 2024). Solvay has also secured bilateral credit lines (~ € 994 million) maturing beyond one year. They were all unused at the end of 2018.

NOTE F36
Net indebtedness

The Group's net indebtedness is the balance between its financial debts and other financial instruments, and cash and cash equivalents.

In € million	2018	2017
Financial debt	3,810	4,226
Other financial instruments	(101)	(89)
Cash and cash equivalents	(1,103)	(992)
Net indebtedness	**2,605**	**3,146**

The decrease in the net indebtedness is due to strong cash generation and the cash proceeds from the issuance of a € 300 million hybrid bond.

Solvay Investment Grade rating is Baa2/P2 (stable outlook) with Moody's and BBB/A2 (stable outlook) with Standard & Poor's.

Financial debt: main borrowings

In € million (except where indicated)	Nominal amount	Coupon	Maturity	Secured	2018 Amount at amortized cost	2018 Fair value	2017 Amount at amortized cost	2017 Fair value
EMTN € bond (issuance € 500 million)	382	4.625%	2018	No	0	0	381	391
Senior US$ notes (144A;US$ 800 million)	698	3.40%	2020	No	697	697	665	681
Senior € notes	750	1.625%	2022	No	745	781	743	788
Senior US$ note Cytec Industries Inc (issuance US$ 400 million)	171	3.5%	2023	No	165	167	156	167
Senior US$ note Cytec Industries Inc (issuance US$ 250 million)	143	3.95%	2025	No	140	138	134	140
Senior US$ notes (144A;US$ 800 million)	698	4.45%	2025	No	695	706	663	708
Senior € notes	500	2.75%	2027	No	496	542	495	560
Total					**2,937**	**3,032**	**3,237**	**3,435**

The Senior US$ notes of Cytec Industries Inc. were partially repaid in 2017. The outstanding amount of the EMTN € 500 million bond was fully repaid in June 2018 (€ 382 million), after an early repayment of € 188 million already executed in 2017.

There are no instances of default on the above-mentioned financial debts. There are no financial covenants, either on Solvay SA, or on any of the Group's holding companies.

Other financial instruments

In € million	2018	2017
Currency swaps	1	4
Other marketable securities > 3 months	68	56
Other current financial assets	32	28
Other financial instruments	**101**	**89**

The "Other financial instruments" amount to € 101 million at the end of 2018 as against € 89 million at the end of 2017. They include currency swaps, other marketable securities > three months (bank drafts), and other current financial assets (mainly margin calls of Energy Services for instruments with a negative fair value).

Cash and cash equivalents

In € million	2018	2017
Cash	907	835
Term deposits	197	157
Cash and cash equivalents	**1,103**	**992**

By their nature, the carrying amount of cash and cash equivalents is equal to, or a very good proxy of, its fair value.

Changes in financial debt and in other financial instruments arising from financing activities

	2017	2018							
In € million	Total	Cash flows from increase of borrowings	Cash flows from repayment of borrowings	Changes in foreign exchange rates	Changes in other current financial assets	Other in financing cash flows	Transfer from non-current to current	Other	Total
Bonds	2,856			76				4	2,936
Other non-current debts	282	16	(13)	(1)			(79)	4	208
Long-term finance lease obligations	44			2			(3)	(8)	35
Non-current financial debt	**3,182**	**16**	**(13)**	**77**			**(82)**	**0**	**3,180**
Short-term financial debt (excluding finance lease obligations)	1,015	2,428	(2,980)	(1)		126	79	(51)	616
Currency swaps	27							(16)	12
Short-term finance lease obligations	2						3	(3)	1
Current financial debt	**1,044**	**2,428**	**(2,980)**	**0**		**126**	**82**	**(70)**	**630**
Total financial debt	**4,226**	**2,444**	**(2,994)**	**77**		**126**		**(70)**	**3,810**
Currency swaps	(4)							3	(1)
Other marketable securities > 3 months	(56)				(11)				(67)
Other current financial assets	(28)				(14)	11			(32)
Other financial instruments	**(89)**				**(25)**	**11**		**2**	**(101)**
Total cash flow		**2,444**	**(2,994)**		**(25)**	**137**			

The financial debt decreased from € 4,226 million at the end of 2017 to € 3,810 million at the end of 2018.

The non-current financial debt remains rather stable:

- on the one hand, the transfer to current financial debt for € 82 million; and
- on the other hand, the changes in foreign exchange rates (€ 77 million) mainly generated by the US$ 1,600 million Senior Notes and Senior US$ notes Cytec Industries Inc (US$ 348 million).

The net decrease in current financial debt (from € 1,044 million in 2017 to € 630 million in 2018) is explained mainly by:

- the transfer from non-current financial debt for € 82 million;
- the repayment of the outstanding amount of the EMTN € bond (€ 382 million);
- the decrease in commercial papers issued at the end of the year (€ 246 million in 2018 versus € 400 million in 2017).

The amounts presented in the cash flow statement under "increase in borrowings" and "repayment of borrowings" include the issuance of € 2,396 million and the repayment of € 2,550 million of commercial papers.

The € 137 million in "Other in financing cash flows" relates to the receipt of margin calls related to Energy Services activities (see note F18 *Other cash flows from financing activities*). The cash out for the Rhodia liquidity convention (€ (9) million) and other finance expenses (€ (4) million) are not presented as other financial liabilities and explain the difference with the € 123 million in the line "Other" in the cash flow from financing activities in the consolidated statement of cash flows.

NOTE F37
Other liabilities (current)

In € million	2018	2017
Wages and benefits debts	329	361
VAT and other taxes	131	130
Social security	68	61
Financial instruments – operational	194	130
M&A related liabilities		21
Insurance premiums	15	13
Advances from customers	31	34
Other	81	98
Other current liabilities	**850**	**848**

Financial instruments – operational include held for trading and cash flow hedge derivatives (see note F35.A. *Overview of financial instruments*).

Miscellaneous Notes

NOTE F38
Commitments to acquire property, plant and equipment and intangible assets

In € million	2018	2017
Commitments to acquire property, plant and equipment and intangible assets	132	90

The amount mainly relates to commitments for the acquisition of property, plant, and equipment.

NOTE F39
Contingent liabilities and financial guarantees

Accounting policy

A contingent liability is:

a. a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity; or

b. a present obligation that arises from past events but is not recognized because
(i) it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation; or
(ii) the amount of the obligation cannot be measured with sufficient reliability.

Contingent liabilities are not recognized in the consolidated financial statements, except if they arise from a business combination. They are disclosed unless the possibility of an outflow of economic benefits is remote.

Financial guarantees are contracts that require the Group to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payment when due in accordance with the original or modified terms of a debt instrument.

In € million	2018	2017
Liabilities and commitments of third parties guaranteed by the Group	812	706
Environmental contingent liabilities	313	317
Litigation and other major commitments	1	1
Total	**1,126**	**1,024**

The liabilities and commitments of third parties guaranteed by the Group mainly concern guarantees relating to:

- RusVinyl, the joint venture with SIBUR for the operation of a PVC plant in Russia. A guarantee of € 85 million at December 31, 2018 (€ 133 million at the end of 2017) has been provided on a several basis by each sponsor, SolVin/Solvay and Sibur, for the benefit of the lenders and which corresponds for each to 50% of the amount in principal of RusVinyl project finance plus interests and costs;
- VAT payment (€ 151 million at December 31, 2018, € 195 million at December 31, 2017); and
- The UK Rhodia Pension Fund, for which the guarantee exceeds the recognized pension liability for an amount of € 210 million – See note F34.B.2. *Description of obligations.*

Within the framework of the annual review of contingent liabilities, environmental contingent liabilities for a total amount of € 313 million have been identified at December 31, 2018 (€ 317 million at December 31, 2017).

NOTE F40
Related parties

Balances and transactions between Solvay SA and its subsidiaries, which are related parties of Solvay SA, have been eliminated in consolidation and are not disclosed in this note. Details of transactions between the Group and other related parties are disclosed below.

Sale and purchase transactions

	Sale of goods		Purchase of goods	
In € million	2018	2017	2018	2017
Associates	12	16	5	8
Joint ventures	55	33	23	19
Other related parties	27	10	49	57
Total	**95**	**59**	**77**	**85**

	Amounts owed by related parties		Amounts owed to related parties	
In € million	2018	2017	2018	2017
Associates	1	1		
Joint ventures	2	1	2	3
Other related parties	10	15	10	15
Total	**13**	**18**	**12**	**18**

Loans to related parties

In € million	2018	2017
Loans to joint ventures	25	23
Loans to other related parties	13	8
Total	**38**	**30**

Compensation of key management personnel

Key management personnel comprise all members of the Board of Directors and members of the Executive Committee.

Amounts due in respect of the year (compensation) and obligations existing at the end of the year in the consolidated statement of financial position:

In € million	2018	2017
Wages, charges and short-term benefits	3	3
Non-compete fee	2	
Long-term benefits	13	11
Cash-settled share-based payments liability	5	5
Total	**23**	**19**

Expenses of the year:

In € million	2018	2017
Wages, charges and short-term benefits	9	8
Non-compete fee	2	
Long-term benefits	2	2
Share-based payments expenses	3	4
Total	**15**	**14**

Excluding employer social charges and taxes

NOTE F41
Dividends proposed for distribution

The Board of Directors will propose to the General Shareholders' Meeting a gross dividend of € 3.75 per share.

Taking into account the dividend advance payment distributed in January 2019 of € 1.44 per share, the dividends proposed for distribution, but not yet recognized as a distribution to equity holders amount to € 245 million.

NOTE F42
Events after the reporting period

Accounting policy

Events after the reporting period which provide evidence of conditions that existed at the end of the reporting period (adjusting events) are recognized in the consolidated financial statements. Events indicative of conditions that arose after the reporting period are non-adjusting events and are disclosed in the notes if material.

On January 18, 2019, the European Commission cleared the divestment of Solvay's Polyamides activities to BASF, a key milestone in the completion of Solvay's transformation into an advanced materials and specialty chemicals company. The closing of the transaction is expected in the second part of 2019 after all remaining closing conditions have been fulfilled.

These conditions include the divestment of a remedy package to a third-party buyer to address the European Commission's competition concerns. BASF has offered remedies involving part of the assets originally in the scope of the acquisition. These entail among others the manufacturing assets of Solvay's polyamide intermediates, technical fibers, and engineering plastics business as well as its innovation capabilities in Europe.

NOTE F43
List of companies included in the consolidation scope

The Group consists of Solvay SA and a total of 341 investees.

Of these 341 investees, 187 are fully consolidated, 8 are proportionately consolidated, and 17 are accounted for under the equity method, whilst the other 129 do not meet the criteria of significance.

List of companies entering or leaving the consolidation scope

Companies entering the consolidation scope

Country	Company	Comments
BRAZIL	Techpolymers Industria E Comercio Ltda, Sao Paulo	New company
GERMANY	Performance Polyamides Gmbh, Hannover	New company
ITALY	Performance Polyamide Italy Srl, Bollate	New company
TURKEY	Solvay Istanbul Kimya Limited Sirketi	Meets the consolidation criteria
SOUTH KOREA	Solvay Chemical Services Korea Co. Ltd	New company

Companies leaving the consolidation scope

Country	Company	Comments
BELGIUM	Solvay Energy S.A., Bruxelles	Liquidated
	Cytec Belgium bvba, Diegem	Liquidated
CHINA	Baotou Solvay Rare Earths Company Ltd, Baotou	Sold to Inner Mongolia New Tech Holding Co
EGYPT	Solvay Alexandria Sodium Carbonate S.A.E., Alexandria	Sold to Ethydco
FRANCE	Solvay Participations France S.A., Paris	Merged into Solvay Finance France
	Cogénération Chalampe S.A.S., Puteaux	Merged into Solvay Finance France
	Solvay Finance France S.A., Paris	Merged into Solvay France
INDIA	Rhodia Specialty Chemicals India Private Limited, Mumbai	Merged into Solvay Specialities India Private Limited
	Cytec India Specialty Chemicals & Materials Private Ltd, Nagpur	No longer meets the consolidation criteria
MEXICO	Solvay & CPC Barium Strontium Reynosa S. de R.L. de C.V., Reynosa	Merged into Solvay & CPC Barium Strontium Monterrey
NETHERLANDS	Cytec Industries Europe C.V., Vlaardingen	Liquidated
	Onecarbon International B.V., Utrecht	Merged into Solvay Chemicals and Plastics Holding B.V.
UNITED KINGDOM	Advanced Composites Group Holdings Ltd, Heanor	No longer meets the consolidation criteria
	Cytec Industries UK Ltd, Wrexham	No longer meets the consolidation criteria
	Med-Lab International Ltd, Heanor	No longer meets the consolidation criteria
UNITED STATES	Solvay Energy Holding LLC	Merged into Solvay Holding Inc
	Solvay Biomass Energy LLC	Merged into Solvay Holding Inc
	Netherlands Cytec GP Inc., New Jersey	Merged into Cytec Global Holdings Inc

List of subsidiaries

Indicating the percentage holding

The percentage of voting rights is very close to the percentage holding.

ARGENTINA	
Solvay Argentina SA, Buenos Aires	100
Solvay Quimica SA, Buenos Aires	100
AUSTRALIA	
Cytec Asia Pacific Holdings Pty Ltd, Baulkham Hills	100
Cytec Australia Holdings Pty Ltd, Baulkham Hills	100
Solvay Interox Pty Ltd, Banksmeadow	100
AUSTRIA	
Solvay Österreich GmbH, Wien	100
BELGIUM	
Carrières les Petons S.P.R.L., Walcourt	100
Solvay Chemicals International S.A., Brussels	100
Solvay Chimie S.A., Brussels	100
Solvay Participations Belgique S.A., Brussels	100
Solvay Pharmaceuticals S.A. - Management Services, Brussels	100
Solvay Specialty Polymers Belgium SA / NV	100
Solvay Stock Option Management S.P.R.L., Brussels	100
BRAZIL	
Cogeracao de Energia Electricica Paraiso SA, Brotas	100
Techpolymers Industria E Comercio Ltda, Sao Paulo	100
Rhodia Brazil Ltda, Sao Paolo	100
Rhodia Poliamida Brasil Ltda , Sao Paolo	100
Rhodia Poliamida e Especialidades Ltda, Sao Paolo	100
Rhopart-Participacoes Servidos e Comercio Ltda, Sao Paolo	100
BULGARIA	
Solvay Bulgaria EAD, Devnya	100
CANADA	
Cytec Canada Inc, Niagara Falls Welland	100
Solvay Canada Inc, Toronto	100
CHINA	
Beijing Rhodia Eastern Chemical Co., Ltd , Beijing	60
Cytec Industries Co. Ltd, Shanghai	100
Cytec Engineered Materials Co. Ltd, Shanghai	100
Liyang Solvay Rare Earth New Material Co., Ltd, Liyang City	96.3
Rhodia Hong Kong Ltd , Hong Kong	100
Solvay (Beijing) Energy Technology Co., Ltd , Beijing	100
Solvay (Shanghai) Engineering Plastics Co., Ltd	100
Solvay (Shanghai) International Trading Co., Ltd, Shanghai	100
Solvay (Shanghai) Ltd, Shanghai	100
Solvay (Zhangjiagang) Specialty Chemicals Co. Ltd, Suzhou	100
Solvay (Zhenjiang) Chemicals Co., Ltd, Zhenjiang New area	100
Solvay Chemicals (Shanghai) Co. Ltd, Shanghai	100
Solvay China Co., Ltd , Shanghai	100
Solvay Fine Chemical Additives (Qingdao) Co., Ltd, Qingdao	100
Solvay Hengchang (Zhangjiagang) Specialty Chemical Co., Ltd, Zhangjiagang City	70
Solvay Lantian (Quzhou) Chemicals Co., Ltd, Zhejiang	55
Solvay Silica Qingdao Co., Ltd , Qingdao	100
Solvay Speciality Polymers (Changshu) Co. Ltd, Changshu	100
Suzhou Interox Sem Co. Ltd, Suzhou	100
Zhuhai Solvay Specialty Chemicals Co Ltd, Zhuhai City	100
CHILE	
Cytec Chile Ltda, Santiago	100

EGYPT	
Solvay Alexandria Trading LLC., Alexandria	100
FINLAND	
Solvay Chemicals Finland Oy, Voikkaa	100
FRANCE	
Cogénération Tavaux SAS, Paris	33.3
Cytec Process Materials Sarl, Toulouse	100
RHOD V S.N.C. , Courbevoie	100
RHOD W S.N.C. , Courbevoie	100
Rhodia Chimie S.A.S. , Aubervilliers	100
Rhodia Energy GHG S.A.S. , Puteaux	100
Rhodia Laboratoire du Futur S.A.S. , Pessac	100
Rhodia Operations S.A.S. , Aubervilliers	100
Rhodia Participations S.N.C. , Courbevoie	100
Rhodianyl S.A.S. , Saint-Fons	100
Solvay - Opérations - France S.A.S., Paris	100
Solvay - Fluorés - France S.A.S., Paris	100
Solvay Energie France S.A.S., Paris	100
Solvay Energy Services S.A.S. , Puteaux	100
Solvay Finance S.A., Paris	100
Solvay France S.A. , Courbevoie	100
Solvay Speciality Polymers France S.A.S., Paris	100
Solvin France S.A., Paris	100
GERMANY	
Cavity GmbH, Hannover	100
Cytec Engineered Materials GmbH, Oestringen	100
European Carbon Fiber GmbH , Kelheim	100
Horizon Immobilien AG, Hannover	100
Performance Polyamides Gmbh, Hannover	100
Salzgewinnungsgesellschaft Westfalen GmbH & Co KG, Hannover	65
German limited partnership, which makes use of the exemptions offered by Section 264(b) of the German Commercial Code, not to publish their annual financial statements.	
Solvay Chemicals GmbH, Hannover	100
Solvay Fluor GmbH, Hannover	100
Solvay Flux GmbH, Hannover	100
Solvay GmbH, Hannover	100
Solvay Infra Bad Hoenningen GmbH, Hannover	100
Solvay P&S GmbH, Freiburg	100
Solvay Specialty Polymers Germany GmbH, Hannover	100
Solvin GmbH & Co. KG - PVDC, Rheinberg	100
Solvin Holding GmbH, Hannover	100
INDIA	
Rhodia Polymers & Specialties India Private Limited, Mumbai	100
Solvay Specialities India Private Limited, Mumbai	100
Sunshield Chemicals Limited, Mumbai	62.4
INDONESIA	
PT. Cytec Indonesia, Jakarta	100
IRELAND	
Solvay Finance Ireland Unlimited , Dublin	100
ITALY	
Cytec Process Materials S.r.l., Mondovi	100
Performance Polyamide Italy Srl, Bollate	100
Solvay Chimica Italia S.p.A., Milano	100
Solvay Energy Services Italia S.r.l., Bollate	100
Solvay Solutions Italia S.p.A. , Milano	100
Solvay Specialty Polymers Italy S.p.A., Milano	100

JAPAN	
Nippon Solvay KK, Tokyo	100
Solvay Japan K.K., Tokyo	100
Solvay Nicca Ltd, Tokyo	60
Solvay Special Chem Japan Ltd, Anan City	67
Solvay Specialty Polymers Japan KK, Minato Ku-Tokyo	100
LATVIA	
Solvay Business Services Latvia SIA, Riga	100
LUXEMBOURG	
Cytec Luxembourg International Holdings Sarl, Strassen	100
Solvay Chlorovinyls Holding S.a.r.l., Luxembourg	100
Solvay Finance (Luxembourg) SA, Luxembourg	100
Solvay Hortensia S.A., Luxembourg	100
Solvay Luxembourg S.a.r.l., Luxembourg	100
MEXICO	
Cytec de Mexico S.A. de C.V., Jalisco	100
Solvay Industrial S.de R.L. de C.V., Mexico	100
Solvay Fluor Mexico S.A. de C.V., Ciudad Juarez	100
Solvay Mexicana S. de R.L. de C.V., Monterrey	100
NETHERLANDS	
Cytec Industries B.V., Vlaardingen	100
Rhodia International Holdings B.V., Den Haag	100
Solvay Chemicals and Plastics Holding B.V., Linne-Herten	100
Solvay Chemie B.V., Linne-Herten	100
Solvay Solutions Nederland B.V., Klundert	100
Solvin Holding Nederland B.V., Linne-Herten	100
NEW ZEALAND	
Solvay New Zealand Ltd, Auckland	100
PERU	
Cytec Peru S.A.C., Lima	100
POLAND	
Solvay Engineering Plastics Poland Sp z.o.o. , Gorzow Wielkopolski	100
Solvay Advanced Silicas Poland Sp. z o.o.	100
PORTUGAL	
Solvay Business Services Portugal Unipessoal Lda, Carnaxide	100
Solvay Portugal - Produtos Quimicos S.A., Povoa	100
RUSSIA	
Solvay Vostok OOO, Moscow	100
SINGAPORE	
Rhodia Amines Chemicals Pte Ltd , Singapore	100
Solvay Fluor Holding (Asia-Pacific) Pte. Ltd., Singapore	100
Solvay Specialty Chemicals Asia Pacific Pte. Ltd., Singapore	100
SOUTH KOREA	
Cytec Korea Inc, Seoul	100
Daehan Solvay Special Chemicals Co., Ltd, Seoul	100
Solvay Chemicals Korea Co. Ltd , Seoul	100
Solvay Chemical Services Korea Co. Ltd, Seoul	100
Solvay Energy Services Korea Co. Ltd , Seoul	100
Solvay Korea Co. Ltd, Seoul	100
Solvay Silica Korea Co. Ltd , Incheon	100
Solvay Specialty Polymers Korea Company Ltd, Seoul	100
SPAIN	
Solvay Quimica S.L., Barcelona	100

Solvay Solutions Espana S.L., Madrid	100
SWITZERLAND	
Solvay (Schweiz) AG, Bad Zurzach	100
Solvay Vinyls Holding AG, Bad Zurzach	100
THAILAND	
Solvay Asia Pacific Company Ltd, Bangkok	100
Solvay (Bangpoo) Specialty Chemicals Ltd, Bangkok	100
Solvay (Thailand) Ltd, Bangkok	100
Solvay Peroxythai Ltd, Bangkok	100
TURKEY	
Solvay Istanbul Kimya Limited Sirketi	100
UNITED KINGDOM	
Advanced Composites Group Investments Ltd, Heanor	100
Cytec Engineered Materials Ltd, Wrexham	100
Cytec Industrial Materials (Derby) Ltd, Heanor	100
Cytec Industrial Materials (Manchester) Ltd, Heanor	100
Cytec Industries UK Holdings Ltd, Wrexham	100
Cytec Med-Lab Ltd, Heanor	100
Cytec Process Materials (Keighley) Ltd, Keighley	100
McIntyre Group Ltd , Watford	100
Rhodia Holdings Ltd , Watford	100
Rhodia International Holdings Ltd , Oldbury	100
Rhodia Limited , Watford	100
Rhodia Organique Fine Ltd , Watford	100
Rhodia Overseas Ltd , Watford	100
Rhodia Pharma Solutions Holdings Ltd, Cramlington	100
Rhodia Pharma Solutions Ltd, Cramlington	100
Rhodia Reorganisation, Watford	100
Solvay Interox Ltd, Warrington	100
Solvay Solutions UK Ltd, Watford	100
Solvay UK Holding Company Ltd, Warrington	100
Umeco Composites Ltd, Heanor	100
Umeco Ltd, Heanor	100
UNITED STATES	
Ausimont Industries, Inc., Wilmington, Delaware	100
CEM Defense Materials LLC, Tempe Arizona	100
Cytec Aerospace Materials (ca) Inc., New Jersey	100
Cytec Carbon Fibers LLC, New Jersey	100
Cytec Engineered Materials Inc., Arizona	100
Cytec Global Holdings Inc., New Jersey	100
Cytec Industrial Materials (ok) Inc., New Jersey	100
Cytec Industries Inc, New Jersey	100
Cytec Korea Inc., New Jersey	100
Cytec Overseas Corp., New Jersey	100
Cytec Process Materials (ca) Inc., New Jersey	100
Cytec Technology Corp., New Jersey	100
Garret Mountain Insurance Co., New Jersey	100
IMC Mining Chemicals LLC, New Jersey	100
Rocky Mountain Coal Company, LLC, Houston, Texas	100
Solvay America Holdings, Inc., Houston, Texas	100
Solvay America Inc., Houston, Texas	100
Solvay Chemicals, Inc., Houston, Texas	100
Solvay Finance (America) LLC, Houston, Texas	100
Solvay Financial Services INC., Wilmington, Delaware	100
Solvay Fluorides, LLC., Greenwich, Connecticut	100
Solvay Holding INC., Princeton, New Jersey	100
Solvay India Holding Inc., Princeton, New Jersey	100
Solvay Soda Ash Expansion JV, Houston, Texas	80
Solvay Soda Ash Joint Venture, Houston, Texas	80
Solvay Specialty Polymers USA, LLC, Alpharetta, Georgia	100
Solvay USA INC., Princeton, New Jersey	100

URUGUAY	
Alaver SA, Montevideo	100
Zamin Company S/A, Montevideo	100

List of joint operations

Indicating the percentage holding

AUSTRIA	
Solvay Sisecam Holding AG, Wien	75
BELGIUM	
BASF Interox H2O2 Production N.V., Brussels	50
BULGARIA	
Solvay Sodi AD, Devnya	73.5
FRANCE	
Butachimie S.N.C. , Courbevoie	50
NETHERLANDS	
MTP HP JV C.V., Weesp	50
MTP HP JV Management bv, Weesp	50
SAUDI ARABIA	
Saudi Hydrogen Peroxide Co, Jubail	50
THAILAND	
MTP HP JV (Thailand) Ltd, Bangkok	50

List of companies consolidated by applying the equity method of accounting

Indicating the percentage holding

Joint ventures

BELGIUM	
EECO Holding SA, Bruxelles	33.3
BRAZIL	
Peroxidos do Brasil Ltda, Sao Paulo	69.4
CHINA	
Shandong Huatai Interox Chemical Co. Ltd, Dongying	50
FRANCE	
Cogénération Belle Etoile SAS, Paris	33.3
GERMANY	
Solvay & CPC Barium Strontium GmbH & Co KG, Hannover	75
Solvay & CPC Barium Strontium International GmbH, Hannover	75
INDIA	
Hindustan Gum & Chemicals Ltd, New Delhi	50
ITALY	
Cogeneration Rosignano S.r.l., Rosignano	25.4
Cogeneration Spinetta S.p.a. , Bollate	33.3
MEXICO	
Solvay & CPC Barium Strontium Monterrey S. de R.L. de C.V., Monterrey	75
RUSSIA	
Rusvinyl OOO, Moscow	50

Associates

CHINA	
Qingdao Hiwin Solvay Chemicals Co. Ltd, Qingdao	30
FRANCE	
GIE Chime Salindres, Salindres	50
INDONESIA	
Solvay Manyar P.T., Gresik	50
MEXICO	
Silicatos y Derivados S.A. DE C.V.	20
POLAND	
Zaklad Energoeloctryczny Energo-Stil Sp. z o.o., Gorzow Wielkopolski	25
UNITED KINGDOM	
Penso Holdings Ltd, Coventry	20

3. Summary of financial statements of Solvay SA

The annual financial statements of Solvay SA are presented in summary format below. In accordance with the Belgian Companies Code, the annual financial statements of Solvay SA, the management report, and the statutory auditor's report will be filed with the National Bank of Belgium.

These documents are also available free of charge on the internet, or upon request sent to:

Solvay SA
rue de Ransbeek 310
B – 1120 Brussels

The balance sheet of Solvay SA at the end of the year 2018 presented below is based on a dividend distribution of € 3.75 per share.

At the end of 2018, Solvay SA has still one Branch, Solvay S.A. Sede Secondaria per l'Italia (Via Piave 6, 57013 Rosignano, Italy).

The accounts of Solvay SA are prepared in accordance with Belgian generally accepted accounting principles.

The main activities of Solvay SA consist of holding and managing a number of investments in Group companies and of financing the Group's activities from the bank and bond markets. As from 2017, Solvay SA has carried out a Group internal factoring activity without recourse. As a result, Solvay SA owns and manages Group's trade receivables from customers based in Europe and in Asia. It manages the research center at Neder-Over-Heembeek (Brussels, Belgium) and a very limited number of commercial activities not undertaken through subsidiaries.

Balance sheet of Solvay SA (summary)

In € million	2018	2017
ASSETS		
Fixed assets	**13,883**	**12,996**
Start-up expenses and intangible assets	172	176
Tangible assets	55	50
Financial assets	13,656	12,770
Current assets	**5,457**	**7,177**
Inventories	0	1
Trade receivables	886	1,033
Other receivables	4,061	5,875
Short-term investments and cash equivalents	492	230
Accrued income and deferred charges	18	38
Total assets	**19,340**	**20,173**
SHAREHOLDERS' EQUITY AND LIABILITIES		
Shareholders' equity	**11,207**	**11,077**
Capital	1,588	1,588
Issue premiums	1,200	1,200
Reserves	1,982	1,982
Net income carried forward	6,436	6,307
Provisions and deferred taxes	**323**	**254**
Financial debt	**3,015**	**3,248**
due in more than one year	2,050	2,450
due within one year	965	798
Trade liabilities	**80**	**144**
Other liabilities	**4,670**	**5,410**
Accrued charges and deferred income	**45**	**40**
Total shareholders' equity and liabilities	**19,340**	**20,173**

The decrease of the total assets (€ 833 million) is the combination of an increase of financial assets (€ 886 million) and a decrease of current assets (€ 1,720 million):

- Financial assets increase (€ 886 million) end of the year 2018 results mainly from the increased investment held in Solvay Holding Inc through the contribution to Solvay Holding Inc of Ausimont shares as follows:
  - the acquisition from Solvay France for € 516 million of 33.4% of Ausimont shares that were subsequently contributed for the same value; and
  - the contribution of 66.6% of Ausimont shares previously held by Solvay SA, realizing a capital gain of € 367 million.
- The currents assets decrease results mainly from significant reimbursements of loans and of trade receivables by the affiliates.

In the liabilities, the financial debt totals € 3,015 million (versus € 3,248 million at the end of 2017). The decrease of € (233) million is due to:

- the repayment of EMTN bonds (€ (382) million), replaced by subordinated bonds (€ 300 million); and
- the net repayment of commercial paper (€ (154) million).

Other liabilities include current accounts towards affiliates, as well as the dividends to be paid in 2019 (€ 397 million).

Income statement of Solvay SA (summary)

In € million	2018	2017
Operating income	**1,024**	**967**
Sales	11	9
Other operating income	1,013	959
Operating expenses	**(982)**	**(829)**
Operating profit	**42**	**138**
Financial income and expenses	495	617
Profit for the year before taxes	**537**	**755**
Income taxes	(11)	(23)
Profit for the year	**526**	**733**
Profit for the year available for distribution	**526**	**733**

In 2018, the profit for the year of Solvay SA amounted in 2018 to € 526 million, compared with € 733 million in 2017.

It includes:

- the operating result amounting to € 42 million, compared with € 138 million in 2017. The decrease is mainly driven by lower recharges to affiliates;
- financial gains and losses of which:
  - dividends received from its various financial investments amounting to € 177 million, as against € 239 million in 2017;
  - the differential between interest expense and income on its financing activities amounting to € (62) million, compared with an amount of € (102) million in 2017;
  - other net financial profit of € 380 million mainly resulting from the contribution of Ausimont shares to the company Solvay Holding Inc (€ 367 million) compared with a profit of € 481 million in 2017 resulting from a sale of investments within the Group (€ 475 million).

An amount of € 6,833 million including the profit for the year is available for distribution.

Profit available for distribution

In € million	2018	2017
Profit for the year available for distribution	**526**	**733**
Carried forward	6,307	5,955
Total available to the General Shareholders' Meeting	**6,833**	**6,688**
Appropriation		
Gross dividend	397	381
Carried forward	6,436	6,307
Total	**6,833**	**6,688**

MANAGEMENT REPORT

DECLARATIONS:
AUDITOR'S REPORTS & DECLARATION BY THE PERSONS RESPONSIBLE

7

Declarations: Auditor's reports & Declaration by the persons responsible

Assurance report of the statutory auditor on a selection of social, environmental and other sustainable development information for the year ended 31 December 2018

Pursuant to your request and in our capacity of statutory auditor of Solvay SA / NV ("the Company"), we hereby present you our assurance report on a selection of social, environmental and other sustainable development information disclosed in the Solvay Group Annual Integrated Report for the year ended 31 December 2018 (the "2018 Annual Integrated Report"), identified by the symbol ✓2018 and ✓✓2018 .

Responsibility of the Company

This selection of information (the "Information") extracted from the 2018 Annual Integrated Report has been prepared under the responsibility of Solvay Group management, in accordance with internal measurement and reporting principles used by Solvay Group (the "Reporting Framework"). The Reporting Framework consists of specific definitions and assumptions that are summarized in section "Extra-financial statements" of the 2018 Annual Integrated Report.

Responsibility of the Statutory Auditor

It is our responsibility, based on the procedures performed by us, to express:

- *"Limited assurance" for the Information identified by the symbol* ✓2018 as included in the 2018 Annual Integrated Report
- *"Reasonable assurance" for the Information identified by the symbol* ✓✓2018 as included in the 2018 Annual Integrated Report

The complete list of Information in scope of our assurance engagement together with the type of assurance has been included in appendix A of this report.

We conducted our procedures in accordance with the international standard as defined in ISAE (International Standard on Assurance Engagements) 3000. With respect to independence rules, these are defined by the respective legal and regulatory texts as well as by the professional Code of Ethics, issued by the International Federation of Accountants ("IFAC").

Nature and scope of procedures

We have carried out the following procedures

- *General procedures:*
  - We assessed the appropriateness of the Reporting Framework with respect to its relevance, completeness, neutrality, clarity and reliability, by taking into consideration, when relevant, the sector reporting practices.
  - We have verified the set-up within Solvay Group of the process to obtain, consolidate and check the selected Information with regard to its completeness and consistency. We have familiarized ourselves with the internal control and risk management procedures relating to the compilation of the information. We have conducted interviews with individuals responsible for social, environmental and other sustainable development reporting.
  - At the sites that we have selected based on their activity, their contribution to consolidated indicators, their location and a risk analysis, we have:
    - Conducted interviews to verify the proper application of procedures and obtained information to perform our verifications;
    - Conducted substantive tests, using sampling techniques, to verify the calculations performed and reconcile data with supporting evidence.
  - All the audited sites and perimeters are listed in appendix B of this document.

- *"Limited assurance" for the Information identified by the symbol* ✓ as included in the 2018 Annual Integrated Report
  - For the entity in charge of consolidation ("the Company"), as well as for the controlled entities, we have designed analytical procedures and verified, using sampling techniques, the calculations as well as the consolidation of this information in order to obtain limited assurance that the selected information does not contain any material errors that would question its preparation, in all material respects, in accordance with the Reporting Framework. A higher level of assurance would have required more extensive procedures.
- *"Reasonable assurance" for the Information identified by the symbol* ✓✓ as included in the 2018 Annual Integrated Report
  - We conducted work of the same nature as the work described in section above (limited assurance) but in further detail, in particular performing an increased number of tests. When relevant, we have tested a representative sample of entities based on their activities, their contribution to the consolidated data, their location and a risk analysis. In these cases, the selected sample represents between 47 % and 63% of the published data, which is significantly more than what would be requested for a limited assurance review.

Conclusion

- *For the indicators in scope of "limited assurance" (identified by the symbol ✓)*

  On the basis of the procedures performed by us, nothing came to our attention that causes us to believe that the Information identified by the symbol ✓ as included in the 2018 Annual Integrated Report, is not prepared, in all material respects, in accordance with the Reporting Framework.

- *For the indicators in scope of "reasonable assurance" (identified by the symbol ✓✓)*

  In our opinion, based on the procedures performed, the Information identified by the symbol ✓✓ as included in the 2018 Annual Integrated Report, has been prepared in all material respects in accordance with the Reporting Framework.

Observations

Without qualifying our conclusion above, we draw your attention to the following points:

- The process, definition, and underlying control environment of societal actions, though it was reinforced in 2018 compared to 2017, remains to be reinforced throughout 2019.
- We have taken note that the process safety management indicator "percentage of sites with a Process Safety Management (PSM) system corresponding to their risk level" is not disclosed in the 2018 Solvay Annual Integrated Report as site data are no longer consolidated by the group, and that the internal control procedures based on the Solvay Care Management System (SCMS), which used to be in place to ensure the robustness on PSM, are no more effective as of 2018.
- We have taken note that the reporting perimeter for process safety indicators, which should cover all industrial sites (production sites and research & innovation centers) excluding joint ventures not majority-owned, is not exhaustive and not homogeneous between the indicators related to risk analysis on the one hand and the indicators related to process safety incidents on the other hand.

Zaventem, 29 March 2019
The statutory auditor

Deloitte Bedrijfsrevisoren/Réviseurs d'Entreprises CVBA/SCRL
Represented by Michel Denayer

Appendix A - Overview of indicators reviewed

Indicators in **bold** are selected for reasonable assurance.

Reporting scope	Information	Audit Procedure	Audit scope
Sustainable business solutions	**Product portfolio assessed**	**Reasonable Assurance**	Group level
	Sustainable business solutions	**Reasonable Assurance**	Group level
Greenhouse gas emissions	**Greenhouse gas emissions intensity**	**Reasonable Assurance**	Group level
	Direct and indirect CO_2 emissions (Scope 1 & 2)	**Reasonable Assurance**	Site level
	Other greenhouse gas emissions according to Kyoto Protocol (Scope 1)	**Reasonable Assurance**	Site level
	Total greenhouse gas emissions according to Kyoto Protocol (Scopes 1 & 2)	**Reasonable Assurance**	Site level
	Other greenhouse gas emissions not according to Kyoto Protocol (Scope 1)	Limited Assurance	Site level
Energy	Primary energy consumption	Limited Assurance	Site level
	Energy efficiency index – Baseline 100 % in 2012	Limited Assurance	Site level
Air quality	Nitrogen oxides emissions – NO_X	Limited Assurance	Site level
	Nitrogen oxides intensity	Limited Assurance	Site level
	Sulphur oxides emissions – SO_X	Limited Assurance	Site level
	Sulphur oxides intensity	Limited Assurance	Site level
	Non-methane volatile organic compounds emissions – NMVOC	Limited Assurance	Site level
	Non-methane volatile organic compounds intensity	Limited Assurance	Site level
Water and wastewater	Freshwater withdrawal	Limited Assurance	Site level
	Freshwater withdrawal intensity	Limited Assurance	Site level
	Chemical oxygen demand (COD)	Limited Assurance	Site level
	Chemical oxygen demand intensity	Limited Assurance	Site level
Waste and hazardous materials	Non-hazardous industrial waste	Limited Assurance	Site level
	Hazardous industrial waste	Limited Assurance	Site level
	Total industrial waste	Limited Assurance	Site level
	Industrial hazardous waste not treated in a sustainable way in absolute volume	Limited Assurance	Site level
	Industrial hazardous waste not treated in a sustainable way intensity	Limited Assurance	Site level
	Substance of very high concern (SVHC) according to REACH criteria present in products sold	Limited Assurance	Group level
	Percentage of completion of Analysis of Safer Alternatives program for marketed substances	Limited Assurance	Group level
Employee health and safety	**Medical Treatment Accident Rate – for Solvay Employees, and contractors (MTAR)**	**Reasonable Assurance**	Site level
	Lost Time Accident Rate – for Solvay Employees and contractors (LTAR)	**Reasonable Assurance**	Site level
	Fatal accidents of Solvay employees and contractors	**Reasonable Assurance**	Site level
Employee engagement and wellbeing	**Solvay engagement index**	**Reasonable Assurance**	Group level
	Coverage by collective agreement	Limited Assurance	Group level
Critical incident risk management (Process accident and safety management)	Number of “risk sheets level 1” at the end of the year	Limited Assurance	Site level
	Percentage of level 1 risk situations resolved within one year	Limited Assurance	Site level
	Risk level 1 situation resolved	Limited Assurance	Site level
	Process safety incident rate	Limited Assurance	Group level
	Medium severity incidents with environmental consequences	Limited Assurance	Site level
	Percentage of product lines having a risk analysis updated in the last five years	Limited Assurance	Site level
	Medium severity incidents with environmental consequences in which the limits of the operating permit were exceeded	Limited Assurance	Site level
Solvay Way	Solvay Way Group profile	Limited Assurance	Site and Group level
Customer welfare	Solvay’s Net Promoter Score (NPS)	Limited Assurance	Group level
Societal actions	Employees involved in local societal actions	Limited Assurance	Site level
Diversity and inclusion	Total headcount	Limited Assurance	Group level
	Percentage of women in the Group	Limited Assurance	Group level
	Headcount by employee category (senior manager, middle manager, junior manager, non-manager)	Limited Assurance	Group level

Appendix B - Overview of perimeter reviewed

		Audited reporting scope								
Audited sites	Country	Greenhouse gas emissions	Energy	Air quality	Water and wastewater	Waste and hazardous materials	Employee health and safety	Process accident and safety	Solvay Way	Societal actions
Paulinia	Brazil	●	●	●	●	●	●	●	○	●
Santo Andre EST	Brazil	●	●	●	●	●	●	●	○	●
Dombasle	France	●	●	●	●	●	●	●	○	●
Collonges	France	●	●	●	●	●	●	●	○	●
Rosignano	Italy	●	●	●	●	●	●	●	○	●
Spinetta	Italy	●	●	●	●	●	●	●	○	●
Bernburg	Germany	○	●	○	○	○	●	●	○	●
Augusta, GA	USA	●	●	●	●	●	●	●	○	●
Devnya	Bulgary	○	○	○			●	○	○	
Rheinberg	Germany	○					●		○	
Torrelavega	Spain						●		○	
Green River, WY	USA	○		○			●			
Alpharetta	USA						●			●
Anaheim, CA	USA						●			
Baltimore	USA									●
Greenville, TX	USA						●			
Long Beach, CA	USA									●
Marietta, OH	USA						●			
Mt Pleasant	USA									●
West Deptford	USA									●
Wrexham	UK						●			
Oldburry	UK									●
Brussels NOH	Belgium						●			●
Oudenaarde	Belgium									●
Welland	Canada									●
Changshu	China						●			
Zhenjiang Songl	China						●			
Shanghai Xin Zh	China						●			
Zhangjiagang YA	China						●			
Zhangijagang FE	China						●			●
St-Fons SP	France						●			
St-Fons RC	France	○					●			

		Audited reporting scope								
Audited sites	Country	Greenhouse gas emissions	Energy	Air quality	Water and wastewater	Waste and hazardous materials	Employee health and safety	Process accident and safety	Solvay Way	Societal actions
Freiburg Engess	Germany						●			
Hannover	Germany									●
Panoli	India						●			
Rasal	India						●			
Bollate	Italy						●			
Onsan Gongdan-R	Korea									●
Gorzow	Poland									●
Carnaxide	Portugal						●			●

○ A selection of indicators audited

● All relevant indicators audited

Audited GBUs and functions	Solvay Way	Customer Welfare
GBU Soda Ash & Derivatives	○	
GBU Technology Solutions	○	
GBU Composite Materials	○	
GBU Silica		●
GBU Specialty Polymers		●
Corporate function – Risk management	○	
Corporate function – Strategy	○	

○ A selection of indicators audited

● All relevant indicators audited

Statutory auditor's report to the shareholders' meeting of Solvay SA for the year ended 31 December 2018

In the context of the statutory audit of the consolidated financial statements of Solvay SA ("the company") and its subsidiaries (jointly "the group"), we hereby submit our statutory audit report. This report includes our report on the consolidated financial statements and the other legal and regulatory requirements. These parts should be considered as integral to the report.

We were appointed in our capacity as statutory auditor by the shareholders' meeting of 10 May 2016, in accordance with the proposal of the board of directors issued upon recommendation of the audit committee and presentation of the works council. Our mandate will expire on the date of the shareholders' meeting deliberating on the financial statements for the year ending 31 December 2018. We have performed the statutory audit of the consolidated financial statements of Solvay SA for 18 consecutive periods.

Report on the consolidated financial statements

Unqualified opinion

We have audited the consolidated financial statements of the group, which comprise the consolidated statement of financial position as at 31 December 2018, the consolidated income statement, the consolidated statement of comprehensive income, the consolidated statement of changes in equity and the consolidated statement of cash flows for the year then ended, as well as the summary of significant accounting policies and other explanatory notes. The consolidated statement of financial position shows total assets of 22 000 million EUR and the consolidated income statement shows a profit for the year then ended of 897 million EUR.

In our opinion, the consolidated financial statements give a true and fair view of the group's net equity and financial position as of 31 December 2018 and of its consolidated results and its consolidated cash flow for the year then ended, in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union and with the legal and regulatory requirements applicable in Belgium.

Basis for the unqualified opinion

We conducted our audit in accordance with International Standards on Auditing (ISA), as applicable in Belgium. In addition, we have applied the International Standards on Auditing approved by the IAASB applicable to the current financial year, but not yet approved at national level. Our responsibilities under those standards are further described in the "Responsibilities of the statutory auditor for the audit of the consolidated financial statements" section of our report. We have complied with all ethical requirements relevant to the statutory audit of consolidated financial statements in Belgium, including those regarding independence.

We have obtained from the board of directors and the company's officials the explanations and information necessary for performing our audit.

We believe that the audit evidence obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole and in forming our opinion thereon; we do not provide a separate opinion on these matters.

Key audit matters

1. Goodwill impairment test Composite Materials

- As a consequence of the group's transition into a specialty chemicals company, significant goodwills have arisen from acquisitions. At 31 December 2018 goodwills amount to 5 173 million EUR and represent 23,5% of the consolidated total assets.
- In accordance with IFRS requirements, the carrying value of goodwill is tested annually for impairment by comparing the carrying amount of each cash-generating unit ("CGU") to its value in use.
- Based on the headroom that exists per CGU as well as sensitivity analyses performed on the valuation and cash flow assumptions used in the impairment test, we have determined the business assumptions of the CGU Composite Materials as focus area in our audit. The goodwill balance for Composite Materials amounts to 1 319 million EUR at 31 December 2018, representing the largest goodwill balance per CGU of the group. The difference between the CGU's carrying amount and the value in use ("headroom") is below the average of the other CGUs.
- We have also focused on the valuation assumptions (discount rate and long-term growth rate) considering Composite Materials' important sensitivity to said assumptions, and the fact that management applied the same discount rate for all the CGUs.
- As consequence, we consider goodwill impairment test for the Composite Materials CGU to be a key audit matter.
- Management's disclosure on impairment of goodwill is included in Note F27 of the consolidated financial statements.

How our audit addressed the key audit matters

- We obtained an understanding and performed walkthroughs of the goodwill impairment and the budgeting/forecasting processes through which we identified relevant controls;
- We evaluated and challenged management's determination of CGUs for the purpose of goodwill impairment testing;
- We tested the carrying amounts of the CGUs used in the impairment test for reconciliation with the financial reporting system;
- We evaluated whether the valuation methodology is appropriate in the circumstances and whether the methodology used for determining the value in use is applied consistently with the preceding periods;
- We assessed and challenged the reasonableness of the valuation assumptions (discount rate and long-term growth rate);
- We assessed and challenged the reasonableness of the cash flow assumptions, both in the projection period as in the terminal period;
- We performed benchmarking and sensitivity analyses with peers and analyst reports, on valuation and cash flow assumptions;
- We tested the mathematical accuracy of the overall model;
- We reviewed and tested the management's reconciliation of the valuations, used for impairment testing purposes, to the entity's market capitalization;
- We involved our valuation specialists to assist us in performing certain of the above procedures;
- We assessed and reviewed the completeness and accuracy of the disclosures in the notes in accordance with IAS 36.

Key audit matters	How our audit addressed the key audit matters
2. Defined benefit obligations	
• The defined benefit net liability, amounting to 2 485 million EUR, consists of defined benefit obligations (5 022 million EUR) offset partially by plan assets (2 536 million EUR). The largest post-employment plans in 2018 are in the United Kingdom, France, the United States, Germany and Belgium. These five countries represent 94% of the total defined benefit obligations. • Defined benefit obligations is a key audit matter mainly as the amounts are significant, the assessment process is complex and it requires key management estimates to determine the actuarial assumptions and fair value of assets. The actuarial assumptions used in the measurement of the group's pension commitments involve judgements in relation to mortality, price inflation, discount rates, and rates of pension and salary increases, around which there are inherent uncertainties. • Management's disclosure on defined benefit obligations is included in Note F34A of the consolidated financial statements	• We assessed and challenged management's assumptions (actuarial and other assumptions), the numerical data, the actuarial parameters, the calculation of the provisions as well as the presentation in the consolidated statement of financial position and the notes to the consolidated financial statements based on the actuarial reports; • Our audit of the fair value of the plan assets was carried out on the basis of respective bank and fund confirmations; • We assessed and reviewed the completeness and accuracy of the disclosures in the notes in accordance with IAS 19; • We involve in this review our actuaries. We also reviewed the internal controls, mainly around database maintenance and update of assumptions.

Responsibilities of the board of directors for the preparation of the consolidated financial statements

The board of directors is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union and with the legal and regulatory requirements applicable in Belgium and for such internal control as the board of directors determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the board of directors is responsible for assessing the group's ability to continue as a going concern, disclosing, as applicable, matters to be considered for going concern and using the going concern basis of accounting unless the board of directors either intends to liquidate the group or to cease operations, or has no other realistic alternative but to do so.

Responsibilities of the statutory auditor for the audit of the consolidated financial statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue a statutory auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISA will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

During the performance of our audit, we comply with the legal, regulatory and normative framework as applicable to the audit of consolidated financial statements in Belgium.

As part of an audit in accordance with ISA, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from an error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the group's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the board of directors;
- conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our statutory auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our statutory auditor's report. However, future events or conditions may cause the group to cease to continue as a going concern;
- evaluate the overall presentation, structure and content of the consolidated financial statements, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- obtain sufficient appropriate audit evidence regarding the financial information of the entities and business activities within the group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with the audit committee regarding, amongst other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the audit committee with a statement that we have complied with relevant ethical requirements regarding independence, and we communicate with them about all relationships and other matters that may reasonably be thought to bear our independence, and where applicable, related safeguards.

From the matters communicated to the audit committee, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our report unless law or regulation precludes any public disclosure about the matter.

Other legal and regulatory requirements

Responsibilities of the board of directors

The board of directors is responsible for the preparation and the content of the directors' report on the consolidated financial statements, the statement of non-financial information attached to the directors' report on the consolidated financial statements and other matters disclosed in the annual report on the consolidated financial statements.

Responsibilities of the statutory auditor

As part of our mandate and in accordance with the Belgian standard complementary (revised in 2018) to the International Standards on Auditing (ISA) as applicable in Belgium, our responsibility is to verify, in all material respects, the director's report on the consolidated financial statements, the statement of non-financial information attached to the directors' report on the consolidated financial statements and other matters disclosed in the annual report on the consolidated financial statements, as well as to report on these matters.

Aspects regarding the directors' report on the consolidated financial statements and other information disclosed in the annual report on the consolidated financial statements

In our opinion, after performing the specific procedures on the directors' report on the consolidated financial statements, this report is consistent with the consolidated financial statements for that same year and has been established in accordance with the requirements of article 119 of the Companies Code.

In the context of our statutory audit of the consolidated financial statements we are also responsible to consider, in particular based on information that we became aware of during the audit, if the directors' report on the consolidated financial statements is free of material misstatement, either by information that is incorrectly stated or otherwise misleading. In the context of the procedures performed, we are not aware of such material misstatement.

The non-financial information as required by article 119, § 2 of the Companies Code, has been disclosed in the directors' report on the consolidated financial statements. This non-financial information has been established by the company in accordance with the Global Reporting Initiative (GRI) framework. As requested by Solvay management, we have issued a separate limited and reasonable assurance report on a selection of social, environmental and other sustainable development information in accordance with the International Standard on Assurance Engagements ISAE 3000. In accordance with article 144, § 1, 6° of the Companies Code we do not express any opinion on the question whether this non-financial information has been established in accordance with the GRI framework. For information not included in our specific assurance report on non-financial information, we do not express any assurance on individual elements that have been disclosed in this non-financial information.

Statements regarding independence

- Our audit firm and our network have not performed any prohibited services and our audit firm has remained independent from the group during the performance of our mandate.
- The fees for the additional non-audit services compatible with the statutory audit, as defined in article 134 of the Companies Code, have been properly disclosed and disaggregated in the notes to the consolidated financial statements.

Other statements

- This report is consistent with our additional report to the audit committee referred to in article 11 of Regulation (EU) No 537/2014.

Zaventem, 29 March 2019
The statutory auditor

Deloitte Bedrijfsrevisoren/Réviseurs d'Entreprises CVBA/SCRL
Represented by Michel Denayer

Declaration by the persons responsible

The Board of Directors hereby declares that, to the best of its knowledge:

a. the financial statements, prepared in accordance with International Financial Reporting Standards ("IFRS"), give a true and fair view of the assets, liabilities, financial position, and earnings of the issuer and of the entities included in the consolidation,

b. the management report includes an accurate review of the business developments, earnings, and financial position of the issuer and of the entities included in the consolidation, as well as a description of the main risks and uncertainties that these entities face.

For the Board of Directors,

Nicolas Boël
Chairman of the Board of Directors

Jean-Pierre Clamadieu
Chairman of the Executive Committee and CEO Director

Glossary

ADJUSTMENTS

Adjustments made to IFRS results for elements distorting comparability of the Group underlying performance over time. These adjustments consist of:

- Results from portfolio management and reassessments, and results from legacy remediation and major litigations (see note F5 in Financial Statements);
- Amortization of intangible assets resulting from PPA (see note F4 in Financial Statements) and inventory step-up in gross margin (see note F2 in Financial Statements);
- Net financial results related to changes in discount rates, coupons of perpetual hybrid bonds deducted from equity under IFRS, and debt management impacts (comprising mainly gains/(losses) related to the early repayment of debt) (see note F6 and F31 in Financial Statements);
- Adjustments of equity earnings for impairment gains or losses and unrealized foreign exchange gains or losses on debt;
- Results from equity instruments measured at fair value through other comprehensive income;
- Tax effects related to the items listed above and tax expense or income of prior years (see note F7 in Financial Statements);
- All adjustments listed above apply to both continuing and discontinued operations, and include the impacts on non-controlling interests.

BASIC EARNINGS PER SHARE

Net income (Solvay's share) divided by the weighted average number of shares, after deducting own shares purchased to cover stock options program.

CAPITAL EXPENDITURE (CAPEX)

Cash paid for the acquisition of property, plant and equipment, and intangible assets

CARECHEM

Carechem 24 is a multilingual telephone advice service providing access to a team of trained responders 24 hours a day, 365 days a year. Carechem 24 provides companies all over the world with emergency product support during a hazardous materials incident.

CASH CONVERSION

(Underlying EBITDA + Capex from continuing operations) / Underlying EBITDA

CFROI

Cash Flow Return On Investment, calculated as the ratio between recurring cash flow and invested capital, where:

- Recurring cash flow = Underlying EBITDA + (Dividends from associates and joint ventures – Underlying Earnings from associates and joint ventures) + Recurring capex + Recurring income taxes;
- Invested capital = Replacement value of goodwill and fixed assets + Net working capital + Carrying amount of associates and joint ventures;
- Recurring capex is normalized at 2% of the replacement value of fixed assets net of goodwill values;
- Recurring income taxes are normalized at 30% of (Underlying EBIT – Underlying Earnings from associates and joint ventures).

CGU

Cash-generating unit.

CODE OF CONDUCT

Solvay is committed to responsible behavior and integrity, taking into account the sustainable growth of its business and its good reputation in the communities in which it operates.

CSR

Corporate Social Responsibility.

CTA

Currency Translation Adjustment

DILUTED EARNINGS PER SHARE

Net income (Solvay's share) divided by the weighted average number of shares adjusted for effects of dilution.

DISCONTINUED OPERATIONS

Component of the Group which the Group has disposed of or which is classified as held for sale, and:

- represents a separate major line of business or geographical area of operations
- is part of a single coordinated plan to dispose of a separate major line of business or geographical area of operations or
- is a subsidiary acquired exclusively with a view to resale.

DIVIDEND YIELD (NET)

Net dividend divided by the closing share price on December 31.

DIVIDEND YIELD (GROSS)

Gross dividend divided by the closing share price on December 31.

DJ STOXX

Dow Jones Stoxx is a European stock index composed of the 665 most important European shares.

DJ EURO STOXX

Dow Jones Euro Stoxx is a pan-European stock index which includes the 326 most important shares of the general Dow Jones index, belonging to eleven countries of the Eurozone.

EBIT

Earnings before interest and taxes.

EBITDA

Earnings before interest and taxes, depreciation and amortization.

ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA or USEPA) is an agency of the United States federal government which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress.

EQUITY PER SHARE

Equity (Solvay share) divided by the number of outstanding shares at year end (issued shares – treasury shares).

EURONEXT

Global operator of financial markets and provider of trading technologies.

FREE CASH FLOW

Cash flow from operating activities (excluding cash flows linked to acquisitions or disposals of subsidiaries) and cash flow from investing activities (excluding cash flow from or related to acquisitions and disposals of subsidiaries and other investments, and excluding loans to associates and non-consolidated investments, as well as related tax elements and recognition of factored receivables).

FREE CASH FLOW TO SOLVAY SHAREHOLDERS

Free cash flow after payment of net interests, coupons of perpetual hybrid bonds, and dividends to non-controlling interests. This represents the cash flow available to Solvay shareholders, to pay their dividend and/or the reduce the net financial debt.

FSB

Financial Stability Board

FTSEUROFIRST 300

The FTSEurofirst 300 Index tracks the equity performance across the region of the 300 largest companies ranked by market capitalization in the FTSE Developed Europe Index.

GEARING RATIO

Underlying net debt / total equity.

GRI

The Global Reporting Initiative (GRI) is a leading organization in the sustainability field. GRI promotes the use of sustainability reporting as a way for organizations to become more sustainable and contribute to sustainable development.

HPPO

Hydrogen peroxide propylene oxide, a new technology to produce propylene oxide using hydrogen peroxide.

ICCA

International Council of Chemistry Associations

IFRS

International Financial Reporting Standards.

IIRC

International Integrated Reporting Council

INTEGRATED REPORTING

This is a process founded on integrated thinking, which results in a periodic integrated report by an organization about value creation over time and related communications regarding aspects of value creation.

ISO 9001

The ISO 9001 standard defines a set of requirements for the establishment of a system of quality management in an organization, whatever its size and activity.

ISO 14001

The ISO 14001 family addresses various aspects of environmental management. It provides practical tools for companies and organizations looking to identify and control their environmental impact and constantly improve their environmental performance.

ISO 14040

The ISO 14040 standard covers life cycle assessment (LCA) studies and life cycle inventory (LCI) studies.

ISO 26000

The ISO 26000 is a global standard which provides guidelines for organizations that wish to operate in a socially responsible manner. The standard was published in 2010 after five years of negotiations among a large number of stakeholders worldwide. Representatives of governments, NGOs, industry, consumer groups, and the world of work were involved in its development. It therefore represents an international consensus.

LCA

Life Cycle Assessment

LEVERAGE RATIO

Net debt / underlying EBITDA of the last 12 months. Underlying leverage ratio = underlying net debt / underlying EBITDA of the last 12 months.

LOSS PREVENTION PROCESS

Loss prevention aims at maintaining production flow and profitability of the plants by providing risk mitigation. It also contributes to increasing the protection of people and the environment.

LTAR

Lost Time Accident Rate.

MATERIALITY

Organizations are faced with a wide range of topics on which they could report. The relevant topics are those that may reasonably be considered important for reflecting the organization's economic, environmental, and social impacts, or influencing the decisions of stakeholders, and therefore potentially merit inclusion in an annual report. Materiality is the threshold at which aspects become sufficiently important that they should be reported.

MTAR

Medical Treatment Accident Rate.

NATURAL CURRENCY HEDGE

A natural currency hedge is an investment that reduces the undesired risk by matching cash in and outflows.

NEAR MISS

accident or collision narrowly avoided

NET COST OF BORROWINGS

Cost of borrowings netted with interest on loans and short-term deposits, as well as other gains (losses) on net indebtedness

NET FINANCIAL DEBT

Non-current financial debt + current financial debt – cash & cash equivalents – other financial instrument receivables.

NET FINANCIAL CHARGES

Net cost of borrowings, and costs of discounting provisions (namely, related to post-employment benefits and HSE liabilities).

NET PRICING

The difference between the change in sales prices and the change in variable costs.

NET SALES

Sales of goods and value added services corresponding to Solvay's know-how and core business. Net sales exclude Revenue from non-core activities.

NET WORKING CAPITAL

Includes inventories, trade receivables, and other current receivables, netted with trade payables and other current liabilities.

OECD

Organisation for Economic Co-operation and Development.

OHSAS 18001

OHSAS 18001 is an international occupational health and safety management system specification.

OPEN INNOVATION

Innovation that is enriched with outside expertise, through partnerships with the academic world and by shareholdings in start-ups, either directly or via investment funds.

ORGANIC GROWTH

Growth of net sales or underlying EBITDA excluding scope changes and forex conversion effects. The calculation is made by rebasing the prior period at the business scope and foreign exchange conversion rate of the current period.

OPERATIONAL DELEVERAGING

Reduction of liabilities (net debt or provisions) through operational performance only, i.e. excluding impacts from M&A and scope, as well as remeasurements impacts (changes of foreign exchange, inflation, mortality and discount rates).

OSHAS

United States Occupational Safety and Health Administration

PP

Unit of percentage points or 1.0%, used to express the evolution of ratios.

PPA

Purchase Price Allocation (PPA) accounting impacts related to acquisitions.

PRICING POWER

The ability to create positive net pricing.

PSM

Process safety management

PSU

Performance Share Unit.

PRODUCT STEWARDSHIP

A responsible approach in managing risks throughout the entire life cycle of a product, from the design stage to the end of life.

RESEARCH & INNOVATION

Research and development costs recognized in the income statement and as capital expenditure before deduction of related subsidies, royalties and depreciation and amortization expense.

RESEARCH & INNOVATION INTENSITY

Research & Innovation / net sales

REACH

REACH is the European Community Regulation on chemicals and their safe use (EC 1907/2006). It deals with the registration, evaluation, authorization, and restriction of chemical substances. The law entered into force on June 1, 2007.

RESPONSIBLE CARE®

Responsible Care® is the global chemical industry's unique initiative to improve health, environmental performance, enhance security, and to communicate with stakeholders about products and processes.

RESULT FROM LEGACY REMEDIATION AND MAJOR LITIGATIONS

It includes:

- The remediation costs not generated by on-going production facilities (shut-down of sites, discontinued productions, previous years' pollution), and
- The impact of significant litigations.

RESULTS FROM PORTFOLIO MANAGEMENT AND REASSESSMENTS

It includes:

- Gains and losses on the sale of subsidiaries, joint operations, joint ventures, and associates that do not qualify as discontinued operations
- Acquisition costs of new businesses
- Gains and losses on the sale of real estate not directly linked to an operating activity
- Restructuring charges driven by portfolio management and reassessment, including impairment losses resulting from the shutdown of an activity or a plant and
- Impairment losses resulting from testing of CGUs.

It excludes non-cash accounting impact from amortization and depreciation resulting from the purchase price allocation (PPA) from acquisitions.

REVENUE FROM NON-CORE ACTIVITIES

Revenues primarily comprising commodity and utility trading transactions and other revenue, considered to not correspond to Solvay's know-how and core business.

ROE

Return on equity.

SAFETY DATA SHEETS

Safety Data Sheets are the main tool for ensuring that manufacturers and importers communicate enough information along the supply chain to allow safe use of their substances and mixtures.

SAELs

Solvay Acceptable Exposure Limits

SASB

Sustainability Accounting Standards Board. SASB's mission is to develop and disseminate sustainability accounting standards that help public corporations disclose material, decision-useful information to investors. That mission is accomplished through a rigorous process that includes evidence-based research and broad, balanced stakeholder participation.

SCMS

Solvay Care Management System

SDG

United Nations Sustainable Development Goals

SEVESO REGULATIONS

The Control of Major Accident Hazards Involving Dangerous Substances Regulations. These regulations (often referred to as "COMAH Regulations" or "Seveso Regulations") give effect to European Directive 96/82/EC. They apply only to locations where significant quantities of dangerous substances are stored.

SOCRATES

Global tool for industrial hygiene management

SOLVAY WAY

Launched in 2013 and aligned with ISO 26000, Solvay Way is the sustainability approach of the Group. It integrates social, societal, environmental, and economic aspects into the Company's management and strategy, with the objective of creating value shared by all of its stakeholders. Solvay Way is based on an ambitious and pragmatic framework serving as a tool of both measurement and progress. Solvay Way lists 49 practices – practices that reflect the Solvay Way's 22 commitments and are structured on a four-level scale (launch, deployment, maturity, performance).

SPM

The Sustainable Portfolio Management tool is integrated into the Solvay Way framework (linked to five practices). It serves as a strategic tool for developing information on our portfolio and analyzing the impacts of sustainability megatrends on our businesses.

SVHC

Substance of Very High Concern (SVHC) is a chemical substance, the utilization of which within the European Union has been proposed to become subject to legal authorization under the REACH regulation.

TCFD

Task Force on Climate-related Financial Disclosure

UN GLOBAL COMPACT

Voluntary corporate sustainability initiative to support companies to align strategies and operations with universal principles on human rights, labor, environment, and anti-corruption, and take actions that advance broader societal goals.

UNDERLYING

Underlying results are deemed to provide a more comparable indication of Solvay's fundamental performance over the reference periods. They are defined as the IFRS figures adjusted for the "Adjustments" as defined above.

UNDERLYING NET DEBT

Underlying net debt reclassifies as debt 100% of the perpetual hybrid bonds, considered as equity under IFRS.

UNDERLYING TAX RATE

Income taxes / (Result before taxes – Earnings from associates & joint ventures – interests and realized foreign exchange results on RusVinyl joint venture) - All determined on an Underlying basis. The adjustment of the denominator regarding associates and joint ventures is made as these contributions are already net of income taxes.

VELOCITY

Total number of shares traded during the year divided by the total number of listed shares, using the Euronext definition.

VELOCITY ADJUSTED BY FREE FLOAT

Velocity adjusted as a function of the percentage of the listed shares held by the public, using the Euronext definition.

WBCSD

World Business Council for Sustainable Development.

YOY

Year on year comparison.

Shareholder's diary

MAY 7, 2019

First quarter 2019 results

MAY 14, 2019

Annual general meeting

MAY 21, 2019

Final dividend ex-coupon date

MAY 22, 2019

Final dividend record date

MAY 23, 2018

Final dividend payment date

JULY 31, 2019

First half 2019 results

NOVEMBER 7, 2019

Nine months 2019 results

FEBRUARY 26, 2020

Full year 2019

MORE INFORMATION

ANNUALREPORTS.SOLVAY.COM/2018

Ce rapport est aussi disponible en français.
Dit jaaversalg is ook beschikbaar in het Nederlands.

Layout, concept and production (print & online)
nexxar, Austria
www.nexxar.com

Content and computer graphic consulting, writing
CAPITALCOM, France
www.capitalcom.fr

Consulting, translation, printing
nexxar, Austria
www.nexxar.com

Publication management
Solvay Communication

Photos
Solvay / Jean-Michel Byl / Cyril Fussien
Page 35: iStock.com/Plarguedoctor
Page 36: iStock.com/urfinguss

Printed on FSC paper.

Solvay employees portrayed on the cover: Bruno, Carole, Hakim, Laetitia, Nathalie, Olivia, Philippe.

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The people portrayed on the cover are Solvay team members.