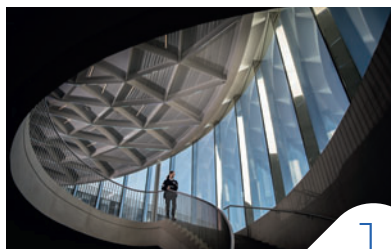


# 2018 Reference Document

INCLUDING THE ANNUAL  
FINANCIAL REPORT

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# 2018

## REFERENCE DOCUMENT

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Including the annual Financial Report

**A world leader in gases, technologies and services for Industry and Health, Air Liquide** is present in **80 countries** with approximately **66,000 employees** and serves more than **3.6 million customers and patients**. Oxygen, nitrogen and hydrogen are essential small molecules for life, matter and energy. They embody Air Liquide's scientific territory and have been at the core of the Company's activities since its creation in 1902.

Air Liquide's ambition is **to be a leader in its industry, deliver long-term performance and contribute to sustainability**. The Company's customer-centric transformation strategy aims at profitable growth over the long term. It relies on **operational excellence, selective investments, open innovation** and a **network organization** implemented by the Group worldwide. Through the commitment and inventiveness of its people, Air Liquide leverages energy and environment transition, changes in healthcare and digitization, and delivers greater value to all its stakeholders.

Air Liquide's revenues amounted to **21 billion euros** in 2018, and its solutions that protect life and the environment represented more than 40% of sales. Air Liquide is listed on the Euronext Paris stock exchange (compartment A) and belongs to the CAC 40, Euro Stoxx 50 et FTSE4Good indexes.



The original French version of this Reference Document was filed with the French financial markets authority (AMF), on 03/06/2019, in accordance with article 212-13 of its General regulations. It may be used in support of any financial transaction if it is supplemented by a prospectus approved by the AMF. This document was prepared by the issuer and its signatories assume responsibility.



Visit  
our website [www.airliquide.com](http://www.airliquide.com)

*This document is a non-binding "free" translation from French into English and has no legal value other than an informative one. Should there be any difference between the French and the English version, only the text in French language shall be deemed authentic and considered as expressing the exact information published by Air Liquide.*

A financial and technical glossary is provided at the end of the document – pages 359 to 362.

## A GLOBAL PRESENCE

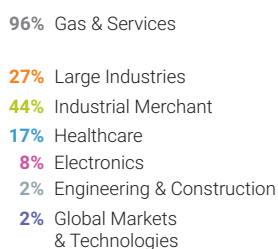
Present in

80  
COUNTRIES

~66,000  
employees

A world leader  
in gas, technologies  
and services  
for Industry  
and Health

### 2018 GROUP REVENUE BY ACTIVITY



27% of revenue for Gas & Services for Industry <sup>(a)</sup> realized in developing economies

### 2018 GROUP REVENUE BY REGION AND BY ACTIVITY, FOR GAS & SERVICES (G&S)

#### EUROPE



#### AMERICAS



#### ASIA-PACIFIC



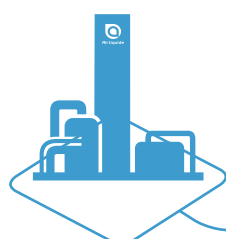
#### MIDDLE EAST & AFRICA



(a) Gas & Services for Industry (GSI): Large Industries, Industrial Merchant, Electronics.

# A WIDE RANGE OF MARKETS AND A STRONG BUSINESS MODEL

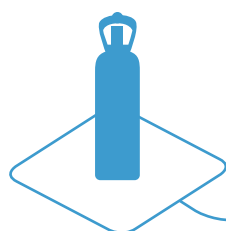
## KEY ELEMENTS BY BUSINESS LINE <sup>(a)</sup>(b)



### LARGE INDUSTRIES

28% of Gas & Services  
5,685 millions euros  
+7% in 2018  
+3% on average over 5 years

High **capital intensity**  
**Customers** in metals, chemicals, refining and energy  
**Industrial basin** and **pipeline network** strategy  
**Long-term contracts** (15 years), **take-or-pay** clauses and **indexed** energy cost  
**Synergies** with other business lines



### INDUSTRIAL MERCHANT

46% of Gas & Services  
9,181 millions euros  
-1% in 2018  
+13% on average over 5 years

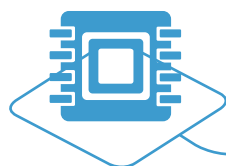
**More than 2 million** customers  
**Technological solutions** adapted to customers' businesses  
Importance of **logistics**  
High number of **end-markets**



### HEALTHCARE

17% of Gas & Services  
3,486 millions euros  
+2% in 2018  
+5% on average over 5 years

**Services activity** in a regulated sector  
**1.6 million** patients  
Geographical **density**  
**Sophisticated information systems** essential for the activity



### ELECTRONICS

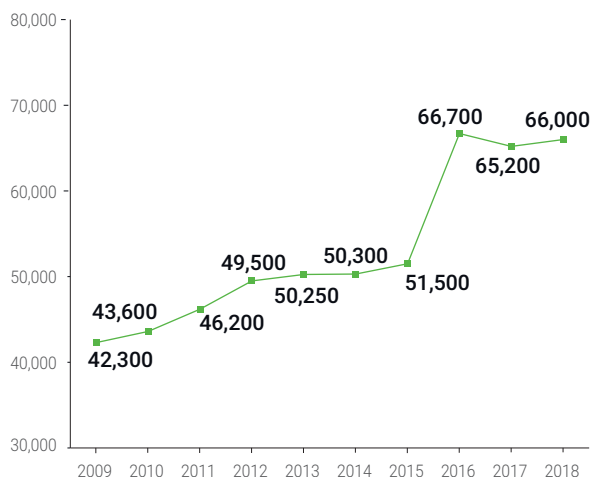
9% of Gas & Services  
1,755 millions euros  
+7% in 2018  
+9% on average over 5 years

Technological solutions with **ultra-purity gases** and **advanced materials**  
**Long-term contracts** for nitrogen with **take-or-pay** clauses and **indexed** energy cost  
Concentration of the activity in **Asia**

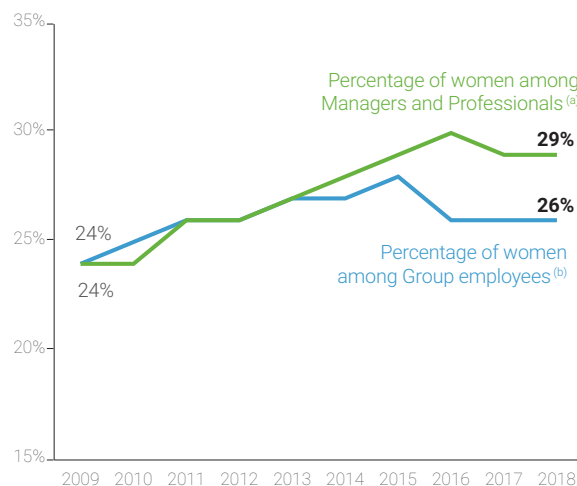
(a) Gas & Services bring together the following business lines: Large Industries, Industrial Merchant, Healthcare, and Electronics. See details in section "Description of Activities" page 19.  
(b) Published data.

## DRIVEN BY COMMITTED WOMEN AND MEN

NUMBER OF EMPLOYEES SINCE 2009



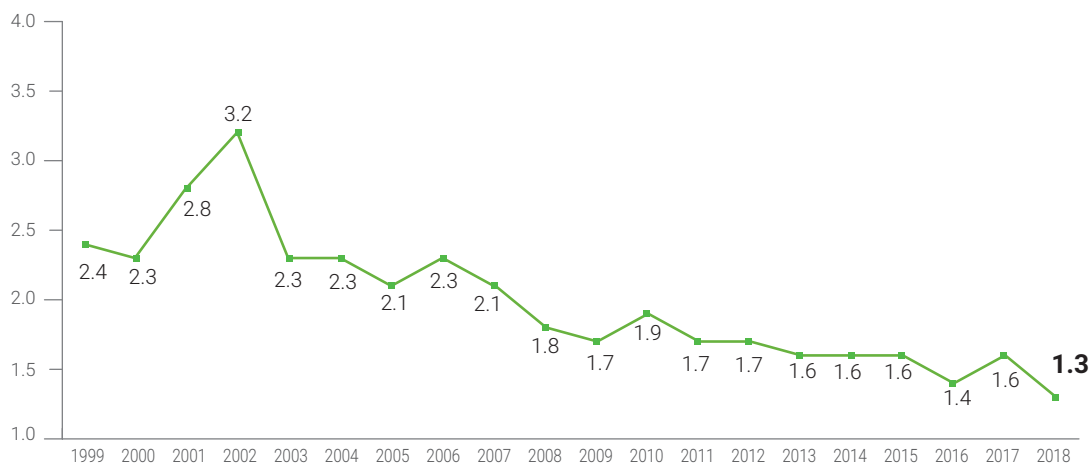
GENDER DIVERSITY EVOLUTION SINCE 2009



(a) Including Airgas since 2017.

(b) Including Airgas since 2016.

FREQUENCY OF ACCIDENTS (a) (b)



(a) Number of lost-time accidents with at least one lost day per million hours worked by Group employees.

(b) Including Airgas since 2017.

**Air Liquide Foundation**

Several hundreds of employees involved

More than 300 projects in around 52 countries for 10 years

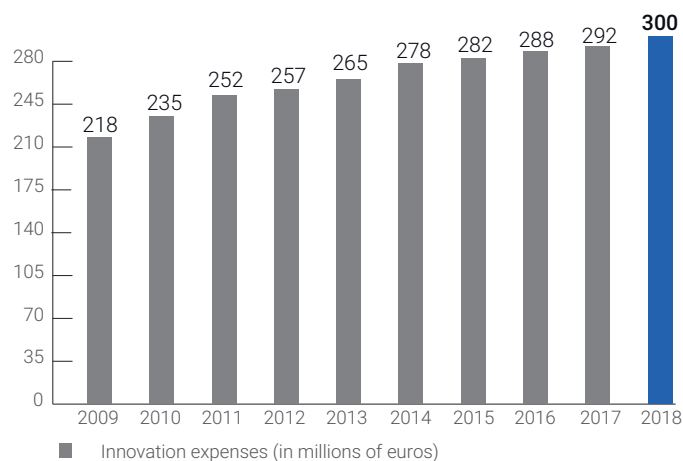
Internal Governance in 2018	Corporate Governance in 2018
<b>97%</b> of the Group's employees belong to an entity that has a local Code of Conduct, for which they are committed to comply	<b>73%</b> of Board members are independent Directors
<b>&gt;90%</b> of revenues subject to international control system processes	<b>45%</b> of Board members are women
	<b>55%</b> of Board members are non-French



## AN INNOVATIVE COMPANY

### INNOVATION EXPENSES

INNOVATION EXPENSES SINCE 2009



**309**

new patents filed in 2018

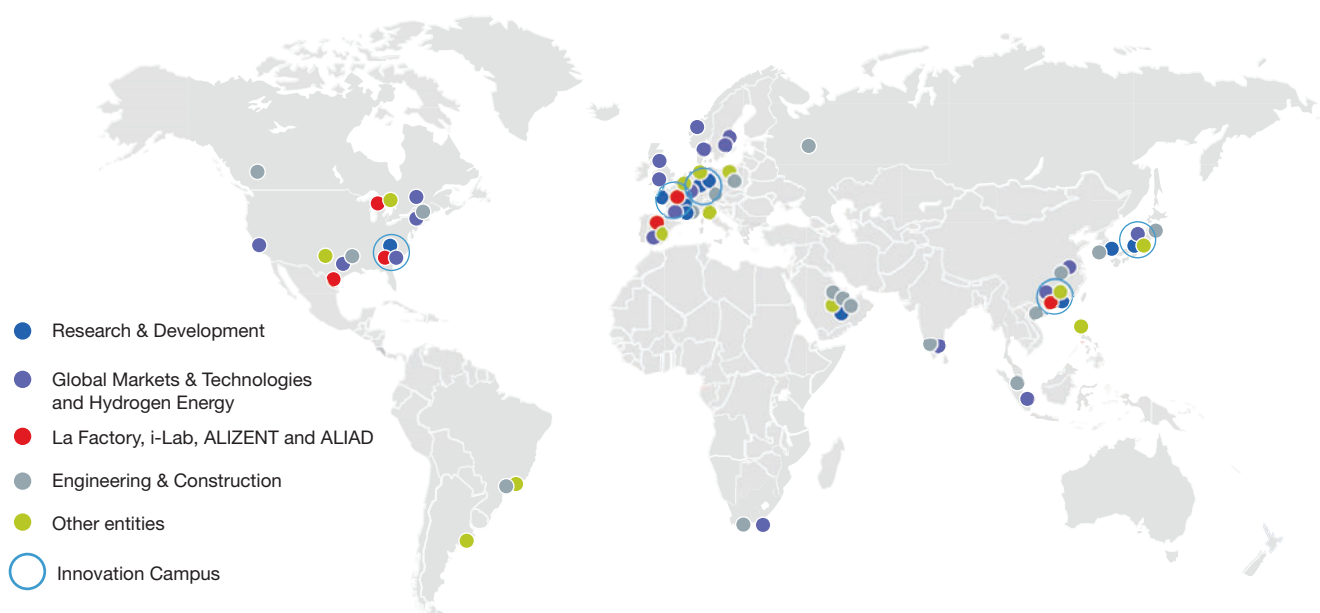
**More than 200**

industrial and scientific partnerships

### GLOBAL NETWORK SUPPORTING INNOVATION

**4,000**

employees in entities dedicated  
or contributing to innovation

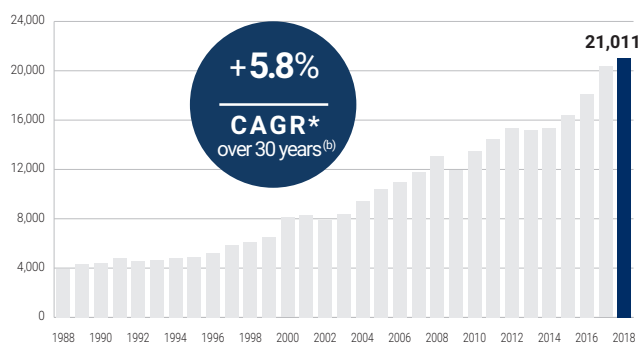


## REGULAR AND SUSTAINED PERFORMANCE

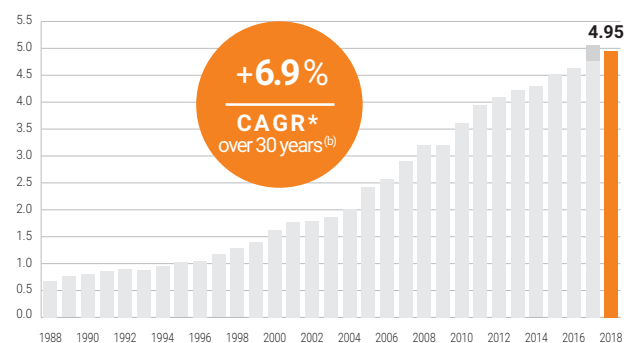
Created in  
**1902**

**18.3%**  
2018 Gas & Services Operating Margin / Revenue

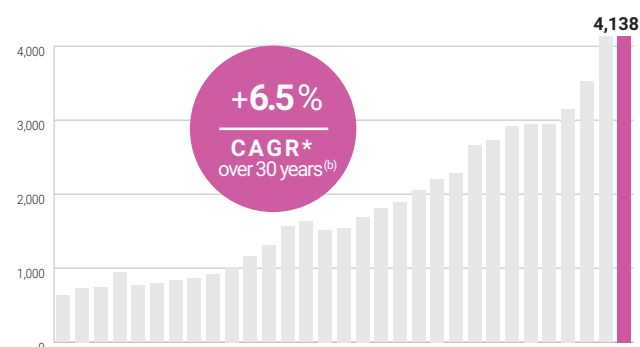
**REVENUE**  
(in million euros)



**EPS<sup>(a)</sup>**  
(in euros)



**CASHFLOW**  
(in million euros)



**DIVIDEND<sup>(a)</sup>**  
(in euros per share)



\* Compound Annual Growth Rate.

(a) Adjusted for the 2-for-1 share split in 2007, for free share attributions and for a 0.974 factor reflecting the value of the rights of the capital increase completed in October 2016.

(b) Calculated according to prevailing accounting rules over 30 years.

## TSR

Total Shareholder Return  
for a single registered share

**+8.5%**  
over 5 years<sup>(c)</sup>

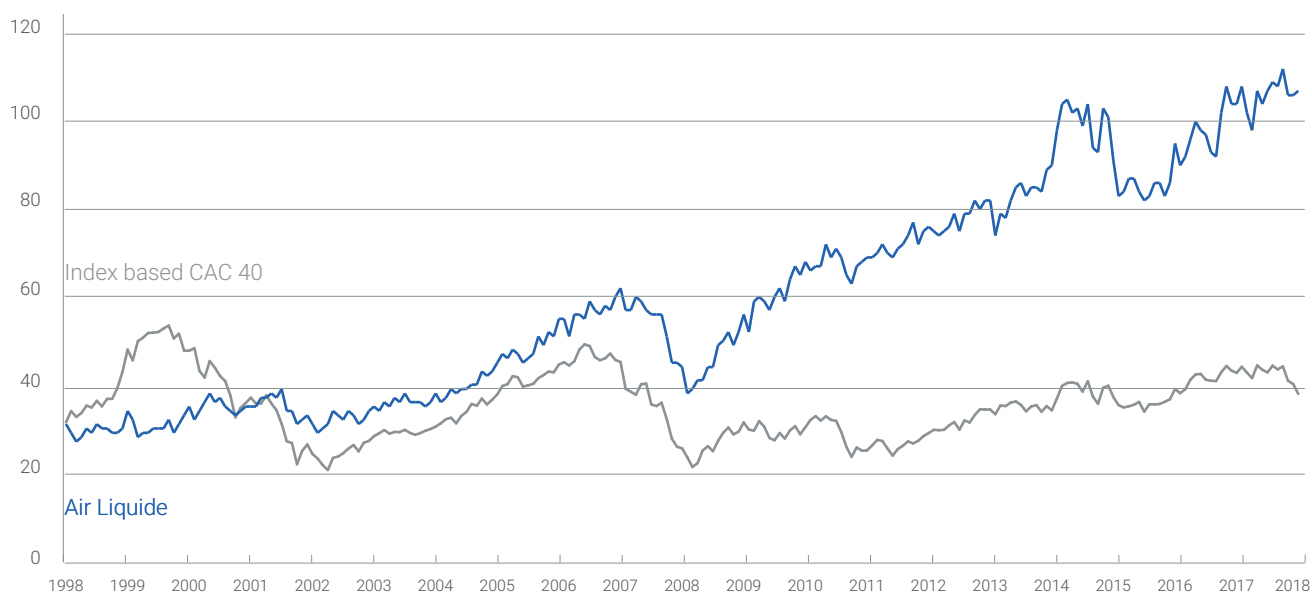
**+12.6%**  
over 10 years<sup>(d)</sup>

(c) At December 31, 2018, for an invested capital since December 31, 2013.

(d) At December 31, 2018, for an invested capital since December 31, 2008.



## STOCK MARKET PERFORMANCE



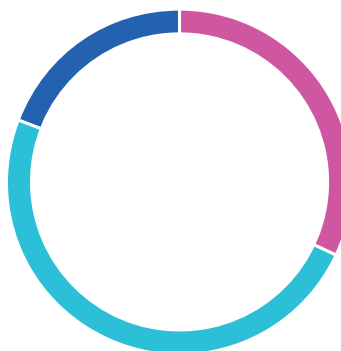
	2014	2015	2016	2017	2018
Market Capitalisation at December 31 <i>(in millions of euros)</i>	35,470	35,672	41,085	45,003	46,571
Closing share price <sup>(a)</sup> <i>(in euros)</i>					
At December 31	91.07	91.78	96.05	105.05	108.45
high	91.73	109.49	96.41	111.45	115.15
low	74.78	86.28	78.55	90.41	97.94
Net earnings <sup>(b)</sup> – EPS <i>(in euros)</i>	4.29	4.53	4.64	5.16	4.95
Net Dividend per share <sup>(b)</sup> – DPS <i>(in euros)</i>	2.25	2.30	2.36	2.65	2.65
Pay ratio	53.9%	52.5%	56.0%	52.8%	55.1%
Dividend yield	2.5%	2.5%	2.5%	2.5%	2.4%
Ex-dividend date	May 18, 2015	May 23, 2016	May 15, 2017	May 28, 2018	May 20, 2019

(a) Adjusted following current Euronext regulation.

(b) Data for 2014, 2015 and 2016 adjusted for attribution of free shares and capital increase.

## SHARE OWNERSHIP BREAKDOWN AT DECEMBER 31, 2018

- 32%** Individual shareholders
- 50%** Foreign institutional investors
- 18%** French institutional investors
- > 0%** Treasury shares



## SUSTAINABLE DEVELOPMENT APPROACH

### GROUP'S AMBITION

To be a leader in its industry – Deliver long term performance  
Contribute to sustainability



### COMMITMENTS

Air Liquide is signatory of the United Nation's **Global Compact**  
and the **Responsible Care®** Global Charter



### NEOS OBJECTIVES AND KPI

#### Prevent global warming and improve air quality

To reduce by **30%** the carbon intensity by 2025 vs 2015<sup>(a)</sup>

For 2018, the carbon intensity is 4.9, which represents a 22% reduction compared to 2015 carbon intensity (6.3) and a 74% progress toward the 2025 target (4.4).

#### Be engaged in an active dialogue with all stakeholders

Increase the number of women among managers and professionals to **35%** and

Hire **33%** of young graduates among managers and professionals by 2025

In 2018, Air Liquide had 29% of women among engineers and managers and young graduates represented 28% of the recruited engineers and managers.



### NON-FINANCIAL RATING AGENCIES

Air Liquide publishes a detailed report and monitors its environmental footprint in its Reference Document. These indicators are audited by an independent verifier and are part of a transparency approach that is recognized by specialized bodies and non-financial rating agencies.



A-



GOLD



(a) In kg CO<sub>2</sub> equivalent / euro EBITDA.



1

# INTEGRATED MANAGEMENT REPORT

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## HISTORY OF THE AIR LIQUIDE GROUP

### 1902

#### ORIGIN

Air Liquide was born of innovation and began with the encounter between two men: Georges Claude, inventor of an industrial process for the production of oxygen from liquid air, and Paul Delorme, a visionary entrepreneur.

### 1906

#### FIRST INTERNATIONAL DEVELOPMENTS

Gas, by its very nature, is difficult to transport and thus local production is required. This was one of the reasons why Air Liquide set its sights internationally early on, building numerous production units abroad. Development was rapid in Europe (1906), Japan (1907), Canada (1911) and the United States (1916).

### 1913

#### LISTING ON THE STOCK EXCHANGE

The critical role played by shareholders became evident in the first years of the Company's development. Listed on the Paris Stock Exchange in 1913, the share celebrated its hundredth-year of listing in 2013. Air Liquide has endeavored to forge a strong and privileged relationship with its shareholders based on exceptional stock market performance, with an average annual increase in its share price over the 100 years to 2013 of +11.9%.

### 1952

#### THE CRYOGENIC REVOLUTION

Storing gas in liquid form in cryogenic tanks allows vast quantities to be transported by road or rail within a radius of approximately 200-250 km from the production site.

### 1960

#### PIPELINE NETWORK STRATEGY

By delivering gas to several customers through pipelines, Air Liquide adopted a network strategy for the first time, linking its gas production units to one another. The Group increased its production capacity to meet soaring demand from large industries: firstly, for oxygen in the steel industry, and secondly, for nitrogen in chemicals.

The Large Industries business was launched with customers committing to long-term contracts of 15 years or more. The Group currently manages more than 9,400 km ( $\approx$  5,800 miles) of pipelines worldwide, in particular in the US along the Gulf Coast of Mexico, from the north of France to the Benelux, in the Ruhr Valley in Germany and in several Asian countries including China and Singapore.

### 1962

#### SPACE INDUSTRY

Convinced of the industrial potential of cryogenics, Jean Delorme, Chairman & CEO of Air Liquide, decided to create a research center near Grenoble dedicated to these technologies. The first applications were rapidly integrated in the space industry. Air Liquide has been a partner of the space adventure for 65 years. The Group's contribution has been in the production of the fluids essential for take off (oxygen, hydrogen, helium and nitrogen), the supply of associated services, in the design and production of tanks, launchers and cryogenic satellite equipment.

### 1970

#### A TRADITION OF INVENTIONS

The Claude Delorme Research Center located in the Paris-Saclay plateau and now called the Paris Innovation Campus, was created in the greater Paris region. The center was created to enhance gas production technologies and their applications. It is evidence of the Group's desire to better understand the industrial processes of its customers and develop new gas applications to better satisfy their requirements. The Center also develops partnerships with universities and industrial companies. Currently, the Group also has research centers in Europe, North America and Asia.

1976

**A TECHNOLOGICAL BREAKTHROUGH**

With the Sasol project in South Africa, for the production of synthetic fuel, Air Separation Units (ASUs) have scaled up, dramatically increasing in size. Following this technological breakthrough, Air Liquide became the leader in large ASUs, and remains so today. At the end of 2017, the world's largest oxygen production unit was commissioned by the Group in South Africa for its customer Sasol.

1985

**A NEW MARKET: ELECTRONICS**

In Japan, the Group began to supply ultra-high purity gases to the semi-conductor industry: this involves carrier gases, mainly nitrogen, used to transport the specialty gases and keep the chip production tools inert, and specialty gases that are used directly in the manufacturing of semi-conductors. In 1987, Air Liquide inaugurated the Tsukuba Research Center in Japan, which is dedicated to the electronics industry.

1986

**MAJOR ACQUISITION**

The Group acquired Big Three in the United States in 1986, a Large Industries business along the Gulf Coast.

1995

**EXTENDED OFFERING: HYDROGEN AND STEAM**

In addition to oxygen and nitrogen, as part of its commitment to protecting the environment and promoting energy efficiency, Air Liquide extended its offering to hydrogen and steam. To ensure the success of this new offering, the Group used its business model, which is behind the success of its air gas business, and deployed from the beginning a basin strategy based on a pipeline network, providing customers with flexibility, distribution reliability and service quality at the best price.

**HEALTHCARE**

Originally an oxygen supplier to hospitals, Air Liquide became a specialist in the healthcare sector. The Group launched its Home Healthcare business and set up a dedicated network of specialist teams. Medical gases were progressively classified as drugs and manufacturers were required to file market authorizations. The Group also ushered in the hygiene sector, a business that naturally complemented hospital services. More recently, Air Liquide launched research programs in therapeutic gases, used for resuscitation and pain relief.

2000

**INTERNATIONAL EXPANSION**

The Group invested massively in China in the early 2000s; the country has been a major growth market for industrial gases and Air Liquide entered into numerous air gas contracts.

The Group acquired part of Messer Griesheim activities in Germany, the United Kingdom and the United States.

2007

**ORGANIZATION BY BUSINESS LINE**

The Air Liquide growth drivers for the coming decades are solid and sustainable, based on changing lifestyles: industrial growth of developing economies, increasing energy needs and environmental challenges, healthcare and high technology. To capture this growth, the Group created a new organizational structure based on four World Business Lines. They combine the technical and operational expertise which are specific to each of the businesses of the Group – Large Industries, Industrial Merchant, Healthcare and Electronics – and centralize the specific market expertise. The Group remains geographically focused, but each zone or country benefits from the support and experience of the business lines to accelerate its development.

Conscious of the strategic dimension of Engineering & Construction capabilities, the Group acquired Lurgi in 2007. This company provides Air Liquide with major proprietary technologies such as hydrogen and carbon monoxide production units, or processes relating to gasification or CO<sub>2</sub> purification, adding to the Group's historical competencies in cryogenics. Thanks to this acquisition, the Group now has a complete technological offering and greater engineering capacity.

2009

**RESILIENCE IN AN UNPRECEDENTED CRISIS**

Affected by a global economic crisis of unprecedented magnitude, the Group focused its efforts on the management of its cash, costs, and investments (capital expenditures). Having tested the solidity of its long-term contracts, Air Liquide confirmed its resilience and demonstrated the relevance of its business model. In a context of global recession, the Group showed itself to be an exception, posting a stable net profit while preserving the strength of its balance sheet.



## 2010-2012

### NEW TERRITORIES, NEW ACQUISITIONS

The Group accelerated its presence in new territories, including Turkey and Mexico, and strengthened its presence in China. These developments contributed to the increase of the developing economies' share of Gas & Services revenue from 16% in 2009 to 24% in 2018.

A weaker growth environment in advanced economies, particularly in Western Europe, led to Air Liquide intensifying its acquisition efforts. At the end of 2012, two major home healthcare players joined the Group: LVL Médical in France and Gasmedi in Spain.

## 2013-2015

### NEW INITIATIVES IN THE INNOVATION FIELD – HYDROGEN ENERGY

Innovation is central to Air Liquide's strategy. In 2013, Air Liquide launched two initiatives to promote open innovation: i-Lab (innovation Lab) and ALIAD, the Group's capital risk subsidiary, to make minority investments in innovative technology start-ups. In 2014, the Group decided on new investments with the modernization of the Research Center near Versailles, the creation of a center for the development and industrialization of gas cylinders for industry and healthcare, and the launch of a technical center of excellence for cryogenic production technologies. In 2015, Air Liquide inaugurated Cryocap™ in France, a unique industrial installation that enables the capture of CO<sub>2</sub> released during hydrogen production via a cryogenic process. After being purified, the captured CO<sub>2</sub> can be used to meet a variety of industrial needs for carbonic gas supply.

In addition, on a worldwide scale, Air Liquide actively contributes to the development of the hydrogen energy activity by supporting automotive manufacturers launching fuel cell electric vehicles on the market. Air Liquide contributes to the construction of hydrogen charging stations (United States, Japan, France, Germany, Belgium, Denmark, the Netherlands and Korea), the majority of which are generally accessible to the public.

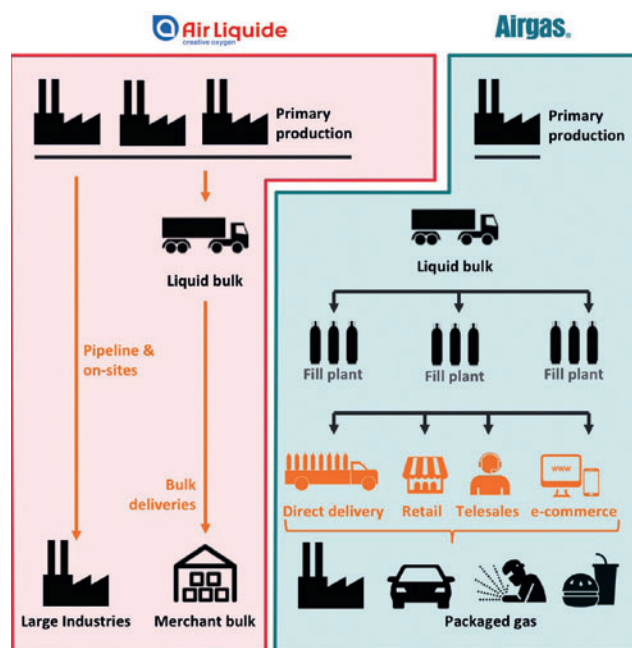
## 2016

### AIRGAS ACQUISITION BY AIR LIQUIDE

On May 23, 2016, Air Liquide completed the acquisition of the American company Airgas. This acquisition enabled the Group to combine two highly complementary businesses and be present on all market segments. At the end of 2018, the United States represented 34% of Gas & Services revenue.

In the US, Air Liquide's presence was primarily upstream with production both in Large Industries (over 23,000 tons per day of oxygen production capacity, over 2,200 miles/3,500 kilometers of pipelines, principally along

the Gulf Coast) and in Industrial Merchant in liquid gases. Air Liquide also served customers in Electronics and Healthcare (medical gases to hospitals only, no home healthcare). Airgas is primarily focused on downstream distribution with 300 fill plants and 900 branches/retail stores delivering packaged gases and hardgoods to more than one million Industrial Merchant and Healthcare customers (medical gases). Airgas also enjoys the most advanced multi-channel network in the United States, including telesales and e-commerce platforms which allow for next-day direct deliveries from national warehouses for a whole range of complementary products.



The integration of this upstream and downstream coverage creates significant value. Air Liquide aims to reach its target of 300 million US dollars in synergies at the beginning of 2019, i.e., more than a year before initially planned. Cost synergies account for around 70% of total synergies and are the result of sourcing optimization, better loading of Air Liquide and Airgas' assets, distribution efficiencies and reorganizations. Growth synergies come from cross-selling the various Gas & Services offers to both customer bases. They also result from the roll-out of Air Liquide technologies via Airgas' various distribution networks, as well as support for Airgas customers in their international expansion (in Canada and Mexico in particular). These represent approximately 30% of the total amount of synergies.

Moreover, Air Liquide believes that the Airgas model, in terms of products, digitization of businesses, and business model, may be applied in certain regions outside the United States. These additional strategic synergies are not included in the 300 million US dollars already announced.

With this acquisition, Air Liquide strengthens its leading position in the United States, the largest industrial gas market worldwide. This market also enjoys the strongest growth among advanced economies. The US market is expected to deliver 20 to 25% of the global industrial gases market's mid-term growth. This market is supported by long-term structural strengths such as competitive natural gas and energy prices driving investments and industrial production.

Approximately half of the US packaged gas market is composed of independent distributors. This current fragmentation of the US market provides further opportunities for growth as Airgas and Air Liquide have significant experience in integrating bolt-on acquisitions

### THE LAUNCH OF THE NEW COMPANY PROGRAM 2016-2020: NEOS

The Group acquired a new dimension following the acquisition of Airgas and thus entered a new phase of its development. On July 6, 2016, Air Liquide published its new mid-term company program, NEOS, for the 2016-2020 period.

Air Liquide's strategy for profitable growth over the long-term is that of a customer-centric transformation. It is based on operational excellence and the quality of its investments, on open innovation and the network organization already implemented by the Group worldwide. Air Liquide's ambition is to be a leader in its industry, deliver long-term performance and contribute to sustainability.

### CREATION OF THE GLOBAL MARKETS & TECHNOLOGIES BUSINESS

To step up the development of offerings in new markets, the Group created the Global Markets & Technologies business, responsible for the incubation of new activities in the field of energy transition and the maritime sector, by leveraging technologies (Space, Aerospace, Cryogenics, scientific exploration).

## 2017

### REFOCUSING ON GAS & SERVICES BUSINESSES

Following the disposal of its Aqua Lung (diving) and Air Liquide Welding (welding) subsidiaries, Air Liquide focused on its Gas & Services businesses and the implementation of its NEOS company program. The Gas & Services businesses now represent 96% of the Group's revenue at the end of 2018.

### NEW VISUAL IDENTITY FOR THE GROUP

To mark its transformation, the Group created a new logo, the fifth since the Company was founded 115 years ago. This new visual identity, which embodies the change within Air Liquide, is that of a leading Group, expert and innovative, that is close to its stakeholders and open to the world.

## 2018

### INTEGRATION OF AIRGAS

Air Liquide has already achieved the majority of the cost and growth synergies resulting from the integration of Airgas. The 300 million US dollar target will be reached at the beginning of 2019, i.e., more than a year before initially planned.

### INAUGURATION OF THE PARIS INNOVATION CAMPUS

Air Liquide inaugurated its Paris Innovation Campus in the Paris-Saclay innovation Cluster, in the greater Paris region. This new Campus illustrates the Group's "open innovation" approach, especially on energy transition and the environment, healthcare and digital transformation. It includes the Group's largest, fully renovated, Research & Development Center. From 2019, the Innovation Campus will also host a deep-tech start-up accelerator.

### ENERGY TRANSITION AND CLIMATE OBJECTIVES

For many years now, Air Liquide has been committed to sustainable growth aimed, in particular, at limiting its CO<sub>2</sub> emissions and those of its customers. On November 30, 2018, Air Liquide announced its Climate objectives, including the commitment to reduce its carbon intensity by 30% between 2015 and 2025, with a global approach that includes its assets, its customers, and ecosystems. The objectives are the most ambitious in the sector and are in line with the NEOS company program.

In this respect, the Global Markets & Technologies activity is stepping up sales to energy transition-related markets, driven by the biomethane sector with the start-up of several production units in Europe and the United States, and by hydrogen energy with the commissioning of new hydrogen charging stations for mobility. Moreover, the Hydrogen Council, which was founded in 2017, brings together more than 50 global leaders in the energy, transport and industry sectors to promote hydrogen with a view to achieving climate change-related objectives, and has held a meeting in China for the first time.



## BUSINESS MODEL

### 1. Description of the business model

Air Liquide creates value for society, the environment and ensures the Company's long-term sustainability. The diagram below set out the Air Liquide Group's business and value creation model.

#### RESOURCES and STAKEHOLDERS

##### HUMAN CAPITAL AND STAKEHOLDERS

- 66,000 employees, with a range of profiles
- 29% of women among managers and professionals
- 4,000 employees contribute to innovation
- Long-term shareholders, of which 410,000 are individual shareholders
- Cooperation with 70,000 suppliers and more than 100 universities.
- Regular dialog with the authorities and local communities

##### INDUSTRIAL CAPITAL

- 3.1 billion euros of investment decisions in 2018
- Almost 300 million euros per year in innovation expenses
- Proprietary technologies and 11,000 patents
- A strong presence in major industrial basins
- 565 production units, 24 million cylinders, 12,000 trucks

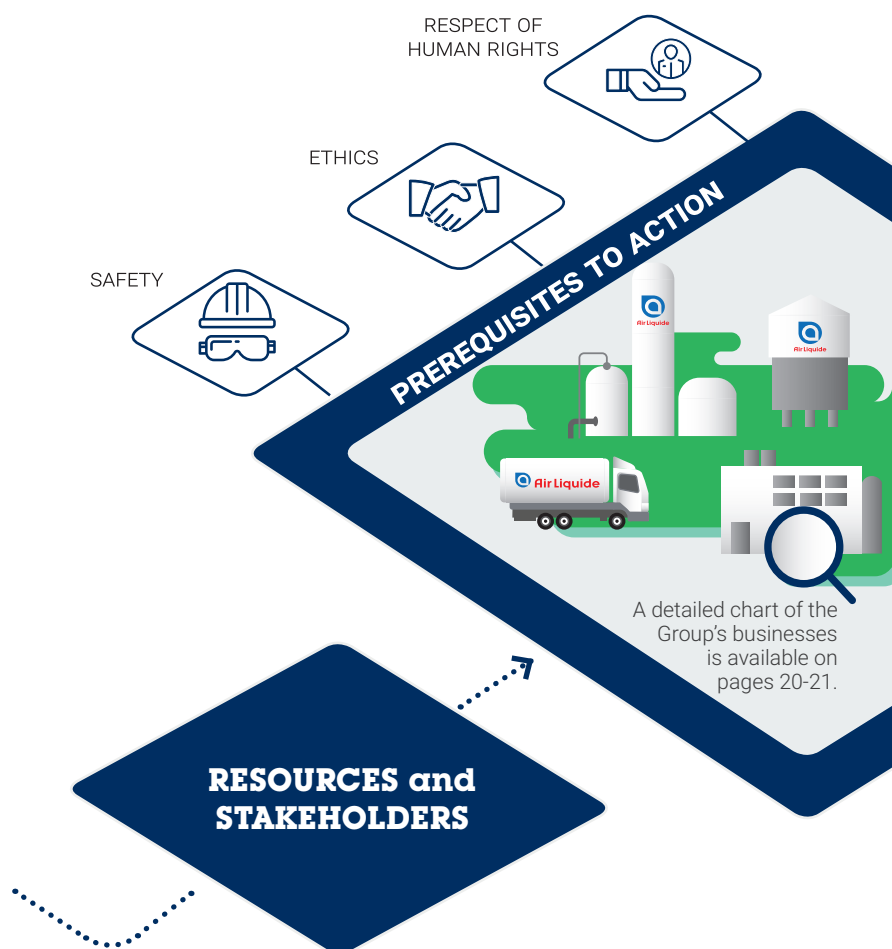
##### FINANCIAL CAPITAL

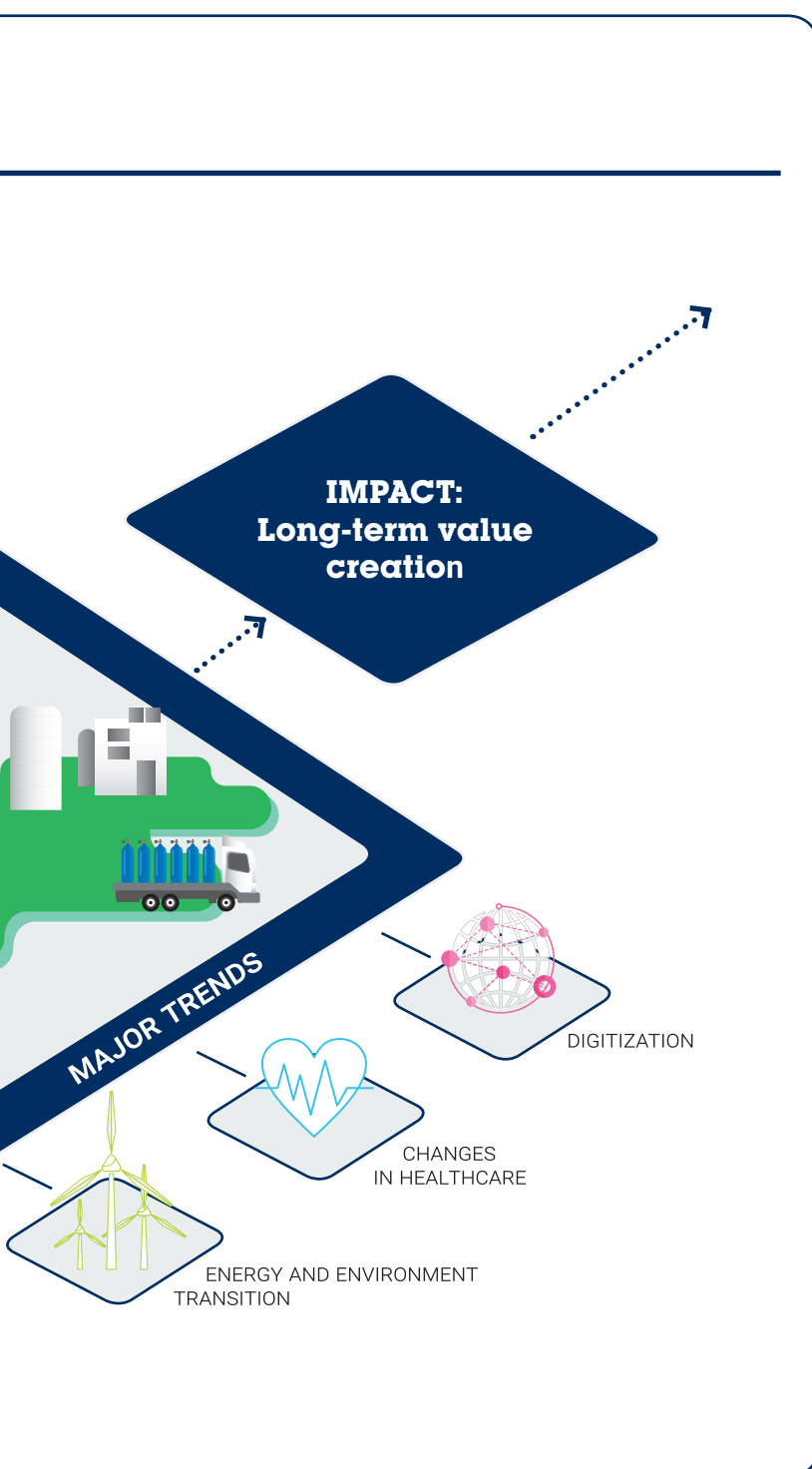
- Long-term customer contracts
- Breakdown of share capital: 32% individual shareholders and 68% institutional shareholders
- Strong balance sheet
- "A" credit rating

#### AIR LIQUIDE BUSINESS: gas, technologies and services for Industry and Health

The Group is a global leader in gas, technologies and services for industry and healthcare and supports the growth of all economic sectors by drawing on its extensive scientific and technical expertise. Its offering includes:

- The production and valorization of molecules
- The integration and marketing of proprietary technologies
- The provision of services and digital solutions





## IMPACT: Long-term value creation

### COMPANY

- Priority given to the safety of employees, customers, subcontractors and suppliers
- Support for more than 2 million industrial customers worldwide
- Introduction of the "Voice of Customer" program in 45 countries
- The Healthcare business, with 1.6 million patients cared for in their homes and service provided to 15,000 hospitals
- More than 230 critical suppliers assessed based on their environment, social, business ethics and procurement policies
- Local growth: present in 80 countries, dense territorial coverage
- Air Liquide Foundation projects

### ENVIRONMENT

- > 40% of sales are related to solutions to protect life and the environment
- Climate objectives: reducing the Group's carbon intensity by 30% between 2015 and 2025
- 70% of electricity consumed by the Group is low-carbon or renewable
- 10.9 million tons of CO<sub>2</sub> avoided by the Group's customers, thanks to Air Liquide solutions
- 9,400 km of pipelines, reducing road transport
- Creation of the Hydrogen Council for a low-carbon society

### LONG-TERM SUSTAINABILITY

- Revenue: +5.8% <sup>(a)</sup> compound annual growth rate (CAGR) over 30 years
- Adjusted net earnings <sup>(b)</sup> per share: +6.9% <sup>(a)</sup> compound annual growth rate (CAGR) over 30 years
- Adjusted dividend <sup>(b)</sup> per share: +8.3% <sup>(a)</sup> compound annual growth rate (CAGR) over 30 years
- 29<sup>th</sup> free share attribution in 2017
- 5 Chairman & CEOs since 1902
- Employee loyalty: 93% loyalty rate among managers and professionals <sup>(c)</sup>

(a) Data calculated according to prevailing accounting rules over 30 years.

(b) Adjusted for the 2-for-1 share split in 2007, the free share attribution and the capital increase completed in October 2016.

(c) Rate calculated based on resignations.

## 2. Prerequisites to action: safety, ethics and the respect of human rights

### 2.1. SAFETY

Safety is an integral part of Air Liquide's operational excellence.

Air Liquide, as a responsible industry player, is committed to efficiently and under all circumstances reducing the exposure of its employees, customers, subcontractors and suppliers to professional and industrial risks. Commitment to safety is total, visible, accompanied by unshakable vigilance and must allow the achievement of the zero-accidents objective.

Safety is a joint commitment and the responsibility of each individual. Prevention, protection, early detection and rapid reaction are at the heart of the Group's concerns. This commitment is reiterated in the General Statement of Air Liquide's Principles of Action, which details the Group's approach in terms of all its stakeholders. These Principles are shared with all entities and are available on the Group's website (<https://www.airliquide.com/group/groups-principles-action>).

#### Safety measures

Air Liquide continues to implement safety measures in three areas:

- the safety of individuals (Air Liquide employees and subcontractors);
- road safety;
- process safety.

**The safety of individuals** is part of a pro-active approach which engages Air Liquide employees and those of its subcontractors.

All Group employees have the ability and duty to ensure their safety and that of their colleagues. Being aware of dangers and risks, applying the rules and taking care of others – all this contributes to reducing the risk of accidents and strengthening Air Liquide's safety culture. Therefore, recognizing contributions in terms of safety, sharing the same values and developing trust-based relationships are key strengths for Air Liquide.

This includes, in particular, safety leadership training and regular workstation-based training courses. Air Liquide's managers encourage safety efforts, by demonstrating their commitment on-site and awarding good practices. Air Liquide's managers encourage safety efforts, by demonstrating their commitment on-site and awarding good practices.

The safety of subcontractors requires particular attention. Air Liquide uses subcontractors within the course of its business and pays particular care to the following:

- assessing the level of maturity and performance of subcontractors' safety measures before any sales commitment is made;
- integrating safety clauses in the terms of contracts;
- jointly establishing a work structure with comprehensive and detailed safety instructions;
- communicating Air Liquide's safety values and standards as well as the regulations in force that must be complied with; being as demanding and rigorous with subcontractors as with our own employees;
- supervising subcontractors in the execution of services;
- carrying out safety reviews once the work is complete, sharing feedback with subcontractors.

**Road safety** is part of an ambitious program launched in 2015 and adapted to Group businesses. This program has three main objectives: ensuring that rules laid down by the Air Liquide Group are efficiently applied across all subsidiaries, deploying the new technologies which help drivers drive safely, and sharing know-how between the various Group subsidiaries. According to region, the following measures are worth highlighting:

- the installation of onboard cameras and IT solutions which, according to their type, can detect driver fatigue and distractions, help change driving habits where necessary, or provide visibility of the vehicle's surroundings;
- at local and international level, increased exchanges on road safety both internally as well as with Air Liquide service providers and other organizations specialized in this subject. Moreover, Air Liquide organizes a European day of discussions and capitalization on transport safety with its service providers each year;
- initiatives which lead to a real change in behavior to implement a dynamic culture of road safety among Air Liquide employees and the employees of the Group's subcontractors.

**Process safety** addresses risks relating to industrial facilities and products. This process draws on Air Liquide's Industrial Management System (IMS) and requires:

- the identification of specific industrial risks for each business;
- knowledge of scenarios and their potential consequences;
- the effective and efficient implementation of appropriate preventative and protective safety measures for each of these risks; and finally, feedback to facilitate learning, awareness-raising, the promotion of a safety culture and to improve prevention.

## 2.2. ETHICS

### 2.2.1. Ethical approach and program

Integrity and transparency are the cornerstones of the Group's ethical approach. They govern behaviors and actions of all employees.

Integrity includes honesty and impartiality.

Transparency is based on the principles of sincerity and openness.

Individual and collective commitment is key to adopt ethical behavior based on integrity and transparency.

The Group's ethical approach is structured so that rules of conduct are shared and respected by all, in particular in regards to the respect for Human Rights, social rights and the environment.

This approach is set out in an ethical program which includes the following points:

- the behavior expected from all employees which is part of the General Statement of the Group's Principles of Action;
- relayed codes developed through internal procedures;
- the awareness-raising and training program;
- the whistleblowing and control system.

### 2.2.2. A dedicated structure

To support the roll-out of this Ethical program, a dedicated organization has been set up:

- An Ethics Committee, composed of Air Liquide's various global functions (Human Resources, Legal, Group Control, Operations, Sustainable Development Departments, etc.), validates the ethical program's guidelines and may, if necessary, make post-fraud sanction recommendations;
- The Group Control Department, which is responsible for Ethics, reports directly to one of the Group's Executive Vice Presidents;
- An Ethics Officer is responsible for providing advice and support to entities in the implementation of the four above-mentioned areas and in the treatment of fraud and deviations. This Officer also suggests improvements to the Ethical program by integrating strategic challenges, best practices and regulatory developments. For example, the Ethics Officer integrated the anti-corruption obligations set out in the Sapin 2 Act into the Group's existing procedures. He relies on a network of ethics correspondents present in each of the Group's geographic regions and business lines.

### 2.2.3. Codes and procedures

Rules for ethics and conduct, which are shared and actively circulated among all Group employees through the BLUEBOOK (the Group's reference framework which includes policies, codes and procedures which apply to all the entities), are set out in particular within the Code of Conduct and the Anti-Corruption Code of Conduct.

### 2.2.4. The key concepts of the Code of Conduct, the employees' Ethics Charter

Each Group subsidiary must apply the key concepts of the Code of Conduct. This decentralized approach combines respect for local customs and regulations and the Group's ethical commitment. The subsidiaries thus embrace the Group's ethical principles by writing their own Codes of Conduct themselves in their working language.

Full details of these key concepts are available on the Group's website <https://www.airliquide.com/group/code-conduct-key-concepts>.

An e-learning module exists on the employee Code of Conduct which sets out the Group's ethics approach and presents key concepts through case scenarios. This module is mandatory and must be followed by all employees each year.

### The Anti-Corruption Code of Conduct

Air Liquide's commitment, which is set out in the introduction to the Principles of Action, to prohibit all forms of corruption is supported by a major anti-corruption program. The Group has formalized an Anti-Corruption Code of Conduct. This Code has been made available to all entities and is available on the website at <https://www.airliquide.com/group/anti-corruption-code-conduct>. This Anti-Corruption Code of Conduct provides a reminder of the anti-corruption laws and deals with relations with intermediaries, specific cases such as mergers, acquisitions and partnerships, types of payments requiring particular attention, as well as administrative and accounting traceability requirements and sanctions applicable in the event of non-compliance with this Code.

Moreover, the Group has a Supplier Code of Conduct which includes a chapter on the prevention of corruption.

An e-learning module covers the Anti-Corruption Code of Conduct. It is primarily intended for those teams which are most exposed to corruption-related risks (sales, procurement, administrative management, and so on) and managers. For these employees, this training module is mandatory each year. It is supplemented by classroom-based training every three years.

### 2.2.5. Respect for competition law

Codes have been established in regard to proper behavior concerning respect for competition law, especially in Europe, the United States and Asia. The most important rules are also included in the employees' Local Codes of Conduct. For some of the Group's activities, Healthcare in particular, specific Codes of Conduct on competition law have also been developed.

Audits are jointly conducted on a regular basis by the Group's Internal Audit Departments and an external attorney. They carry out tests and interviews to identify and correct practices at risk or any deviations observed. Awareness-raising meetings on compliance with competition law are also held throughout the Group. Finally, an e-learning program was launched covering competition law-related practices and international principles.

### 2.2.6. The whistleblowing system

The Group has a formal whistleblowing system at all its entities, whereby employees can anonymously alert an independent external service provider of any deviations from the Code of Conduct of their entity. Employees can file this alert in their own language by telephone or through the provider's dedicated website. All reports are dealt with confidentially and as quickly as possible. The Group guarantees that any employee who reports something in good faith will not be sanctioned or any retaliatory measures taken. It also reiterates in the Code of Conduct that the processing of reports is supervised by the Group's Ethics Officer.

This system is an additional solution to the usual process for reporting incidents within the entities: through managers and the Human Resources teams. It helps to accelerate the processing of reports received, and thus to minimize their potential impact on individuals and the organization.

## 2.3. RESPECT FOR HUMAN RIGHTS

Air Liquide is dedicated to the highest standards for the conduct of its business and its Chairman and Chief Executive Officer has signed the United Nations Global Compact, an initiative in which the 10 founding principles relate to Human Rights, international labor standards, the environment and the fight against corruption. Signatories of the Global Compact are committed to:

- support and respect the protection of internationally proclaimed Human Rights;
- ensure that they are not complicit in Human Rights abuses;
- uphold the freedom of association and the recognize the right to collective bargaining;
- help eliminate all forms of forced or compulsory labor;
- contribute to the effective abolition of child labor;

- help eliminate all discrimination in respect of employment and occupation;
- apply a precautionary approach to environmental challenges;
- undertake initiatives to promote greater environmental responsibility;
- encourage the development and diffusion of environmentally-friendly technologies;
- act against corruption in all its forms, including extortion and bribery.

Air Liquide's letter of commitment, signed by its Chairman may be viewed on the Air Liquide and Global Compact websites.



Air Liquide also complies with the international rules of the International Labour Organization (ILO) in terms of labor law and follows guidelines for multinational companies issued by the OECD. These Guidelines encourage the reasonable conduct of companies in terms of professional relationships, Human Rights, the environment, taxation, the publication of information, anti-corruption, the interest of consumers, science and technology, and competition.

Moreover, Air Liquide has signed the Responsible Care® Global Charter of the International Council of Chemical Associations (ICCA) which aims to improve global performances in the chemical industry in terms of health, safety and the protection of the environment.



### 3. Description of activities

The Group classifies its activities as follows: Gas & Services, Engineering & Construction, Global Markets & Technologies. Additional information is available in the "2018 Performance" section of this chapter.



#### 3.1. GAS & SERVICES

The supply of gas involves local production in order to limit transport costs. Therefore, Air Liquide gas production units are located throughout the world and can supply many types of customers and industries with the relevant volumes and services required. Air Liquide's structure is made up of a base, in Paris, and four hubs: Americas, Europe, Asia Pacific and Middle East and Africa. These hubs draw on the Group's expertise and presence in these geographic regions.

Moreover, the operational management of Gas & Services businesses is led by the World Business Lines to better adapt to changes in the different markets:

- **Large Industries** supplies industrial gases by operating major production units. It serves customers in the metals, chemicals, refining and energy industries with high gas consumption, requiring delivery through a dedicated plant or pipeline. Large Industries also supplies the Group's other business lines;

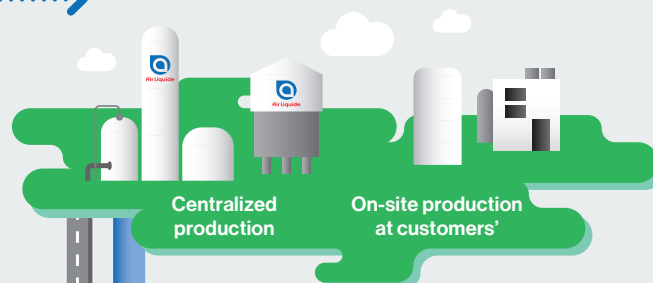
- **Industrial Merchant** supplies a wide range of different gases, application equipment and associated services. It serves industries of all sizes that require quantities smaller than those for customers of Large Industries. The product is either distributed in bulk, in liquid form, for medium and large quantities, or in cylinders, in gaseous form, for small quantities;
- **Healthcare** supplies medical gases, hygiene products, medical devices and services to hospitals and patients in their homes. It also produces and distributes healthcare specialty ingredients for the cosmetics, pharmaceutical and vaccine markets;
- **Electronics** supplies gas and services mainly for the production of semi-conductors, but also for flat panels and photovoltaic panels.

## AIR LIQUIDE SUPPORTS THE GROWTH OF ALL ECONOMIC SECTORS

DESIGNING  
INDUSTRIAL GAS  
PRODUCTION  
UNITS FOR  
AIR LIQUIDE  
AND CUSTOMERS  
PRODUCING  
DIRECTLY



SUPPLYING  
GASES AND  
SERVICES FOR  
ALL INDUSTRIES  
AND HEALTH



AIR SEPARATION UNITS,  
HYDROGEN AND CARBON MONOXIDE  
PRODUCTION UNITS

LARGE QUANTITIES by pipelines

MEDIUM QUANTITIES by tanker trailers



SMALL QUANTITIES in cylinders

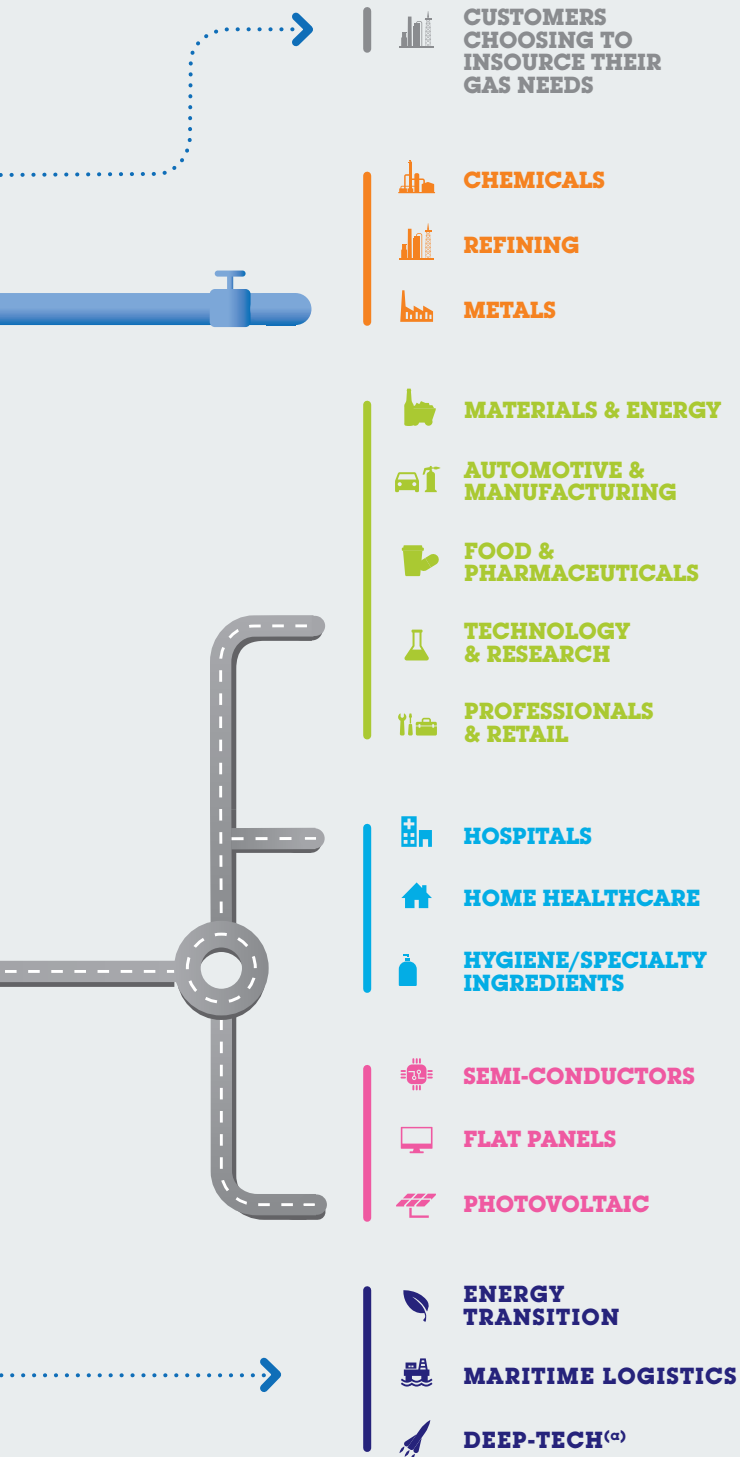


DEVELOPING  
NEW MARKETS AND  
BREAKTHROUGH  
TECHNOLOGIES



BIOMETHANE PRODUCTION UNITS,  
HYDROGEN CHARGING STATIONS AND OTHERS





### ENGINEERING & CONSTRUCTION

Building plants and equipment for gas production



### LARGE INDUSTRIES

Producing and delivering gases in large quantities



### INDUSTRIAL MERCHANT

Serving a wide range of customers thanks to the Group's expertise in gases and processes



### HEALTHCARE

Providing gases, medical products and services to support our clients and patients, in the hospital and at home



### ELECTRONICS

Designing, manufacturing, and providing molecules and equipment for this sector



### GLOBAL MARKETS & TECHNOLOGIES

Providing technological solutions (molecules, equipment and services) for new markets

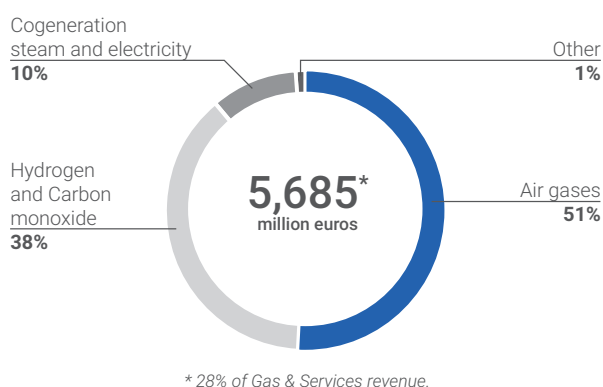


(a) Scientific breakthroughs and disruptive technologies that can fundamentally change design and production methods.

## LARGE INDUSTRIES

The Large Industries business line proposes gas and energy solutions to customers in the metals, chemicals, refining and energy industries, which are essential for their own industrial production, to improve process efficiency and to make their plants more environmentally friendly. The world leader in this sector, Air Liquide benefits from dedicated in-house development and engineering teams, differentiating proprietary technologies and rigorous processes for selecting investments and carrying out projects.

### 2018 LARGE INDUSTRIES REVENUE BY ACTIVITY



### Large Industries key figures

- 369 large Air Separation Units;
- 52 hydrogen and/or carbon monoxide production units;
- > 9,400 km of pipeline network;
- 19 cogeneration plants.

The Large Industries business line provides oxygen, nitrogen, argon, hydrogen and carbon monoxide through a network of plants and pipelines. The Group also operates cogeneration plants to supply customers with steam and electricity.

The **chemicals** industry uses mainly oxygen, hydrogen and carbon monoxide in its manufacturing processes, as well as nitrogen to inert its installations.

The **refining** industry requires hydrogen to desulfurize fuels and break up heavy hydrocarbons. The demand for hydrogen is growing due to the combination of increasingly stringent emissions legislation and the use of heavier hydrocarbons.

In the **metals** industry, Air Liquide supplies large volumes of oxygen to steel producers notably, the use of which improves their energy performance and reduces significantly their CO<sub>2</sub> emissions. The majority of new projects are currently located in developing economies.

Numerous industries linked to **energy** or **chemicals** use large quantities of oxygen to transform coal, natural gas or liquid hydrocarbons into syngas for the production of chemical products, synfuel or electricity. To meet customer requirements, the supply of large quantities of gas is critical. Air Liquide supplies its customers directly by pipelines from a dedicated plant or different plants linked by a network. Air Liquide has built its pipeline networks progressively over the last 40 years. With a total length of more than 9,400 kilometers (≈ 5,800 miles), these networks stretch, for example, across Northern Europe, from Rotterdam through to Dunkirk, and along the Gulf Coast in the United States from Lake Charles (Louisiana) to Corpus Christi (Texas). Many other mid-sized local networks have also been built in other significant and fast-developing industrial basins in Germany, Italy, Singapore and, more recently, China.

The use of industrial gases is critical for these various industrial processes. As any discontinuity in the supply necessitates a stoppage of the customer's production operations, supply reliability is crucial. However, although vital, gas supply generally represents a very small part of total production cost for the customer.

The raw materials necessary for the production of industrial gases vary according to the type of gas and the location of the production unit. The production of oxygen and nitrogen requires air and a large quantity of electricity. Hydrogen and carbon monoxide production units mainly consume natural gas and little electricity. Cogeneration units consume natural gas and water. The energy and capital intensity of these industrial processes is generally high.

The supply of gas is generally contracted for 15 years. For certain projects this can be extended to 20 years and beyond. The signing of new contracts for new industrial customers' sites is a strong predictor of future growth. Within these contracts, the Group guarantees long-term service continuity and a high level of reliability with respect to the gas supply via a high-performing industrial solution. In return, the contracts include the indexation of input costs, mainly electricity and natural gas, and guaranteed minimum volumes through take-or-pay clauses.



### Key points

The **Large Industries** business operates under long-term contracts, where costs are indexed, in particular, to energy costs. These contracts, which include take-or-pay clauses, offer considerable visibility of future revenue and protection in the event of a significant fall in customer volume consumption (below the minimum take-or-pay level). The long investment cycle and high capital intensity require a solid balance sheet. The signing of new contracts is a strong predictor of future growth.

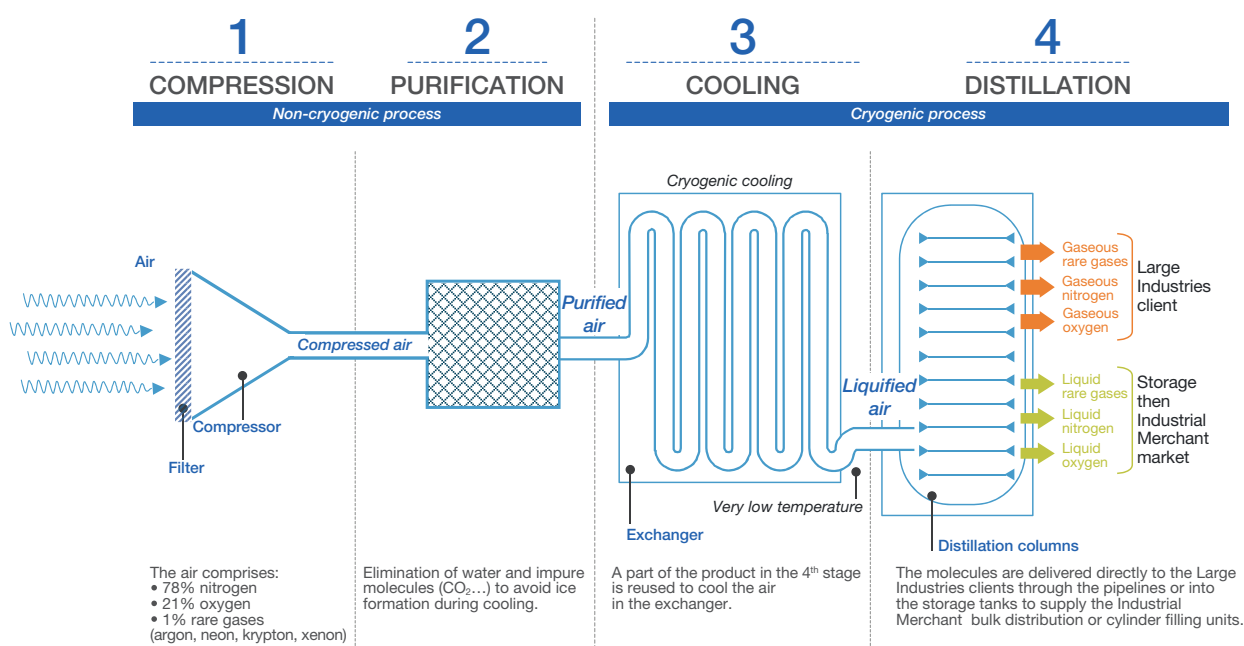
Air Liquide is developing a pipeline network strategy in the industrial basins in order to provide customers with greater supply reliability while optimizing operating costs.

## Large Industries processes

### Air gases production (ASU: Air Separation Unit)

An ASU compresses, liquefies and distills air in order to separate it into its different components: 78% nitrogen, 21% oxygen, 1% argon and rare gases (neon, krypton and xenon). Only certain large ASUs can produce rare gases. Electricity consumption is significant.

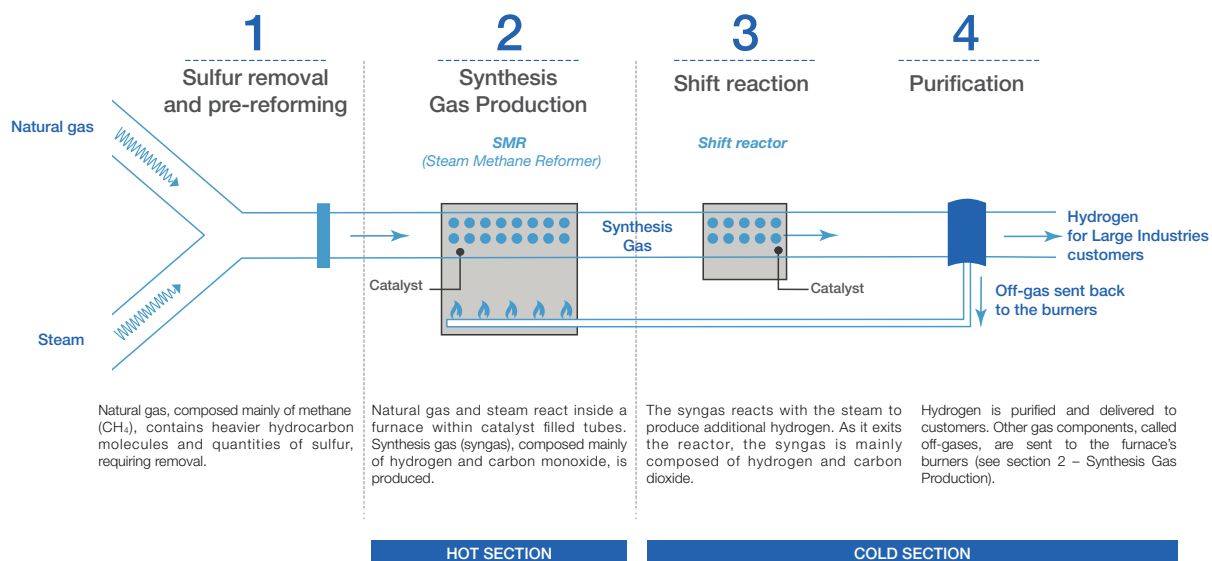
#### SIMPLIFIED DIAGRAM OF AN AIR SEPARATION UNIT'S OPERATION



### Hydrogen and carbon monoxide production (SMR: Steam Methane Reformer)

By steam reforming natural gas, an SMR produces hydrogen and carbon monoxide. The most significant raw material is natural gas; electricity and water consumption is modest.

#### SIMPLIFIED DIAGRAM OF A HYDROGEN UNIT'S OPERATION



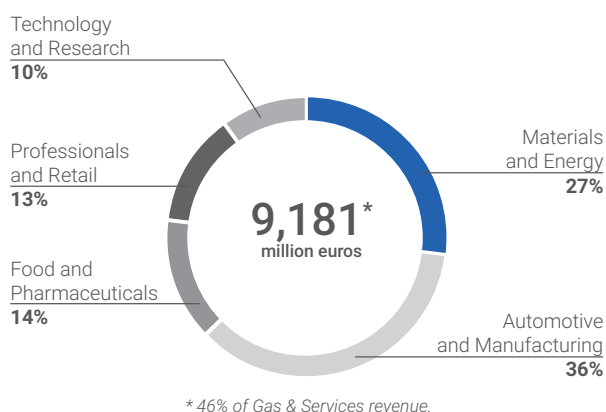
### Cogeneration

Cogeneration consists of simultaneously and efficiently producing electricity and steam generally by consuming natural gas and water. The electricity is used by the plant or supplied to the local network, while the steam is required for certain industrial processes.

## INDUSTRIAL MERCHANT

The Industrial Merchant business line serves a wide range of markets and customers – craftsmen, SMEs, large multinational industrial groups – offering comprehensive gas solutions for the implementation and optimization of their industrial processes. Supported by a global network of business experts and extensive geographical coverage, Air Liquide provides more than two million customers with innovative solutions including industrial gases, welding equipment, application and safety equipment and related services.

### 2018 INDUSTRIAL MERCHANT REVENUE BY END-MARKET



### Industrial Merchant key figures

- ~ 20 million cylinders;
- ~ 12,000 trucks;
- ~ 60,000 cryogenic tanks at customers sites;
- > 1,000 on-site units;
- ~ 35,000 employees;
- ~ 1,000 stores.

The Industrial Merchant activity serves five primary markets:

- **Materials and Energy:** customers in this market use a wide range of different gases. Oxygen is used to reduce energy consumption in glass and metal manufacturing processes and to treat wastewater. Nitrogen is used to create inert atmospheres for the conservation of oxygen-sensitive products. Carbon dioxide is used in drinking water treatment, helium for professional deep-water diving and magnetic resonance imaging. Nitrogen and carbon dioxide can be used for the enhanced recovery of oil and gas and, in certain cases, the reduction of water and solvent consumption.

#### ➤ ZOOM ON...

**THE GLASS INDUSTRY:** in all areas of glass, customers use oxygen to facilitate the melting of raw materials, to reduce fossil fuels and to reduce their emissions of pollutants such as nitrogen oxide. For plate glass manufacturing for construction and automotive industries, glassmaker customers also use nitrogen and hydrogen to improve the quality and transparency of their products, while for container glass used in packaging (bottles, flasks, etc.) or for tableware, customers use oxygen to eliminate manufacturing defects and obtain a quality appearance. These manufacturers receive delivery either by truck, in the form of cryogenic liquid, or by small generators of on-site gas production (on-site units) for larger furnaces. Air Liquide provides the storage and accessories for the measuring and controlling of gas flow as well as combustion technologies, such as burners designed by its engineers, to maximize the performance and efficiency of melting furnaces.

- **Automotive and Manufacturing:** argon and argon mixtures are used for metal parts welding in manufacturing industries, hydrogen and nitrogen for heat treatment, specialty gases for waste gas analysis, helium for airbags, and rare gases (krypton, xenon) for lighthouses and thermal insulation. Oxygen and acetylene are used in metal heating and cutting operations. Air Liquide therefore enables customers to produce high quality products, while improving their manufacturing processes and preserving their working environment.

### ZOOM ON...

**MANUFACTURING:** many operations in manufacturing involve cutting, welding or heat treatment of metal parts. Industrial gases play an essential role in improving site productivity while ensuring the quality of the manufacturing. They are supplied in gaseous form at high pressure, with cylinders often equipped with innovative integrated trigger valves, or in liquid form for the larger production sites. The Air Liquide experts support their customers by proposing the most adapted gas solutions to their processes and specific needs. Argon, carbon dioxide or helium are essential molecules to ensure the quality of arc welding, oxygen and acetylene are used for metal cutting, nitrogen or oxygen for laser cutting, argon or nitrogen for new 3D printing processes while nitrogen or hydrogen are essential for physicochemical treatments such as annealing, carburizing or tempering, making it possible to achieve the final mechanical properties. Air Liquide installs storage or panopies of packaged gases at client sites as well as the associated equipment to control the relative processes, including devices for measuring and controlling the atmosphere of heat treatment furnaces.

- Food and Pharmaceuticals:** the Group's technologies help increase shelf-life and improve food and pharmaceutical manufacturing and cooling processes. The three major activities in this market are the supply of carbon dioxide for beverages, gas mixtures for modified atmosphere packaging, and nitrogen for inerting or freezing food. Air Liquide ensures these products comply with prevailing market regulations and in particular gas traceability.

### ZOOM ON...

**FOOD FREEZING:** Eating habits are changing profoundly and becoming more global. Today, consumers are looking for sustainable food, healthier and safer. Cryogenics allows food temperatures to drop very quickly, avoiding surface dehydration and the formation of large ice crystals in the product. This process makes it possible to preserve all the taste properties of frozen foods. Air Liquide provides and guarantees customers as to the quality and food safety of the nitrogen or liquid carbon dioxide required for deep freezing in accordance with the regulatory traceability specifications. Air Liquide also provides agri-business with deep freezing tunnels or cabinets as developed by its engineers, thus enabling them to process their production directly while guaranteeing the best conditions of hygiene, quality, productivity and efficiency. Air Liquide ensures the adjustment and maintenance of this equipment and provides customers with the expertise needed to integrate and use its deep freezing equipment along their production line.

- Technology and Research:** industrial gases are used in the assembly and encapsulation of electronic components in optoelectronics processes – particularly LED manufacturing and optic fiber and silicon cylinder drawing. Specialty gases required, in particular for the calibration of analysis instruments, are widely used in research centers and analytical laboratories. Specific, highly technical gases and equipment have been developed for these various applications.

### ZOOM ON...

**OPTOELECTRONICS:** the production of an optical fiber initially requires the production of a silica bar called a preform. This preform is consolidated with hydrogen, oxygen and helium, then melted in an oven and stretched into an optical fiber at a speed of 1,500 to 2,000 meters per minute. The stretched fiber is then cooled with helium. Air Liquide assists optical fiber manufacturers by supplying these high purity gases. Moreover, the base material used by the white and blue LEDs requires a nitrogen atom. For this process, UHP (ultra-high purity) ammonia is injected during the deposition phase. Liquid at room temperature, the ammonia must be heated to take on its gaseous form. The Air Liquide induction heating solution, which evaporates UHP ammonia more efficiently, allows its customers to use large volumes of this gas. Air Liquide proposes all of the gases intended for the manufacture of LEDs, including equipment and installation facilities.

- Professionals and Retail:** a wide range of gases are offered for use in plumbing, heating, ventilation, air conditioning, industrial maintenance and auto repair activities, mostly for welding. These gases are often sold in special-purpose packaging – cylinders in compressed gaseous form, tailored to customer usage requirements. Across a number of countries, notably in North America, Air Liquide also offers a complete range of welding equipment, wires and units, as well as all personal protective equipment required in order to be able to work safely, enabling customers who are craftsmen and contractors to find quickly and in the same place all the elements they need to carry out their welding activities.

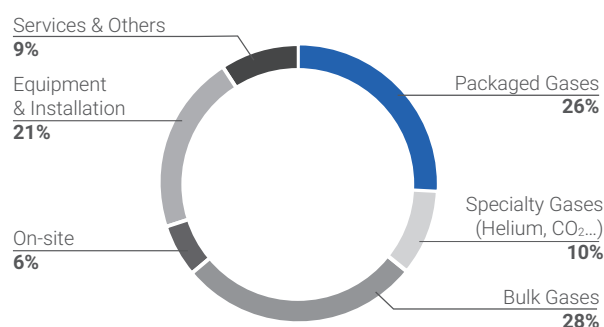
Industrial Merchant sells packaged gases (high-pressure gas cylinders) through multiple channels to cover all customer needs: over the phone, e-commerce and/or via its distribution network. Cylinders can be delivered directly to the customers' doors or picked up through the distribution network with optimized inventory management based on cylinder traceability. Air Liquide's expertise in customer processes is always offered.

## Gas supply modes

Industrial Merchant provides gas using the supply mode which is best adapted to customer's needs. These include one or several of the following supply modes:

- **On-site production units:** for Industrial Merchant customers with major volume requirements, oxygen, nitrogen or hydrogen generators can be installed at customers' sites (called "on-site units"). Supply is contracted over a long period of time, up to 15 years, and includes a backup system which guarantees supply continuity. This supply mode also significantly reduces the number of kilometers traveled to deliver gases to customers.
- **Bulk:** for medium- and large-scale needs or cryogenic systems, gases are provided in liquid form and distributed by trucks. Bulk customers consume the gas directly in liquid form (for example, in the agri-business) or in gaseous form after vaporization.
- **Cylinders:** for smaller scale needs and use on building sites, gases are distributed in cylinders. From an operational point of view, the main sources gases (nitrogen, oxygen, argon, CO<sub>2</sub>) are delivered in liquid form to a filling center where they are stored in liquid form and then, after vaporization, transformed into gaseous form and stored in cylinders of different capacities (typically 5 to 50 liters). Gases can be mixed together to better meet customers' needs. Cylinders are then directly delivered to customers or to distributors and stores by a fleet of adapted trucks.

## 2018 INDUSTRIAL MERCHANT REVENUE BY ACTIVITY



The distribution of gas in cylinders and bulk remains traditionally local with transport distances rarely exceeding a radius of 200 to 250 kilometers around the production site. To ensure this local presence, the Industrial Merchant business relies mainly on the gas production capacity of Large Industries and thereafter develops its own distribution logistics. Air Liquide ensures the reliability of the gas supply and guarantees the quality of the materials used (storage tanks and cylinders). The gas usage and applications equipment are generally investments made by Air Liquide, who also covers their maintenance.



## Key points

**Industrial Merchant** is characterized by a wide range of customers, markets, applications, and solutions and services. The contract terms can be up to five years for cylinders and liquid gas supply and up to 15 years for small on-site gas generators. Revenue comes from the sale of gas and related services.

It is a business based on expertise and services with a high technology and innovation content, extremely local, with dense geographic coverage as a key factor. The competitive environment can vary between areas.

Innovation with regards to markets, products and applications is a major growth driver. Business growth is generally dependent on local industrial production growth trends.



## HEALTHCARE

The Healthcare business line provides gases and medical products, specialty ingredients and services which support patients along the continuum of care, from the hospital to their home, and help protect the most vulnerable lives. Air Liquide is one of the world leaders in this business sector, which is subject to both stringent regulatory requirements as well as to multiple stakeholders (patients, doctors and payers). The business line provides products and services in four areas:

- **Medical Gases:** Air Liquide provides medical gases to 15,000 hospitals and clinics. Among the main medical gases and their areas of application, Air Liquide provides: medical oxygen for respiratory diseases and intensive care units; medical nitrous oxide, a mixture of oxygen and nitrous oxide O<sub>2</sub>/N<sub>2</sub>O (KALINOX™) and xenon (LENOXe™) for anesthesia/analgesia; and nitrogen monoxide (KINOX™ and VasoKINOX™) for resuscitation.

Air Liquide ensures compliance with the strictest of safety and quality standards through the installation and maintenance of medical gases' distribution networks in hospitals and permanent inventory control.

- **Home Healthcare:** Air Liquide cares for more than 1.6 million patients in their homes suffering from chronic diseases. Once the diagnosis and treatment is established by a doctor, the long-term treatment requires patient education, on-going support, interventions by trained nurses or technicians and the implementation of therapies in the fields of respiratory, perfusion or other.

Air Liquide has developed an offer beyond oxygen therapy and helps take care of patients suffering from chronic obstructive pulmonary disease, obstructive sleep apnea, chronic respiratory insufficiency, diabetes, pulmonary arterial hypertension, and Parkinson's disease, providing them with services for long-term follow-up care.

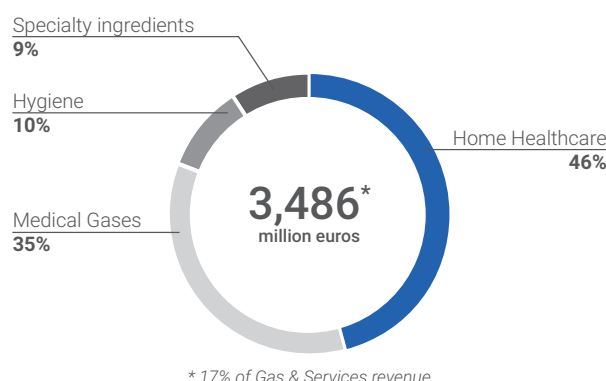
Demographic and sociological factors such as an aging population and urbanization are contributing to the increase in the number of chronic diseases. Air Liquide's Home Healthcare business strives to meet these public health challenges as well as the growing constraints on health spending in advanced economies, by avoiding hospitalization and developing digital monitoring. In developing economies, Home Healthcare is growing in areas where health systems are being introduced.

- **Hygiene:** with its subsidiary Schülke, a leader in hospital disinfection, Air Liquide contributes to the fight against infections and pandemics through a wide range of products used in hospitals and private practice (dentists, family practitioners, etc.).

For example, Air Liquide provides skin disinfectants for the pre-surgical preparation of patients as well as for medical staff, antiseptics and other products for wound-healing and medical instrument disinfection. These products can be found in operating units and medical wards.

- **Healthcare Specialty Ingredients:** for over 70 years, through its subsidiary Seppic, Air Liquide has designed and developed innovative specialty ingredients for the healthcare sector, in particular adjuvants for vaccines, film-coating systems for the pharmaceutical industry as well as a complete range of eco-friendly thickeners, stabilizers, emulsifiers and active ingredients for the cosmetics market.

### 2018 HEALTHCARE REVENUE BY ACTIVITY



The Healthcare activity, in particular Medical Gases, mainly relies on the gas production capacities of Large Industries and develops its own distribution logistics. Medical gases have a drug designation status which requires market authorization from the country's health authorities. They are subject to specific pharmaceutical traceability and are supplied in gas or liquid form by qualified personnel. The integration of the Industrial and Healthcare activities has led to synergies and industrial efficiency.

Over the last 20 years, Air Liquide strengthened a leading healthcare role in Western Europe, Canada and Australia. The Group also has businesses in the United States (medical gases only), South America and certain Asian, African and Eastern European countries. It continues to grow in all regions, in particular according to the expansion of healthcare systems. As a result, approximately 71% of the Healthcare business line's sales are in Europe and around 22% in the Americas.



### Key points

The **Healthcare** business produces and distributes medical gases for hospitals and provides medico-technical healthcare services for the care of patients at home. It operates in a strict regulatory framework. Density, quality of support services and efficiency are essential criteria that help to offset pricing pressures of healthcare systems, particularly in advanced economies.

Air Liquide is present along the continuum of care: from treatment of acute diseases (with medical gases in hospitals), to treatment of chronic diseases at home (with Home Healthcare), and prevention/well-being (with businesses in Hygiene and Healthcare Specialty Ingredients).

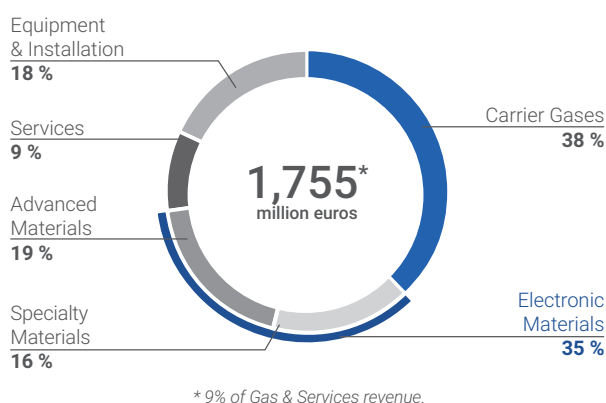
With aging populations and the escalating need for care due to the increase in chronic diseases, as well as the continuing expansion of healthcare systems in developing economies, the Healthcare activity represents a solid growth driver for the Group.



## ELECTRONICS

Thanks to its long-term vision, Air Liquide provides innovative solutions to the semi-conductor, flat panel and photovoltaic markets, leveraging its expertise, global infrastructure and strategic proximity to manufacturers. Its products and services respond to increasingly challenging customer demands for improved mobility, connectivity, computing power and energy consumption. Technological progress is constant and a growth driver for industrial gases.

### 2018 ELECTRONICS REVENUE BY PRODUCT



- **Carrier Gases:** Carrier gases (primarily ultra-pure nitrogen) supplied by on-site facilities, are intended for the transport of molecules and materials as close as possible to the chip manufacturing, providing the inerting required to protect the electronic systems. The need for a regular and constant supply of carrier gases requires long-term commitments for up to 15 years from customers with the building of production units near their premises or even on the customer's site.
- **Electronic Materials:** **Electronic Specialty Materials** are used in semi-conductor, flat panel and solar cell manufacturing. **Advanced**

**Materials** are key to the processes used in semi-conductor manufacturing. The acquisition of Voltaix in 2013 extended the Group's range of advanced deposition materials. The Group develops and markets offers with strong added value, including the ALOHA™ and Voltaix offers. The most sophisticated of these advanced materials are developed in cooperation with customers and are essential for the miniaturization of new electronic chips.

- **Equipment & Installation:** the Electronics business line also supplies equipment and installs gas distribution units and networks for ultra-pure gases and chemical products, at its customer's facilities.
- **Services:** on site, manufacturers can rely on the Group's expertise in the total management of fluids and equipment as well as on its cutting-edge analytical services used to continuously improve production processes.

The Electronics business model is primarily based on long-term carrier gas supply agreements with the necessity for continuous technological innovations to satisfy the needs of the major industrial players by designing new advanced materials also called precursors.

Air Liquide's Electronics business is based near its customers, including 72% in Asia, 21% in the Americas and 7% in Europe.



### Key points

The Group's **Electronics** activity covers four different activities: **Carrier gases with a business model based on long-term contracts including minimum volumes guaranteed by take-or-pay type clauses; Electronic Materials with a high level of technical expertise; Equipment & Installation sales which are correlated to the growth of semi-conductor plants; Services.** In a growing electronics sector, the mix of business specific to Air Liquide with its long-term contracts, offers a true competitive advantage.

### 3.2. ENGINEERING & CONSTRUCTION

To provide customers with the gases required for their industrial production, Air Liquide engineers have developed innovative proprietary technologies. The Group designs and constructs gas production units, from the feasibility study stage through to the delivery of the complete installation, for its own use or for sale to customers who prefer to insource their gas requirements. Air Liquide complies with the increasingly strict safety, reliability and competitiveness requirements of Air Separation Units and hydrogen units.

Since the acquisition of Lurgi in 2007, the Group has expanded its range of technological expertise. It possesses its own proprietary technologies (as developed by Lurgi over 50 years) to produce hydrogen and carbon monoxide through steam methane reforming. This acquisition also expanded the Group's offering of natural gas conversion technologies to produce syngas, synthetic natural gas, methanol, propylene, liquid fuels and biofuels. This expanded Engineering & Construction aptitude has assisted the Group's involvement, upstream of industrial gas production projects as well as in the development of its customer processes, thus boosting sales growth.

The majority of Air Liquide's Engineering & Construction business is geared toward industrial gas production technologies, and in particular the manufacture of air gas or hydrogen and carbon monoxide production units.

To cover all of the primary industrial markets and manage its production costs, the Engineering & Construction business has extensive geographical coverage with engineering centers located mainly in North America, Europe, Asia and the Middle East.

The Group favors the development of its gas sales business over equipment sales. Nonetheless, Engineering & Construction has a strategic value for the Group, both internally and externally.

Internally, the Group benefits from the relevant engineering resources during the investment phase of the projects of its Gas & Services businesses. It provides a high level of expertise, crucial to the design of efficient units which specifically respond to the needs of the Group's industrial gas customers. It provides support for the Group during site takeovers, by ensuring the appropriate assessment of the quality of assets purchased.

The Engineering & Construction business also serves third-party customers. Air Liquide designs and builds customized units which customers will own and operate. Also, this third-party customer business allows the Group to permanently assess the competitiveness of its own technologies and commercial offering. In particular, Air Liquide is able to forge close relations with customers who produce their own gas and better understand their industrial processes and investment projects. In certain cases, negotiations initially steered toward the sale of equipment were finalized by the signing of a long-term industrial gas supply contract. As part of this third-party customer business, the strategy consists of favoring research and equipment

supply contracts and to not support construction risks. Accordingly, Engineering & Construction's contribution to consolidated revenue can vary significantly from year to year.



#### Key points

**The Engineering & Construction activity provides the Group with a genuine competitive edge, enabling it to offer turnkey solutions to its customers and to engage for its own purposes in a process of continuous improvement of industrial processes and reduction in the cost of its industrial assets.**

In 2018, consolidated third-party Engineering & Construction sales totaled 430 million euros.

### 3.3. GLOBAL MARKETS & TECHNOLOGIES

The Global Markets & Technologies (GM&T) business delivers technological solutions (molecules, equipment and services) to support the new markets of energy transition, maritime logistics and deep tech, in order to accelerate Air Liquide's sustainable growth.

To support the energy transition, the GM&T business brings environmentally-friendly solutions to the clean energy market with hydrogen energy and bio Vehicle Natural Gas (bio-NGV), refrigerated transport using nitrogen, but also the treatment and injection of biomethane into the local domestic energy grid as a power source.

As a player in the deep tech sector, GM&T commercializes technologies dedicated to Space, Aerospace and scientific exploration. GM&T also supplies gases for players in the maritime sector and provides logistics and cryogenic transportation solutions, particularly by sea, for value added molecules such as helium.

Air Liquide masters the entire hydrogen supply chain, from production to storage, and from distribution to the development of applications for end users, thus contributing to the wider use of hydrogen as a clean energy source, notably for mobility. To date, the Group has designed and installed 120 hydrogen stations worldwide and invests in the production of carbon-free hydrogen (see pages 81 to 87 on innovation).

GM&T employs 1,900 people world-wide and generated 2018 revenue of 474 million euros.

### 3.4. THE STRENGTH OF AIR LIQUIDE'S MODEL

Among the four Gas & Services businesses, Large Industries and Healthcare are the two which are the least dependent on economic cycles. They represent 45% of Gas & Services revenue. Industrial Merchant is impacted by local industrial production momentum, whereas Electronics is linked to the semiconductor sector.

In Large Industries, the supply of gas is contracted for a duration of 15 years, or more for specific projects, and includes take-or-pay clauses which guarantee a minimum level of revenue.

Underlying trends for the Healthcare business (longer life expectancy, more sedentary lifestyles, urbanization) ensure growth in demand which is decorrelated from economic cycles.

Industrial Merchant serves a very wide range of markets and multiple customers in various industrial processes.

The development of the semiconductor industry with its numerous digital applications is the main source of sales growth in Electronics, an industry which is maturing.

The Group's capacity to innovate enables it to continuously improve its current offerings by integrating new technologies and new ways of working, developing differentiating solutions for its customers and patients, and drawing on its internal and external ecosystems to open up new markets. It contributes to the Group's robustness.

Moreover, through its four World Business Lines, the Group serves more than 3.6 million customers and patients in a variety of industries and across a wide range of regions, which provides high resistance to economic cycles. These characteristics, which are inherent to the industrial and healthcare gas business, reinforce the strength of the business model.

## 4. Competition

At a global level, the industrial gases industry comprises three main players: Air Liquide and Linde plc (Ireland), co-market leaders with sales in excess of 20 billion euros each, and Air Products (United States) with revenue which is more than two times lower. Linde plc is the new entity following the merger of equals between two global players, Linde AG (Germany) and Praxair (United States), which was completed in October 2018. There are also a number of global and regional players, such as Taiyo Nippon Sanso (Japan), Messer (Germany), PAG (China), Air Water (Japan) and Hangzhou Hangyang (China). Finally, numerous smaller-sized players are also present in local markets.

In Large Industries, the customer can choose between self-production and over-the-fence gas supply. Self-production is estimated to account for 80% of hydrogen production and 60% of oxygen production globally, although with significant geographical disparities. Companies self-producing gas thus remain the Group's greatest competition. In this respect, the potential to convert self-production into over-the-fence supply represents a major growth opportunity for the Large Industries business. The level of self-production varies strongly depending upon the geographic region, type of industry or local culture. In advanced economies, the supply of oxygen is largely over-the-fence, while the supply of hydrogen for refining remains primarily in-house. In developing economies, while relatively new, over-the-fence supply is accelerating significantly. Air Liquide, the world leader in Large Industries, is in competition with the other major global players and local players.

Industrial Merchant is a local business: transport costs limit the operating area to within 200 to 250 km of a production unit, except for high value-added gases such as argon and helium. This market, which is highly diversified due to the size and activity of its customers, thus includes numerous small and medium-sized local competitors, either ensuring gas production and distribution, or solely distributing gas.

### 3.5. SYNERGIES

The Group's various businesses serve one unique business line, that of industrial gases. The four business lines comprising the Gas & Services activities are closely tied by a strong industrial philosophy where proximity is key. The diagram pages 20 and 21 illustrates the sharing of production or distribution assets between the different business lines for a given geographic region. Due to this efficient industrial network, Air Liquide capitalizes on its proximity to its customers to anticipate their needs, understand market changes and offer innovative solutions.

The synergies enjoyed by all of the Group's businesses are not limited to the industrial aspect, but also include scientific and technological expertise, the innovation approach and Human Resources. The strong integration of the various World Business Lines thus allows the Group to create synergies, become stronger and to grow while creating long-term value.

In Electronics, five companies play a major role: Air Liquide, Linde plc, Versum (United States), Air Products and Taiyo Nippon Sanso. Air Liquide is the leader in this industry.

Finally, in Healthcare, most gas industry players also supply hospitals with medical oxygen, but few are present in the treatment of chronic diseases at home. In Home Healthcare, Air Liquide is number one in Europe, whereas Linde plc has a larger presence in the United States. This market remains fragmented in almost all regions with a multitude of small companies and associations. This fragmentation provides bolt-on acquisition opportunities. Finally, Air Liquide is the only industrial and medical gases company to have developed a Hygiene and Specialty Ingredients business.

In Engineering & Construction, Air Liquide also competes with industrial gas players. In "cold" technologies used for air gas separation, the main competitors are Linde plc, Hangzhou Hangyang (China), Kaifen (China) and Air Products. Chinese competitors are gaining ground due to strong demand in their country. In "hot" technologies used for producing hydrogen and the chemical conversion of syngas, the largest competitors are Technip (France), Haldor Topsoe (Denmark) and Linde plc.

Global Markets & Technologies is growing worldwide, on markets with a strong technological dimension as well as on new promising markets such as those relating to energy transition and the climate (for example, hydrogen energy). The competitive landscape varies greatly from market to market, with companies of various sizes: from multinationals to start-ups.

# STRATEGY

## 1. Ambition

Air Liquide is a world leader in gases, technologies and services for industry and health. Its ambition is economic and societal. The Group thus strives to **be a leader in its industry, deliver long-term performance and contribute to sustainability.**

The ambition of being a leader in its industry implies adopting a pioneering role. Leadership goes beyond size alone, it is a state of mind. The Group aims to outperform in its core business, by generating growth exceeding that of its market. To do so, it must excel in customer experience, both in terms of safety and reliability of its products. Digital transformation, simplification of transactions and greater optionality are among the measures implemented to offer the best services and

generate efficiencies. Finally, the Group strives to be a major player in terms of innovation, by developing new solutions, in particular in energy transition, digital transition and healthcare;

Air Liquide's performance and its sustainability commitment go hand in hand.

The Group is committed to its economic performance and long-term value creation. It also strives to provide solutions that contribute to meeting the planet's societal and environmental challenges. This mission is key for both motivating the Group's teams and nurturing the long-term trust of stakeholders.

**For more than 30 years, Air Liquide has posted strong performances which has driven its long-term growth outlook. This performance is due to both the nature of the industrial gases market and the strength of Air Liquide's business model.**

### Air Liquide's performance over 30 years

**Revenue:** +5.8% on average per year

**Cash flow from operating activities** before changes in working capital: +6.5% on average per year

**Net profit:** +7.5% on average per year

**Earnings per share** <sup>(a)</sup>: +6.9% on average per year

**Dividend per share** <sup>(a)(b)</sup>: +8.3% on average per year

**Safety – Reduction in the accident frequency rate:** -2.1% on average per year.

**Number of employees:** +3.3% on average per year.

*(a) Adjusted for the 2-for-1 share split in 2007, for free share attributions and for a factor of 0.974 reflecting the value of the preferential subscription rights of the capital increase completed in October 2016.*

*(b) Subject to the approval of the Shareholders' Meeting on May 7, 2019.*

### MARKETS WITH SUSTAINABLE GROWTH

The industrial gases sector has enjoyed steady growth over the last 100 years due to the ever increasing needs resulting from the emergence of new applications supported by innovation and technological research and to increased outsourcing by customers of their industrial gases needs. Demand has thus risen faster historically than industrial production.

Within this framework, the Group's strategic approach has shifted from a geographical viewpoint, where industrial growth was mainly coming from capacity increases in developing economies and the introduction of existing offerings by adapting them to local needs, to a market-based focus, where each country aims to attract new investments in growth sectors.

Air Liquide's innovation strategy aims to **transform the Group and widen the scope of its businesses** beyond its traditional areas of expertise by developing and presenting new offerings which focus on three major trends which are shaping the Group's markets: **energy transition, healthcare and digital transformation**. It is an integral part of the Group's **customer-centric transformation strategy**.

In particular, environmental challenges, and notably those related to the necessary energy transition, present many opportunities for the industrial gases market. Several applications help improve the energy efficiency of industrial processes and thus contribute to decreasing the industry's CO<sub>2</sub> emissions. Moreover, certain solutions/molecules such as biomethane and hydrogen energy are also an effective way to address particulate matter and greenhouse gas emissions from transport.

## 2. Strategy

Safety, the respect of ethics and human rights are key fundamentals for our operations. These requirements, which feature in the Group's Principles of Action, are at the heart of Air Liquide's corporate culture, in all countries in which it is present.

Building on these prerequisites, the Group's strategy is customer-centric. It aims to deliver profitable and responsible growth over the long term and is based on four cornerstones:

- operational excellence, thanks mainly to an outstanding customer experience, a reinforced competitiveness and the digitalization of our operations;

Due to the nature of its industrial businesses (the desulfurization of fuels, oxy-combustion, sharing of assets, etc.) and in Healthcare, Air Liquide has always contributed to improving the environment and society. The Group's strategy is therefore embedded into its wider Sustainability approach. Thus, all of the Group's businesses are rolled out in a way that contribute to major environmental and societal challenges, such as the climate and air quality, which are also growth drivers for Air Liquide.

- the quality of its investments, which is in line with the Group's business profile and targeting, as a priority, the most promising markets and technologies;
- open innovation, in both core business and groundbreaking technologies, by fostering external partnerships (universities, start-ups, etc.);
- a network-based structure, which provides agility and efficiency, supported by the use of collaborative digital tools.

### Air Liquide's contribution to the United Nation's Sustainable Development Goals

Air Liquide contributes through its business and its commitment to reach certain Sustainable Development Goals (SDGs) introduced by the UN to eradicate poverty, protect the planet and guarantee prosperity for all by 2030.

To illustrate this contribution, environmental and societal achievements are associated with the relevant SDGs in the performance section of this report.



The Sustainable Development aspect of the strategy is centered on two goals which are described in the NEOS company program:

- preventing global warming and improving air quality.** The Group believes that these two environmental challenges are all the more essential in that its businesses lend it legitimacy and levers for action in these areas;

- strengthening dialog with stakeholders** with whom the Group interacts on a daily basis, including employees, customers, shareholders, suppliers, public authorities and NGOs as well as local communities.

The implementation of this strategy is reflected in the commitment and inventiveness of all Group employees.

### 3. NEOS company program and mid-term objectives

Following the Airgas acquisition, the Group acquired a new dimension and thus entered a new phase of its development. On the occasion of its Capital Markets Day in July 2016, Air Liquide has presented its vision of the evolution of its markets, its strategy, its growth prospects, and its new company program NEOS for the period 2016-2020, which marks a new step in the development of the Group.

In an economic environment characterized by moderate global growth and major changes related to scientific and technological advances, Air Liquide has identified three major long-term trends, which are sources of growth for its businesses. These trends are energy and environment transition, changes in healthcare, and digitization. The latter affects both asset management and the way in which the Group interacts with customers and patients, and is part of an open ecosystem.

Air Liquide's ambition is to be a leader in its industry, deliver long-term performance and contribute to sustainability. To address these key challenges and this new market potential, Air Liquide can rely on its leading positions in the major industrial basins worldwide, its proprietary technologies, its capacity for innovation, its solutions and services, its operational excellence, and its network organization.

The NEOS company program, for the period 2016-2020, provides a framework to build a Group sustainably more efficient, more connected to its stakeholders and more innovative and includes two sets of objectives.

#### 3.1. FINANCIAL OBJECTIVES

The financial aims of the NEOS company program for the 2016-2020 period are based on:

- a revenue compound annual growth rate (CAGR) of +6% to +8%, including in 2017 the scope effect relating to the consolidation of Airgas, which contributes +2% to the CAGR;
- substantial recurrent efficiency gains of more than 300 million euros on average per year from 2017, in addition to synergies related to Airgas for a total amount above 300 million US dollars;
- a Return On Capital Employed (ROCE) above 10% by 2021-2022;
- maintaining its long-term "A" range rating thanks to the strength of its balance sheet.

The 300 million-US dollar target of cumulated synergies related to Airgas is reached in the 1<sup>st</sup> quarter of 2019.

The strong investment momentum in our customers' main markets led to an increase in investment opportunities for the Group and in the number of new long-term contracts signed. In this favorable environment for future growth and to ensure reaching the NEOS target of a ROCE in excess of 10% by 2021-2022, the Group significantly strengthened its efficiency program. As of 2019, the annual target for efficiencies is therefore set at more than 400 million euros.

#### 3.2. ENVIRONMENTAL AND SOCIETAL OBJECTIVES

**For Air Liquide, safety, ethics and the respect of Human Rights are prerequisites for any action. They are structural elements and are embedded into the corporate culture.**

In terms of safety, the Group has set a zero-accidents objective for many years.

The NEOS company program also includes Sustainable Development objectives which support the Group's strategy and contributes to its long-term performance.

##### 3.2.1. Preventing global warming and improving air quality

As part of its global approach to climate, Air Liquide is presenting the most ambitious objectives in its sector. The Group's commitments seek not only to **reduce the carbon intensity<sup>(a)</sup> of its Assets (A)**, but also **to act with its Customers (C)** towards a sustainable industry and **to contribute to the development of a low-carbon society with the Ecosystems that are part of it (E)**. These objectives named "ACE" break down as follows:

##### Assets (A)

Within its activities, including production, distribution and services, Air Liquide is committed to **reducing its carbon intensity by 30% by 2025**, based on its 2015 emission levels. These objectives will be reached notably by:

- increasing by nearly 70% its purchases of renewable electricity (from 6 to 10 TWh/year);
- reducing by -5% the energy consumption per volume of production of its units;
- and reducing by -10% the carbon footprint of its bulk and cylinder products through the optimization of both production and transportation.

##### Customers (C)

With its customers, the Group is also committed to a sustainable industry by promoting low-carbon solutions. Thanks to its in-depth knowledge of customers' processes, Air Liquide is already offering technologies like oxy-combustion, which allows its customers to improve the energy efficiency of their industrial processes and reduce their emissions of CO<sub>2</sub> and pollutants. The Group is continuously innovating and developing new solutions, such as CO<sub>2</sub> capture and valorization, and the development of new materials for Electronics.

As part of the Climate objectives, the Group has stepped up its aim of developing new offers. The injection of hydrogen in blast furnaces and the use of its enScribe™ technology in electronics could have a major impact on the reduction of its customers' emissions.

Air Liquide has also positioned itself on emissions capture technologies for their storage or use (CCUS), which helps reduce their environmental footprint when there is no other alternative.

(a) In kg CO<sub>2</sub> equivalent / euro EBITDA.



### Ecosystems (E)

With ecosystems, via an active dialog with key players (public policymakers, industrial partners, NGOs, etc.), Air Liquide is contributing to the development of a low-carbon society by:

- developing biomethane for industry and transport;
- proposing alternative solutions for refrigerated logistics;
- promoting hydrogen – in particular carbon-free hydrogen – which will play a key role in the fight against climate change and energy transition, with regards to both mobility and energy.

### Climate Group's investment decisions

For all its major projects, Air Liquide includes an internal carbon price of 50 euros per ton of CO<sub>2</sub> in its investment decision process. This is a value that Air Liquide voluntarily sets for itself to assess the economic cost of greenhouse gases emissions. The analysis of investments with this internal carbon price ensures the robustness and sustainability of the customer project: for major projects, the potential costs associated with a possible tax on CO<sub>2</sub> emissions from Group's assets are reflected in the price of industrial gases and paid by the customer. This analysis also makes possible to validate the relevance and viability of the investment solution planned by Air Liquide and to propose low-carbon technological solutions, whenever possible.

### 3.2.2. Strengthening dialog with stakeholders

For Air Liquide, dialog with stakeholders is a strategic objective. Through these ongoing discussions, the Group is committed to:

- taking into account their issues;
- identifying priority development issues;
- sharing its ambition to contribute to a more sustainable world;

The stakeholders of Air Liquide are:

- **Group employees:** Air Liquide brings together 66,000 men and women of more than 150 nationalities, in 80 countries, who form multi-cultural teams with a host of skills. The Group strives to promote this diversity, encourage innovation and the commitment of employees, to meet customers' expectations and guarantee its long-term performance.

The Group has set itself the following Human Resources objectives for 2025 :

- 35% of women among managers and professionals in the Group's employees,
- 33% of recruitment of young graduates.

- **3.6 million customers and patients** currently place their trust in Air Liquide. They are all living in changing environments. Energy transition, health-related changes (an aging population, more sedentary lifestyles, urbanization) as well as digital transformation are all sources of new usages and new challenges. Moreover, the industrial offering is gradually shifting towards the end user and is therefore transforming the traditional value chain.

- For more than a century, the Group has fostered a close relationship with **its shareholders**, who are institutional investors and individuals. They are an integral part of its culture. Air Liquide's individual shareholders have supported the Group since its creation and still represent 32% of its share capital. They support the Group's growth through their loyalty, which allows Air Liquide to implement a long-term profitable growth strategy, based in particular on projects and long-term investments. Air Liquide attaches great importance to its relationship with its individual shareholders and institutional investors and maintains regular and high-quality dialog within them in a transparent manner.

- With its **suppliers**, Air Liquide is committed to building balanced relationships based on mutual trust and mutual benefit. The

Group guarantees a high level of safety, reliability, competitiveness and innovation among its suppliers, while ensuring the respect of ethics and sustainable development through its sustainable procurement policy.

- **Local communities:** the Group implements social measures in favor of the communities in the regions in which it operates, in partnership with its employees and its sites. These can be social entrepreneurial projects or projects led by the Air Liquide Foundation, for which the means have been increased (5 million euros over 5 years). They highlight Air Liquide's commitment to being a responsible company.

Furthermore, it is as part of this objective that Air Liquide is developing new forms of initiatives: "Inclusive Business" which sets up activities with a two-fold objective: the social impact of working with those at the bottom of the social pyramid to integrate them within our value chain and the economic viability to cement these initiatives over the long term.

- Concerning its relationships in **the public sphere**, Air Liquide leads initiatives on an international level.

The major initiatives of 2018 are presented in the Environmental and Societal Performance section (page 70).

The Group's relationship with its stakeholders and their governing principles are set out in chapter 4 (page 278).



### Key points

#### CLIMATE OBJECTIVES

The Climate Group's commitments (ACE) aim to :

- reducing its carbon intensity of its assets (A) by 30% by 2025,
- act with its customers (C) for a sustainable industry,
- contribute to the development of a low-carbon society with the Ecosystems (E).

#### HUMAN RESOURCES OBJECTIVES 2025

The Group has set itself the following Human Resources objectives for 2025 :

- 35% of women among managers and professionals in the Group's employees,
- 33% of young graduates among managers and professionals recruitment.



## 4. Steering strategy

### 4.1. ORGANISATION

Various internal structures contribute to the definition and steering of the Group's strategy. Their roles are presented in the "Risk factors and internal control procedures" section on page 40 of this chapter.

SIC-R meetings (Strategic Investment Committee Review) are chaired by the Chairman and CEO in order to periodically review the Group's strategy, large investments and policies. The Executive Committee meets on a regular basis to review the strategy and its implementation.

Moreover, monthly meetings of the Group Performance Steering Committee are held to establish investment budgets and the action plans to undertake or amend in order to achieve the annual or multi-annual objectives.

Finally, investments are validated through the Resources and Investment Committees (RIC), the operation of which is described on page 37 of this chapter.

Over the past five years, Air Liquide has reinvented its innovation approach and has introduced a dedicated structure to manage the Group's Innovation strategy. The Innovation & Development Division (IDD) steers the innovation strategy on behalf of the Group's hubs and operations, and contributes to the Group's transformation. It is responsible for understanding the shift in customer and patient usages (energy transition, changes in healthcare, digital), defining and implementing the Group's technological roadmap (including Intellectual Property) and scientific knowledge of Essential Small Molecule properties (oxygen, nitrogen, hydrogen, CO<sub>2</sub>, etc.) to develop new applications.

Taking environmental and societal challenges into account are also an integral part of the Group's strategy. The Sustainable Development Department, which reports to the Vice President in charge of Innovation and Development (a member of the Executive Committee who reports directly to the Chairman and CEO), contributes to the development of the strategy and defines the specific measures to be included in the NEOS company program. Moreover, this Innovation and Development Vice President takes part in the above-mentioned meetings and contributes their sustainable development vision.

### 4.2. INVESTMENT PROCESS

The Group's steady long-term growth is largely due to its ability to invest in new projects each year. Investment projects in the industrial gas business are spread throughout the world, highly capital intensive and supported by long-term contracts, in particular for Large Industries. Air Liquide has thus tailored its financing to the nature of its projects, based on the diversification of financing sources, the prudent management of the balance sheet and innovative financing methods. This financing policy is fundamental for the Group's continued development.

The Group's investments reflect its growth strategy. They can be classified into two categories:

- industrial investments, which bolster organic growth or guarantee the efficiency, maintenance or safety of installations;
- financial investments, which strengthen existing positions, or accelerate penetration into a new region or business segment through the bolt-on acquisition of companies or assets already in operation, as well as new technologies.

The nature of industrial investments differs from one World Business Line to the next: from gas production units for Large Industries and Electronics, to filling centers, logistics equipment, storage facilities, medical devices and management systems for Industrial Merchant, Electronics and Healthcare. The nature of investments is also highly varied within Global Markets & Technologies. Capital intensity varies greatly from one business to another.

#### 4.2.1. Capital intensity

Capital intensity is the ratio of capital required to generate one euro of supplementary revenue, when projects or businesses reach maturity. This capital is either invested in industrial assets (production units, storage facilities, logistics equipment, etc.), or used as working capital to finance the development of the activities.

Capital intensity varies significantly from one business to another:

- Large Industries:
  - air gases production has a capital intensity of between 2 and 3. It varies with the trend in electricity prices;
  - hydrogen and cogeneration have a capital intensity of between 1 and 1.5, due to the high proportion of natural gas in the cost of sales. This capital intensity therefore varies with the changes in natural gas and electricity prices;
- Industrial Merchant capital intensity to launch the business in a new market is between 1.5 and 2;
- Electronics has an average capital intensity close to 1;
- Healthcare has a capital intensity, excluding acquisitions, of around 1 depending on the product mix.

The Group's capital intensity continues to vary depending on the business mix, project type and prices of raw materials.

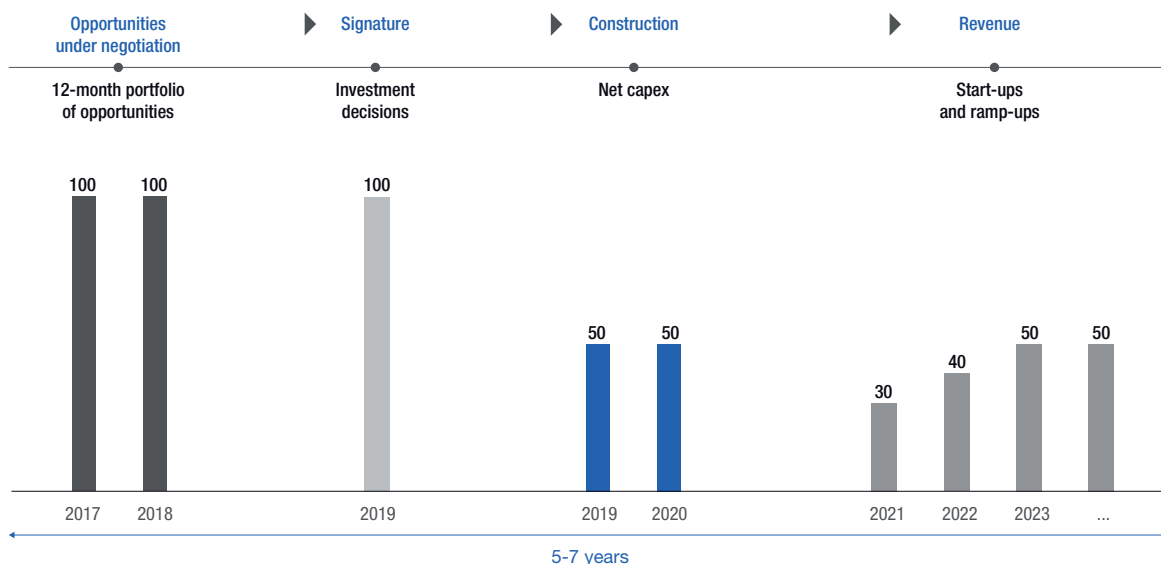
Whatever the capital intensity, any project must enable the Group to achieve its Return On Capital Employed (ROCE) objective over the long term. Therefore, for the same level of return on investment, the operating margin (OIR to revenue ratio) of a project will depend on the capital intensity of the activity in which the project is carried out.

### 4.2.2. The theoretical lifespan of gas production unit contracts

Long-term development is one of the key characteristics of the Industrial Gas business. It is particularly evident in the investment cycle, where there is approximately a five-year span between the study of a new

construction project for a Large Industries customer and the first corresponding industrial gas sales. Investment cycles in other business lines are generally shorter. Monitoring the lifespan of these projects is essential to anticipating the Group's future growth. The chart below provides details of each stage of this process based on the example of a Large Industries contract.

#### INVESTMENT CYCLE OF A LARGE INDUSTRIES CONTRACT



Applying a theoretical capital intensity of 2, an investment of 100 million euros in a new project should generate 50 million euros of sales per annum, when fully ramped-up.

➤ **Identification and Negotiation phase:** the project is included in the portfolio of investment opportunities and enters into the development process. Projects exceeding 5 million euros of investment are monitored within the portfolio of potential opportunities and split between those for which a decision is expected within 12 months and those for which the investment decision will take more than one year. Projects are then discussed and negotiated with the customer. Projects can be removed from the portfolio for several reasons:

1. the contract is signed, it is removed from the portfolio and therefore becomes an investment decision;
2. the project is abandoned by the customer;
3. the customer decides against an over-the-fence gas supply, or the project is awarded to a competitor;
4. the project is delayed beyond 12 months: it is removed from the 12-month portfolio but remains in the long-term portfolio.

➤ **Signature phase:** the two parties reach an agreement. The signing of a long-term contract represents an investment decision validated by the internal governance bodies. The project is removed from the portfolio of investment opportunities and is registered in current investments.

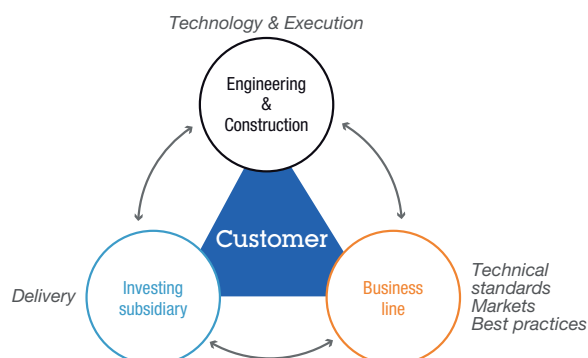
➤ **Construction phase:** the construction of the unit generally takes between 12 and 24 months and sometimes up to 36 months depending on the size of the project. This is the capital expenditure period. The project remains in current investments.

➤ **Revenue phase:**

1. **commissioning:** this corresponds to the start-up of the unit. Sales reflect the needs of the customer with a guaranteed minimum volume at the **take-or-pay** level, guaranteeing minimum profitability from the beginning of the contract;
2. **ramp-up:** this is the unit's ramp-up phase. Over the course of the contract term, volumes increase above the take-or-pay level to the nominal amount defined in the contract. Nominal capital intensity is achieved only at the end of this phase.

### 4.2.3. Governance of major growth projects

Three Air Liquide entities are at the heart of major growth projects, from development through to its execution.



The business line involved ensures the global customer relationship is monitored, provides the required know-how and ensures the overall consistency of the project, in terms of both contract and technical standards. It is also responsible for good internal governance practices.

The local subsidiary proposes the project and, once the contract has been signed, carries the investment on its balance sheet. It is then responsible for operations, customer relations and the project's financial profitability.

Engineering & Construction provides the technologies and guarantees that they are competitive, both overall and specifically for each project, thanks to a good industrial architecture solution. Engineering & Construction is responsible for the technical part of the execution of the project.

Potential projects are identified well in advance, based on good market knowledge and a strong local presence. The first stage includes selecting the opportunities in which the Group would like to invest both commercial and technical resources, in line with its global strategy. This selection process is followed by a series of validation stages.

During the development stage, the project is submitted for the approval of the geographic region on which it depends. At the Group level, two major bodies validate the relevance of the project: the RIC (Resources & Investment Committee – see below) which is responsible for assessing and validating investment requests, and the ERC (Engineering Risk Committee) which is responsible for assessing technical and execution risk.

Once the project has been decided on by Air Liquide and signed with the customer, it is executed by a team composed of representatives of the investing subsidiary and of Engineering & Construction, under the supervision of the geographic hub.

The type, complexity, geography and size of investment opportunities have changed significantly during recent years. A dedicated CIG (Capital Implementation Group) made up of experts strengthens the team in charge of executing investments.

During the start-up of a unit, project management is the responsibility of the local operational teams, under strict standards to ensure the site's security and integrity. The operational management of the unit is carried out by the local subsidiary, and the Group and hub's Operations Control monitors its financial performance.

### The Resources & Investment Committee (RIC)

The purpose of these Committees is to assess and approve requests for investments that have been submitted, as well as medium and long-term contractual commitments and Human Resource requirements that may arise therefrom.

They meet regularly (usually once a month) for each hub (Houston, Frankfurt, Shanghai, and Dubai) and each World Business Unit (Healthcare, Engineering & Construction, Innovation & Development Division (IDD), Head Office).

Each Committee meeting is chaired by a member of the Executive Committee in charge of the hub or of the World Business Unit involved and brings together managers of the region and business line concerned by the investment, as well as representatives of the Group Finance Department, Engineering & Construction, and the Capital Implementation Group (CIG).

The Committee's decisions are reviewed by Executive Management.

The decision is based on a rigorous assessment of individual projects as well as each project's expected profitability. The following criteria are systematically reviewed:

- the location of the project: the analysis will take into account whether the project is based in an industrial basin with high potential, whether it is connected to an existing pipeline network, or whether it is in an isolated location;
- the competitiveness of the customer's site: based on size, production processes and particularly of their environmental footprint, cost of raw materials and access to markets;
- customer risk;
- exposure to the risk of corruption;
- contract clauses;
- end products and the stability of future demand for these products;
- quality and risk related to the technical solution;
- country risk: evaluated on a case-by-case basis and can lead to changes in the financing policy and its supplementary insurance cover;
- Social and Environmental Responsibility criteria, in particular relating to greenhouse gas emissions, water consumption, and relations with local communities.

Following approval by the RIC and signing with the customer, the project is transferred to the current investment category.

### Investment cycle definitions

#### Investment opportunities at the end of the period

Cumulative value of investment opportunities taken into account by the Group for a decision within the next 12 months. Industrial projects generating revenue of more than 5 million euros for Large Industries and more than 3 million euros for other business lines. Includes replacement assets and efficiency projects. Excludes maintenance and security-related investments.

#### Decisions during the period

Cumulative value of industrial and financial investment decisions. Growth and non-growth industrial projects, including replacement, efficiency, maintenance and security assets. Financial decisions (acquisitions).

#### Investments backlog at the end of the period <sup>(a)</sup>

Cumulative value of investments for projects that have been decided but not yet started up. Industrial projects of more than 10 million euros, including replacement assets and efficiency projects, excluding maintenance and security.

#### Sales backlog

Cumulative value of forecast annual revenue, generated by current investments at the end of the period, fully ramped-up.

*(a) Different from construction in progress (see note 13.1 to the consolidated financial statements on page 213) without threshold or business criteria.*

## 4.3. FINANCING

The financing policy is regularly reviewed to provide the best possible support to the Group's development and take into account changes in financial market conditions, while respecting a credit profile in line with Standard & Poor's and Moody's long-term minimum "A" category rating. This credit profile depends on key ratios such as net debt to equity and cash flow from operating activities after change in working capital requirements to net debt.

The Air Liquide Group applies the following principles of prudence:

- ▶ pursuing the diversification of financing sources and spreading of debt maturities in order to minimize refinancing risk;
- ▶ backing commercial paper issues with confirmed credit facilities;
- ▶ hedging interest rate risk to ensure visibility of financing costs, in line with long-term investment decisions;
- ▶ funding investments in the currency of the operating cash flows, to ensure a natural currency hedging;
- ▶ a permanent centralization of funding and excess cash through Air Liquide Finance, a wholly-owned entity of L'Air Liquide S.A.

### 4.3.1. Diversifying and securing financing sources

Air Liquide diversifies its financing sources by accessing various debt markets: commercial paper, bonds and banks.

Air Liquide uses the short-term commercial paper market, in France, through two French Commercial Paper programs of up to an outstanding maximum of 3 billion euros each, and in the United States through a US Commercial Paper program (USCP) of up to an outstanding maximum of 2 billion US dollars.

For its long-term financing, Air Liquide has a Euro Medium Term Note (EMTN) program to issue long-term bonds of up to an outstanding maximum amount of 12 billion euros. This program allows, in particular, for bonds to be issued in the principal currencies (euro, US dollar, Japanese yen) as well as in other currencies (Chinese renminbi, Swiss franc, pound sterling and Russian ruble). As part of the Group's policy to diversify its financing sources, Air Liquide also has access to a bond issue program on the domestic Chinese market for a maximum amount of 10 billion Chinese renminbi, maturing in February 2020.

The Group also raises funds through bank debt (loans and credit facilities) in selected geographies.

To avoid liquidity risk relating to the renewal of funding at maturity, and in accordance with the Group's internal policy, the Group limits its short-term debt maturities to an amount which is covered by committed credit facilities from its core banks.

Investments are generally funded in the currency in which the cash flows are generated, creating a natural currency hedge.

#### 4.3.2. Centralization of cash and funding, excess cash and hedging

To benefit from economies of scale and facilitate capital markets financing (bonds and commercial paper), the Group uses a dedicated subsidiary, Air Liquide Finance. This subsidiary centralizes the vast majority of the Group's financing transactions. It hedges currency, interest rate and energy risk for the Group's subsidiaries in those countries where it is permitted by law.

In the countries where local regulations permit, Air Liquide Finance centralizes cash flow balances through direct or indirect daily cash pooling of these outstanding balances. When daily international cash concentration is not possible, there exist, nonetheless, local cash poolings which allow periodic intercompany loans to Air Liquide Finance.

Due to the currency matching within Air Liquide Finance, resulting from the currency hedging of intra-group loans and borrowings, these internal financing transactions do not generate a foreign exchange risk for the Group.

Air Liquide Finance, which centralizes the Group's financial hedging transactions, complies with EMIR requirements (European Market Infra-structure Regulation) relating to its status as a non-financial counterparty (NFC-): risk mitigation and derivative transaction reporting are in line with technical standards published by ESMA.

Furthermore, in certain specific cases (e.g. regulatory constraints, high country risk, joint ventures, etc.), the Group limits its risk by setting up specific financing in the local banking market, and by using credit risk insurance.

#### 4.3.3. Staggering debt maturity schedules

To minimize the refinancing risk related to debt maturity schedules, the Group diversifies financing sources and spreads maturities over several years. Debt maturity schedules and maturities are regularly reviewed by Finance Committee, on a monthly basis.

Refinancing risk is also reduced by the regularity of the cash flow generated from Group activities.

#### 4.3.4. Use of bank guarantees

Group subsidiaries require from time to time bank guarantees, mostly in favor of Engineering & Construction and Healthcare customers, either during the tender period (bid bond), or after contract award, during contract execution until the end of the warranty period (advance payment bond, retention bond, performance bond, and warranty bond).

The most common bank guarantees are advance payment bonds and performance bonds.

In the Group's ordinary course of business, certain subsidiaries are required to provide financial payment guarantees to secure rental or insurance obligations.

The projects, for which these guarantees are granted, are regularly reviewed by management and should guarantee payment calls become probable, the necessary provisions are recorded in the consolidated financial statements.

## RISK FACTORS AND INTERNAL CONTROL PROCEDURES

### 1. Risk factors

The Group identifies the risk factors to which it is exposed using a formal risk management approach.

The risks presented below, at the date of this Reference Document, are the risks that the Group considers may have a significant negative impact on its business, results, outlook, or reputation, should they occur. The list of these risks is, however, not exhaustive and other risks, unknown at the date of this document, could occur and have a negative effect on the Group's business.

As part of the Group's risk management approach, the Group is committed to regularly assessing the risks and to reducing the likelihood that they will occur or their potential impact by implementing the internal control and risk management procedures described on page 45, as well as formalized and specific action plans.

#### 1.1. SPECIFIC BUSINESS-RELATED RISKS

The industrial gas business is characterized by a significant technology content (both in the design phase and the construction of production units), local production capacity, high capital intensity, and substantial energy requirements.

The risks associated with these characteristics are mitigated by various factors which include primarily the diversity of industries and customers served by the Group, the multiple applications that it offers them, as well as the large number of geographical locations in which it operates. In addition, a significant share of business is subject to specific contracts, a strict investment project authorization and management process, and a tailored energy policy.

##### 1.1.1. Industrial risks

Industrial risks are linked to the various industrial processes and distribution methods implemented by the Group. They are distributed over a large number of sites from which it operates.

The Group's key priority is safety, with a formal objective of "zero accidents, on every site, in every region, in every unit". The safety results for the past 25 plus years illustrate the long-term effectiveness of Group's actions in this area.

Over and above the usual risks inherent in all industrial activities, Air Liquide's businesses entail more specific risks relating to:

- ▶ products: the intrinsic properties of certain products packaged by the Group classifies them in the dangerous materials category, for which tailored procedures and means are required to ensure safety and compliance with local regulations as a minimum;

- ▶ processes and their operation: cryogenics is used to separate gases by distillation, store them and transport them. This very low temperature technique requires specific means of control and protection. The same applies for high temperature techniques, used in particular in the production of hydrogen. In addition, pressure is central to the Group's processes. Pressurized equipment must be designed with security features restricting uncontrolled release which may trigger accidents;
- ▶ logistics and transportation: each year, delivery vehicles, sales staff and technicians travel many kilometers. Non-compliance by the drivers with the highway code or the lack of regular maintenance of vehicles would expose drivers and third parties to increased risks of accidents. Preventive measures are regularly implemented, such as awareness campaigns. In addition, industrial sites use a lot of motorized lifting gears. Training and authorization are required to operate them;
- ▶ engineering and construction: industrial risks are factored in and must commence at the design phase of future installations. Subsequently, during the construction phase, the lack of prevention plans and rigorous organization would hamper the coordination among the various trades; the project and competences management tools aim to reduce these risks;
- ▶ delivery reliability: a variety of solutions aimed at reducing the risks of fault in the systems supplying gas to customers: direct pipeline connection from a production unit, on-site storage with remote surveillance enabling the automatic trigger of resupply or bar-coded gas cylinders ensuring the traceability of products;
- ▶ challenges in the medical area: the products and services for the healthcare and wellbeing of patients are regulated by internal standards and specific regulations, and must be subject to particular attention by the teams in question.

To manage these risks, the Group has an Industrial Management System (IMS), that is described in greater depth in Internal control and risk management procedures on page 47.

##### 1.1.2. Industrial investment-related risks

The Group may be exposed to certain risks specific to its industrial investments. Each investment project may be affected, particularly in its profitability, by different factors linked primarily to project location, customer quality, the strength of its projects, and particularly the respect of its implementation schedule, the competitiveness of the site, as well as to design, cost estimates and the construction of gas production units.



Moreover, in new emerging markets such as those related to energy transition, the Group may be exposed, in addition to the above-mentioned risks, to risks related to the degree of maturity of some of these market segments or in certain regions.

The investment authorization process is led by Resources & Investment Committees, which apply extremely strict appraisal criteria to projects. The investment decision-making process is detailed in the "Strategy management" section on page 35.

### 1.1.3. Supply-related risks

Electricity and natural gas are the main raw materials used by production units. Their availability is thus essential to the Group. Due to the geographic spread of its activities, Group supply contracts are diversified. Where the local market permits, Group subsidiaries secure these resources through medium to long-term supply commitments and competitive bidding scenarios with local suppliers with the objective of achieving the most reliable and competitive energy costs, with a low-carbon footprint, available on the market. The Group passes on cost variations to its customers via indexed invoicing integrated into medium and long-term contracts.

Moreover, the Group may be temporarily exposed to supply shortages for certain molecules which are only produced at a limited number of sites, in particular with worldwide reach.

Commodity risk is described in note 26.1 to the consolidated financial statements on page 238.

### 1.1.4. Risks relating to unit design and construction

Air Liquide enters into contracts to design and build production units worldwide. The primary role of Group Engineering is to undertake internal investment projects. It also performs projects for third-party customers that are selected based on criteria aimed at limiting the risks associated with these Engineering & Construction activities.

These projects generally extend over several years. Potential risks relating to design, purchasing, transport or construction and more generally to the overall quality of work may arise at different stages of the project. Risks relating to these projects are often greater during the construction stage, in particular for turnkey projects:

- the quality and delivery times for critical equipment, on the one hand, and on-site construction costs and deadlines on the other may give rise to project start-up setbacks and impact project profitability;
- unexpected technical problems may also arise as a result of new innovative processes being implemented. Preliminary tests on pilot or demonstration units are therefore meant to help reduce such risks prior to commercial implementation;
- certain projects are located in regions of the world that may be a source of specific political or economic risks and are therefore subject to reinforced monitoring.

The impact of the risks described above depends also on the contractual commitments given to customers.

Measures to limit commitments on the most complex projects are described in the Internal control and risk management procedures on page 48.

### 1.1.5. Business-related risks

The primary business-related risk is the risk of customer bankruptcy or closure of a customer's production site. The diversity of the Group's geographic presence in 80 countries distributes the risk among customers and markets. The Group's subsidiaries serve a very large number of customers (more than two million worldwide) in a broad range of industries: chemicals, steel, metals, refining, food, pharmaceuticals, automotive, healthcare, electronics, photovoltaic and research laboratories, etc. The Group's top customer represents around 2% of revenue, the Group's top 10 customers represent around 11% of revenue and the top 50 customers represent around 25% of revenue.

Moreover, a significant part of the Industrial Gas business is covered by customer contracts, with commitment periods specific to the relevant business line:

- the Large Industries business and a third of the Electronics business respectively rely on 15-year to 20-year, and up to 15-year, take-or-pay secured contracts, ensuring a guaranteed minimum revenue. These contracts provide strong future cash flow predictability;
- the contracts in the Industrial Merchant business, generally with a one to five-year duration, also include services relating to storage and cylinders;
- in the Healthcare business, positions vary between health systems, with certain countries awarding one to five-year contracts on a regional and pathology basis following public tenders.

In addition, the business of some Group clients may be interrupted following major climatic or political events.

The impact on the Group of the risks of customer business interruption following major climatic or political events is, however, limited by the wide diversity of countries in which it operates. This impact can be offset by the necessary recourse to gases in critical situations. Indeed, gases are needed to secure industrial or chemical installations (inert gases), maintain local industrial activity (essential to industrial processes) and even sustain life (medical gases). They are therefore often protected or prioritized depending on the situation.

The amount of operating receivables as well as allowance for doubtful receivables are shown in note 18 "Trade receivables" to the consolidated financial statements on page 217.

Finally, on a worldwide level it is noted that the planned merger between Linde AG and Praxair, confirmed at end-2018, will result in a change in the competitive landscape in certain regions, with a particular impact on divestiture operations that will involve the competition authorities.

### 1.2. FINANCIAL AND TAX RISKS

Financial risk management is a priority for the Group.

The financial risk management processes are detailed on page 48, in accordance with a governance structure that defines the role of the Finance Department, the various Committees and the role of local entities.

The Finance Department also analyzes country and customer risks on investment decisions; it participates in Investment Committee meetings.

#### 1.2.1. Foreign exchange risk

Since industrial and medical gases are not transported over long distances, most products are manufactured in the country where they are sold. The Group considers that its activities and its profitability have a low level of exposure to currency fluctuations.

Foreign exchange transaction risk is related both to cash flows arising from royalties, technical support and dividends, as well as to foreign currency commercial cash flows from operating entities. These commercial cash flows in foreign currencies are not material when compared to consolidated revenue on an annual basis. This foreign exchange transaction risk is managed through the hedging policy implemented by the Finance Department.

Furthermore, the Group provides a natural hedge and reduces its exposure to exchange rate fluctuations by raising debt in the currency of the cash flows generated to repay debt. Thus, financing is raised either in local currency, or when sales contracts are indexed in euros or US dollars, in foreign currency (EUR or USD).

The Group presents its financial statements in euros. Foreign exchange risk related to the translation of local currency financial statements into euros mainly corresponds to the sensitivity to the main foreign currencies – the US dollar (USD), the Japanese yen (JPY) and the Chinese renminbi (CNY).

Following the acquisition of Airgas in the United States, the exposure of the Group's revenue and assets to the US dollar has increased, as has the Group's US dollar denominated debt, with a risk linked to the translation of the financial statements:

- large fluctuations in the value of the euro against the US dollar will have a more significant impact on the Group's published results than before the acquisition;
- these foreign exchange variations will have an impact on the figures presented in the Group's balance sheet, particularly concerning the debt.

Note 25.3 to the consolidated financial statements presents the net indebtedness by currency and note 26.1 to the consolidated financial statements describes the foreign exchange transaction risk management process and the derivative instruments used, as well as sensitivity to foreign currency exchange rates.

#### 1.2.2. Interest rate risk

The interest rate risk is mainly linked to the fluctuation of future cash flows on debt when the rate is variable, indexed to indices such as Euribor or Libor. The Group's objective is to reduce the impact of interest rate fluctuations on its interest expenses and, guided by the principle of prudence, to finance long-term assets with shareholders' equity and fixed-rate long-term debt. Since most of Air Liquide's investments are based on long-term contracts (10 to 20 years), a policy promoting interest rate risk hedging ensures control over financing costs when deciding on long-term investments.

Group policy is to maintain, over a medium to long-term period, a majority of total debt at fixed rates, mainly by using firm or option hedges. This approach enables the Group to limit the impact of interest rate fluctuations on financial expenses.

Due to the increased level of indebtedness resulting from the Airgas acquisition, and particularly in case of a significant increase in interest rates upon future renewals of bonds in euros and in US dollars issued post-acquisition, the Group may find itself obliged to devote a more significant portion of cash flows from its operational activities to service the debt.

Note 25.4 to the consolidated financial statements presents the fixed-rate portion of debt and note 26.1 to the consolidated financial statements describes the sensitivity of the Group's financial expenses to interest rate fluctuations and the interest rate repricing schedule for fixed-rate debt and interest rate risk hedging instruments.

#### 1.2.3. Risk involving credit ratings

As anticipated, following the Airgas acquisition, S&P downgraded L'Air Liquide S.A.'s credit rating for the long-term debt by two notches (from A+ to A-). A stable outlook was associated with this credit rating as well as the first credit rating issued by Moody's (A3) in May 2016. In addition, like all groups that are subject to ratings, Air Liquide could suffer a negative impact on its ability to finance its continuing operations and to refinance its debt should a rating agency significantly downgrade its rating below their current levels, due to a higher level of indebtedness than expected or for other credit-related reasons.

#### 1.2.4. Financial counterparty and liquidity risk

Financial counterparty risk primarily relates to outstanding amounts on short-term investments and derivative instruments for hedging, to trade receivables, and to credit facilities contracted with each bank. To ensure its development and independence, the Group must have sufficient and permanent sources of liquidity, meaning adequate financing resources available at any time and at the lowest cost from banks and financial markets. In this area, the Group adopts a prudent approach to counterparties and their diversification, applying a strict limit on individual outstandings.

Note 26.1 to the consolidated financial statements describes financial counterparty and liquidity risk for the year ended December 31, 2018. Notes 18.1 and 18.2 to the consolidated financial statements provide a breakdown of trade and other operating receivables and allowances for doubtful receivables.

### 1.2.5. Tax risks

The Group is exposed to tax risk in certain countries, due to changes in applicable regulations, which may have an impact on its activities or its results. Its Tax Department and operational Finance Departments monitor these changes carefully to ensure the Group complies with these regulations.

## 1.3. DIGITAL RISKS

The Group's activities, expertise and, more generally, its relations with all the stakeholders (customers, suppliers, communities of experts, etc.) depend on increasingly dematerialized and digitalized operations. These operations rely on interdependent information systems and communication networks both in functional, technical, as well as human level terms.

The Group's pursuit of this digital transformation increases its exposure to risks in both data confidentiality and in the availability of IT systems and applications. For data confidentiality, the increase in expectations and requirements for protection also adds the risk of regulatory non-compliance.

These risks, which impact all economic and political players, are increasing in intensity due to the severity and frequency of digital attacks and to their changing nature (historically, cyber risks constituted industrial espionage or data hacking and have come to involve the risks of cyber criminality, cyber attacks, and extortion). These attacks, which spread rapidly, have the potential to affect all regions and businesses, with extremely significant impacts on industrial processes (disturbance of production or distribution activities), the capacity for communication, notably internal, and on the Group's image (digital identity theft, dissemination of false information, etc.).

This constant and rapidly changing background requires continuous strengthening of the Group's preventative and monitoring measures and of its ability to react within the priority areas and activities. The Digital Security Policy and the associated risk management operational program are described on page 49.

## 1.4. ENVIRONMENT AND SOCIETY RISKS

In terms of environment and society risks, the Group is mainly exposed to risk relating to:

- greenhouse gas emissions;

and, to a lesser extent, to other risks such as:

- resource management;
- discharges into air and water;
- physical risks;
- health and safety risks.

### 1.4.1. Greenhouse gas emissions

Electricity used by Air Liquide to power its production units, mainly those which produce air gases, generate CO<sub>2</sub> emissions at electricity suppliers which are known as indirect emissions. The Group's two other main activities, namely hydrogen production and cogeneration, account for nearly 15% of large production units and use combustion processes emitting CO<sub>2</sub> (direct emissions).

Greenhouse gas emission risk is closely monitored for compliance with the relevant legislation and any changes to this legislation.

### 1.4.2. Resource management

Air Liquide's competitiveness depends on the efficiency of its operations. The Group thus permanently strives to minimize its consumption of commodities.

Through its Engineering & Construction business, the Group designs its own production units. For example, it adapts the design of these units to customers' needs, technological developments and energy costs. Air Liquide also operates Air Separation Units and hydrogen units and therefore benefits from a virtuous circle of steady improvement from the design stage through to the units' operation. Old units are replaced by new ones that are more efficient in terms of the consumption of resources whenever circumstances enable it.

The main resources consumed by the Group are electricity and natural gas. Water is another resource necessary for the Group's main processes. Air Separation Units use water exclusively for cooling purposes during the separation process. Hydrogen production units require water in the form of steam in the reaction producing hydrogen. Finally, the cogeneration units produce steam, which is mainly supplied to customers.

### 1.4.3. Discharges into air and water

Discharges into air and water in the industrial and medical gas business are limited, by nature. Around 85% of the Group's large production units separate the components of atmospheric air, i.e. oxygen, nitrogen, argon and rare gases. These plants "without chimneys" do not use any combustion processes and consume almost exclusively electrical energy. They are particularly environmentally-friendly as they emit almost no sulfur oxides or nitrogen oxides. Cogeneration and hydrogen production units use a combustion process and emit small quantities of nitrogen oxide and sulfur oxide.

### 1.4.4. Physical risks

Physical risks include natural disasters linked to climate change that can disrupt the smooth running of operations.

Adaptation measures covering risks relating to the scarcity of water in geographic regions under water stress as well as extreme weather-related phenomena exist at the main sites affected.

### 1.4.5. Health and safety risks

Finally, the Group may be exposed to health and safety of persons risks for which the specific measures are implemented.

Moreover, the Group complies with the highest standards in terms of the respect of Human Rights which are included in its internal policies.

### 1.5. HUMAN RESOURCE MANAGEMENT RISKS

The long-term performance of the Air Liquide Group is driven, in particular, by the quality of its employees, their expertise and their commitment.

By the nature of its activities, the Group is committed to ensuring development of the scientific and technical competencies required for innovation and efficient working of its operations.

However, the Group may be faced with difficulties in attracting and sustaining the required skills at the right time and in the right place, in particular in emerging markets where the Group is expanding its activities, or in regions where the employment market is strained. Moreover, due in particular to digitization, the Group may be faced with a change in the expertise required in some of its businesses, which must be anticipated as best as possible.

The Group ensures the building of a performance-focused, attractive professional environment, through a Human Resources policy aiming to identify, attract, retain and develop competent employees with diverse backgrounds. The objectives of this policy are set out on page 51.

### 1.6. GEOPOLITICAL RISKS

Considering the changing international climate, the terrorist threat, and the increased tensions between or in certain regions, the Group, its employees, its sites and assets may be exposed locally to security, economic or financial risks in certain countries, for which specific measures are implemented.

In terms of Brexit, the Group's direct exposure appears limited, due to the negligible weight of its business in the United Kingdom. However the Group, as many others, maybe exposed to the indirect consequences of Brexit (for which the schedule, form and global impact remain unclear, at the time of writing), in particular the macro-economic impact.

### 1.7. LEGAL RISKS

The Group has a worldwide presence. Its companies operating industrial and medical gas production facilities must comply with the rules and regulations in force locally, particularly in the technical field, and monitor any changes.

In Healthcare in particular, the regulatory environment constantly evolves and specific regulatory constraints exist which relate notably to public markets, to the marketing of products which may be subject to drug regulatory control, and the protection of private information on each patient. In this domain, the evolution of the regulatory environment is monitored with particular vigilance and is accompanied by the implementation of adapted reinforced means.

In addition, the Group is faced with the risks relating to contracts and competition law, as well as anti-corruption and international trade issues that are also subject to individual monitoring.

To the Group's knowledge, there have been no governmental, judicial or arbitration proceedings, including any such proceedings which are pending or threatened, of which we are aware, which may have or have had, in the past 12 months, significant impacts on the financial situation or profitability of the Company and/or Group.

Liabilities and contingent liabilities related to disputes are described in notes 23 and 31 to the consolidated financial statements.

### Innovation and intellectual property-related risks

The Group's business is not dependent on technologies patented by third-parties; it relies mainly on technologies, processes and designs which are mostly protected by patents, drawings and models, and utility models as well as by brands; these technologies, processes and designs are developed internally, notably by its Research & Development, Marketing, Engineering and Global Markets & Technologies teams, as well as through partnerships with third parties. In addition, third-party technologies can be incorporated in implementing its business.

There is a risk of third-party rights being infringed, in particular when several market players are developing similar technologies. The Group is also developing innovative activities through collaboration with partners, acquisitions, or buying shares in innovative entities: risks may arise in the breakdown between stakeholders of rights and obligations relating to intellectual property and in the treatment of confidential information.

Measures aimed at ensuring governance of intellectual property are set out on page 51.

### 1.8. INSURANCE MANAGEMENT

The Group has adequate insurance coverage, underwritten by first-rate insurers, for civil liability, property damage and business interruption.

#### 1.8.1. Property damage and business interruption

Group property and business interruption are covered by property and casualty insurance policies underwritten in each country in which the Group operates. Almost all of these policies are integrated into an international program.

These policies, which are generally of the "All Risks" form, cover fire, lightning, water damage, explosions, vandalism, impact, machinery breakdown, theft and, depending on the country and in limited amounts, natural disasters.

Business interruption is insured for most production sites under these same policies. The coverage period for business interruption is 12 to 18 months. Deductible amounts are correlated to the size of the sites. Insurers conduct regular visits at the main industrial sites for risk prevention purposes.

### 1.8.2. Civil liability

In terms of civil liability, the Group maintains two separate covers, one for the North American zone and another for the rest of the world. The North American zone is covered by insurance underwritten in the United States. For the other zones, the Group has subscribed an umbrella policy, underwritten in France, which covers both the Company and its subsidiaries outside of the United States and Canada, beyond any local coverage provided for the subsidiaries.

These two policies cover liability of the Group companies for any damage they might cause to a third party in the course of doing business (operational risk) or arising from their products (product risk).

The coverage amounts underwritten exceed 500 million euros. Both policies are built on several overlapping insurance lines and each line has been underwritten for a given amount with several insurers sharing the risk. Beyond the first line, the upper lines pick up the excess risk from the lower lines.

The policy underwritten by the Company in France serves as an umbrella for subsidiaries outside North America. Under this umbrella, each foreign subsidiary has its own policy covering damages to third parties incurred through its businesses or products. The amount insured for each subsidiary in its policy depends on the amount of its revenue. The coverage under the Group's umbrella policy is supplemental to any local amounts.

### 1.8.3. Captive reinsurance

A portion of property damage and business interruption risk is kept by the Group via a captive reinsurance company located in Luxembourg, which also participates in the coverage of the Group's civil liabilities excluding the North American zone as well as in the coverage of goods transported.

This company covers claims of up to a maximum of 27 million euros per year with sub-limits per claim adapted to the nature of the claim. Beyond these amounts, risks are transferred to third-party insurers. Their management is entrusted to a captive manager approved by the Luxembourg Insurance Commission.

## 2. Internal control and risk management procedures instituted by the Company

This section describes the main internal control and risk management procedures instituted by the Company.

They are based on the reference framework of the internal control and risk management system, developed under the supervision of the French financial markets authority (AMF) and which were prepared with contributions from several departments (particularly Finance, Group Control, Legal, Safety and Industrial Systems, etc.).

### 2.1. INTERNAL CONTROL

In addition to the Principles of Action, (<https://www.airliquide.com/group/groups-principles-action>) which reaffirm the Group values with particular reference to stakeholders (shareholders, customers and suppliers, employees, etc.), the Group's codes, policies, and procedures are grouped together in an overall reference manual, the BLUEBOOK, which is available to employees on the Intranet. They constitute a set of internal control and risk management documents, which must be implemented by each entity included in the Group's consolidated financial statements.

The BLUEBOOK is the cornerstone of the Group's internal control system, which aims to ensure that:

- the Group's activities and the conduct of its members:
  - comply with laws and regulations, internal standards and applicable best practices,

- comply with the objectives defined by the Company, especially in terms of risk prevention and management policies,
- contribute to safeguarding the Group's assets;
- all financial and accounting information communicated either internally or externally gives a true and fair view of the situation and activity of the Group and complies with prevailing accounting standards.

Generally, the Group's internal control system should contribute to the management of its activities, the efficiency of its operations and the efficient use of its resources.

As with other "assurance systems", it cannot provide an absolute guarantee that the Group's objectives will be met.

In 2018, the Group pursued the actions undertaken in previous years, with more than 70 material Group entities and shared service platforms (representing over 90% of consolidated Group revenue), reviewing the appropriateness of their internal control system in relation to the Reference Framework for internal control and risk management systems. These entities also implemented actions aimed at improving their control system in terms of annual guidelines defined at the beginning of the year by the hubs and World Business Units, the Group Control Department and the Finance Department. The latter two together organize these improvement measures and report on their progress to the Group's Executive Management then to the Audit and Accounts Committee.



Audits are coordinated by the Group Control Department and the Statutory Auditors, based on a joint work program, to verify assessments of the internal control system and the correct implementation of key operating controls, including in small and medium-sized entities based on a framework of key control processes adapted for their use.

In 2018, the Group continued its efforts to improve the quality of its internal control and risk management system, in particular with the launch of a Group project to strengthen its efficiency in terms of organization and tools, and furthermore:

- the updating and supplementing of certain Group codes and policies, in particular (i) for ethics and prevention of corruption – updating of Codes of Conduct and of corruption risk mapping, and (ii) the launch of a Group project to adapt the crisis management system to the specific needs of cyber risk;
- the strengthening of certain tools: for operations control – the implementation of a new digital platform (Business Intelligence or BI) to facilitate analysis and improve the Group's data reliability in several areas such as HR, finance, safety, and operations;
- other specific actions have been undertaken:
  - in digital security, both the expansion of the CyberAll program with continued compliance initiatives for the General Data Protection Regulation (GDPR) and the launch of a program to adapt the digital protection to industrial assets;
  - in ethics, the supplementing of procedures on third parties and traceability of training for the most exposed populations.

## 2.2. ORGANIZATION

The Group is organized and based on a consistent Group strategy. It is supported by a method of management which centers on mid-term objectives that are categorized by business, as well as a steering process for activities based on annual budgetary objectives, which are further categorized down to the individual plan level. As part of the NEOS company program, the organization has developed into a network structure that promotes communication and shortens decision-making circuits.

The organization breaks down into:

- hubs which ensure the presence and representation of the Group in the main global regions. With the base (L'Air Liquide S.A. Head Office), they are responsible for defining the Group's operational strategy and its global performance. They accommodate the representatives of the Corporate functions and World Business Lines who ensure that the Group strategy is properly implemented locally;
- entities, grouped in groups of countries (Clusters) for internal pooling of resources, which provide operational management of their activities and implement Group strategy in those countries where the Group has a presence;
- the World Business Lines, which:
  - with the hubs and Strategy Department, prepare the medium-term strategic goals for the businesses they represent,

- have responsibility for strategic marketing, the transformation of their respective businesses, industrial policy and the suitability of skills in their specific areas of business;

- the World Business Units specific to certain businesses (Healthcare, Engineering & Construction);
- the Innovation & Development Division, which brings together all the research and innovation resources, technology development, Digital teams (La Factory, ALIZENT, i-Lab), the Global Markets & Technologies (GM&T) WBU, and Hydrogen Energy.

This organization also includes the Corporate functions, which notably comprise the three key control departments that report to Executive Management:

- the Finance Department, which is responsible for:
  - the reliability of accounting and financial information,
  - the Group's financial and tax risk management,
  - the drafting of Group objectives and monitoring of performance by operations control, based on financial data prepared by the accounting teams and analysis conducted by the financial teams of the various entities;
- the Group Control Department, which:
  - provides expertise and assistance to entities in the roll-out of their risk management approach (see below) and builds a Group synthesis,
  - verifies the effective application of internal control and risk management procedures through audits carried out according to a defined program presented to the Group's Audit and Accounts Committee. This program, developed and based on the risk analysis, is regularly monitored by the Audit and Accounts Committee in liaison with the Environment and Society Committee (for environmental and societal issues). Audit Reports are systematically supplemented by corrective action plans, which are supervised by a member of the Executive Committee. These reports, as well as subsequent follow-up reports, are the subject of various communications and periodic discussions with the Statutory Auditors,
  - helps Group entities ensure compliance with and promotion of both the Group's ethical values, particularly through training and awareness-raising actions and the treatment of fraud and deviations (all these actions, organizations, and tools are presented in detail in the Extra-financial Performance Declaration), as well as with international trade regulations,
  - provides guidance to Group entities, through the Digital Security Department, which reports directly to the Group Control Department, on the identification and protection of their data, systems, and digital applications (definition of rules, roll-out expertise and advice, control of proper implementation);
- the Legal Department, which identifies legal risks, issues internal guidelines and codes, and then oversees their proper implementation. It also monitors the main litigation cases and manages insurance.



Finally, this organization relies on a framework of authorizations and delegations:

- to members of the Executive Committee and certain departments and services in order to define their commitment and payment powers for commercial transactions (sales or purchasing);
- to certain executives in charge of entities or sites in France in particular, in order to ensure the prevention and control of industrial risks in terms of hygiene and safety;
- to certain financial executives, in order to ensure the security of transactions and financial flows.

The managers of the various Group subsidiaries exercise their duties under the control of the Boards of Directors and in accordance with laws and regulations applicable in the countries where they operate.

## 2.3. RISK MANAGEMENT

To ensure the continued development of its activities, the Group must actively pursue an approach to prevent and manage the risks (especially industrial and financial risks) to which it is exposed.

In terms of the Group's business activities, industrial risk management must essentially focus on prioritizing safety and security while maintaining a permanent focus on the reliability of installations.

Financial risk management requires strict control over investments, combined with prudent and rigorous practices regarding the accounting and financial aspects of the activities.

The Group formal risk management approach aims to ensure:

- the regular identification of the different forms of risk (industrial, financial and other) encountered by the Group during the pursuit of business activities, which are assessed according to both potential damage and probability of occurrence;
- the assessment of the risk management level of each risk based on a common scale with respect to the quality of policies, organizational structures, processes and controls in place;
- the progress of the main corrective action plans undertaken to mitigate these risks, by focusing monitoring activities on a limited number of priorities.

This three-phase risk management process (mapping, management levels, mitigation plans) covers over 70 entities representing more than 90% of consolidated Group revenue.

The Risk Management Department within the Group Control Department leads this approach using:

- resources dedicated by the hubs, World Business Units and World Business Lines to manage the approach in their respective scopes of responsibility (under the supervision of the Boards of Directors of the entities concerned) and by providing a summary thereof;
- the work of members of the Risk Committee that it coordinates (described on page 52).

The Audit and Accounts Committee reviews Group risk management based on presentations covering:

- the progress of the approach (on an annual basis);
- each major risk management system based on a multi-year program structured according to the challenges;
- internal audit summaries of these risk management systems.

Finally, an annual summary of risk management actions undertaken by the Group is presented to the Board of Directors; each year it validates the Audit Committee's provisional program which is presented to it beforehand, as well as a list of subjects of strategic interest or with particular relevance that will be presented in a more specific manner.

## 2.4. AREAS OF CONTROL

The main internal control and risk management procedures established and communicated by the Group in the BLUEBOOK aim to:

### 2.4.1. Ensure the safety and security of people, products and installations, as well as the reliability of operations, in compliance with the rules and regulations for accident prevention

To this end, the Group has an Industrial Management System (IMS), which operates based on:

- empowerment of the Management bodies governing the Group's various entities for the effective implementation of this system;
- the issue of key management and organizational procedures that aim to ensure:
  - regulatory compliance,
  - design management,
  - industrial risk management,
  - hygiene, health and environmental management,
  - training and certification of personnel,
  - management of operating and maintenance procedures,
  - management of industrial purchasing,
  - change management,
  - analysis and treatment of incidents and accidents,
  - shared technical standards within Group entities.

The IMS document base is updated and supplemented on an ongoing basis.

The Safety and Industrial Systems Department and the Industrial Departments of the relevant World Business Lines supervise and control the implementation of the IMS, by notably relying on:

- on-going awareness-raising actions for teams by providing specifically related training;
- the presentation of various indicators designed to review performance in terms of the safety and reliability of operations;
- process audits to verify the implementation conditions and compliance of operations with IMS requirements;
- technical audits carried out by the Industrial Departments to ensure the compliance of operations with Group rules.

Safety performance of operations and their level of compliance with IMS requirements are regularly monitored by the Executive Committee.

Moreover, considering the changing international climate and in particular the terrorist threat, the Group, which is present in many countries, has defined and rolled out additional measures to protect its employees and secure its products and sites that are most exposed locally to an external threat.

#### 2.4.2. Ensure very strict control of Group investments and commitments with:

- an in-depth review of investment requests using very strict assessment criteria as well as the medium and long-term contractual commitments which may arise therefrom, within the Resources and Investments Committees (described on page 53);
- control of investment decisions through the specific follow-up of authorizations granted as well as contributions expected and seen during the initial years. In addition, the subsidiaries are obliged to report (above certain thresholds) all budget overruns and implement corrective action plans aimed at ensuring the profitability of the investments concerned; for the largest ones, they are supported by experts ("Capital Implementation" teams) in order to secure good preparation as well as execution;
- more in-depth profitability analyzes (comparative analysis prior and subsequent to completion) for certain significant investments.

#### 2.4.3. Ensure control of energy purchasing, particularly with respect to availability and matching with Group commitments to customers

The energy management policy defines rules governing energy purchasing and the related decision-making processes. The Enrisk Group Committee reviews the procurement strategies of the entities, validates the most significant commitments and ensures the relevant policies are properly applied, in particular in terms of sustainable development.

Each month, the Enrisk Group Committee brings together the Vice President in charge of the Large Industries World Business Line, the Energy Vice President and the Group Deputy Chief Financial Officer.

Meeting minutes are sent to all Executive Committee members.

#### 2.4.4. Manage financial and tax risks

Financial decision-making governance is the responsibility of the two Finance Committees (Strategic Finance Committee and Operational Finance Committee), with the former considering issues relating to the financing strategy and the latter dealing with the practical methods of its implementation.

The Company has defined financial policies, which forbid speculative transactions notably on financial instruments, and that are subject to regular review. These policies were brought together in a Group financial policy. These procedures set out the principles and procedures for the management of financial risks to which the business is exposed, notably in relation to:

- foreign exchange risk: the Company has defined methods for hedging its main foreign exchange risks, whether this is borne by the holding companies or the operating entities, in terms of authorized hedging instruments, the decision process and the execution of transactions;

- interest rate risk: the Company has defined methods managed on a centralized basis for the hedging of interest rates related to indebtedness that is carried in major currencies (mainly EUR, USD, JPY, and CNY), which represent more than 90% of total net indebtedness with:
  - a selection of authorized tools,
  - the hedging decision processes,
  - methods of executing transactions.

For other foreign currency indebtedness, rules have been defined in order to ensure that the transactions initiated to hedge interest rate risk are consistent with Group objectives;

- counterparty risks: the Company has defined rules aimed at ensuring that the Group's counterparties are sufficiently diversified and solid (commitment limits/minimum rating);
- liquidity risks: the Company has defined rules aimed at ensuring the Group has an appropriate level of "confirmation" and diversification (by type and maturity) for all external financing sources. The Group staggers short- and long-term repayment maturities over time in order to limit amounts to be refinanced each year and has precautionary facilities.

These measures are supplemented by treasury management rules adapted to local circumstances, which are aimed at ensuring compliance and security of transactions and optimizing the management of liquidity (forecasting of cash in/cash out, etc.).

The application of this financial policy is controlled by the Finance Department. The majority of transactions are executed directly on a centralized basis (financing and management of related interest rate risk, hedging of foreign exchange risk), which is completed by consolidated reports provided by various Group entities on a monthly or quarterly basis, depending on the type of risk.

The activities are managed on the basis of highly segregated duties, using a multilateral negotiation platform, cash management software, and a communication platform linked to the Swift banking network.

As far as tax is concerned, the Group focuses on complying with laws and regulations. Modifications of laws and regulations are followed and monitored by its Tax Department and its local Financial Departments.

The Group's tax charter supports its ambition to remain a leader in its sector by acting in a responsible manner, consistent with the Group's long-term growth strategy. Air Liquide has defined the following principles which govern its tax policy, in line with article L. 225-102-1 of the French Commercial Code:

- Group entities must respect the laws and regulations in force, as well as the international standards that affect it such as those of the OECD, in particular on transfer prices;
- Group entities ensure that tax returns and payments are completed in compliance with local regulations. They complete the required tax returns according to the jurisdictions in which the Group operates;
- the Group is committed to acting with integrity in all tax-related matters. It aims to operate in a transparent manner and build constructive, long-term relationships with the tax authorities;

- the Group deals with tax-related matters by banning tax havens and does not make use of shell corporations without economic substance;
- the Group protects value for its shareholders by taking measures to minimize double taxation phenomena. Furthermore, it acts to minimize fiscal risk.

Its tax strategy is in line with the Group's strategy. It is transparent, sustainable in the long term and complies with the Code of Conduct.

Within this governance framework, the Group's tax affairs are managed by a team of dedicated, qualified tax experts, which work closely with management and respect the Group's values.

#### 2.4.5. Ensure the reliability of financial and accounting information

In order to guarantee the quality and reliability of financial and accounting information produced, the Group primarily relies on a set of accounting principles and standards, as well as a consistent accounting and management reporting system and feeds both the Group statutory consolidation process and the management analysis that is under the responsibility of independent departments, which report to the Finance Department.

The Group accounting manual, which includes the Group financial policy, defines the accounting rules and principles as well as the consolidation methods applicable and states the formats applicable for reporting financial and accounting information. This manual is regularly updated by the Finance Department with the amendments to IFRS or their interpretations.

Management and Accounting Reports are each prepared under the responsibility of independent but interactive departments that follow identical methods and principles:

- this independence allows for the enhancement of information and analysis through the use of complementary indicators and data, particularly those which are specific to each business;
- the fact that these bodies are interactive provides for better control of the reliability of information through the systematic and regular reconciliation of data.

The reports primarily include:

- monthly management reporting, known as the "Monthly Flash Report", that provides information on revenue and the main financial indicators: income statement, cash flow from operating activities, net indebtedness and the amount of investments authorized and committed;
- quarterly reporting, known as the "Management Control Report", which provides details of the primary items of the income statement, balance sheet and cash flow statement;
- a quarterly "variance" analysis report to assess the various components of the change in operating income recurring.

These three documents are compiled by each management entity according to a predefined yearly timetable.

They are systematically accompanied by comments on activities drawn up by the Director and the controller within the entity, and are consolidated at Group level with a breakdown for each hub and business;

- quarterly reporting for accounting consolidation is compiled by each subsidiary which, in addition, must provide (on a semi-annual basis) information on off-balance sheet commitments that include in particular:
  - energy purchasing,
  - financial guarantees and deposits,
  - all other contractual commitments.

Accounting consolidation statements and monthly reporting are escalated to the Central Consolidation Department. This department prepares the consolidated data and works in conjunction with the Operations Control Department, whose duty is to analyze and comment on the results, identify and explain any differences with respect to forecasts, and to update the forecasts.

As part of the scope of the Group Performance Steering Committee, a rolling forecast for the rest of the current year is systematically presented by the Finance Department, in order to identify, when applicable, any differences with respect to yearly targets and take the necessary steps.

Through regular controls, the Finance Department ensures the effective application of accounting methods and principles in the various Group entities. The most complex accounting standards, particularly those relating to employee benefits (IAS 19R), methods of consolidation (IFRS 10/11), the classification of major Large Industries' contracts (IFRS 15) and derivative financial instruments (IAS 32, IFRS 7, IFRS 9) are subject to tighter controls or treated directly by the Finance Department.

It also relies on audits carried out by the Group Control Department, with which it has regular contact.

The quality and reliability of financial and accounting information also depends on information systems which are increasingly integrated (such as ERP), a Group consolidation software package.

The project, which aims to further harmonize ERPs, continues on the basis of the definition of an accounting and financial framework tailored to the various Group businesses.

#### 2.4.6. Ensure the protection of Group data and IT applications

The Digital Security Policy sets the basic rules governing the identification of digital security stakes and handling of associated risks, and outlines the roles and responsibilities in this area. It is accompanied by:

- procedures describing, in particular, how to secure data and applications, detect and deal with incidents;
- codes outlining principles to be respected by users and IT administrators.

The Digital Security Department reports directly to the Group Control Department and uses resources set aside in the hubs, groups of countries (clusters), World Business Units and World Business Lines to coordinate and control in conjunction with the IT Department the roll-out of this policy from a risk assessment that is regularly updated according to the development of threats. This roll-out is centered on a long-term operational program aimed at defining the key areas and measures to be taken under the supervision of a member of the Executive Committee, with in particular:

- risk prevention and awareness raising for employees using teaching tools such as phishing campaigns, e-learning courses on information protection and use of IT tools, etc.;
- better consideration of digital security from the project design phase, as an inherent part of any resulting solution, and continued treatment of IT vulnerabilities, protection of critical applications and of the most sensitive information; monitoring of digital threats and major cyber incidents that could affect the Group's activities, particularly through penetration testing;
- implementing regulatory compliance for the organization using specific projects or programs (Military Planning Act, General Data Protection Regulation, etc.); for the latter, a framework agreement was drafted governing data sharing within the Group, and a mechanism for the handling and processing of complaints was introduced;
- revision of the incident management system completed by undertaking a diagnosis to assess the quality and efficiency of the protection of our sensitive digital assets.

Moreover, the Group has launched a project aimed at adapting the crisis management system and operational continuity plans to the specificities of the risk of a cyber attack; it has also launched a multi-year program aimed at supplementing the mechanism for the digital protection of industrial assets.

### 2.4.7. Manage environmental and societal risks

All the Group's operations are subject to local regulations as well as the codes, policies and procedures (Principles of Action, procurement policy, IMS, etc.) contained in the BLUEBOOK, with these tools relating to environmental subjects. Moreover, each subsidiary must reassess its environmental risks and their related action plans on an annual basis.

The Group's strategy also aims to support its development while limiting its environmental impact, in particular its carbon footprint and certain environmental risks (emissions into the atmosphere, annual water supply, etc.) which are part of the criteria for analyzing investment projects.

An environmental and societal risks procedure has been published in the BLUEBOOK. It includes an analysis and the identification of risks and the related preventative measures.

The Group also announced its Climate objectives in 2018, accompanied by quantified targets to measure and improve its environmental impact. Air Liquide's Climate objectives commit the Group to taking active operational measures, as well as with its customers and more generally step up its actions in favor of a low-carbon society.

The Group is also attentive to risks associated with extreme weather-related phenomena, which are the subject of specific adaptation plans on the main sites located in high-risk areas.

### Vigilance plan

The aim of the Group's vigilance plan is to identify risks and prevent serious violations with respect to Human Rights and fundamental freedoms, to the health and safety of persons and to the environment, which may result from the activities of the Group, its subcontractors, or suppliers with whom Air Liquide has an established business relationship.

The report on the vigilance plan actions that have been implemented is explained below.

Air Liquide's vigilance plan applies to all Group subsidiaries, subcontractors and suppliers with whom the Group has an established business relationship. It is applied as follows:

### Associated risks

- The environmental and societal risks are clearly identified in the Group's global risk mapping.
- A detailed analysis of these risks enabled the drafting of a dedicated mapping covering all Group businesses. These risks are described on page 43.
- This risk analysis was supplemented by a mapping of supplier risks based on the methodology drawn up by the Group Procurement Department. This methodology allows subsidiaries to identify their critical suppliers based on seven main principles.
- Suppliers who present CSR risks are automatically classed as critical suppliers for the Group, and, as such, require a dedicated qualification process.

### Regular assessment of subsidiaries, subcontractors and suppliers

- All Group subsidiaries are subject to social, safety and environmental reporting each year. Data are reported, analyzed, consolidated and published in the Reference Document. These data are audited by the independent verifier and are subject to an action plan when non-compliance with Group expectations is identified.
- For suppliers identified as critical, the Group continues, with the support of EcoVadis, to assess their performance in great detail (more than 230 assessments completed in 2018) focusing on the following subjects: the environment, social issues, corporate ethics and the supply chain.

### Risk mitigation measures and the prevention of serious harm

- Air Liquide has formalized in the BLUEBOOK, its values, policies, procedures and internal Codes of Conduct, in order to mitigate CSR risks. In terms of safety and the environment, the IMS provides a framework for operations. The Group's commitment in terms of Safety, ethics and Human Rights (see "Prerequisites to action" section on page 16) highlight that these are prerequisites that are taken into account in all of the Group's businesses.

- To reduce risks and prevent the grave abuse of Human Rights, health and safety of individuals, and the environment by suppliers, Air Liquide routinely sends the Supplier's Code of Conduct to all Group suppliers in order to promote and enforce practices relating to Human Rights, ethics, the environment and safety. This Code can be found on Air Liquide's website (<https://www.airliquide.com/group/sustainable-procurement>).
- Moreover, a sustainable development clause is included in the Group's new contracts and framework agreements with its suppliers. This clause covers the option for Air Liquide to assess the supplier's sustainable development performance, as well as the obligation to implement adequate corrective measures. It also includes a compulsory reporting element for the supplier, in particular on safety, energy and water consumption and atmospheric emissions, as well as Human Resources.
- The Group also conducts on-site Sustainable Development audits for certain suppliers that are considered to be particularly at risk in this area, following unsatisfactory evaluations. They are conducted according to recognized external benchmarks, often by a specialized external auditor. Following these audits, corrective action plans are drawn up. In certain cases, the business relationship may be suspended while the supplier brings its practices into compliance.
- In addition to these measures, the Group also has procurement procedures and provides training (see page 287 Sustainable procurement – chapter 4).

#### Whistleblowing mechanism and compilation of reports

- The current whistleblowing tool, Ethicall, allows employees and external collaborators to report deviations from the Code of Conduct, including on subjects relating to Human Rights, health, hygiene and safety in the workplace as well as environmental protection.

#### Monitoring system

- Beyond, the report on the actions stated above, the monitoring system that includes the key indicators is provided in chapter 4 (see page 287 Sustainable procurement).
- The Board of Directors' Environment and Society Committee was informed of the monitoring of the implementation of the Vigilance plan.

#### 2.4.8. Ensure the development of the Group's expertise and talents

The Human Resources policy defines the main rules, together with the roles and responsibilities of the different parties in their implementation, with respect to, among others:

- the acquisition and sustaining of requisite skills, in particular through the SPRING long-term program, which identifies and manages critical skills. Training provided under the Air Liquide University brand also contributes to this goal and, in particular, e-learning courses attended by an increasing number of users (more than 55,000 in 2018) in a wide range of domains (ethics, industrial safety, competition law, digital security, etc.);
- supporting employees in their personal development throughout their career, particularly thanks to training, with the continuing roll-out of improvement tools for the management of training

programs (LMS: Learning Management System), the management of careers and skills (TMS: Talent Management System) and the communication of career advancement opportunities (TAS: Talent Acquisition System);

- measuring and recognizing performance and contributions for all employees. Other than remuneration policies, the Group's specific programs promote, for example, technical expertise (Technical Community Leaders), inventors (inventor recognition program) and entrepreneurs.

#### 2.4.9. Ensure that laws, regulations and internal management rules are respected within the Group, notably in the legal and intellectual property areas

- With the Group legal policy, which encompasses:
  - a Group procedure relating to Powers (limitations and delegations) for use by Group entities;
  - a Group procedure on the governance of subsidiaries (Boards of Directors) ;
  - an Insurance Guide for all Group entities;
  - Group codes on how to behave in order to comply with competition laws (including Europe, the United States and Asia-Oceania), accompanied by surprise audits and training that includes e-learning;
  - a memorandum, specifying the rules to be observed to prevent market abuse (insider trading) ;
  - various contract guides (for Large Industries, Engineering & Construction, Industrial Merchant, Electronics and Financing) and Codes of Good Practices (for Healthcare);
  - an anti-corruption program: this program leverages the active involvement of Executive Management and management; it includes, in particular, key principles of the Codes of Conduct and an Anti-Corruption Code rolled out within the subsidiaries and accessible online, as well as a highly efficient awareness-raising and training program tailored for populations exposed to corruption-related risks, and a strengthened roll-out of the whistleblowing system. This program was further reinforced to take into account requirements related to the Sapin 2 Law. In particular, based on an updated corruption risk map, third-party assessment procedures were extended and specific accounting controls for certain types of transactions were introduced. This program is coordinated by the Group Ethics Officer who relies on a network of ethics correspondents that was enlarged in 2018 and the support of the Operational Departments in the hubs and businesses.
- In intellectual property, with a Group policy and procedures aimed at:
  - ensuring Air Liquide's compliance with valid patents and other intellectual property rights held by third parties in its different areas of business, particularly for verifying freedom to operate;
  - protecting Group intellectual property, by protecting its inventions, designs and brands through their identification (on an official filing basis) and in the event of partnerships or other third-party relations targeting innovation;
  - managing the Group's obligations in terms of the recognition of their inventors.



To this end, the Group relies on an Intellectual Property Department, comprising professionals located at the Group's head office and in the main geographic regions.

## 2.5. MONITORING OF CONTROL MEASURES

The Board of Directors exercises its control over Group management based on the various quarterly activity reports it receives from Executive Management and the work of the Audit and Accounts Committee, according to the methods and principles described above (reports, debriefings, etc.).

Executive Management exercises its control over risk management, in particular through SICR meetings (Strategy – Investment – Corporate Policies Review) and the monthly Group Performance Meetings (described on page 35).

It also relies on existing reports and:

- Executive Committee meetings, with, in particular, debriefings from the Safety and Industrial System Department regarding Group performance in terms of security and the progress of current actions;
- work carried out by the Finance Department, and the Group Control Department;
- recommendations made by various Group Committees set up to ensure enhanced management of certain commitments and more significant stakes (the role and members of these Committees are described below).

These control measures are enhanced by the involvement of operational departments and the Executive Committee in the implementation and follow-up of actions needed to improve and strengthen the quality of internal controls.

### The Risk Committee

The purpose of this Committee is to provide support and expertise to the hubs, World Business Units and World Business Lines which must implement and coordinate the risk management approach in their respective scopes of responsibility.

It brings together the Corporate functions: Group Control (notably covering ethics and digital security), Legal, Finance, Communication, Safety and Industrial System, Human Resources and Group Operations Control Departments.

Chaired by the Chairman and CEO and attended by two Executive Vice Presidents and the Strategy Director, it meets twice a year to, on one hand, report on the progress of priority mitigation measures for major risk, prepare a risk management synthesis and define Group orientations and, on the other hand, examine certain strategic risks more closely.

### The Finance Committees

#### The Strategic Finance Committee

The purpose of this Committee is to verify the effective application of the Group's financial policy, to approve financial management proposals and suggestions that have been submitted and to approve the rules governing the Group's financial policy, which are subjected to regular review.

It brings together the Executive Vice President - Chief Financial Officer, the Group Corporate Finance and Treasury Director, and the Corporate Finance Director who meet under the authority of the Chairman & CEO.

The Committee meets at least three times a year and upon request, if necessary.

#### The Operational Finance Committee

The purpose of this Committee is to make day-to-day decisions concerning the financial management of the Group, to propose structuring transactions to the Strategic Finance Committee and to ensure their implementation after approval.

It brings together the Group Executive Vice President - Chief Financial Officer, the Corporate Finance and Treasury Director, and the Corporate Finance Director, assisted by a Committee Secretary.

The Committee meets every four to six weeks, and the minutes of these meetings are sent to the Chairman and CEO.



### The Resources & Investment Committees (RIC)

The purpose of these Committees is to assess and approve requests for investments that have been submitted, as well as medium and long-term contractual commitments and Human Resource requirements that may arise therefrom.

They meet regularly (usually once a month) for each hub and each World Business Unit.

Each Committee meeting is chaired by a member of the Executive Committee in charge of the hub or of the World Business Unit involved and brings together managers of the region and business line concerned by the investment, as well as representatives of the Group Finance Department, Engineering & Construction, and the Capital Implementation Group (CIG).

The Committee's decisions are reviewed by Executive Management.

### The Ethics Committee

The purpose of this Committee is to supervise the Group's ethics program (monitoring of actions undertaken to prevent deviations, proposing short- and medium-term orientations) and to recommend sanctions in case of significant deviation.

It brings together the Legal, Group Control, and Human Resources Departments as well as a representative of operational functions; it meets at least once per year and more often when required.

### The Digital Security Committee

This Committee is responsible for setting the strategic directions for digital security and for ensuring the operational progress of certain Group projects (industrial IT, digital innovation, etc.).

It brings together the IT, Digital Transformation, and Digital Security managers and other Corporate Departments when required. It meets each month under the chairmanship of a member of the Executive Committee.

# PERFORMANCE

**Group revenue** for 2018 stood at **21,011 million euros**, up **+6.1%** on a comparable basis and above the high end of the NEOS target range. It was supported by high Gas & Services sales growth, **+5.2%**, increasing sequentially, an improvement in Engineering & Construction (**+31.5%**) and strong growth in Global Markets & Technologies (**+29.6%**). The negative currency impact of -3.6% in 2018 eased over the year, mainly due to a stronger US dollar against the euro. The energy impact, which was negative during the 1<sup>st</sup> quarter, turned positive as of the 2<sup>nd</sup> quarter, and reached +1.3% over the year. The sale of the Airgas Refrigerants business at the end of 2017 led to a significant scope impact of -0.5% in 2018. Published Group revenue was therefore up +3.3% over 2018.

**Gas & Services revenue** reached **20,107 million euros** in 2018, up **+5.2%** on a comparable basis. All zones contributed to the growth.

- ▶ Gas & Services revenue in the **Americas** totaled **7,982 million euros** in 2018. Growth, which continued to improve quarter-on-quarter, stood at **+5.2%** for the year. Large Industries activity level was high (+5.4%) in both air gases and hydrogen. Industrial Merchant sales posted strong growth (+4.6%) with a high price impact. Healthcare revenue continued to improve markedly (+8.2%), despite a limited contribution from bolt-on acquisitions. Electronics posted revenue growth of +6.7% over the year.
- ▶ Revenue in the **Europe** zone totaled **7,111 million euros**, up **+2.5%** over the year. Large Industries sales improved (+1.9%) in particular in air gases. Growth was solid in Industrial Merchant (+3.2%), with price impacts increasing throughout the year. Healthcare continued its steady growth (+4.8%), mainly driven by organic sales growth.
- ▶ Revenue in the **Asia Pacific** zone totaled **4,359 million euros** in 2018, up **+8.2%**. In Large Industries, higher sales (+3.5%) benefitted from the ramp-up of units in the 1<sup>st</sup> half and from start-ups at the end of the year. Industrial Merchant was up markedly in the zone (+7.0%), especially in China. Electronics revenue posted record growth of +17.1%, with strong gas sales and exceptionally high Equipment & Installation sales.
- ▶ Revenue in the **Middle East and Africa** zone amounted to **655 million euros**, up **+15.5%** over the year. In Large Industries, 2018 sales benefited from the start-up in December 2017 of the largest Air Separation Unit in the world in South Africa. Business momentum remained high in Egypt.

Gas & Services revenue benefited from a strong contribution from all business lines. **Industrial Merchant** growth was solid, **+4.5%**, supported by high price impacts (+2.5%), which were stronger in the 2<sup>nd</sup> half (+3.1%) than in the 1<sup>st</sup> half (+1.9%). **Large Industries**, **+4.7%**, benefited in particular from a major start-up in South Africa in December 2017 and sustained demand in oxygen, notably in the Americas and Asia. Sales growth in **Healthcare** was strong, **+5.7%**, despite a limited contribution from bolt-on acquisitions. **Electronics** posted record growth of **+9.9%**, with a marked increase in Carrier Gases and Advanced Materials and exceptionally high Equipment & Installation sales.

**Engineering & Construction** revenue for 2018 totaled **430 million euros**, up **+31.5%** compared with 2017. It benefited from the gradual improvement in order intake seen since the beginning of 2017.

**Global Markets & Technologies** sales were up **+29.6%** in 2018 at **474 million euros**, the biogas activity being the main contributor to this growth.

The **additional Airgas synergies** in 2018 amounted to **76 million US dollars** and reached a **cumulated 290 million US dollars** since the acquisition. The **300 million-US dollar target of cumulated synergies is therefore reached in the 1<sup>st</sup> quarter of 2019, i.e., more than a year before initially planned.**

For the year, **efficiencies** amounted to **351 million euros**, largely above the NEOS company program's annual target of more than 300 million euros. The strong investment momentum in our customers' main markets led to an increase in investment opportunities for the Group and in the number of new long-term contracts signed. In this favorable environment for future growth and to ensure reaching the NEOS target of a ROCE in excess of 10% by 2021-2022, **the Group is significantly strengthening its efficiency program. As of 2019, the annual target for efficiencies is therefore set at more than 400 million euros.**

The Group's **operating income recurring (OIR)** reached **3,449 million euros** in 2018, +6.7% excluding the currency impact. The **operating margin (OIR to revenue)** stood at 16.4% and at **16.6% excluding the energy impact**, which corresponds to a **+10 basis point** improvement compared with 2017. Excluding the energy impact, the operating margin for **Gas & Services** increased by **+30 basis points** compared with 2017.

**Net profit (Group share)** amounted to **2,113 million euros** in 2018, up **+4.2%** compared with the "recurring" net profit for 2017 which excluded exceptional items and the impact of the US tax reform that had no impact on cash flow, and up **+8.7%** when also excluding the currency impact.

**Cash flow from operating activities before changes in working capital requirement** totaled 4,138 million euros and stood at **19.7% of Group sales**. It allowed in particular the financing of net industrial capital expenditures, which reached 2.2 billion euros, and the decrease of the debt-to-equity ratio, down from 80% at the end of 2017 to 68.8% at the end of 2018. **Gross industrial capital expenditures** represented **10.7% of sales**.

**Industrial and financial investment decisions** exceeded **3.1 billion euros**, a **+22%** increase compared with 2.6 billion euros in 2017. This was a record level excluding major acquisitions. Despite this particularly high level of investment decisions, the **12-month portfolio of investment opportunities** totaled **2.6 billion euros**, as of December 31, 2018, up **500 million euros** compared with 2017.

The **return on capital employed after tax (ROCE)** stood at **8.0%**, a **+30 basis point** increase compared with the recurring ROCE at the end of 2017 (7.7%). Excluding the currency impact, ROCE improved by **+60 basis points**. The Group confirmed the NEOS target of returning to a ROCE above 10% by 2021-2022.

Moreover, for many years now, Air Liquide has been committed to a **sustainable growth**, notably to limit its own CO<sub>2</sub> emissions as well as those of its customers. The Group presented on November 30, 2018 its **Climate objectives**, in particular the **30% reduction objective in its carbon intensity\* between 2015 and 2025**, with a global approach that

includes its assets, its customers, and ecosystems. These objectives are the most ambitious of its sector and are in line with its NEOS company program.

Unless otherwise specified, all variations on revenue commented below are made on a comparable basis, which excludes the currency, energy (natural gas and electricity) and significant scope impacts. The reference to Airgas corresponds to the Group Industrial Merchant and Healthcare activities in the United States.

## 1. Key Figures

(in millions of euros)	FY 2017	FY 2018	2018/2017 published change	2018/2017 Recurring change <sup>(b)</sup>	2018/2017 comparable change <sup>(a)</sup>
<b>Total Revenue</b>	<b>20,349</b>	<b>21,011</b>	<b>+3.3%</b>		<b>+6.1%</b>
Of which Gas & Services	19,642	20,107	+2.4%		+5.2%
Operating Income Recurring	3,364	3,449	+2.5%		+7.6%
Operating Income Recurring (as % of Revenue)	16.5%	16.4%	-10 bps		
Variation excluding energy		+10 bps			
Other Non-Recurring Operating Income and Expenses	(344)	(162)			
Net Profit (Group Share)	2,200	2,113		+4.2%	+8.7% <sup>(c)</sup>
<b>Adjusted Earnings per Share (in euros)</b>	<b>5.16</b>	<b>4.95</b>		+4.0%	
<b>Adjusted Net Dividend per Share (in euros)</b>	<b>2.65</b>	<b>2.65 <sup>(h)</sup></b>			
Net Cash Flow from Operating Activities <sup>(d)</sup>	4,254	4,716	+10.9%		
Net Capital Expenditure <sup>(e)</sup>	1,850	2,272			
Net Debt	13,371	12,535			
Debt-to-Equity ratio	80%	68.8%			
<b>Return On Capital Employed – ROCE after tax</b>	<b>8.2 %</b>	<b>8.0 %</b>		+30 bps <sup>(f)</sup>	<b>+60 bps <sup>(g)</sup></b>

(a) Change excluding the currency, energy (natural gas and electricity) and significant scope impacts, see reconciliation in appendix.

(b) Change compared to 2017 recurring net profit, i.e. 2,029 million euros (excluding the exceptional items and the impact of the US tax reform that had no impact on cash flow).

(c) Change compared to 2017 recurring net profit and excluding currency.

(d) Cash flow after changes in working capital requirements and other items.

(e) Including transactions with minority shareholders.

(f) Change compared to 2017 recurring ROCE.

(g) Change compared to 2017 recurring ROCE and excluding currency.

(h) Subject to the approval of the Annual General meeting on May 7, 2019.

\* In kg CO<sub>2</sub> equivalent / € Operating income recurring before depreciation and amortization.

## 2. Income Statement

### REVENUE

Revenue (in millions of euros)	FY 2017	FY 2018	2018/2017 published change	2018/2017 comparable change
Gas & Services	19,642	20,107	+2.4%	+5.2%
Engineering & Construction	335	430	+28.4%	+31.5%
Global Markets & Technologies	372	474	+27.3%	+29.6%
<b>TOTAL REVENUE</b>	<b>20,349</b>	<b>21,011</b>	<b>+3.3%</b>	<b>+6.1%</b>

Revenue by quarter (in millions of euros)	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Gas & Services	4,831	4,938	5,066	5,272
Engineering & Construction	85	95	105	145
Global Markets & Technologies	94	119	100	161
<b>TOTAL REVENUE</b>	<b>5,010</b>	<b>5,152</b>	<b>5,271</b>	<b>5,578</b>
<b>2018/2017 Group published change</b>	<b>-3.2%</b>	<b>+0.7%</b>	<b>+6.6%</b>	<b>+9.1%</b>
<b>2018/2017 Group comparable change</b>	<b>+6.0%</b>	<b>+5.6%</b>	<b>+6.0%</b>	<b>+6.8%</b>
<b>2018/2017 Gas &amp; Services comparable change</b>	<b>+5.0%</b>	<b>+5.1%</b>	<b>+5.2%</b>	<b>+5.6%</b>

### Group

Group revenue for 2018 stood at **21,011 million euros**, up **+6.1%** on a comparable basis and above the high end of the NEOS target range. It was supported by high Gas & Services sales growth, **+5.2%**, which increased quarter-on-quarter, an improvement in Engineering & Construction (**+31.5%**) and strong growth in Global Markets & Technologies (**+29.6%**). The negative currency impact of -3.6% in 2018 eased over the year, mainly due to a stronger US dollar against the euro. The energy impact, which was negative during the 1<sup>st</sup> quarter, turned positive as of the 2<sup>nd</sup> quarter, and reached +1.3% over the year. The sale of the Airgas Refrigerants business at the end of 2017 led to a significant scope impact of -0.5% in 2018. Published Group revenue was therefore up +3.3% over 2018.

### Gas & Services

Gas & Services revenue reached **20,107 million euros** in 2018, up **+5.2%** on a comparable basis. This was driven by a strong contribution from all business lines and all zones. Industrial Merchant growth was solid, **+4.5%**, supported by high price impacts (+2.5%), which were stronger in the 2<sup>nd</sup> half (+3.1%) than in the 1<sup>st</sup> half (+1.9%). Large Industries, **+4.7%**, benefited in particular from a major start-up in South Africa in December 2017 and sustained demand in oxygen, notably in the Americas and Asia. Sales growth in Healthcare was strong, **+5.7%**, despite a limited contribution from bolt-on acquisitions. Electronics posted record growth of **+9.9%**, with a marked increase in Carrier Gases and Advanced Materials and exceptionally high Equipment & Installation sales. As published revenue was up +2.4%; the energy impact, at +1.4%, did not offset the unfavorable currency and scope impacts (at -3.7% and -0.5% respectively).

Revenue by geography and business line (in millions of euros)	FY 2017	FY 2018	2018/2017 published change	2018/2017 comparable change
Americas	8,150	7,982	-2.1%	+5.2%
Europe	6,776	7,111	+5.0%	+2.5%
Asia-Pacific	4,081	4,359	+6.8%	+8.2%
Middle East & Africa	635	655	+3.2%	+15.5%
<b>GAS &amp; SERVICES REVENUE</b>	<b>19,642</b>	<b>20,107</b>	<b>+2.4%</b>	<b>+5.2%</b>
Large Industries	5,336	5,685	+6.6%	+4.7%
Industrial Merchant	9,261	9,181	-0.9%	+4.5%
Healthcare	3,401	3,486	+2.5%	+5.7%
Electronics	1,644	1,755	+6.7%	+9.9%

## Americas

Gas & Services revenue in the Americas totaled **7,982 million euros** in 2018. Growth, which continued to improve quarter-on-quarter, stood at **+5.2%** for the year. Large Industries activity level was high (+5.4%) in both air gases and hydrogen. Industrial Merchant sales posted strong growth (+4.6%) with a high price impact. Healthcare revenue continued to improve markedly (+8.2%), despite a limited contribution from bolt-on acquisitions.

### AMERICAS GAS & SERVICES 2018 REVENUE

17% Large Industries  
68% Industrial Merchant  
10% Healthcare  
5% Electronics



- **Large Industries** posted revenue growth of **+5.4%** in 2018. The start-up of the OCI unit in the United States at the end of the 2<sup>nd</sup> quarter and the ramp-up of units in Latin America contributed to the increase in oxygen volumes. Hydrogen sales were also up, driven by high demand. The cogeneration activity in Canada enjoyed favorable electricity market conditions in Alberta in 2018.
- **Industrial Merchant** sales were up **+4.6%** over the year. Growth in the United States was driven by very solid cylinder gas and hardgoods sales, which benefited from favorable conditions in most end markets, in particular in Metal Fabrication, Construction and Energy. In Canada, cylinder gas and hardgoods sales were up, in particular in the Metal Fabrication end market, and offset weaker liquid nitrogen volumes for oil well services in Alberta. Growth in South America retained momentum, with a marked increase in liquid gas volumes in Brazil in particular. Price impacts increased towards the end of the year, reaching +4.2% in the 4<sup>th</sup> quarter, and stood at **+3.0%** for the year, in line with inflation.
- **Healthcare** revenue grew strongly, **+8.2%**, in 2018 despite a limited contribution from bolt-on acquisitions. Medical Gases growth was strong in the United States, driven in particular by the success of cylinders with a digital interface and increased sales to proximity care customers. Business momentum continued in Latin America, in particular in Brazil and Colombia, notably in Home Healthcare.
- **Electronics** posted revenue growth of **+6.7%** over the year, with an increase in Carrier Gases and Advanced Materials sales and exceptionally high Equipment & Installation sales.

## Europe

Revenue in the Europe zone totaled **7,111 million euros**, up **+2.5%** over the year. Large Industries sales improved (+1.9%) in particular in air gases. Growth was solid in Industrial Merchant (+3.2%), with price impacts increasing throughout the year. Healthcare continued its steady growth (+4.8%), mainly driven by organic sales growth.

### EUROPE GAS & SERVICES 2018 REVENUE

33% Large Industries  
30% Industrial Merchant  
35% Healthcare  
2% Electronics

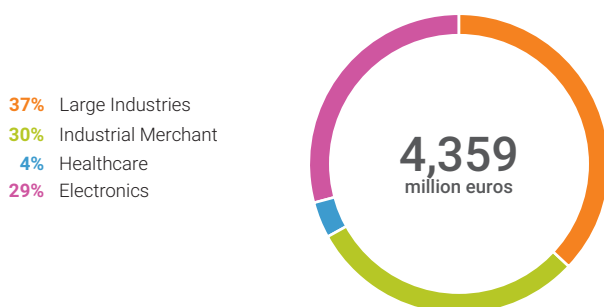


- **Large Industries** revenue was up **+1.9%** in 2018, with air gas sales increasing, in particular in France, Benelux and Italy, and increased cogeneration activity in Benelux. Hydrogen sales were impacted in the 2<sup>nd</sup> half by major customer turnarounds, in particular in Benelux. Momentum was particularly strong in Turkey with the start-up of a new unit during the 4<sup>th</sup> quarter. The Group also launched its operations in Kazakhstan during the 3<sup>rd</sup> quarter with the takeover of a hydrogen production unit to meet the needs of the national oil company.
- **Industrial Merchant** sales were up **+3.2%** in 2018, with growth solid throughout the year and particularly strong during the 4<sup>th</sup> quarter at +4.7%. The majority of the countries contributed to this growth. Cylinder gas sales improved at a faster pace in the 2<sup>nd</sup> half of the year, but the increase remained below that of liquid gas sales. Growth continued at a very high pace in Turkey and in Eastern Europe, in particular in Poland and Russia. Price impacts increased quarter-on-quarter, gradually catching up with the rate of inflation, and reached **+1.5%** for the year and +2.6% for the 4<sup>th</sup> quarter.
- **Healthcare** continued to improve steadily posting mostly organic sales growth of **+4.8%**, with bolt-on acquisitions having a limited contribution. Home Healthcare momentum remained very strong with, in particular, a marked increase in the number of diabetic patients in Scandinavia. Growth in sales of Medical Gases for hospitals was impacted by constant price pressure. Specialty Ingredients revenue grew significantly.

### Asia Pacific

Revenue in the Asia Pacific zone totaled **4,359 million euros** in 2018, up **+8.2%**. In Large Industries, higher sales (+3.5%) benefitted from the ramp-up of units in the 1<sup>st</sup> half and from start-ups at the end of the year. Industrial Merchant was up markedly in the zone (+7.0%), especially in China. Electronics revenue posted record growth of +17.1%, with strong gas sales and exceptionally high Equipment & Installation sales.

#### ASIA PACIFIC GAS & SERVICES 2018 REVENUE



- **Large Industries** sales were up **+3.5%** in 2018, driven by the contribution from the ramp-up of units during the 1<sup>st</sup> half and from several start-ups in China at the end of the year. These additional sales largely offset the loss of revenue from the disposal of three isolated units in Northern China at the end of 2017. Customer demand was solid, in particular for hydrogen in South Korea and for air gases in South-East Asia.
- **Industrial Merchant** revenue grew strongly, **+7.0%**, over the year, with performances varying greatly by country. In China, growth exceeded +15% for the year, driven by the strong increase in cylinder gases and liquid argon volumes as well as by higher prices. Revenue in Japan declined slightly. Sales were up in Australia, notably in liquid gas for the mining sector. Price impacts stood at **+1.8%** for the year and at +1.2% for the 4<sup>th</sup> quarter, due to softer price impact in China following five consecutive quarters of strong growth.

- **Electronics** revenue posted a record increase of **+17.1%** in 2018. This was driven by strong momentum for Advanced Materials, in particular in South Korea, China and Taiwan, and the ramp-up of Carrier Gases units in Singapore, Taiwan, China and Japan. Equipment & Installation sales were also exceptionally high, and posted growth above +50%.

### Middle East and Africa

Revenue in the Middle East and Africa zone amounted to **655 million euros**, up **+15.5%** over the year. In Large Industries, 2018 sales benefitted from the start-up in December 2017 of the largest Air Separation Unit in the world in South Africa. Business momentum remained high in Egypt, with the start-up of an Air Separation Unit during the 1<sup>st</sup> quarter 2018 and growing volumes in Industrial Merchant. Healthcare continued its development, in particular in Saudi Arabia, where an acquisition at the end of 2017 led to the local launch of the Home Healthcare activity.

### Engineering & Construction

Engineering & Construction revenue for 2018 totaled **430 million euros**, up **+31.5%** compared with 2017. It benefitted from the gradual improvement in order intake seen since the beginning of 2017.

Order intake reached **807 million euros** at the end of December 2018, a double-digit increase compared with 2017. Air Separation Units accounted for more than half of all orders. These included Group projects and third-party customer orders, notably in Asia.

### Global Markets & Technologies

Global Markets & Technologies sales were up **+29.6%** in 2018 at **474 million euros**. The main contributor to this growth was the biogas activity, which benefitted from the ramp-up of a major landfill biogas purification unit in the United States and four smaller farm waste biogas purification units in France and in the United Kingdom. Maritime and Advanced Technologies activities also posted strong growth.

Order intake was up more than +30% at the end of December and reached **460 million euros**.





## Global Markets & Technologies

- Air Liquide and 10 large Japanese companies, representing several industries and finance, announced the creation in March of the **"Japan H2 Mobility" consortium** for the purpose of accelerating the deployment in Japan of hydrogen stations and fuel cell electric vehicles. The 11 founding companies will contribute to the development of a large-scale hydrogen infrastructure in order to build a network of 320 stations by 2025, and 900 by 2030. Today, there are about 100 stations already in operation in Japan. For its part, **Air Liquide will install and operate some 20 stations by 2021.**
- In March, Air Liquide inaugurated a new **hydrogen station** near Versailles in France. This station will fuel two **hydrogen-powered buses**, scheduled for **rollout in 2019**, and supplement the Paris hydrogen taxi fleet "Hype" which is developing rapidly. This is the **third station that has been installed by Air Liquide in the Greater Paris Area.**
- Air Liquide has commissioned **three new biomethane production units, in the United States, in France, and in the United Kingdom** in the 1<sup>st</sup> quarter 2018, doubling its biomethane production capacity, which now stands at 60 MW, the equivalent of 500 GWh for a full year of production. Over the course of the last four years, the Group has decided around **100 million euros in investments** in biomethane production. The Group operates 10 production units around the world, designed to purify biogas in order to transform it into biomethane and inject it into the natural gas network.
- Early September, Air Liquide inaugurated in Hobro, **Denmark, HyBalance, a pilot site for the production of carbon-free hydrogen**, in the presence of the project's partners. This facility uses **electrolysis technology** and allows **to balance the electricity grid and store surplus electricity in the form of hydrogen** that will be used in industry and transportation. The electrolyser, with a capacity of 1.2 MW, enables the production of around 500 kg of hydrogen a day without releasing CO<sub>2</sub>. As part of this project initiated in 2016, Air Liquide developed, built, and is operating the facility that produces hydrogen from water electrolysis as well as the filling center for its customers delivered by trailers.
- At the end of November, Air Liquide announced the construction of the **first world scale liquid hydrogen production unit dedicated to the hydrogen energy markets**, located in the **Western U.S.** Air Liquide expects to invest more than **150 million US dollars** for the production of nearly 30 tons of hydrogen per day that will serve the growing needs of the hydrogen mobility market in California.
- At the end of January 2019, Air Liquide announced that it acquired an **18.6% stake in the capital of the Canadian company Hydrogenics Corporation**, a leader in electrolysis hydrogen production equipment and fuel cells. This strategic transaction represents an **investment of 20.5 million US dollars** (18 million euros). Air Liquide and Hydrogenics have also entered into a **technology and commercial agreement** to jointly develop electrolysis technologies.

## OPERATING INCOME RECURRING

Operating income recurring before depreciation and amortization reached **5,215 million euros**, up **+1.4%** as published compared with 2017, and **+5.3%** excluding the currency impact.

**Purchases** were up +7.2%, in particular due to the increase in energy prices. Equipment purchases were also up for the Equipment & Installation activity in Electronics as well as for Engineering & Construction. Besides, the continued attention paid to costs and efficiencies allowed for **personnel costs** and **other expenses and income** to grow at a slower pace than sales (+0.2% and +0.8% respectively, compared with published sales growth of +3.3%).

Depreciation and amortization reached **1,766 million euros**, down -0.7% due to the currency impact. Excluding the currency impact and despite the impact of start-ups and ramp-ups, depreciation and amortization growth remained lower than revenue growth. This development also reflected the large number of contract renewals in 2018 in our main Large Industries basins.

At the end of 2018, **Airgas synergies** represented a **cumulated 290 million US dollars** since the acquisition in May 2016. These included 231 million US dollars of cost synergies, i.e., more than the initial objective, and 59 million US dollars of growth synergies. The **300 million-US dollar target of cumulated synergies is therefore reached in the 1<sup>st</sup> quarter of 2019, i.e., more than a year before initially planned.** The integration of Airgas is now complete.

For the 2018 fiscal year, synergies amounted to 76 million US dollars. The share of **growth synergies** continued to rise and represented more than 40% of synergies for the year. These came from the rollout of cross-selling offerings in the United States, such as small onsite generators using Air Liquide technology offered to Airgas customers and cylinder gases and hardgoods now available to Air Liquide customers. Supporting Airgas customers in their expansion in Canada and Mexico is another example of growth synergies.

For the year, **efficiencies** amounted to **351 million euros**, largely above the NEOS company program's annual target of more than 300 million euros. They included a contribution from Airgas for the first time in 2018, which amounted to 31 million euros. They represented savings of 2.3% of the cost base and 2.9% excluding Airgas. Industrial Merchant was the greatest contributor, with more than one third of efficiencies, followed by Large Industries and Healthcare. Moreover, approximately 50% of these efficiencies related to industrial projects which mainly target a decrease in logistic costs and the optimization of production unit operation. The accelerated rollout of remote operation centers (Smart Innovative Operations, SIO) was a major example of this in 2018. Almost one third of efficiencies related to procurement savings, notably for the purchases of molecules in Electronics, equipment in Home Healthcare, and energy in Large Industries. The remaining efficiencies mainly related to administrative efficiencies and realignment plans in several countries and businesses, including Engineering & Construction.

The strong investment momentum in our customers' main markets led to an increase in investment opportunities for the Group and in the number of new long-term contracts signed. In this favorable environment for future growth and to ensure reaching the NEOS target of a ROCE in excess of 10% by 2021-2022, **the Group is significantly strengthening its efficiency program. As of 2019, the annual target for efficiencies is therefore set at more than 400 million euros**, compared with a target of more than 300 million euros previously. Half of the additional efficiencies will be related to the integration of Airgas in the program and half from the reinforcement of asset pooling and platform sharing projects, as well as an acceleration in the implementation of digital solutions.

The Group's **operating income recurring (OIR)** reached **3,449 million euros** in 2018, a published increase of +2.5%, or +6.7% excluding the currency impact. The **operating margin (OIR to revenue)** stood at 16.4% and **16.6% excluding the energy impact**, which corresponds to a +10 basis point improvement compared with 2017.



### Purchases and Efficiencies

- One year after the launch of the first **remote operation center** in France, Air Liquide inaugurated in January 2018 in **Malaysia** its Smart Innovative Operations (SIO) Center for the Southeast Asia Pacific region. The SIO Center enables the remote management of production for **18 Air Liquide Large Industries production units** spanning eight countries across the region, as well as optimizing energy consumption and improving reliability at these sites. Air Liquide invested **20 million euros** in this project.
- At the end of November, Air Liquide announced a **new agreement** to purchase 50 megawatts (MW) of **renewable wind electricity** from a subsidiary of NextEra Energy Resources, LLC, the world's largest generator of renewable energy. By using the wind-generated electricity, Air Liquide **will save 1.5 million tons of CO<sub>2</sub> emissions** over the term of the agreement.

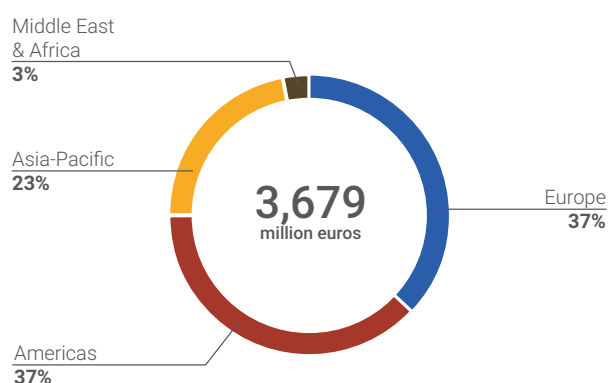
### Gas & Services

Operating income recurring for Gas & Services amounted to **3,679 million euros**, an increase of +2.6% as published compared with 2017. The operating margin as published was 18.3%. **Excluding the energy impact**, it stood at **18.6%**, representing a **+30 basis point** increase compared with 2017.

In an environment where global inflation is stronger, sales prices increased +1.5% for the year, thanks in particular to the Industrial Merchant business which was up **+2.5%**. Prices were down slightly in Electronics and almost flat in Healthcare.

**Efficiencies** totaled **315 million euros** in 2018 for Gas & Services.

### GAS & SERVICES 2018 RECURRING OPERATING INCOME



Gas & Services Operating margin <sup>(a)</sup>	2017	2018	2018, excluding energy
Americas	16.8%	17.2%	17.2%
Europe	19.3%	19.2%	19.8%
Asia-Pacific	19.7%	19.2%	19.5%
Middle East & Africa	17.2%	16.0%	15.0%
<b>TOTAL</b>	<b>18.3%</b>	<b>18.3%</b>	<b>18.6%</b>

(a) Recurring operating income/revenue, as published figures.

Operating income recurring for the **Americas** zone stood at **1,369 million euros** in 2018, stable **(+0.3%)** compared with 2017 due to the depreciation of the US dollar against the euro and the disposal of Airgas Refrigerants activity. Excluding the energy impact, the operating margin stood at 17.2%, an increase of **+40 basis points** compared with 2017. The Industrial Merchant operating margin improved markedly, notably due to the contribution from Airgas synergies and a high price impact. Conversely, strong Equipment & Installation sales in Electronics and the disposal of Airgas Refrigerants business had a dilutive effect on the margin.

Operating income recurring in the **Europe** zone reached **1,368 million euros**, an increase of **+4.5%**. Excluding the energy impact, the operating margin was 19.8%, a **+50 basis point** increase mainly due to price impact getting stronger throughout the year in Industrial Merchant and efficiencies generated across all business lines in the zone. Moreover, the active management of the business portfolio that led to the disposal of a small Equipment & Installation business in Electronics also had an accretive impact on the margin.

Operating income recurring in the **Asia Pacific** zone stood at **837 million euros**, an increase of **+4.1%**. Excluding the energy impact, the operating margin was 19.5%, down **-20 basis points**. The exceptionally high level of Equipment & Installation sales in Electronics and several Large Industries unit start-ups in China during the 2<sup>nd</sup> half had a slightly dilutive impact on the margin. Nevertheless, the Industrial Merchant operating margin improved, driven by cylinder gas sales growth and efficiencies.

Operating income recurring for the **Middle East and Africa** zone amounted to **105 million euros**, a decrease of **-3.9%** compared with 2017. Excluding the energy impact, the operating margin totaled 15.0%, a decrease of **-220 basis points**. After a transitional period in relatively exceptional operating conditions, the hydrogen production units in Yanbu, Saudi Arabia, have now reached their nominal operating mode marked by a structural adjustment of the operating margin.

## Engineering & Construction

Operating income recurring for Engineering & Construction totaled **-4 million euros**, penalized by a business volume which remained insufficient. Nevertheless, the gradual improvement in the business contributed to the return to a positive operating income recurring in the 2<sup>nd</sup> half which should continue to improve gradually to reach a margin of between 5% and 10% in the medium term.

## Global Markets & Technologies

Operating income recurring for Global Markets & Technologies reached **50 million euros** with an operating margin of 10.5% for the year; it was higher in the 2<sup>nd</sup> half (12.0%). A portion of these activities is in start-up phase and the margin level, which depends on the nature of the projects carried out during the period, may vary significantly.

## Research & Development and Corporate costs

Research & Development expenses and Corporate costs stood at **277 million euros**, a +14.2% increase compared with 2017, due to an increase in research and the ramping-up of the Group's digital transformation.

## NET PROFIT

**Other operating income and expenses** showed a **net balance of -162 million euros**. This was mainly related to costs for realignment plans in various countries and businesses, in particular Engineering & Construction, Airgas integration costs and provisions for exceptional geopolitical risks.

The **financial result of -353 million euros** was down compared with 2017 (-489 million euros). Net finance costs, at -303 million euros, were down -28.1% and benefited from a non-recurring gain of around 55 million euros generated during the 1<sup>st</sup> half of the year by the unwinding of hedging instruments relating to debt restructuring in the United States. Excluding this impact, the **average cost of net indebtedness**, at **3.0%**, was down by **-20 basis points** compared with 2017.

Income tax expense stood at **731 million euros**, a +523 million euros increase compared with 2017 when an exceptional non-cash gain of 586 million euros was recognized mainly due to the US tax reform. The effective tax rate was **24.9%** in 2018, a +450 basis point improvement over the recurring effective tax rate of 2017. This decrease was mainly due to the reduction of the US federal income tax rate from 35% to 21% coupled with exceptional items, notably in France during the 1<sup>st</sup> half of the year and in the Netherlands during the 2<sup>nd</sup> half of the year.

The **share of profit of associates** amounted to **4 million euros**, compared with 5 million euros in 2017. The **share of minority interests in net profit** reached 94 million euros, an increase of **+2.2%**, as the profit from subsidiaries with minority shareholders rose, particularly in China.

For the record, **net profit from discontinued operations** for 2017 (-37 million euros) reflected the impact of the disposal of Air Liquide Welding.

**Net profit (Group share)** amounted to **2,113 million euros** in 2018, down -3.9% as published, but up **+4.2%** compared with the "recurring" net profit for 2017 which excluded exceptional items and the impact of the US tax reform that had no impact on cash flow, and up **+8.7%** when also excluding the currency impact.

**Net earnings per share**, at **4.95 euros**, were up **+4.0%** compared with the "recurring" net earnings per share for 2017, in line with the increase in net profit (Group share). The average number of outstanding shares used for the calculation of net earnings per share as of December 31, 2018 was **426,674,123**.

## CHANGE IN THE NUMBER OF SHARES

	2017	2018
<b>Average number of outstanding shares <sup>(a)</sup></b>	<b>426,409,142</b>	<b>426,674,123</b>
Number of shares as of December 31, 2017		426,731,852
Options exercised during the year		185,549
Capital increase reserved for employees		1,049,529
<b>NUMBER OF SHARES AS OF DECEMBER 31, 2018</b>		<b>427,966,930</b>

(a) Restated in 2017 for the impact of the free share attribution on October 4, 2017.



## Change in the number of shares

- At the end of October, Air Liquide announced an **increase in share capital reserved for employees**. This transaction, which forms part of the Group's policy to develop employee share ownership, covers more than seventy countries. Air Liquide aims to **further associate its employees** to the Group's development and its performance over the long-term.

## DIVIDEND

At the Annual General Meeting on May 7, 2019, the payment of a dividend of **2.65 euros per share** as well as **a free share attribution of 1 for 10** will be proposed to shareholders for the fiscal year 2018. The total estimated pay-out taking into account share buybacks and

cancellations would amount to **1,165 million euros**, representing a **pay-out ratio of 55%** of the published net profit. The ex-dividend date is scheduled for May 20, 2019 and the payment is scheduled for May 22, 2019.

## 3. 2018 Cash Flow and Balance Sheet

(in millions of euros)	2017	2018
<b>Cash flow from operating activities before change in working capital</b>	<b>4,133</b>	<b>4,138</b>
Change in working capital requirement	188	613
Other items	(67)	(35)
<b>Net cash flow from operating activities</b>	<b>4,254</b>	<b>4,716</b>
Dividends	(1,099)	(1,234)
Purchases of property, plant and equipment and intangible assets, net of disposals <sup>(a)</sup>	(1,850)	(2,272)
Increase in share capital	70	138
Purchase of treasury shares	(158)	(64)
Impact of exchange rate changes and net indebtedness of newly consolidated companies & restatement of net finance costs	780	(448)
<b>Change in net indebtedness</b>	<b>1,997</b>	<b>836</b>
Net indebtedness as of December 31	(13,371)	(12,535)
<b>DEBT-TO-EQUITY RATIO AS OF DECEMBER 31</b>	<b>80%</b>	<b>69%</b>

(a) Including transactions with minority shareholders.

## NET CASH FLOW FROM OPERATING ACTIVITIES

**Cash flow from operating activities before changes in working capital requirement** totaled 4,138 million euros, stable (+0.1%) compared with 2017, and stood at **19.7% of Group sales**.

**Net cash flow from operating activities after changes in working capital requirement** amounted to **4,716 million euros**, up **+10.9%** compared with 2017, and reached **22.4%** of sales. This improvement is the result of measures taken to reduce working capital requirement.

## CHANGES IN WORKING CAPITAL

Working capital requirement (WCR) **decreased by -613 million euros** in 2018. This improvement mainly came from Gas & Services, where trade receivables were down, notably thanks to the introduction of a non-recourse factoring program at Airgas. Engineering & Construction WCR was also down, albeit to a lesser extent, and that of Global Markets & Technologies was stable. Working capital requirements excluding tax came to **4.1% of sales**, down compared with the 2017 ratio of 6.4%.

## CAPITAL EXPENDITURE

In 2018, **gross capital expenditure** totaled **2,380 million euros**, including transactions with minority shareholders.

(in millions of euros)	Industrial investments	Financial investments <sup>(a)</sup>	Total capital expenditures <sup>(a)</sup>
2014	1,902	273	2,175
2015	2,028	395	2,423
2016	2,259	12,180	14,439
2017	2,183	144	2,327
<b>2018</b>	<b>2,249</b>	<b>131</b>	<b>2,380</b>

(a) Including transactions with minority shareholders.

**Proceeds from the sale of fixed assets**, for a total of **103 million euros**, related to smaller non-strategic assets. These disposals were part of active business portfolio management.

**Net capital expenditure**, including the buyout of minority interests, amounted to **2,272 million euros**.

### Industrial capital expenditure

Gross industrial capital expenditure for the Group amounted to **2,249 million euros** in 2018, up +3.1% compared with 2017. They represented **10.7% of sales**. For Gas & Services, this expenditure totaled **2,071 million euros** and their geographical split is described below.

(in millions of euros)	Gas & Services				Total
	Europe	Americas	Asia Pacific	Middle East and Africa	
2017	578	690	509	154	1,931
<b>2018</b>	<b>676</b>	<b>861</b>	<b>461</b>	<b>73</b>	<b>2,071</b>

### Financial investments

Financial investments amounted to **131 million euros**, including transactions with minority shareholders of one million euros.

## NET INDEBTEDNESS

Net indebtedness at December 31, 2018 reached **12,535 million euros**. Despite a negative currency impact and an increase in the dividend, net indebtedness declined -836 million euros compared with the end of 2017 due to a very high level of net cash flow from operating activities in 2018. The **debt-to-equity ratio** stood at **68.8%** at the end of December 2018, a strong decline compared to 80% at the end of 2017.



### Debt issue

- In March, Air Liquide successfully completed a **first bond issuance on the Chinese mainland market** ("Panda") for an aggregate nominal amount of **2.2 billion renminbi (approximately 280 million euros)**, becoming one of the first European companies to issue on this market. This transaction bears coupons of **5.95% and 6.40%** for a **3-year and a 5-year maturity** respectively. The 5-year issuance, the longest maturity ever achieved by a European company on the Panda market, reflects the long-term dimension of the Group's activities. The proceeds of this issue will be used to finance new investments in China and to refinance debt related to previous investments in China.

## ROCE

The return on capital employed after tax (ROCE) stood at **8.0%**, a **+30 basis point** increase compared with the recurring ROCE at the end of 2017 <sup>(a)</sup> (7.7%). Excluding the currency impact, ROCE improved by **+60 basis points**. The Group confirmed the NEOS target of returning to a ROCE above 10% by 2021-2022.

(a) Which excludes from 2017 net profit the non-cash impacts of exceptional items and the US tax reform.

## 4. Investments and financing

### INVESTMENTS

The momentum in investment projects seen in recent quarters continued. Investment decisions reached a record level, while the 12-month portfolio of opportunities increased sharply.

#### Investment decisions and investment backlog

<i>(in billions of euros)</i>	Industrial investment decisions	Financial investment decisions (acquisitions)	Total investment decisions
2014	1.9	0.2	2.1
2015	1.9	0.5	2.4
2016	2.0	12.2	14.2
2017	2.4	0.2	2.6
<b>2018</b>	<b>3.0</b>	<b>0.2</b>	<b>3.1</b>

In 2018, **industrial and financial investment decisions** exceeded **3.1 billion euros**, a **+22%** increase compared with 2.6 billion euros in 2017. This was a record level excluding major acquisitions. At 1,173 million euros, 4<sup>th</sup> quarter decisions were particularly high.

**Industrial investment decisions** amounted to **2,960 million euros**. These included nine major investments in Large Industries, of which five are in key industrial basins for the Group, in Benelux and along the Gulf Coast of the United States, three are in developing economies, in Eastern Europe and in China, and one efficiency investment was in Japan. Industrial investment decisions in Electronics were up more than +40% compared with 2017 and reached a record high in 2018. These included nine ultra-pure nitrogen supply investments for major

players in the integrated circuit industry, mainly in Asia. Moreover, investment decisions in Global Markets & Technologies, linked to the energy transition, were up markedly in 2018, in particular for hydrogen energy and biomethane.

**Financial investment decisions** reached approximately **160 million euros** for the year. These mainly included bolt-on acquisitions in Industrial Merchant, in the United States (seven companies were acquired by Airgas in 2018) and in China, as well as in Healthcare.

The **investment backlog** totaled **2.2 billion euros**, an increase of almost 100 million euros compared with 2017. It is expected to bring a future contribution to annual sales of approximately **0.9 billion euros per year** after full ramp-up of the units.





## Industrial and financial investment decisions

- Air Liquide announced in April having signed a new **long-term contract with Covestro**, a world-leading supplier of high-tech polymer materials, **for the supply of hydrogen** to their new production site in the port area of Antwerp. Air Liquide will invest **80 million euros** in the construction of a hydrogen production unit fitted with a new proprietary technology that **improves energy efficiency and the overall environmental footprint of the production process**. **By capturing carbon and upgrading the recovered CO<sub>2</sub>**, this model is part of a **circular economy system**. The hydrogen produced will also enable Air Liquide to supply customers in this industrial basin in Europe.
- Air Liquide and Evraz, a world major steel producer, have signed a **long-term contract for the supply of oxygen, nitrogen and argon** in Novokuznetsk, Russian Federation. Air Liquide will invest **around 130 million euros** for the construction of two state-of-the-art Air Separation Units of **1,500 ton per day of oxygen each**. These plants will improve energy efficiency and the overall **environmental footprint** of the production process.
- In April, Air Liquide announced having signed a new **long-term contract in the United States with LyondellBasell to supply oxygen** to their new petrochemical plant in Texas, expected to be completed in 2021. This new propylene oxide/tertiary butyl alcohol plant (PO/TBA) is expected to be the largest in the world upon construction. The oxygen will be sourced from **Air Liquide's pipeline system** which spans more than 2,000 miles along the coasts of Texas and Louisiana, part of the largest pipeline system in the world.
- With the **acquisition** of the respiratory division of **Thimar Al Jazirah Company (TAC)** in **Saudi Arabia**, announced in early January, Air Liquide enters the Home Healthcare market in Saudi Arabia, where the Group already supplies medical gases to hospitals. This division is specialized in the distribution of respiratory equipment and related services. TAC is the main player in this field, serving over **1,400 patients** at home throughout the country. In **2016**, the Home Healthcare division of TAC generated a **revenue of over 5.5 million euros**.
- Air Liquide extends its service offering of Home Healthcare activity via the **acquisition at the beginning of April of the start-up EOVE**, a French company specialized in the **design and manufacture of ventilators** for home-based patients suffering from chronic respiratory failure. EOVE developed an innovative solution: a connected portable ventilator that takes into account the mobility needs of patients and facilitates the practice of doctors.
- Airgas announced, in May, **the acquisition of the assets and operations of Weiler Welding Company**, a full-service industrial gas, beverage and gas welding supply business, based in Moraine, Ohio. **This transaction marks the 500<sup>th</sup> acquisition in Airgas' 36-year company history**.
- In June 2018, Air Liquide announced the **acquisition of a minority stake in the Chinese startup STNE** (Shanghai Sino-tran New Energy Automobile Operation CO., Ltd.) to **accelerate the rollout of hydrogen-powered electric truck fleets in China**. This agreement fits in the Chinese government's 13<sup>th</sup> five-year-plan, which aims notably to support the development and sale of hydrogen-powered electric vehicles serving clean mobility.

## Start-ups

There were **17 start-ups** during 2018 including Fujian Shenyuan in China in December: six start-ups in the Americas including four in the United States; four in Europe including the Kazakhstan takeover, which marks the Group's entry into this country; five in Asia including three in China; and two in the Middle East and Africa in Egypt. Fujian Shenyuan also contributes for one month of activity, all tests being

successfully completed and all necessary permits being obtained, while discussions are still going-on regarding the full implementation of certain contract clauses.

**Over 2018, the contribution to sales** of unit start-ups and ramp-ups totaled **270 million euros**. The largest contribution came from the start-up of a major Air Separation Unit in South Africa at the end of December 2017.



- In December 2017, Air Liquide has started-up the **world's largest oxygen production unit** for **Sasol**, an international integrated energy and chemicals company. Air Liquide invested around **200 million euros** for the construction of this unit, with a total production capacity of **5,000 tonnes of oxygen per day** in Secunda (around 140 km East of Johannesburg). Owned and operated by Air Liquide, it is the first time that Sasol has chosen to outsource its oxygen needs to a specialist of industrial gas production at this site.
- The start-up of this major unit in South Africa is also a new source of rare gases. In 2018, several **multi-year contracts worth a total of more than 50 million euros supplying xenon and krypton** have been signed by Air Liquide and the semiconductor and the satellite industries. The **semiconductor industry** uses xenon or krypton in its new processes to produce high-end flash memories at a lower cost. The **all-electric propulsion satellites** also use xenon, enabling significant launching costs reduction.
- Early September, **Air Liquide starts supplying hydrogen in Kazakhstan** through the **acquisition of hydrogen and purification units** with a total capacity of up to 30,000 Nm<sup>3</sup>/h. This investment of 12 million euros by Air Liquide Munay Tech Gases (ALMTG) marks **the first step in the cooperation between Air Liquide and KazMunayGaz (KMG)**. The hydrogen and steam produced will be delivered to the Pavlodar Oil Chemistry Refinery (POCR) in the context of a long term Gas Supply Agreement.

## Investment opportunities

The **12-month portfolio of investment opportunities** totaled **2.6 billion euros**, as of December 31, 2018, up **500 million euros** compared with 2017, despite a particularly high level of investment decisions. Indeed, new projects in the portfolio represented amounts that exceeded those signed by the Group, awarded to the competition or delayed. The portfolio of investment opportunities had not reached this level since the end of 2015.

The Americas remained the leading region within the portfolio with more than one third of opportunities followed by Asia, which increased its relative share. Opportunities mainly came from the chemicals and metals industries in Large Industries, which represented two thirds of the portfolio, and from the integrated circuit industry in Electronics.

Around half of projects had investments of less than 50 million euros and five projects had investments of between 100 and 150 million euros. The **average size of projects was down compared with prior years to around 20 million euros**, which contributed to a better distribution of risk and ensures more regular future growth. The portfolio of opportunities also included some takeovers that would have a faster contribution to growth.

## 2018 FINANCING

### "A" category rating confirmed

Air Liquide is rated by two main rating agencies, Standard & Poor's and Moody's. The long-term rating from Standard & Poor's for Air Liquide is "A-" and from Moody's "A3". These are in line with the Group's strategy. Moreover, the short-term ratings attributed to Air Liquide are "A2" for Standard & Poor's and "P2" for Moody's. Standard & Poor's, on October 11, 2018, and Moody's, on June 18, 2018, confirmed their ratings and have maintained their stable outlook.

### Diversifying and securing financial sources

As of December 31, 2018, financing through capital markets accounted for 94% of the Group's total debt, for an amount of bonds outstanding of 12.4 billion euros, across all programs, and 0.7 billion euros of commercial paper.

As of December 31, 2018, the total amount of credit facilities had increased significantly, from 3.1 billion euros, to 3.6 billion euros. The amount of bilateral credit facilities decreased from 1.8 to 1.6 billion euros, as one facility reached maturity, and was renewed for an amount that was 0.2 million euros lower. The Group also renewed a syndicated credit facility, taking the amount from 1.3 billion euros to 2 billion euros. This facility will mature in December 2023, and has two extension options of one year each.

As of December 31, 2018, the amount of total debt maturing in the next 12 months was 2.5 billion euros, stable compared to the amount at December 31, 2017.

## 2018 issues

In March 2018, Air Liquide Finance successfully completed a **first bond issuance on the Chinese mainland market** ("Panda") for an aggregate

nominal amount of **2.2 billion Chinese renminbi (approximately 280 million euros)**. Income from this issue was used to finance new investments and to refinance debt related to previous investments in China.

Moreover, as of the end of 2018, outstanding bonds issued under the EMTN program amounted to 5.9 billion euros (nominal amount).

## Net indebtedness by currency as of December 31

	12/31/2017	12/31/2018
Euro	31%	45%
US dollar	52%	37%
Chinese renminbi	5%	3%
Japanese Yen	3%	3%
Other	9%	12%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

Investments are generally funded in the currency in which the cash flows are generated, creating a natural currency hedge. In 2018, US dollar debt decreased markedly, following the financing in euros of a share of debt in US dollar contracted for Airgas acquisition. The weighting between the euro and the US dollar has thus shifted in favor of the euro. Moreover, the debt in US dollars has benefited from a favorable currency impact. Debt denominated in Chinese renminbi decreased in volume and share, as the cash flow generated was used to repay a portion of the debt. Debt denominated in Japanese yen remains stable.

## Centralization of cash and funding

Air Liquide Finance continued to pool the cash flow balances of Group entities. In 2018, Air Liquide included the Australian dollar in its daily cashpooling, which now contains 14 currencies.

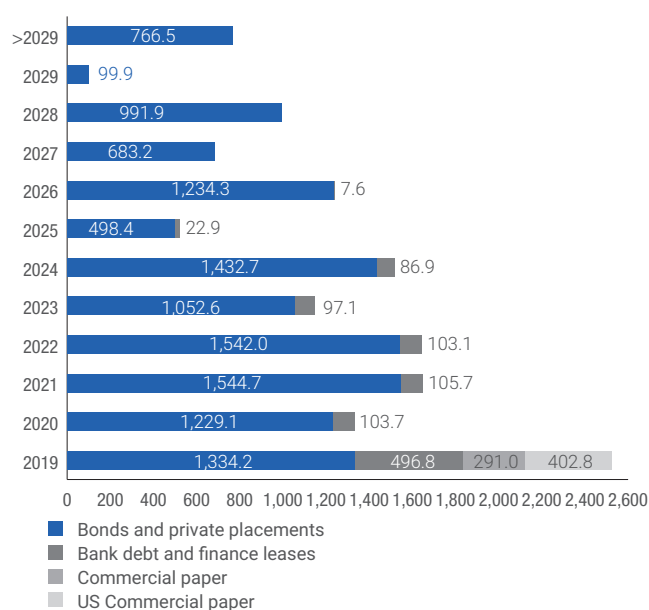
As of December 31, 2018, Air Liquide Finance had granted, directly or indirectly, the equivalent of 15.4 billion euros in loans and received 4.4 billion euros in excess cash as deposits. These transactions were denominated in 28 currencies (primarily the euro, US dollar, Singapore dollar and Chinese renminbi). The direct and indirect scope (including subsidiaries where cashpooling is carried out locally before being centralized at Air Liquide Finance) included around 390 subsidiaries.

## Debt maturity and schedule

The average of the Group's debt maturity stood at 5.9 years at December 31, 2018. This is a slight decrease compared with December 31, 2017, due to bond issues which reached maturity in 2018 without renewal, through the use of cash.

The following chart represents the Group's debt maturity schedule. The single largest annual maturity represents approximately 18% of total debt.

### DEBT MATURITY SCHEDULE



## APPENDICES

## Estimated impact of IFRS 16 on the fiscal year 2019

As of January 1, 2019, the Group financial statements will include the impacts of the mandatory adoption of the standard IFRS 16 « Leases » issued on January 13, 2016. **The Group will not restate the financial statements of prior periods.** The standard **will not affect the recognition of revenue** for the Group as a lessee, as mentioned in the paragraph 3 of accounting principles of the consolidated financial statements (pages 192 and 193). The main impact of the application of IFRS 16 for the Group as a lessee consists of the recognition on the balance sheet of all lease contracts, without distinction between finance and operating leases. In the course of its activity, the Group as a lessee enters in contracts mainly for the following type of assets:

- Land, buildings and offices;
- Transportation equipment, in particular for Industrial Merchant and Healthcare;
- Other equipment.

Any contract containing a lease leads to the **recognition on the lessee's balance sheet of a lease liability** measured at the present value of the remaining lease payments **and a right-of-use asset** measured at the amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments as well as of any provision for onerous leases recognized in the balance sheet as of December 31, 2018.

Data collection and quantitative analysis of the impacts on the Group's financial statements are being finalized but the Group anticipates the following impacts:

- **Consolidated Balance Sheet:** The Group estimates that the first application of IFRS 16 would lead to the recognition on January 1, 2019, of a right-to-use and a lease liability in the range of **1.3-1.5 billion euros**.
- **Consolidated Income Statement.** The operating expenses linked to lease contracts will from now on be accounted for as Depreciation & Amortization and Finance Costs:
  - The **Operating Margin before Depreciation & Amortization** <sup>(a)</sup> should increase by approximately **+100 basis points**;
  - The **Depreciation & Amortization on Revenue** ratio should increase by approximately **+100 basis points**;
  - The Operating Income Recurring (OIR) should increase slightly, the impact of which on the **OIR on sales ratio should be limited to a maximum of +10 basis points**;
  - The Group **does not expect any material impact on the Net Profit**.
- **Return on Capital Employed (ROCE):** with the recognition of an additional debt, the ROCE should decrease by **-10 to -20 basis points**.

(a) Operating Income Recurring before Depreciation & Amortization on Revenue

## Currency, energy and significant scope impacts (Year)

## Applied method

In addition to the comparison of published figures, financial information is given excluding currency, natural gas and electricity price fluctuation and significant scope impacts.

- Since industrial and medical gases are rarely exported, the impact of currency fluctuations on activity levels and results is limited to euro translation impacts with respect to the financial statements of subsidiaries located outside the euro zone. **The currency effect** is calculated based on the aggregates for the period converted at the exchange rate for the previous period.
- In addition, the Group passes on variations in the cost of energy (electricity and natural gas) to its customers via indexed invoicing integrated into their medium and long-term contracts. This indexing can lead to significant variations in sales (mainly in the Large Industries business line) from one period to another depending on fluctuations in prices on the energy market.
  - **An energy impact** is calculated based on the sales of each of the main subsidiaries in Large Industries. Their consolidation allows the determination of the energy impact for the Group as a whole. The foreign exchange rate used is the average annual exchange rate for the year N-1.
  - Thus, at the subsidiary level, the following formula provides the energy impact, calculated for natural gas and electricity respectively:
 
$$\text{Energy impact} = \text{Share of sales index to energy year (N-1)} \times (\text{Average energy price over the year (N)} - \text{Average energy price over the year (N-1)})$$
  - This indexation effect of electricity and natural gas does not impact the operating income recurring.
- **The significant scope effect** corresponds to the impact on sales of all acquisitions or disposals of a significant size for the Group. These changes in scope of consolidation are determined:
  - for acquisitions during the period, by deducting from the aggregates for the period the contribution of the acquisition,
  - for acquisitions during the previous period, by deducting from the aggregates for the period the contribution of the acquisition between January 1 of the current period and the anniversary date of the acquisition,
  - for disposals during the period, by deducting from the aggregates for the previous period the contribution of the disposed entity as of the anniversary date of the disposal,
  - for disposals during the previous period, by deducting from the aggregates for the previous period the contribution of the disposed entity.

(in millions of euros)	FY 2018	FY 2018/2017 Published Growth	Currency impact	Natural gas impact	Electricity impact	Significant scope impact	FY 2018/2017 Comparable Growth
<b>Revenue</b>							
Group	21,011	+3.3%	(752)	186	93	(98)	+6.1%
Impacts in %			-3.6%	+0.9%	+0.4%	-0.5%	
Gas & Services	20,107	+2.4%	(733)	186	93	(98)	+5.2%
Impacts in %			-3.7%	+0.9%	+0.5%	-0.5%	
<b>Operating Income Recurring</b>							
Group	3,449	+2.5%	(142)	-	-	(26)	+7.6%
Impacts in %			-4.2%			-0.8%	
Gas & Services	3,679	+2.6%	(141)	-	-	(26)	+7.3%
Impacts in %			+3.9%			-0.7%	

The operating margin excluding energy impact corresponds to the operating income recurring on sales excluding energy. For the year 2018 and at Group level it stands at 16.6% = 3,449 / (21,011 – 186 – 93).

The sale of the **Airgas refrigerants** business in October 2017 generated a significant scope impact on 2018 revenue, the details of which is broken down per quarter below:

(in millions of euros)	Q1 2018	Q2 2018	Q3 2018	Q4 2018	2018
Airgas refrigerants	(35)	(36)	(26)	(1)	(98)
Impacts in %	-0.7%	-0.7%	-0.5%	-0.0%	-0.5%

The 2017 recurring net profit (Group share) reached 2,029 million euros and corresponded to the published net profit (Group share) of 2017 excluding the non-cash impacts of non-recurring items and the US tax reform. The currency impact on the 2018 net profit (Group share) was 92 million euros. The 2018/2017 change compared to 2017 recurring net profit and excluding energy stood therefore at (2,113 + 92) / 2,029 – 1 = +8.7%.

## Return on Capital Employed – ROCE

### Applied method

Return on capital employed after tax is calculated based on the Group's consolidated financial statements, by applying the following ratio for the period in question: For the numerator: net profit – net finance costs after taxes for the period in question. For the denominator: the average of (total shareholders' equity + net indebtedness) at the end of the past three half-years.

<b>ROCE FY 2018</b> (in millions of euros)		2017 (a)	H1 2018 (b)	2018 (c)	ROCE Calculation
	Profit for the period			2,207.4	2,207.4
	Net finance costs			-303.4	-303.4
	Effective tax rate <sup>(a)</sup>			25.5%	25.5%
	Net financial costs after tax			-226.0	-226.0
	<b>Profit for the period - Net financial costs after tax</b>			<b>2,433.4</b>	<b>2,433.4</b>
<b>Denominator</b> <b>((a)+(b)+(c))/3</b>	Total equity	16,718.4	16,769.4	18,207.4	17,231.7
	Net indebtedness	13,370.9	14,217.3	12,534.9	13,374.4
	<b>Average of (total equity + net indebtedness)</b>				<b>30,606.1</b>
<b>ROCE</b>					<b>8.0%</b>

(a) Excluding non-recurring tax impacts.

ROCE FY 2017 (in millions of euros)		2016 (a)	H1 2017 (b)	2017 (c)	ROCE Calculation
	Profit for the period			2,291.6	2,291.6
	Net finance costs			-421.9	-421.9
	Effective tax rate *			29.4%	29.4%
	Net financial costs after tax			-297.9	-297.9
	<b>Profit for the period - Net financial costs after tax</b>			<b>2,589.5</b>	<b>2,589.5</b>
<b>Denominator ((a)+(b)+(c))/3</b>	Total equity	17,125.0	16,049.0	16,718.4	16,630.8
	Net indebtedness	15,368.1	15,610.1	13,370.9	14,783.0
	<b>Average of (total equity + net indebtedness)</b>				<b>31,413.8</b>
<b>Published ROCE</b>					<b>8.2%</b>
<b>ROCE EXCLUDING THE NON-CASH IMPACTS OF THE 2017 EXCEPTIONAL ITEMS</b>					<b>7.7%</b>

\* Excluding non-recurring tax impacts.

Return on capital employed after tax was at **8.0%**, up **+30 basis points** from **recurring ROCE at the end of 2017\*\* (7.7%)**. Excluding the currency effect, the improvement was **+60 basis points**:

- The numerator, net profit - net finance costs after taxes in 2018, became 2,532.5 million euros

- The denominator, the average of (total shareholders' equity + net indebtedness) at the end of 2017, the 1<sup>st</sup> half of 2018 and 2018, became: 30,413.0 million euros.
- The ROCE excluding the currency effect, corresponding to the two elements above, therefore became  $2,532.5/30,413.0 = 8.3\%$ , which gave an improvement of +60 basis points compared to the ROCE published at the end of 2017, which was 7.7%.

## 5. Environment and society

This part presents the Group's most significant sustainability actions, in response to the risks and challenges set out in "Risk factors and internal control procedures" on page 40. These results are closely monitored and are at the heart of the Group's performance. Additional information and the reporting of environmental and social risks are also presented in chapter 4 of this document.

The main environmental and societal risks, the risk management policies applied by the Group and the results of these policies described in chapters 1 and 4, represent the Extra-financial Performance Declaration – (article L. 225-102-1 para. 1).

### 5.1. PREREQUISITES TO ACTION: SAFETY, ETHICS AND THE RESPECT OF HUMAN RIGHTS

#### 5.1.1. Safety: a key Air Liquide value

Long-term performance is at the heart of Air Liquide's ambition. To achieve this, prerequisites include Safety, Ethics and the respect of Human Rights and the Environment. Regarding Safety, Air Liquide has a "zero accidents" objective.

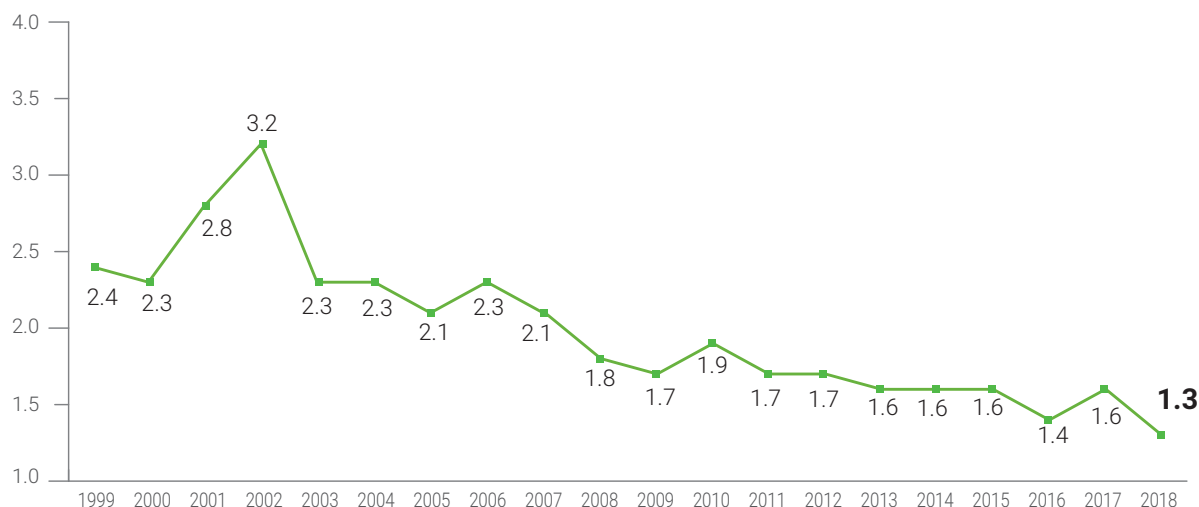
#### 2018 Safety results

Air Liquide's employees lost-time accident frequency rate was 1.3 at the end of 2018, a 20% improvement compared to 2017. **This is the lowest frequency rate the Group has achieved in 20 years.**

\*\* Which excludes from 2017 net profit the non-cash impacts of exceptional items and the US tax reform.



## FREQUENCY OF ACCIDENTS <sup>(a)</sup> <sup>(b)</sup>



(a) Number of lost-time accidents with at least one lost day per million hours worked by Group employees.

(b) Including Airgas since 2017.

These results include the safety performance of newly-acquired companies, in particular Airgas and Home Healthcare subsidiaries such as Oxymaster in Colombia.

Key success factors can be seen in these various acquisitions. First, carrying out an on-site review is an essential step to identify potential risks and discrepancies which need to be addressed before defining priorities and in particular putting in place the required resources; notably safety and risk management functions. Second, the full commitment of the new subsidiary's entire management board is paramount. Finally, the upgrading of infrastructure and equipment at risk is key, with the allocation of a specific budget.

In 2018, Air Liquide unfortunately experienced three fatal accidents among its employees and five among its subcontractors, mostly on the road. In response to these tragedies and led by the Group's Executive Committee, coordinated action plans were implemented, in particular in terms of road safety and safety leadership expectations.

### Industrial Management System

Almost 15 years ago, Air Liquide introduced an Industrial Management System (IMS) dedicated to its businesses. This system has changed work methods significantly and improved process management in safety, reliability, protection of the environment and industrial risk management. Rolled out across the Group, its implementation is regularly assessed by specific IMS internal audits. Building on the experience acquired, a project was launched in 2018 to adapt the IMS, in order to improve its efficiency in all Group entities. While maintaining

the strong fundamentals of the current IMS, the protocol will be simplified, roles and responsibilities made clearer and governance strengthened. New tools, some of which digital, will be made available to the operating entities.

### 5.1.2. Ethics

The Code of Conduct supports the Group's anti-corruption program (see pages 17 and 44).

This Code of Conduct is adapted at the local level for Group employees. In 2018, 97% of them belonged to subsidiaries that have a local Code of Conduct. The employees who do not yet have a local Code of Conduct primarily belong to entities recently acquired by the Group and undergoing integration. Currently, these Codes of Conduct have been translated into more than 20 languages to ensure their appropriation by all employees.

### The whistleblowing system

Air Liquide has a whistleblowing\* system covering all Group entities. Almost 300 reports were received during 2018 mainly from the United States, Brazil, the United Arab Emirates and France, as well as from 30 other countries. Human Resources issues accounted for more than 70% of the reports and the remaining issues related to fraud and other subjects such as safety. Around one fourth of the reports processed were sufficiently detailed to implement corrective measures or disciplinary sanctions. The whistleblowing system is also accessible to external collaborators (temporary workers, service providers, etc.)

\* Airgas has a specific alert system.

### 5.1.3. Human Rights

Air Liquide is dedicated to the highest standards for the conduct of its business and its Chief Executive Officer signs the United Nations Global Compact. Air Liquide's letter of commitment, signed by its CEO may be viewed on the Air Liquide and Global Compact websites.

Air Liquide also complies with the rules of the International Labour Organization (ILO) in terms of labor law and follows guidelines for multinational companies issued by the OECD. These Guidelines

encourage the reasonable conduct of companies in terms of professional relationships, Human Rights, the environment, taxation, the publication of information, anti-corruption, the interest of consumers, science and technology, and competition.

Moreover, Air Liquide has signed the Responsible Care® Global Charter of the International Council of Chemical Associations (ICCA) which aims to improve global performances in the chemical industry in terms of health, safety and the protection of the environment.

## 5.2. CLIMATE ACHIEVEMENTS IN 2018

### 5.2.1. Climate objectives

#### CLIMATE OBJECTIVES



At the end of November 2018, Air Liquide announced its 2025 Climate objectives.

As part of a global approach named A.C.E., the Group has set objectives which are the most ambitious in its sector. These commitments therefore focus not only on **reducing the carbon intensity of its Assets (A)**, but also on **working with its Customers (C) towards a sustainable industry and taking part in the emergence of a low-carbon society with all its Ecosystems (E)**.

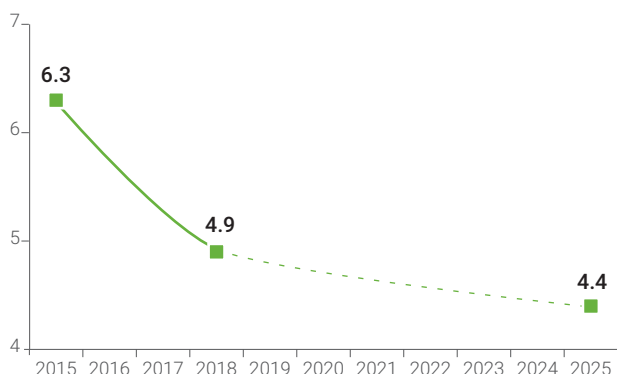
#### Working with the Group's Assets (A)



Within its production, distribution and services activities, Air Liquide is committed to reducing its carbon intensity<sup>(a) (b)</sup> by 30% by 2025, based on its 2015 emission levels.

**For 2018, the carbon intensity is 4.9, which represents a 22% reduction compared to the 2015 carbon intensity (6.3) and a 74% progression toward the 2025 target (4.4).**

#### CARBON INTENSITY



(a) In kg CO<sub>2</sub> equivalent / euro EBITDA.

(b) EBITDA calculated at constant exchange rates on the basis of 2015 exchange rates.

Air Liquide has identified three key levers over the period 2015-2025 to reach this objective:

#### **Increasing its purchases of renewable electricity by nearly 70%**

To increase its purchases of renewable electricity from 6 TWh in 2015 to 10 TWh in 2025, Air Liquide has introduced a proactive approach to renewable electricity procurement through direct contracts with producers (called PPA – Power Purchase Agreements). Moreover, the Group has included the energy mix in the selection criteria of its suppliers. This lever also includes the improvement targeted by the Paris Agreement for the energy mix of the countries where the Group operates.

For 2018, the amount of renewable energy purchased by Air Liquide totaled 7.4 TWh. **The change since 2015 represents 35% of the ambition set for 2025.**



#### **Air Liquide signs a renewable electricity purchase agreement**

Air Liquide has signed an agreement to purchase 50 megawatts (MW) of renewable wind electricity from a subsidiary of NextEra Energy Resources, LLC, the world's largest producer of renewable energy. The wind farm that will supply the 50 MW to Air Liquide is under development in Menard County, Texas, and is scheduled to be completed by the fourth quarter of 2020.

Thanks to this agreement, Air Liquide expects to supply a significant portion of its growing industrial gas production assets in Texas using renewable energy sources. By using the wind-generated electricity, the Company will save 1.5 million tons of CO<sub>2</sub> emissions over the term of the agreement.

### Improving the energy efficiency of its production units by 5%

In this area, the Group aims to reduce the energy consumption by unit of volume of its plants by 5%. First, the efforts of the innovation teams which permanently push the limits of the Group's main technologies, should lead to benefits in terms of the performance of the most recent production units.

Moreover, the Group has decided to invest more in the modernization of its production units by equipping them with cutting edge technologies.

Finally, thanks to the automation and centralization of its operations, the Group has optimized the performances of its plants – in particular in terms of energy consumption – resulting in both efficiency gains and a reduction in its environmental footprint (CO<sub>2</sub> avoided emissions).

In 2018, the Group' ASUs efficiency improved, with a 1.5% reduction in energy consumption per m<sup>3</sup> of air gas produced compared to 2015.

However, the performance of HyCO units declined, with an increase of 0.4% in energy consumption per m<sup>3</sup> of hydrogen produced since 2015.

**Overall, efficiency has increased by 1%, representing 21% of the target to be achieved in 2025.**



### A new remote operations center in South-East Asia

One year after the launch of its first remote operation center in France, Air Liquide inaugurated in 2018 its Smart Innovative Operations (SIO) Center for the South-East Asia Pacific region, located in Malaysia. The SIO Center enables the remote management of the production for 18 Air Liquide Large Industries units spanning eight countries across the region.

Through big data combined with the Group's expertise, the workflow of each Air Liquide production unit linked to the SIO Center is adapted in real time to the needs of each customer. The SIO Center enables 24/7 responsiveness to customer demand and improves the energy efficiency of our assets, by leveraging predictive maintenance to ensure continuous supply.

### Reducing the carbon footprint of its bulk and cylinder products by 10% through the optimization of both production and transportation and the efficiency of delivery rounds.

Today, only 15% of the air gases or hydrogen produced by Air Liquide are transported by road (the rest of the deliveries are carried out, either by pipeline or through units directly installed at the customers' sites). Moreover, thanks to the success of the delivery optimization programs,

the efficiency of industrial gases transportation continues to improve. In 2018, and following the integration of Airgas into the Group's reporting, the efficiency of our distribution decreased by 2.6% compared to 2015, but the target of a 10% improvement by 2025 is maintained.

Moreover, Air Liquide aims to convert 20% of its fleet of trucks to alternative fuels by 2025. The first project has been launched in Europe which aims to convert 50% of its trucks during this period (including trucks operated by subcontractors).

### EVOLUTION OF THE DISTANCE TRAVELED PER TON OF LIQUID INDUSTRIAL GAS DELIVERED <sup>(a)</sup>

2014	2015	2016 <sup>(b)</sup>	2017	2018
94.8	92.2	90.3	93.3	94.6

(a) In kilometers per ton delivered for the Industrial Merchant activity. 2008 base of 100.

(b) Excluding Airgas.

### Taking action with customers (C)



With its customers, the Group is committed to working towards a clean and sustainable industry. Thanks to its essential molecules management (oxygen, hydrogen, CO<sub>2</sub>, etc.) and its in-depth knowledge of its customers' processes, Air Liquide offers technologies which allow its customers to improve the energy efficiency of their industrial processes and reduce their emissions.

Air Liquide has identified two key levers to reach this objective:

#### *Rolling out low-carbon offerings and solutions*

Air Liquide provides its customers with the possibility of outsourcing some of their processes in order to pool assets and thus reduce the amount of energy used by up to 20%.



#### **Air Liquide starts up the world's largest oxygen production unit in South Africa**

In 2018, Air Liquide started up in South Africa the world's largest oxygen production unit for its customer Sasol, an international integrated energy and chemicals company. Owned and operated by Air Liquide, it is the first time that Sasol had chosen to outsource its oxygen needs at this site to an industrial gas production specialist.

This outsourcing decision confirms Sasol's trust in Air Liquide's technological expertise and ability to innovate. The new unit, with a total production capacity of more than 5,000 tons of oxygen per day, was designed and built by Air Liquide's Engineering & Construction teams using proprietary technologies, including several air compression process innovations. It allows Sasol to decrease its annual electricity consumption by more than 20% and contributes to reducing its carbon footprint by 200,000 tons of CO<sub>2</sub> each year.

The Group is also developing offerings which will reduce transport-related emissions, in particular through on-site production and new generation cylinders which are 40% lighter than those made of steel.

Through its promotion of oxy-combustion technology, Air Liquide has already helped its customers to avoid more than 10.7 Mt of CO<sub>2</sub> emissions in 2018.

#### *Co-developing innovative procedures with its customers*

Air Liquide is working in partnership with its customers to introduce new solutions that will reduce the environmental footprint in various business areas:

- either by reducing, where possible, customers' CO<sub>2</sub> emissions;
- or by capturing CO<sub>2</sub> to give it a second life (CCU <sup>(a)</sup> – Industrial Merchant business and Large Industries customers) or by storing it permanently (CCS <sup>(b)</sup> – storage in old offshore natural gas reserves, for example).



#### **A new range of advanced etching materials: enScribe™**

Semi-conductor manufacturers must meet growing needs for data storage capacity with the quantity of data being 300 times greater today than it was 10 years ago, while at the same time, components have reached nanometric scale. In this new environment, balancing compactness and performance represents an ongoing challenge.

To support its customers in this goal, Air Liquide has developed enScribe™, a new family of advanced etching materials.

Designed for the 3D construction of a new generation of memory chip, the innovative materials of enScribe™ are capable of etching the new chip structures very deeply. Moreover, due to their chemical structure, they have a lower lifespan in the atmosphere, thus helping to reduce the impact of the etching process on the environment. Its products are designed to reduce the Global Warming Potential (GWP) impact that is typically associated with most gases currently used in etching processes.

Its use, for a single customer, has already reduced the global emissions of the semi-conductor industry by 1%, which represent 117,000 tons of CO<sub>2</sub>-eq. per year.

(a) Carbon Capture & Usage.

(b) Carbon Capture & Storage.

## Acting for the planet and ecosystems (E)



With ecosystems, via an active dialog with key players (public authorities, industrial partners, NGOs, etc.), Air Liquide is contributing to the development of a low-carbon society.

Air Liquide has identified four key levers to reach this objective:

### Expanding the circular economy<sup>(a)</sup>

Air Liquide currently owns around 10 biomethane production units and some 60 charging stations. Through the construction of new biomethane units, the Group contributes to the purification of biogas, in particular in Europe and the United States. For further information, please refer to page 82.

For road freight transport, the use of biomethane reduces fine particles emissions by 85%, CO<sub>2</sub> emissions by 90% and noise emissions by 50% compared with diesel. The use of biomethane is growing and diversifying into the industrial and transport sectors by using new efficient and environmentally-friendly applications. In 2018, this use has made it possible to avoid 84,000 tons of CO<sub>2</sub> emissions.



#### Pot-au-Pin Énergie initiative in Cestas

Planète Végétal – a carrot and leek farmer operator – and Air Liquide have joined forces to create Pot-au-Pin Énergie to valorize biomass from the farm to produce biomethane.

At the end of the process, the biomethane is injected into the natural gas distribution network, which supplies Air Liquide's multi-energy station in Cestas, located 3 km from the production site. This station distributes biomethane (bio-NGV), an alternative to fossil fuels, to Casino Group carriers.

The Pot-au-Pin Énergie initiative shows that the biomethane value chain contributes to the development of the **circular economy** by bringing together local players who are working together to make the **energy transition** happen.

### Facilitating clean refrigerated transport

Refrigerated transport is changing and cryogenic technologies are at the forefront of this change. The use of molecules for cryogenics in refrigerated transport helps reduce noise emissions and improve the carbon assessment of vehicles. Air Liquide's expertise in cryogenics has led to the development of Blueeze™, an innovative solution (based on liquid nitrogen) for refrigerated transport by truck, and Cryocity™ (based on CO<sub>2</sub>), aimed at inter-urban delivery and reducing air and sound pollution.

### Promoting hydrogen for clean mobility

Air Liquide is investing in low-carbon hydrogen production assets as well as in a distribution network for hydrogen mobility. To date, Air Liquide has installed more than 120 stations worldwide.



#### First large liquid hydrogen production unit

Air Liquide announced the construction of the first large liquid hydrogen production unit dedicated to the hydrogen energy markets in the Western United States. The Group has also signed a long-term contract with First Element Fuel Inc. (FEF), a major player in hydrogen distribution in California, to supply hydrogen to its network of stations in California. The plant will have a production capacity of nearly 30 tons of hydrogen per day – an amount that can fuel 35,000 Fuel Cell Electric Vehicles (FCEVs). Through this investment of more than 150 million US dollars, Air Liquide will contribute to the large-scale rollout of hydrogen mobility on the West Coast of the United States.

(a) Even if the fight against food waste is not a subject considered a priority by Air Liquide because of its industrial activity, the circular economy initiatives participate in the fight against this food waste.

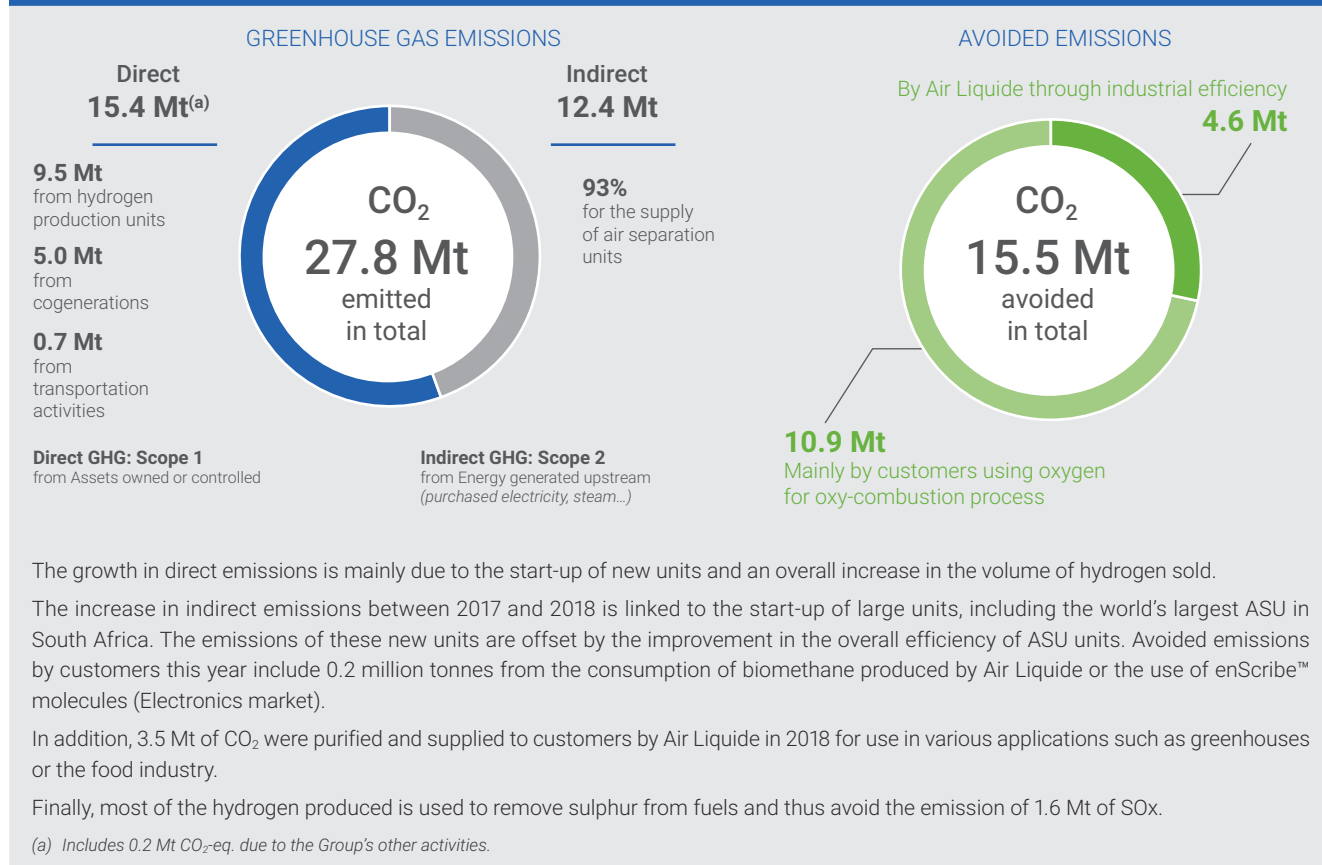
### Creating a global hydrogen economy

Air Liquide is a key driver in the creation of a global hydrogen economy. The Group was one of the founders of the Hydrogen Council, a global initiative to share their vision and ambition for hydrogen to drive the energy transition and achieve climate change targets. Hydrogen can make final usages carbon-free, such as in transport, energy for industry or heating and residential electricity. At the same time, hydrogen can

play a major role in the storage of surplus energy in markets dominated by renewable energies.

Thus, in September 2018, Air Liquide inaugurated a pilot site for the production of carbon-free hydrogen: HyBalance. This 1.2 MW-capacity facility uses electrolysis technology to balance the electricity grid and store surplus electricity in the form of hydrogen that will be used in industry and transportation.

### 2018 report on Air Liquide's greenhouse gas emissions



### 5.3. DIALOG WITH STAKEHOLDERS IN 2018

For Air Liquide, dialogue with stakeholders is a strategic objective announced in the NEOS corporate program. Through ongoing discussions with its stakeholders, the Group is committed to:

- ▶ taking into account their issues;
- ▶ identifying priority development issues;
- ▶ sharing with these stakeholders its ambition to contribute to sustainability.

In this field in 2018, the Sustainable Development Department sponsored a survey on the expectations of civil society towards companies in partnership with five other French industrial groups within the

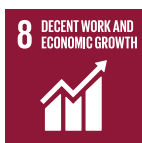
Observatory for Materiality. This survey was carried out by the Institut du Capitalisme Responsable, in partnership with the IFOP (the French Institute of Public Opinion) on a sample of 3,000 persons representing civil society in France, Germany and Poland in November 2018. This survey highlighted that civil society expected concrete measures from companies, in particular environmental and social measures.

Participants identified the major challenges arising from their country's current issues (survey carried out in mid-November 2018):

- ▶ France: the environment, unemployment, terrorism;
- ▶ Germany: immigration, the environment;
- ▶ Poland: healthcare, employment, purchasing power.



### 5.3.1. Employees



#### A new Human Resources strategy

In 2018, Air Liquide's Human Resources teams drew up a new Human Resources strategy which is in line with the Group's overall objectives.

Due to major environmental changes, the time had come to redefine priorities for the next three to five years.

This new strategy takes into account feedback from operations and employees to reflect the Group's diversity, business model and various regions. Our global Human Resources principles must be applied by taking into account local culture and context. Nevertheless, several fundamentals are necessary to create a common culture and state of mind among the various teams across the world.

Three societal trends fueled reflection on this new Human Resources strategy:

- ▶ the coexistence of several generations among whom the Company must facilitate interactions and engagement;
- ▶ digital transformation;
- ▶ the VUCA environment (Volatility, Uncertainty, Complexity, Ambiguity) of today's world.

In an environment which is undergoing profound transformation, Air Liquide has developed a Human Resources strategy to identify, attract, maintain and develop competent employees from all walks of life. This strategy is based on the following three priorities:

- ▶ encouraging employee engagement as a key factor of the Company's performance;

- ▶ developing an agile and collaborative structure which is more in line with global changes and employees' expectations;
- ▶ anticipating the "work of the future" to better understand future transformations (digital, artificial intelligence, etc.).



#### Key points

#### HUMAN RESOURCES OBJECTIVES

- ▶ 35% of women among managers and professionals;
- ▶ 33% of young graduates among manager and professional recruitments.

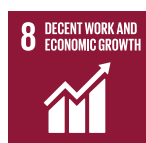
These objectives are described in greater detail in chapter 4, page 278 to highlight the gradual introduction of this strategy within the Group and take into account the risks identified in the chapter "Human resource management risks" on page 44.

To measure its implementation, an indicator for assessing employee engagement is currently being drawn up.

In 2018, 29% of Air Liquide's managers and professionals were female.

In 2018, 28% of Air Liquide's managers and professionals recruits among managers and professionals were young graduates.

### 5.3.2. Shareholders



#### 2018 stock market performance and overall shareholder return

In 2018, the stock market performance of Air Liquide's share was 3.24% (vs. -10.95% for the CAC 40).

On the other hand, 29 allotments of free shares have been made since 1962.

At 31 December 2018, the overall financial performance of the Air Liquide share, i.e. the rate of return on invested capital, or Total Shareholder Return (TSR)<sup>(a)</sup>, amounts to:

#### END OF 2018 DATA

TSR	5 years	10 years	20 years
Air Liquide Registered shares	8.5%	12.6%	9.6%
Air Liquide bearer shares	8.2%	12.1%	9.1%
CAC40 reinvested dividends	5.2%	7.8%	4.0%

(a) The TSR is an annualized rate of return for a shareholder who buys his shares at the beginning of the period and resells them at the end of the period. This calculation takes into account the evolution of the share price, the dividends reinvested in shares as well as the allocations of free shares, both increased by the loyalty bonus, and includes the impact related to the increase capital of 2016.

### Measures taken in favor of shareholders in 2018

#### Individual shareholders

Individual shareholders have been contributing to and supporting the Group's growth since its creation. Shareholders' trust and loyalty are key to Air Liquide's growth. For more than a century, the Group has been dedicated to involving them in its growth and has fostered a long-term relationship based on transparency, dialog and proximity.

At the end of 2018, more than 410,000 individual shareholders of the Group owned 32% of the capital, the highest percentage among companies in the CAC 40.

#### Meeting with shareholders

**The Shareholders' Meeting:** The 2018 Shareholders' Meeting welcomed 3,569 people and almost 130,000 votes are counted each year. The dates for the next Air Liquide Combined Shareholders' Meeting are Tuesday May 7, 2019; Tuesday May 5, 2020; and Tuesday May 4, 2021.

**"Post-Shareholders' Meeting" conferences:** the Chairman and Chief Executive Officer visits several towns and cities in France to present the Group's results, strategy and outlook.

**Conferences and trade shows:** the Director of Shareholder Services and his teams regularly meet with shareholders. Talks at business schools, universities and colleges are also organized, so that the future generations have an early awareness of the culture of the stock market and of the major role of the shareholder in financing the economy.

#### Institutional investors

The Investor Relations team met with more than 600 investors in 2018 during 18 roadshows, 22 conferences and many individual meetings. Members of the Executive Committee took part in some of these events.

In 2018, these roadshows and conferences were held in Europe, notably in London, Paris and Frankfurt, and in North America, primarily in New York, Boston and Los Angeles.

These meetings provided the opportunity to discuss subjects related to strategy and performance, Socially Responsible Investment (SRI) and corporate governance with investors. On November 30, 2018, an event was organized in Paris during which Air Liquide announced its Climate objectives.

#### Initiatives in favor of the climate: TCFD and SBTi

The Group believes that the major challenges facing our society can be met through active dialog. For this reason, it has been an active member of the TCFD (Task Force on Climate-related Disclosures), a task force which brings together institutional investors, audit firms and listed companies with the aim of developing recommendations for voluntary disclosures regarding financial risks linked to climate change. The TCFD's recommendations were published in July 2017.

Today, like all European companies, the Air Liquide Group applies the European Directive on extra-financial reporting for the publication of information corresponding to 2018. This directive includes all of the recommendation made by the TCFD, except for the financial forecast for climate-related measures.

Although the Group believes that improved reporting on climate-related opportunities and risks may be of significant help in responding to global climate change challenges, it also believes that these recommendations must be implemented in a fair manner in a global competitive environment in order to be efficient.

In the same spirit of dialog and openness, and driven by its Climate objectives, announced in November 2018, the Group is working towards taking part in the Science Based Targets (SBTi) initiative. SBT is a certification created by a coalition of players committed to environmental issues. It is used by companies to validate GHG emission reduction objectives in line with the 2°C average temperature rise scenario.

However, for the moment, there is no sector approach that is specific to the Group's businesses, which main characteristic is to serve a wide range of economic sectors. Moreover, SBT's current methodology does not take into account avoided emissions, which is one of Air Liquide's major commitments for reducing emissions beyond its own businesses. Air Liquide will continue its efforts and discussions with the SBT initiative to better value its actions in favor of the climate.

### Employee shareholders

The Group wishes to continue increasing the involvement of its employees at the global level in its development by encouraging them to play a greater role in the capital of L'Air Liquide S.A.

The regular organization of Capital Increases Reserved for Employees (ESPP) allows employees to become shareholders under preferential subscription conditions.

Two and a half years after the 2016 offer, the AL FOR YOU 2018 offer – the 14<sup>th</sup> of its kind – has been a success which underlines the continued commitment of all employees to their Group.

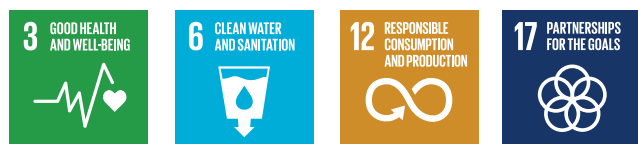
At the end of the second year of the Airgas integration, the results of the AL FOR YOU 2018 offer were as follows:

- 19,078 employees (and retired employees) – 29.4% of eligible staff – across 72 countries subscribed to a total of 1,049,529 shares;
- a +12.3% increase in subscriptions compared with 2016;
- a 29.4% participation rate (down slightly compared to the 2016 figure of -3.2%) – which should be viewed against the strong increase in the number of Group employees due to the integration of Airgas and the increase in the number of eligible retired employees (+23.1%).

At December 31, 2018, the share of capital held by the Group's current and former employees was estimated at 2.4%, of which 1.7% (within the meaning of article L. 225-102 of the French Commercial Code) corresponds to shares subscribed by employees during employee-reserved capital increases or held through mutual funds.

These employee share ownership transactions contribute significantly to increasing employee motivation and sense of belonging to the Group.

### 5.3.3. Customers and patients



#### Air Liquide contributes to its customers' performance

The Group pays particular attention to the satisfaction of its customers and patients and implements action plans to continuously improve it. Air Liquide, in particular, helps enable its industrial customers to operate in a safer, cleaner and more economic manner and supports them in their national and international expansion.

#### Customers: the focus of the Group's interest and actions

In an increasingly dynamic and competitive environment, Air Liquide focuses its attention on its customers and their satisfaction in order to provide them with long-term growth. To strengthen this priority, the Group Customer Department is supervised by a member of the Executive Committee.

The aim of this team is to contribute to the success of each of our 3.6 million customers and patients. The Customer Department is structured in a way which covers all business sectors and geographical regions, so that customers are the key focus of the Group's thinking and actions. The team is also the control center for customer satisfaction measurement and customer experience improvement programs, the

management of the Group's strategic accounts, commercial excellence and the sharing of best practices across regions and the Group's various business sectors.

### Successful customer commitment

In 2018, feedback from tens of thousands industrial customers was received and showed that 85% of them are satisfied or very satisfied with Air Liquide. Customers particularly appreciate the quality of the Group's products and services, safety standards, as well as the attitude and efficiency of the teams with which they are in contact.

### Partnership with patient associations

Air Liquide supports patient causes as part of its partnership with organizations which work to raise awareness and support treatment for chronic diseases. Air Liquide Healthcare and its entities support patient associations in all countries in which the Group is present. For example:

- Air Liquide is currently working in partnership with IDF Europe (International Diabetes Federation Europe), the European branch of the International Diabetes Federation, supporting it in its information and awareness-raising actions among patients suffering from diabetes, the general public and European public authorities.

Dietary behaviors are changing deeply and are being globalize. Consumers are now looking for a more responsible, healthier, safer food. This involves a reinvention of the agri-food chain in which Air Liquide is actively involved.

- The Group also supports IDF Europe in promoting diabetes research with the 2018 IDF Europe Young Researcher Prize which rewards the work of a young researcher under 40 who is involved in research aimed at improving the health of diabetic patients.

### 5.3.4. Sustainable procurement



The Group attaches great importance to the ability of its suppliers to offer long-term partnerships and to ensure a high level of safety, reliability, competitiveness and innovation, while guaranteeing that ethics, Human Rights and Sustainable Development are also taken into account.

#### Air Liquide rewarded as a supplier

In 2018, and for the third year in a row since 2016, Air Liquide was scored 67/100 by EcoVadis. This score puts the Group in the "Gold" category as an "advanced" supplier in terms of Sustainable Development (only 5% of suppliers fall within this category, which is the highest ranking). EcoVadis is the main global rating platform for the social and environmental performance of supply chains. The assessment covered the environment, social, business ethics and sustainable procurement. Air Liquide also works with this platform to assess the sustainable development performance of its own suppliers.

### A recognized sustainable procurement approach

In April 2018, Air Liquide received recognition from EcoVadis in the "Sustainable Procurement: Stakeholder Engagement" category. These awards recognize best-in-class practices and commitment to founding sustainable procurement programs.

In May 2018, Air Liquide China and E&C China provided Sustainable Procurement training to around one hundred Chinese suppliers during a "Suppliers Day" in partnership with EcoVadis. Three suppliers received the "Air Liquide China 2017 Excellent CSR Supplier Award".

### Sustainable procurement for all

In October 2018, the Group Procurement Department organized its first Business Meeting for the adapted and protected work sector with HandivAirsity which was launched by the Group in 2017. Among the one hundred or so guests, 15 ESATs (Organizations for the social and professional integration of disabled persons) and EAs (Adapted Companies) as well as our partner Handeco gave presentations to key players within the Group covering a wide range of businesses and services across the whole of France.

#### 5.3.5. The Air Liquide Foundation and local communities



Created in 2008, the Air Liquide Foundation represents the Group's commitment to being a responsible enterprise. To celebrate its 10<sup>th</sup> anniversary, the Foundation has stepped up its actions with a 5-million euro budget for a new five-year term. The Air Liquide Foundation provides financial, material and Human Resources means to the projects which it supports in the countries where the Group is present.

In 2018, the Foundation approved projects in 21 countries, including one new country, Paraguay:

- ▶ three environmental research projects on climate change, methane flux in the marine environment and plastic atmospheric pollution;
- ▶ three healthcare/breathing research projects on respiratory tract infections in chronic respiratory pathologies and cystic fibrosis sufferers;
- ▶ 28 local development micro-initiatives in the fields of education and training, access to care, disability, social welfare and access to water and energy.

Over the past ten years, the Air Liquide Foundation has supported more than 300 projects in 52 countries. A dedicated website enables projects to be directly submitted online, in French or English. The website address is: [www.fondationairliquide.com](http://www.fondationairliquide.com).

In 2018, the Air Liquide Foundation's Board of Directors welcomed a new qualified member, Dr. Sophie Szopa, a specialist in atmospheric chemistry at the Laboratoire des Sciences du Climat et de l'Environnement in Paris Saclay. This new appointment highlights the Group's commitment to air quality.

Moreover, in 2018 Air Liquide SA launched a micro-donation initiative to get employees involved in the Group's solidarity commitment. The micro-donation initiative allows employees to make a donation to the Foundation each month. The amount is automatically deducted from their payslip. The micro-donation is matched by Air Liquide S.A. (1 euro for 1 euro). Micro-donations collected are used to support the joint action of Group employees and NGOs in favor of educational programs and youth training courses in France and Africa.

### Focus on the Foundation Awards

The Air Liquide Foundation Awards recognize the most innovative organizations among the ones supported by the Foundation. During the second edition (February 2018), two scientific organizations were singled out in the Research category for their projects promoting the environment and health.

New this year, the 2018 Awards for Societal Commitment also honored the commitment of Group employees working alongside associations on citizenship projects supported by the Foundation. In all, six employees and six organizations received awards. The Group's employees also awarded a special "Coup de coeur" prize to a project supported by Air Liquide employees.

#### 5.3.6. Relationships with the public sphere

As part of its "Public Affairs" policy, in 2018 Air Liquide introduced transparency measures as recommended in the law relating to transparency, the fight against corruption and the modernization of economic activity (the Sapin 2 Law).

Air Liquide, listed since the end of 2017 in the "Interest Representatives" register which is managed by the High Authority of Transparency in Public Life (Haute Autorité pour la Transparence de la Vie Publique – HATVP), thus made its first disclosure in 2018 for interest representation activities for the July-December 2017 period. This disclosure can be accessed by the public on the HATVP's website ([www.hatvp.fr](http://www.hatvp.fr)).

In addition to compliance with the relevant laws and decrees, Air Liquide's Public Affairs teams in France have increased discussions and information sharing regarding the various interest representation measures relating to the Air Liquide businesses which they represent, both directly and indirectly via boards and professional bodies. These discussions, which took place throughout 2018, helped identify new measures with our counterparts in the public sphere that were better coordinated and more cross-divisional between the Group's various businesses in France and which offered greater clarity in our messages.

Air Liquide's Public Affairs teams will continue with this constructive momentum in 2019.

## 6. Innovation

### 6.1. TRANSFORMING THE GROUP AND PREPARING FOR FUTURE GROWTH

The Group's innovation expenses amounted to **300 million euros** in 2018. This amount is higher than that of the past five years. Innovation expenses correspond to the OECD definition, namely research and development, market launch and marketing expenses for new offerings and products.

Likewise, applying the OECD definition, **4,000 employees** work in entities dedicated to innovation or that contribute to innovation through the development and the market launch of new offerings and products.

Patented inventions contribute to the Group's competitiveness and the specialization of its offerings, and highlight the Group's capacity for technological innovation. **309 new inventions** were protected in 2018. These are complemented by third-party intellectual property rights, obtained by partnerships, which allow the Group to test new technologies and digital solutions. Air Liquide has a portfolio of 3,395 inventions, which are protected by at least one patent. Air Liquide's portfolio has more than 11,000 patents.

The **maturity** of this innovation approach helps **reduce development time and the market launch** of innovative solutions. It relies on the **Assets – Customers – Ecosystems (ACE) approach**: the Group focuses on the continuous improvement of its Assets by integrating new technologies and new ways of working, developing differentiating solutions for its Customers and patients, and drawing on its internal and external Ecosystems.

The Group focuses its innovation expenses on the three subjects related to the major trends shaping the Group's markets (see page 33): **energy transition, healthcare and digital transformation**. The proliferation of innovative technologies and solutions in the **energy transition** field, drawing on the strength of digital solutions and their integration in ecosystems, allowed the Group, in 2018, to **commit to low-carbon growth** as part of its Climate objectives.

Finally, the Group relies on a dedicated structure (see page 35). The Innovation & Development Division (IDD) steers the innovation strategy on behalf of the Group's hubs and operations, with support from the **Innovation Campus** and the **Labs**.

### 6.2. INNOVATE FOR LOW-CARBON GROWTH

The Group intends to dedicate around **100 million euros of its Innovation expenses** every year to reduce its carbon footprint and that of its customers. In addition to Innovation expenses, cumulative capital expenditure since 2014 totaled around 300 million euros in biomethane and hydrogen mobility.

#### 6.2.1. Innovate to reduce carbon emissions

##### Assets (A)

The Group develops technologies to reduce its own emissions and offers cleaner solutions for other CO<sub>2</sub>-emitting sectors: the Innovation

teams are currently working, for example, on improving the **energy efficiency** of production units, as well as on CO<sub>2</sub> capture and valorization technologies (CCS and CCUS).



#### Reducing the CO<sub>2</sub> emissions of our assets through energy efficiency

Air Liquide and Covestro signed a contract to supply hydrogen at Covestro's production site located in the port of Antwerp, Netherlands. The Group will invest 80 million euros to build a "new generation" hydrogen production unit. This new generation production unit will produce hydrogen **by recovering steam** produced during the process and **recycling** it as energy to power the production process. This technology, which **will reduce CO<sub>2</sub> emissions by 22,500 tons per year**, was developed by the R&D and Engineering & Construction teams.

To improve the energy efficiency of combustion in the steel and glass industries, Air Liquide provides **oxy-combustion solutions**. This process consists of enriching air with oxygen to reduce energy consumption, and is illustrated by the roll out of the **HeatOx** offering, in particular in China.

Moreover, by combining its **digital expertise** with its technological capabilities, Air Liquide plays an innovative role in **digital solutions** which help **optimize production operations**, with the implementation of Smart Innovative Operations (SIO) centers to remotely manage its production units in France, China and South-East Asia. The Group is also developing new solutions to **optimize the distribution channels** of its trucks which transport liquid products and cylinders.



#### Improving the performance of our assets, thanks to digital solutions

One year after the launch of its first remote operation center in France, in January 2018 Air Liquide inaugurated its *Smart Innovative Operations* (SIO) center for the *South-East Asia Pacific region*, located in Malaysia. The SIO Center enables the remote management of production for 18 Air Liquide Large Industries production units spanning eight countries across the region, as well as optimizing energy consumption and improving reliability at these sites. Air Liquide invested 20 million euros in this project. The SIO Center enables 24/7 responsiveness to customer demand and **improves production-unit energy efficiency**. It also uses predictive maintenance to anticipate certain equipment failures and program maintenance operations. In the connected plants, new digital technologies are being deployed to simplify maintenance and inspection management operations.



In **Healthcare**, new **patient telemonitoring solutions** and the ability to observe in real time and remotely the usage of medical devices, has helped reduce the number of house calls to patients suffering with sleep apnea, while also improving the quality of monitoring. Air Liquide's Healthcare teams can now intervene all along the patient path. Combined with the optimization of home visits, innovation in telemonitoring in France helped **reduce the number of kilometers traveled in 2018 by 800,000**, the equivalent of 150 tons of CO<sub>2</sub>, despite an increase in the number of patients cared for compared with 2017.

### Customers (C)

Innovation also focused on the **introduction of new low-carbon offerings and solutions** for the Group's customers. The Group aims to expand the **circular economy**, through the production and usage of biomethane. The Innovation teams are working on the purification and valorization of biogas, including the Group's membrane technology, as well as the production and injection of biomethane into the network and its distribution, in particular in fuel form (bio-NGV – bio Vehicle Natural Gas) a renewable non-fossil fuel which allows to reduce the carbon footprint of 90% and particulate matter emissions of 85%, compared to diesel.



#### Expanding the circular economy through biomethane

In 2018, Air Liquide commissioned **new biomethane production units in the United States, France and the United Kingdom**, considerably increasing its biomethane production capacity which now stands at 600 GWh for a full year of production. The Group operates 12 production units around the world, designed to purify biogas to transform it into biomethane and inject it into the natural gas network. The new biomethane facility in the United States, which was inaugurated in 2018 at the Northeast Mississippi Landfill (NEML) site, is the first large-scale unit built by Air Liquide in the United States. It purifies biogas from household waste treatment sites and transforms it into biomethane. In Europe, the units purify biogas from farm waste and transform it into biomethane. Part of this biomethane is used for trucks fueled by bio-NGV. In Cestas, near Bordeaux, Air Liquide inaugurated in 2018 a biomethane production unit and a multi-energy charging station nearby. Thanks to its control of the entire biogas valorization chain, Air Liquide is rolling out its clean mobility offering in France for road transport. By replacing fossil fuel with biomethane, a renewable energy, the Group is committed to a circular economy approach in favor of energy transition.

The Group's increased biomethane production reflects the **strong growth in new energy transition markets**, and Air Liquide's commitment to rolling out clean transport solutions for its customers.



#### Customers: an energy-saving cryogenic solution based on the Turbo-Brayton technology

Air Liquide has developed an **innovative and efficient cryogenic refrigeration solution**, based on its Turbo-Brayton technology, which enables the refrigeration and liquefaction of gases between 25K (-248°C) and 200K (-73°C). This solution **saves energy** as a result of its components, thanks to the automatic adjustment of the engine's speed depending on the level of refrigeration capacity required and thanks to a reduced footprint. Moreover, no oil is required for the engine to work, which is a real environmental advantage. This technology is currently mainly used to re-liquefy natural gas boil-off transported by tankers in liquefied form. In 2018, Air Liquide sold 16 cryogenic solutions based on its Turbo-Brayton technology.

### Ecosystems (E)

Air Liquide continues to invest in **low-carbon hydrogen production assets** and announced, in 2018, an investment in a carbon-free hydrogen pilot plant in Denmark and in the first major liquid hydrogen production unit for the hydrogen energy market in the Western United States. Air Liquide plans to invest more than 150 million US dollars to build this plant with a generation capacity that will fuel 35,000 Fuel Cell Electric Vehicles. The Group has also signed a long-term contract with FirstElement Fuel Inc. (FEF), a major player in hydrogen distribution in the United States. This new plant is the first large-scale investment to support hydrogen energy solutions. Air Liquide and FEF have entered into an agreement outlining Air Liquide's intention to make an equity investment in FEF, a company which is already supported by Toyota and Honda.

The teams continue to innovate in hydrogen production and distribution processes.





## Ecosystems: producing carbon-free hydrogen

Air Liquide inaugurated **HyBalance** in Hobro, Denmark, a **pilot site for the production of carbon-free hydrogen**, in partnership with Hydrogenics, LBST, Neas Energy, Hydrogen Valley, and with the support of Fuel Cells and Hydrogen Joint Undertaking (FCH JU). This facility uses electrolysis technology and allows for balancing of the electricity grid and storing of surplus electricity in the form of hydrogen that will be used in industry and transportation. Denmark is a pioneer in the integration of renewable energies into the national energy mix, with 40% of the country's electricity produced by wind turbines. By compensating for renewable energy intermittency, hydrogen offers a **solution for storing surplus electricity** to meet the challenges posed by the energy transition. In addition to industrial customers, the hydrogen that is produced is used to supply the network of five hydrogen charging stations installed and operated by the Copenhagen Hydrogen Network (CHN), a subsidiary of Air Liquide in Denmark.



### Key points

**Blue Hydrogen®** is an Air Liquide initiative that aims to gradually lower the carbon content of its hydrogen production dedicated to energy applications. More precisely, Air Liquide is committed to achieving at least 50% of the carbon-free hydrogen necessary for these applications by 2020, by combining:

- the use of low-carbon energies, water electrolysis and reforming of biomethane;
- capture, storage and valorization technologies for the CO<sub>2</sub> emitted during the production of hydrogen from natural gas.

Even when produced using natural gas, hydrogen is a virtuous energy: over an equal distance traveled, the use of Fuel Cell Electric Vehicles decreases greenhouse gas emissions by 20% compared with combustion vehicles and does not emit any particulate matter.

Moreover, following the commitment which was confirmed in September 2018 by the Hydrogen Council (co-chaired by Air Liquide), 100% of hydrogen for mobility applications will be carbon-free by 2030.

The Group has designed and installed **120 hydrogen charging stations** for mobility around the world to date, providing it with feedback from its teams and partners to improve its customer experience and reduce costs ahead of a large-scale deployment.

To improve driver's user experience, Air Liquide has launched the **H2 Station Finder** mobile app which allows drivers to locate the closest hydrogen charging station, consult its capacity levels, and monitor the amount of CO<sub>2</sub> emissions avoided by charging their vehicles with hydrogen energy. This application was launched in California, where the Group has built hydrogen charging stations in Anaheim, Palo Alto, and at Los Angeles International Airport. It is also available in France.



## Ecosystems: stepping up the roll-out of hydrogen charging stations

In **France**, Air Liquide has inaugurated a new hydrogen station in Loges-en-Josas, near Versailles. Designed and installed by Air Liquide with the support of the FCH JU and the European program 3Emotion, this station will fuel the hydrogen-powered buses launched in 2019 to run between Vélizy and Versailles. This is the third station that has been installed by Air Liquide in the Greater Paris Area and follows those commissioned near the Pont de l'Alma in Paris and the Paris-Orly Airport. With this new station, Air Liquide continues to support the growth of the 100-strong fleet of the "Hype" Parisian hydrogen-powered taxis by making a new charging station available.

In **Germany**, Air Liquide is a founding partner of "H2 Mobility Deutschland" joint venture, created in 2015. Great Wall Motor (GWM, China) joined the joint venture in October 2018. 60 hydrogen stations open to the public are in operation in Germany. Among them, 22 are based on Air Liquide technology, including 10 delivered in 2018.

In **Korea**, Air Liquide announced the installation of four new hydrogen charging stations for mobility, as part of the government's plan to install 310 stations for 81,000 Fuel Cell Electric Vehicles across the country by 2022.

In **Japan**, Air Liquide and 10 large Japanese companies, representing several industries and finance, created the "**Japan H2 Mobility**" consortium. This was in line with the Japanese government's ambition, to develop a large-scale hydrogen infrastructure in order to build a network of 320 stations by 2025, and 900 by 2030. Almost 110 stations are already in operation in Japan to date. Initially, the member companies of the "Japan H2 Mobility" consortium aim to provide 80 new hydrogen charging stations over the next four years, to recharge a fleet of nearly 40,000 Fuel Cell Electric Vehicles. Air Liquide will install and operate around twenty stations by 2021.

In **China**, Air Liquide and **Chinese start-up STNE** (Shanghai Sino-tran New Energy Automobile Operation CO., Ltd.) signed a partnership agreement to accelerate the roll out of hydrogen-powered electric truck fleets. This partnership includes the acquisition of a stake by Air Liquide in the Chinese start-up STNE, a hydrogen logistics platform for the urban delivery of goods. STNE aims to run a fleet of thousands of trucks and operate a network of around 10 hydrogen stations by 2020. Air Liquide has also signed a partnership agreement with Chengdu Huaqi Houpu Holding (HOUPU) to develop, manufacture and commercialize hydrogen charging stations in China.

### 6.2.2. Innovate to improve air quality

In large metropolitan areas worldwide, air quality is a major challenge: many citizens remain exposed to air pollution levels which exceed the World Health Organization's recommendations. Air Liquide is developing **solutions to improve air quality**, in particular through the use of cryogenic molecules for the refrigerated transportation of products.

Air Liquide's expertise in cryogenics has led to the development of the **Blueeze™** offering, a cryogenic refrigeration unit for the refrigerated transportation of products. This silent and innovative solution reduces particulate matter by 90% compared with diesel. Combined with bio-NGV, this solution represents real ecological and economic advantages for carriers, by reducing the carbon footprint of trucks.

Air Liquide is working on pilot projects to purify outdoor air in urban locations, through the capture of particulate matter, for polluted public areas such as underground platforms and stations.



#### Ecosystems: improving air quality

As part of the "Innovation for the air in our stations" call for tender by the Île-de-France region, Air Liquide will test an innovative solution in an SNCF train station in Paris. This solution uses a technology which consists of electrically charging particulates to capture them by forming aggregates that are easier to recover.

Air Liquide is also working on a pilot **indoor air purification solution**. Selected by Urban Lab, the experiment business of the City of Paris' development and innovation agency Paris&Co, this solution purifies indoor air by treating ventilated air within a building to reduce the CO<sub>2</sub> concentration of the indoor atmosphere. By simultaneously replacing fresh air with recycled air, the building's energy consumption is reduced. This procedure is based on a gas purification technology that the Group has mastered for a long time – adsorption. This technology captures certain gas molecules for better air quality. This trial system, which is installed in a building in France, will allow to validate and roll out this solution in commercial premises or with industrial customers.

### 6.3. A DEDICATED STRUCTURE TO DRIVE THE GROUP'S INNOVATION STRATEGY

The Air Liquide Group's **Innovation & Development Division (IDD)** drives the Group's innovation strategy and contributes to its transformation. This division brings together:

- **R&D**, with a focus on science and the knowledge of Essential Small Molecules (oxygen, hydrogen, nitrogen, CO<sub>2</sub>, etc.) which constitute the Group's scientific territory;

- the drive and financing of **Engineering & Construction's Innovation initiatives**;
- the **Digital** teams (including i-Lab, La Factory and ALIZENT) which work with the Information Technology (IT) teams, to support the roll out of digital solutions;
- the **Global Markets & Technologies World Business Unit**, which provides technological solutions for new markets such as energy transition, maritime logistics and deep tech;
- the **Hydrogen Energy World Business Unit**, which focuses on markets opened by the use of hydrogen in energy transition and the hydrogen economy;
- **ALIAD**, Air Liquide's capital venture arm, whose role it is to invest in minority stakes in technology start-ups;
- the Group's **Intellectual Property** Department.

### 6.3.1. Digital solutions to boost innovation

2018 saw the **roll out**, in groups of countries (clusters) and Operations, of **digital solutions** designed and developed by La Factory and the Digital Fabs, reflecting the maturity and efficiency of the **Group's Digital transformation approach** which it launched in 2016.

The Digital Fabs work on specific subjects and steer the digital transformation approach related to a given business line or Corporate Function, drawing on the expertise of flexible multi-disciplinary teams, including various IT, World Business Line, Operations and Digital teams. In 2018, the *Large Industries Fab* continued with various initiatives, and contributed in particular to the rollout of the Smart Innovative Operations program, for example, the predictive maintenance approach implemented at more than 160 Group sites. This program contributes greatly to the Group's efficiency programs. The *Business Performance Management Fab* rolled out the BIG project, a shared platform within Air Liquide which compiles several data sources (financial, HR, safety, operations, etc.) and provides access to this information which is collected, sorted and analyzed using visual and interactive dashboards. Almost 5,000 employees use this platform to date. The *Customer Experience Fab* contributed to the Voice of Customers program, as was the case with the pilot program developed with the Operations teams in Benelux to simplify and improve their Customer services teams' experience. The *New Ways of Working Fab*, which contributed to supporting the teams in their transitions to a collaborative approach, greatly expanded the LINK platform which is used to share digital initiatives implemented in Operations and best practices. The new *Healthcare Fab* focused on the customer and patient experience.

To support digital transformation, La Factory contributed key expertise to various projects in terms of design, development, user research and in the data field. Moreover, the Group's **Data & Decisions Lab (d2Lab)** continued its work on data analysis, machine learning and artificial intelligence, as well as on financial mathematics and game theory.

### 6.3.2. Campuses to unite innovation ecosystems

In 2018, Air Liquide stepped up its open innovation strategy with the creation of **Innovation Campuses** in Europe, the United States and Asia, to **unite the innovation ecosystems** in which the Group has played a major role for many years.

These Innovation Campuses unite, in the same building, **the teams which contribute to innovation**, in particular the R&D teams, operational Business Development teams which are responsible for the local implementation of innovation as soon as it is launched, World Business Line employees, and the Innovation & Development teams.

These campuses are an integral part of the Group's **open innovation approach**. For many years, Air Liquide has adopted a **co-development approach for its solutions**, from the R&D to launch phases and right through to the end user, with its **customers, suppliers, universities and start-ups**. Campuses allow the Group to benefit from new expertise, favor new collaborative work methods, and thus bring innovative offerings to market more rapidly.



#### Inauguration of the Paris Innovation Campus

In September 2018, Air Liquide inaugurated its new **Paris Innovation Campus** on the Plateau de Saclay, in France. This campus brings together almost 500 employees, including 350 research staff, and has 48 laboratories. It is a high-energy performance building which allows new clean energies to be tested. During the inauguration, Air Liquide announced that in 2019 the Campus will host a **deep-tech start-up accelerator**. Not only will Air Liquide host start-ups but will grant them access to shared experimental facilities and customized support from Air Liquide experts, with the objective of accelerating the industrialization of their offerings.

Open on the world, this Campus benefits its location in the Plateau de Saclay to establish **many partnerships** with **research institutes** such as **the CEA, the CNRS, and the Institut de Recherche Technologique Systemx** on predictive maintenance, **the Institut Photovoltaïque d'Île-de-France (IPVF)** to develop technologies capable of producing high-yield low-cost solar cells, the **Additive Factory Hub** (additive manufacturing), as well as several collaborations with France's Universities and Grandes Écoles (Paris-Sud, Polytechnique, Centrale, etc.).



#### Scientific partnerships

For example, the Group created in 2018 a **shared laboratory with the CEA** to pool their complementary expertise and know-how in cryogenics – the analysis and production of very low temperatures – aimed, in particular, at space industry applications and fusion. This initiative showcases the long-term partnership between Air Liquide and the CEA as well as Air Liquide's commitment to researching groundbreaking solutions for deep tech markets.

In 2018, Air Liquide became a founding member of the **Fondation Université Grenoble Alpes**, aimed at promoting technological innovation and the development of educational and scientific innovation using an entrepreneurial and collaborative approach.

In Healthcare, the Group has continued its partnerships with the **Institut Pasteur** on new therapeutic applications of medical gases and with the Institut du Cerveau et de la Moelle épinière (Brain and Spine Institute) in neurodegenerative diseases. In 2018, Air Liquide formed a partnership with IDF Europe (International Diabetes Federation European Region), to support it in its information and awareness-raising actions among patients suffering from this condition and European public authorities, and to help advance diabetes research.

### A global network

Since December 2018, the **Frankfurt Innovation Campus** houses the **High Temperature Center (HTC)**, composed of the Engineering & Construction teams and the R&D teams, to develop and industrialize innovative technologies related to the production and management of the two key molecules in energy transition: hydrogen and CO<sub>2</sub>.

In the **United States**, Air Liquide and its subsidiary Airgas inaugurated, in November 2018, an **Advanced Fabrication Center at the Delaware Innovation Campus**. This Advanced Fabrication Center is devoted to the joint-development of technological solutions for manufacturing processes. It brings together experts from Air Liquide specialized in plasma and electric arc welding and cutting, in laser and additive fabrication, and in robotic and cobotic welding, and is equipped with new state of the art equipment and technology provided by partners for the purpose of carrying out tests, to better meet the needs of end-users.

Air Liquide works in partnership with several **DoE (US Department of Energy) laboratories** and participates in six multi-partner consortia, in particular the CAPD, led by the Carnegie Mellon University working on decision-making tools for the optimized management of production units and distribution. The **Delaware Innovation Campus** also enjoys numerous partnerships with Cornell, Carnegie Mellon and Delaware Universities in addition to Wharton Business School (University of Pennsylvania), in the fields of data science and artificial Intelligence, to improve the client/patient knowledge. In Canada, Air Liquide is working with the University of Montreal on the treatment and monitoring of patients suffering from Chronic Obstructive Pulmonary Disease (COPD).

The **Shanghai Innovation Campus**, which was opened in 2016, and which houses almost 250 employees including researchers, experts in customer applications and business development teams, has become a major center of innovation for the Group in the Asia Pacific region. It is home to the Smart & Innovative Operations remote management center for Air Liquide's production units in China. It has formed partnerships with **the Universities of Shanghai, Zhejiang and Jiatong**.

Finally, Air Liquide has completed the construction of its **Tokyo Innovation Campus**, in **Japan**, which as of 2019 will house the R&D, Global Markets & Technologies, ALTEC and Business teams in the city of Yokosuka, near Tokyo. This campus works in partnership with Kyoto University and Nagoya University on organic metals in gas separation and storage.

**More than 60% of Research and Development projects** were conducted under partnerships with laboratories, start-ups, industrial players and customers in 2018. Air Liquide steers 75 industrial partnerships and 126 scientific partnerships, and supports two research chairs in France with the École Centrale Paris and the Mines ParisTech.

To identify new partners, in 2018 Air Liquide launched its second **Scientific Essential Small Molecules Challenge**, aimed at boosting R&D as part of its open innovation approach. This year, the three topics selected aim to improve air quality and prevent global warming. This Scientific Challenge is open to teams from universities, private Research & Development departments, start-ups and public or private Institutes.

### 6.3.3. Dedicated Labs

In addition to its Innovation Campuses, the Group relies on labs, which focus on specific themes:

- the **i-Lab** for new usages and new methods of consumption, to identify and test new growth opportunities, via a user-centric approach;
- **La Factory** which brings together designers, developers, data scientists and user researchers to deliver digital solutions, in particular through the creation of prototypes that are then rolled out within the Group. It also develops digital practices;
- the **m-Lab (molecule Lab)**, focused on science and Essential Small Molecules (oxygen, nitrogen, hydrogen and carbon dioxide), which integrates recent advances in scientific knowledge and is constantly inventing new usages for these Essential Small Molecules, based on their unique properties;
- the **d2Lab**, dedicated to data science and decision sciences, aimed at developing the Group's scientific excellence in data analysis, financial mathematics and game theory, artificial intelligence and machine learning.

## 6.4. RECOGNIZING GROUP TEAMS WHICH CONTRIBUTE TO INNOVATION

The Group's innovation strategy relies on the creativity, curiosity and ability of its teams to deliver which is key to allowing Air Liquide to reinvent its business, anticipate the challenges of its markets and take into account the new usages of its customers and patients. The Group has not only implemented **internal programs** to encourage and recognize the talent and expertise of its technical experts who contribute to innovation, but also, since 2014, the talent of its internal entrepreneurs.

The **recognition of technical expertise** is a key factor for innovation. The Group has introduced **Technical Community Leaders (TCL)**, a promotion and recognition program for the technical field and for the expertise of Group employees which has six levels. Each level is a progression in terms of responsibilities, recognition and influence. Since the launch of TCL in 2003, **more than 3,000 Air Liquide experts** have been recognized, and play a key role in the sharing of knowledge and best practices, transferring technical expertise and developing the long-term expertise that Air Liquide will require in the future. In 2018, two Senior Fellows, five International Fellows, 21 International Senior Experts and 66 International Experts received this recognition.

The **#iNVENT** recognition program rewards **employee inventors** of patented inventions that are successfully marketed, or that give the Air Liquide a competitive advantage. Moreover, a trophy is awarded for the best invention of the year, selected from among the patent applications filed within each business in the past two years, and a bonus to inventors when a patent is delivered. This program ensures that inventors are rewarded quickly and the portfolio of inventions is managed more efficiently. More than **3,000 rewards** have been awarded to inventors employed by Air Liquide since 1997. These patented inventions mainly come from the employees in the Group's R&D, Engineering & Construction and Global Markets & Technologies teams, but also from certain operating entities.

Air Liquide also recognizes its **employee entrepreneurs** who contribute to innovation by imagining new ways of developing the Group's business or by adapting Group offerings to make them more customer-centric. In 2018, Air Liquide honored 102 internal entrepreneurs, in Paris and in all its hubs, during its annual Be Innovation event.

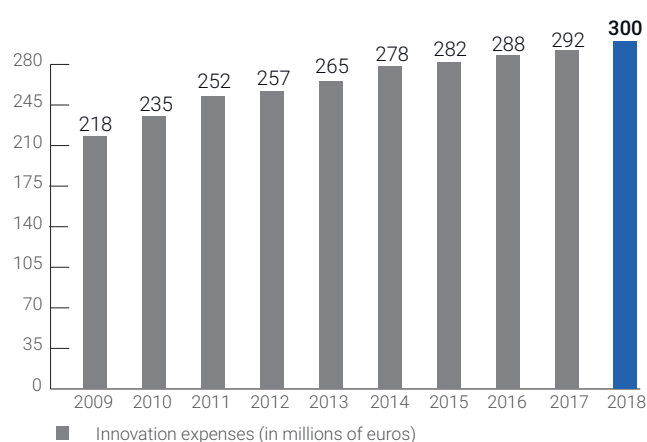
This collective intelligence approach, which involves the creation of transversal teams, with a strong diversity of profiles, contributes to the efficiency of innovation.

## 6.5. INNOVATION INDICATORS CONCERNING THE GROUP AS A WHOLE <sup>(a)</sup>

AS AT DECEMBER 31, 2018

Number of employees working on innovation	4,000
including researchers	1,200 researchers of 41 nationalities
including Global Markets & Technologies employees	1,900
including employees working on innovation in other entities	900
R&D industrial partnerships	75
R&D scientific partnerships (academic and technology institutes)	126
Start-ups collaborating with the Group	100

### INNOVATION EXPENSES



### PATENTS

	2014	2015	2016	2017	2018
Number of inventions protected by at least one patent	3,369	3,200	3,363	3,335	3,395
New patent applications filed during the year	287	271	296	318	309

(a) Applying the OECD definition.

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## OUTLOOK

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2018 was a particularly strong year, whether we are looking at sales growth to 21 billion euros and the rise in net profit to 2.1 billion euros or the efficiencies and synergies achieved as well as the high level of industrial investment decisions.

Sales growth is the highest since 2011. All activities / businesses are growing, in particular Gas & Services activities, which account for 96% of the Group's revenue, with the last quarter particularly dynamic in Electronics and Industrial Merchant. From a geographic perspective, growth was also seen across the Board, especially for the Americas and Asia Pacific, particularly China.

The Airgas synergies are achieved a year ahead of schedule, confirming that the integration is now successfully completed. In addition, operating efficiency objectives were surpassed, contributing to the improved operating margin in Gas & Services, excluding the energy impact. As of 2019, the annual efficiency objective is raised to 400 million euros for the Group, which is 100 million euros more than the objective initially announced in the NEOS company program.

Cash flow grew and contributed to a significant reduction in the debt ratio, to 69%. The Group's balance sheet is strong and its ROCE improved, reaching 8.3% excluding the currency impact, in line with the NEOS objective.

In a context where industrial opportunities remain substantial, the Group's investment decisions reached more than 3 billion euros. Investment backlog amounted to 2.2 billion euros, supporting future growth.

Accordingly, assuming a comparable environment, Air Liquide is confident in its ability to deliver net profit growth in 2019, calculated at constant exchange rate.





# CORPORATE GOVERNANCE

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This chapter includes, in particular, the elements of the Report on Corporate Governance drawn up on the basis of Ordinance n°2017-1162 of July 12, 2017 by the Board of Directors at its meeting on February 13, 2019, on the recommendation of the Appointment and Governance Committee and the Remuneration Committee.

Those parts of the Report relating to the composition, preparation and organization of the work of the Board of Directors have been prepared on the basis of contributions from several of the Company's corporate functional divisions, including in particular the Legal, Financial and Human Resources Departments.

## MANAGEMENT AND CONTROL

### 1. Board of Directors

#### DIRECTORS CURRENTLY IN OFFICE (AS OF DECEMBER 31, 2018)

Members of the Board	Changes in 2018 <sup>(a)</sup>	Nationality	Age <sup>(b)</sup>	Gender	Year of first appointment	Years of service on the Board <sup>(b)</sup>	End of current term
Benoît POTIER Chairman and Chief Executive Officer	May 16, 2018 (renewal: BoD)	French	61	M	2000	14	2022
Jean-Paul AGON Lead Director	May 16, 2018 (renewal: BoD, LD, RC, Chairman NGC)	French	62	M	2010	8	2022
Geneviève BERGER		French	63	F	2015	3	2019 <sup>(e)</sup>
Philippe DUBRULLE Director representing the employees	May 16, 2018 (renewal: BoD, ESC)	French	46	M	2014	4	2022
Pierre DUFOUR		Canadian	63	M	2012	6	2020
Brian GILVARY		British	56	M	2016	2	2020
Siân HERBERT-JONES		British	58	F	2011	7	2019 <sup>(e)</sup>
Xavier HUILLARD	May 16, 2018 (appointment: Chairman RC)	French	64	M	2017	1	2021
Karen KATEN		American	69	F	2008	10	2020
Sin Leng LOW	May 16, 2018 (renewal: BoD, AAC)	Singaporean	66	F	2014	4	2022
Thierry PEUGEOT		French	61	M	2005	13	2021
Annette WINKLER	May 16, 2018 (renewal: BoD, NGC, RC)	German	59	F	2014	4	2022

(a) BoD: Board of Directors; LD: Lead Director; AAC: Audit and Account Committee; NGC: Nomination and Governance Committee; RC: Remuneration Committee; ESC: Environment and Society Committee.

(b) Number of full years of service as of December 31, 2018. The term of office of Mr Benoît Potier as President of the Management Board (2001-2006) is not taken into account.

(c) Pursuant to the decision of the Board of Directors of February 13, 2019; for information regarding independence criteria, please refer to this Reference Document – page 94.

(d) In accordance with the recommendation of the AFEP/MEDEF Code.

(e) Renewal of term proposed to the Shareholders' Meeting of May 7, 2019.

#### SOCIAL AND ECONOMIC COMMITTEE DELEGATES

Pierre GAC                Social and Economic delegate  
Patrice LEVEE           Social and Economic delegate

Independent Director <sup>(c)</sup>	Board Committees				Number of directorships in listed companies <sup>(d)</sup>	Experience and expertise
	Audit and Accounts Committee	Nomination and Governance Committee	Remuneration Committee	Environment and Society Committee		
No					2	Chairman and Chief Executive Officer
Yes		President	Member		1	Executive Officer of an international corporation with an understanding of consumer products markets
Yes				Member	1	Expertise in hospital, health and research
No				Member	0	Knowledge of the Air Liquide Group and its activities as an employee
No				President	1	Former Executive Officer of the Air Liquide Group, deep knowledge of the engineering and gas businesses and intensive international experience
Yes	Member				1	Knowledge of the oil and gas industry, financial expertise, as well as the global vision of a large international group
Yes	President				2	Expertise in finance and audit, knowledge of the Service sector
Yes			President		2	Experience as a Chairman and Chief Executive Officer of a large international group and knowledge of construction business
Yes		Member			0	Managerial experience within a large pharmaceutical group and knowledge of the health sector particularly in North America and the rest of the world
Yes	Member				0	Management of industrial activities and knowledge of the Asian markets
No	Member				1	Management experience within a large company in the automotive sector
Yes		Member	Member		0	Senior Management of a division of a large German industrial group with an international reach in the automotive sector

## 2. Executive Management and Executive Committee as of December 31, 2018

<b>Benoît Potier</b> Chairman and Chief Executive Officer <sup>(a)</sup> Born in 1957 – French	<b>François Jackow</b> Senior Vice President In charge of Healthcare activities Supervises the Dubai hub supervising Africa, Middle East and India, as well as the Customer Experience program Born in 1969 – French
<b>Michael J. Graff</b> Executive Vice President Houston hub Executive Vice President supervising America Supervising Electronic World Business Line, Safety and Industrial systems Chairman of the Board of Airgas Born in 1955 – American	<b>François Venet</b> Senior Vice President Strategy Vice President Supervising Large Industries business line and Engineering & Construction Born in 1962 – French
<b>Fabienne Lecorvaisier</b> Executive Vice President in charge of Finance, Operations Control and General Secretariat Born in 1962 – French	<b>François Abrial</b> Shanghai hub Executive Vice President supervising Asia Pacific Born in 1962 – French
<b>Guy Salzgeber</b> Executive Vice President Frankfurt hub Executive Vice President supervising Europe Industries Supervising Group Procurement and Corporate Sustainability Program Born in 1958 – French	<b>Pascal Vinet</b> Chief Executive Officer of Airgas Born in 1962 – French
<b>François Darchis</b> Senior Vice President Innovation and Development Vice President Supervising Information Technologies, Industrial Merchant business line and Sustainable Development objectives Born in 1956 – French	<b>Armelle Levieux</b> Vice President Group Human Resources Born in 1973 – French
<b>Jean-Marc de Royere</b> Senior Vice President Corporate Sustainability Program Chairman of the Air Liquide Foundation Born in 1965 – French	

(a) Within the meaning of the French Commercial Code.

## COMPOSITION, PREPARATION AND ORGANIZATION OF THE WORK OF THE BOARD OF DIRECTORS

As at December 31, 2018, the Board of Directors comprises 12 members: 11 members appointed by the Annual Shareholders' Meeting, including six foreign members (German, American, British, Canadian and Singaporean) and five women (representing 45%), and one Director representing the employees appointed by the France Group Committee.

The term of office is for four years. The Board aims to stagger the renewals of the terms of office. In May 2019, at the close of the Shareholders' Meeting, subject to the approval of the proposed resolutions, the Board of Directors will comprise 12 members and the structure of the composition indicated above will remain unchanged.

### 1. Code of corporate governance

The Board of Directors confirmed that, in keeping with the Group's previous practices, the AFEP/MEDEF Code of corporate governance for listed companies is the Code to which the Company voluntarily refers. This Code, as last updated in June 2018, is available on the website <http://www.afep.com/contenu/focus/code-de-gouvernement-d-entreprise-des-societes-cotees>.

The AMF Report of November 26, 2018 on corporate governance, the remuneration of Executive Officers, internal audit and risk management, together with the Report of the Haut Comité de Gouvernement d'Entreprise (French High Committee on Corporate Governance) of October 2018 have been reviewed.

Pursuant to article L. 225-37-4, 8° of the French Commercial Code, those provisions of the aforementioned Code that are currently not

applied and the reasons for this are stated in this Report. A summary is presented in table format on page 112.

The principles governing the professional ethics of Directors, the diversity policy which applies to the Board of Directors, together with the composition, role and rules of operation of the Board and its Committees are defined in the internal regulations. The text of the internal regulations was amended in accordance with the corresponding revision of the AFEP/MEDEF Code in order, in particular, to incorporate the aspects relating to corporate and environmental responsibility and non-financial information. The internal regulations were approved by the Board of Directors on September 25, 2018 and are published in their entirety on the Company's website.

### 2. Composition of the Board of Directors

The internal regulations stipulate that:

"Members are chosen for their skills, their integrity, their independence of mind and their determination to take into account the interests of all shareholders."

"The diversity policy concerning the Board of Directors: the composition of the Board of Directors, with regard to its members appointed by the Annual Shareholders' Meeting upon the proposal of the Board of Directors, shall reflect diversity and complementarity of experience, in particular international experience, nationalities, age, gender, cultures and expertise, including a significant number of executive managers or former executive managers; the Board of Directors shall look for persons possessing skills in the following areas: marketing, services, industry, finance, health, research and technology."

The Board of Directors, which has 12 members, reflects a diversity of profiles, experience and complementarity of skills, which is appropriate for the issues faced by Air Liquide. The Board of Directors considers that compliance with the diversity policy criteria listed above contributes to the quality of its debates.

The diversity policy which applies to the members of the Board is accompanied by guidelines, which are set forth in the internal regulations which, although not written in stone, also guide the composition of the Board, in particular in terms of the number of Directors appointed by the Shareholders' Meeting (in principle between 10 and 12), the balance between (former) executive managers and external members, the duration of the terms of office (four years, principle of staggering renewals, the proportion of members appointed by the Shareholders' Meeting in office for more than 12 years cannot exceed one-third), age or the proportion of members who qualify as independent, thus aiming to comply with the recommended principles in terms of good corporate governance practices.

The Board of Directors relies upon the work of the Appointments and Governance Committee in order to propose to the Shareholders' Meeting, any new appointment or renewal of the offices of Director.

The Appointments and Governance Committee carries out its search for new members on the basis of its evaluation of the needs and developments expressed by the Board of Directors and in consideration of the principles and the diversity policy defined above.

In this regard, in 2018, in order to prepare for future recruitments, the Appointments and Governance Committee examined the profiles of several candidates, particularly those from North America, who had expressed interest. The Committee also pursues its research in liaison with an outside firm in order to identify other potential candidates, including in particular female candidates and profiles with particular skills in the Digital and Innovation sectors. A report has been made to the Board.

The non-discrimination and diversity policy in leaderships and particularly information relating to the manner in which the Company

tries to obtain a balanced representation of men and women on the Executive Committee, and to the results concerning the gender mix with regard to the 10% of positions which carry the most responsibility, is contained in this Reference Document, at chapter 4, pages 280 et 281.

In accordance with the AFEP/MEDEF Code, the internal regulations provide for a limit, for non-executive Directors, of four other terms of office in French or foreign listed companies and, for the executive Directors, of two other terms of office. Moreover, an obligation to provide information on the terms of office held in other companies, including their participation on the Board Committees of such companies, is provided for non-executive Directors; an obligation to ask for the opinion of the Board of Directors (which makes a decision on the recommendation of the Appointments and Governance Committee) before accepting a new corporate office in a listed company is also provided for the Company's Executive Officers.

### 3. Independence of Board Members

Based on the full definition of independence set out in the AFEP/MEDEF Code of corporate governance, the internal regulations define the criteria applied within the Company to assess the **independence** of Board members.

"A member of the Board of Directors is independent when he/she has no relationship of any kind with the Company, its Group or its management which may interfere with his/her freedom to exercise his/her judgment.

In this spirit, the criteria which may provide guidance to the Board in order to classify a member as independent will be as follows:

- he/she is not and has never been an employee or member of the Executive Management of the Company;
- he/she does not hold office as Chairman, Chief Executive Officer, Chairman or member of the Management Board of a company in which the Chairman of the Board of Directors, the Chief Executive Officer or a Senior Executive Vice President of Air Liquide is a Director or member of the Supervisory Board;
- he/she must not have any business relations with the Air Liquide Group which represent a significant part of the business activities (i) of the company of which the Director is a member of the Executive Management or (ii) of Air Liquide;
- he/she must not have any close family links with the Chief Executive Officer or a Senior Executive Vice President;
- he/she must not have been an auditor of the Company during the previous five years;
- he/she must not have been a member of the Board of Directors (or Supervisory Board) of the Company for more than 12 years."

An assessment of the independence of its members appointed by the Shareholders' Meeting is included on the agenda for a Board Meeting once a year. In reliance on the work of the Appointments

and Governance Committee, the Board of Directors reviews each of the criteria contained in the Board's internal regulations and in the AFEP/MEDEF Code for assessing the independence of each Director.

For the criteria relating to business relations, the Board relies upon a chart summarizing the purchases and sales implemented during the previous fiscal year between companies of the Air Liquide Group and companies of groups within which an Air Liquide Director appointed by the Shareholders' Meeting (or proposed Director) also exercises a term of office or executive role. Such figures are weighed against the total purchases and sales of each group to measure their significance. In addition to the aforementioned **quantitative** criteria, the Board of Directors carries out a **qualitative** review of the situation of each Director holding a term of office or executive role at the group in question.

For the 2018 fiscal year, this chart shows that the amounts of sales by the Air Liquide Group to any of the relevant groups or of its purchases from any of such groups do not exceed 0.4% of the total sales or purchases by the Air Liquide Group or by any of the relevant groups.

From a qualitative point of view, it was also noted that neither Air Liquide nor the relevant groups have a relationship of economic dependence or exclusivity, as they are large international groups with highly diversified activities. It was asserted that, in light of the highly decentralized organization of the Air Liquide Group, its size, the diversity of its businesses, which are, for the most part, extremely local, and its broad geographical presence, the relevant Directors do not become involved in business relations which are conducted, within the Air Liquide Group, entirely by the managers of the relevant hubs, groups of countries or entities (clusters) and countries.

After a review of each individual situation, the Board concluded that none of the Directors has to exercise a direct or indirect decision-making power in the contractual negotiations leading to the business affairs discussed. If this were not the case, he/she would have to declare a conflict of interest to the Board. This matter would then be addressed in accordance with the ethical rules provided for in the internal regulations.



The review by the Board of Directors of the individual situation of each Director in light of the criteria required by the AFEP/MEDEF Code for independent status is shown in the following table:

AFEP/MEDEF Criteria	Benoît POTIER (Chairman & CEO)	Jean-Paul AGON	Geneviève BERGER	Pierre DUFOUR	Brian GILVARY	Siân HERBERT- JONES	Xavier HUILLARD	Karen KATEN	Sin Leng LOW	Thierry PEUGEOT	Annette WINKLER	Philippe DUBRULLE (Director representing the employees)
<b>Criterion 1</b> Employee Executive Officer within the previous 5 years	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	N/A
<b>Criterion 2</b> Cross-directorships	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
<b>Criterion 3</b> Significant business relations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
<b>Criterion 4</b> Family ties	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
<b>Criterion 5</b> Not to have been an auditor of the Company within the previous 5 years	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
<b>Criterion 6</b> Term of office in excess of 12 years	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	N/A
<b>Criterion 7</b> Status of non-executive company officer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Criterion 8</b> Major shareholder status	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The Board also reviewed the situation of each Director in light of each of the criteria in the internal regulations as set forth above (page 94 of this Reference Document). The criteria used are very largely inspired by the AFEP/MEDEF Code of corporate governance. The Board continues

to consider, however, that the Company's former employees or officers cannot be deemed to be independent **even if they ceased to hold office more than five years ago.**

Further to the recommendation made by the AMF, a table showing the list of Directors in 2018 who are considered to be independent in light of the criteria provided for in the internal regulations, as compared with the AFEP/MEDEF Code, is set out below.

**As at 12/31/2018**  
**Independence of the Directors elected**  
**by the Shareholders' Meeting in light of the criteria in the**

	Internal regulations	Code AFEP/MEDEF
Benoît Potier (Chairman and Chief Executive Officer)	No	No
Jean-Paul Agon (Lead Director)	Yes	Yes
Geneviève Berger	Yes	Yes
Pierre Dufour	No <sup>(a)</sup>	No <sup>(a)</sup>
Brian Gilvary	Yes	Yes
Siân Herbert-Jones	Yes	Yes
Xavier Huillard	Yes	Yes
Karen Katen	Yes	Yes
Sin Leng Low	Yes	Yes
Thierry Peugeot	No <sup>(b)</sup>	No <sup>(b)</sup>
Annette Winkler	Yes	Yes
Philippe Dubrulle (Director representing the employees)	N/A	N/A

(a) Former employee/Member of the executive management of the Company.

(b) Length of term of office exceeding 12 years.

The Board thus found that, at the end of the fiscal year 2018, the following members elected by the Shareholders' Meeting were independent: Jean-Paul Agon, Geneviève Berger, Brian Gilvary, Siân Herbert-Jones, Xavier Huillard, Karen Katen, Sin Leng Low and

Annette Winkler (namely 73% are independent Directors). Pursuant to the provisions of the AFEP/MEDEF Code, Philippe Dubrulle, Director representing the employees was not taken into account when calculating this ratio.

## 4. Professional ethics of Directors – Rights and obligations of Directors

The internal regulations summarize the main obligations imposed on Directors. The Directors represent all the shareholders and shall act in all circumstances in the Company's best interests.

Each Director undertakes to meet the obligations imposed upon him/her by the articles of association and the various legal, regulatory or internal Company provisions and, more specifically, the internal rules relating to the prevention of market abuse or the obligations to

report transactions in the Company's shares. Each Director is bound by an obligation of secrecy. The members of the Audit Committee are, in particular, bound by an obligation of confidentiality concerning the information relating to the services performed by the Statutory Auditors, in accordance with the legal conditions. Each Director shall endeavor to take part in all meetings of the Board and the Committees of which he/she is a member, and attend the Shareholders' Meetings.

The information required by the AFEP/MEDEF Code concerning the level of attendance of the members of the Board of Directors is shown below:

	Board of Directors	Audit and Accounts Committee	Appointments and Governance Committee	Remuneration Committee	Environment and Society Committee
<b>Benoît Potier</b> <i>Chairman and Chief Executive Officer</i>	100%	-	-	-	-
<b>Jean-Paul Agon</b> <i>Lead Director</i>	83.33%	-	100%	100%	-
<b>Geneviève Berger</b>	100%	-	-	-	100%
<b>Pierre Dufour</b>	100%	-	-	-	100%
<b>Brian Gilvary</b>	100%	75%	-	-	-
<b>Siân Herbert-Jones</b>	100%	100%	-	-	-
<b>Xavier Huillard</b>	100%	-	-	100%	-
<b>Karen Katen</b>	100%	-	100%	-	-
<b>Sin Leng Low</b>	83.33%	75%	-	-	-
<b>Thierry Peugeot</b>	100%	100%	-	-	-
<b>Annette Winkler</b>	100%	-	100%	100%	-
<b>Philippe Dubrulle</b> <i>Director representing the employees</i>	83.33%	-	-	-	100%
<b>TOTAL</b>	<b>95.83%</b>	<b>87.50%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Each Director shall keep him/herself informed and devote the time and attention required to perform his/her duties. Under the Company's articles of association, each Director must hold at least 500 registered shares in the Company. The Director shall inform the Company of the number of shares which he/she holds.

These provisions do not apply to the Director representing the employees.

Under the internal regulations:

"the members of the Board of Directors must inform the Board of any situation of conflict of interest, even if it is only potential, with the Company, and must refrain from taking part in the discussions and in the vote on the corresponding decision."

This obligation is completed by a formal annual declaration provided to the Company by each Director, attesting to the absence of a potential conflict of interest involving him/her. Finally, the Appointments and Governance Committee, under the management of the Lead Director, currently has the task of preventing potential situations of conflict of interest on the Board.

As every year, an internal memo on the prevention of market abuse was sent to the Directors (at the beginning of 2019), which outlines in greater detail the applicable legal and regulatory obligations by which they are bound pursuant to the European and national provisions.

All the provisions governing Directors' rights and obligations are included in the manual for members of the Board of Directors which is updated every year.

## 5. Combination of the roles of Chairman and Chief Executive Officer

The Board of Directors decided to maintain the combination of the roles of Chairman and Chief Executive Officer, both roles being held by Benoît Potier, at the close of the Shareholders' Meeting on May 16, 2018 which decided upon the renewal of his term of office as Director. Within the scope of the evaluation questionnaire, which was prepared at the end of 2018, concerning the way in which the Board operates, the Directors confirmed their agreement to this General Management organization.

This mode of executive management of the Company allows for regular, personalized exchanges between the shareholders and the General Management through a single contact person, who has an in-depth knowledge of the Group and its businesses and makes it possible to ensure that the definition of the Group's strategy takes due account of shareholders' expectations and interests over the long term. Maintaining the combination of roles therefore promotes a close, trusting relationship between the Executive Officer and the shareholders. This organization is in keeping with the very specific shareholding structure of Air Liquide which has always consisted, alongside institutional investors from all continents, of a significant number of individual shareholders (who hold 32% of the capital at the end of 2018), accompanying the Group over the long term.

In this regard, the Company regularly organizes, in particular through its Shareholder Service, meetings between the Chairman and Chief Executive Officer and the individual shareholders. Accordingly, the Chairman and Chief Executive Officer chairs the Committee for communication with individual shareholders which, in 2018, met three times at the Company's head office. Each year, after the Shareholders' Meeting, two meetings are organized in two cities in France: accordingly, in 2018, they were held in Reims (May 22, 2018) and Cannes (May 31, 2018). These encounters are followed by a question and answer session (as at the Annual Shareholders' Meeting) during which the Chairman and Chief Executive Officer has discussions with the shareholders. Finally, on November 23, 2018, Benoît Potier also attended the Actionaria fair and accordingly had discussions with the individual shareholders.

The Chairman and Chief Executive Officer also regularly meets the institutional shareholders, through the intermediary of the Shareholder Relations Service, either individually or at group meetings which are organized several times a year. These are essentially question and answer sessions. Accordingly, in 2018, Benoît Potier met several dozen institutional investors at meetings in Paris, London and New York. On November 30, 2018, Benoît Potier also made an announcement to the financial markets concerning the Group's Climate objectives at an event organized in Paris.

A procedure is in place which enables the Board of Directors to be informed of contacts made between the Chairman and Chief Executive Officer and the principal shareholders.

The combination of the roles of Chairman and Chief Executive Office complies with the balanced governance rules, ensuring the continued success of the Group and the loyalty of its shareholders. The principal applicable governance rules are described below:

- the presence of an independent Lead Director, Jean-Paul Agon, who has specific powers, including the power to ask the Chairman to

convene the Board of Directors on a given agenda, the Chairman being bound by that request. The Lead Director may be asked by the other Directors for individual meetings, whenever they consider necessary and the Directors are regularly questioned on their level of dialogue with the Lead Director. In order to further enrich the dialogue with the principal shareholders, the latter have the right, at their request, to meet with the Lead Director (three meetings thus took place in 2018);

- a composition of the Board which ensures a preponderance of independent Directors and a balance of skills and nationalities. The articles of association grant a power to one-third of the Directors to convene a Board Meeting and determine its agenda, if a Board Meeting has not been convened for over two months. In addition, the Directors have the possibility of setting up working groups within the Board in the event of a significant acquisition. Every year, the Board holds an executive session, chaired by the Lead Director, without the presence of the Executive Officers and former Executive Officers or of any person internal to the Group;
- the existence of specialist Committees on appointments and governance, remuneration, audit and environment and society, each Director now being a member of one Committee. A monitoring task was entrusted to the Appointments and Governance Committee which is responsible for supervising the proper working of the governance bodies. In this regard, pursuant to the internal regulations, the Committee is the organ of dialogue between the non-executive Directors and the Chairman and Chief Executive Officer, in particular in the event of conflicts within the Board; it monitors the changes in the corporate governance practices and the process for evaluating the Board.

Since 2014, as part of the annual evaluation questionnaires, the Directors are systematically questioned on the mode of exercise of the General Management (combination of roles) and on the actual participation of the members of the Board.

Each year, the Appointments and Governance Committee considers the procedure for the replacement of the General Management in the event of an emergency situation.

In connection with the interactions between the Board of Directors, the Chairman and Chief Executive Officer and the management teams, the relations between the Board of Directors, the Chairman and Chief Executive Officer and the Executive Committee are linked as follows:

- a balanced organization:
  - limits on the powers of the Chairman and Chief Executive Officer, the Board's agreement being required for significant transactions,
  - regular interactions between the non-executive Directors and the members of the Executive Committee at the time of specific presentations made to the Board, in particular during the full-day session on strategy or during Committee meetings. The Directors may ask to meet members of the Executive Committee at any time,
  - regular information being provided to the Directors, including in-between Board meetings;

- an annual review of the assessment of performance and remuneration of the Executive Officers by the Committee which is always carried out without the presence of the relevant Executive Officer;
- the Executive Committee, which comprises 11 members, ensures the coordination between the various Group programs and

activities. The Executive Committee focuses principally on the review of operational management, in terms of objectives, state of progress and action plans, the conduct of projects for change, Human Resources strategy and development. The three Executive Vice Presidents form part of the Executive Committee.

## 6. Lead Director

Pursuant to the terms of article 13 of the articles of association, the Board of Directors is obliged to appoint a Lead Director, as long as the roles of Chairman and Chief Executive Officer are combined.

Within this framework, on May 3, 2017 and on the recommendation of the Appointments and Governance Committee, the Board of Directors appointed Jean-Paul Agon, an Independent Director, as Lead Director. Jean-Paul Agon's term of office as Director, having expired, was renewed by the Shareholders' Meeting on May 16, 2018 for a period

of four years. At the close of that Shareholders' Meeting, the Board of Directors decided to renew Jean-Paul Agon's position as Lead Director for the period of his term of office on the Appointments and Governance Committee.

The Board of Directors, at the same meeting, also decided to renew Jean-Paul Agon's position as Chairman of the Appointments and Governance Committee for the period of his term of office as director.

The internal regulations of the Board of Directors:

A) define the responsibilities and powers of the Lead Director as follows:

### ***"Responsibilities and powers of the Lead Director"***

The Lead Director has the following responsibilities and powers:

1. He conducts, upon delegation from the Chairman of the Appointments and Governance Committee when he is not the Committee Chairman himself, the work of the Appointments and Governance Committee concerning the governance tasks entrusted to the committee, notably for the examination of the choice of general management organization, the review of changes in and application of the rules of corporate governance, the preparation of the evaluation of the functioning of the Board, the review of ethical issues, the attention paid to the proper functioning of the governance bodies, in particular in the transmission of the information requested by independent directors; on all these points, the Lead Director can formulate all proposals and make any suggestions he considers necessary.

More specifically, the Lead Director coordinates, within the committee, the implementation of the procedures aimed at identifying and analyzing potential situations of conflicts of interest on the Board; he draws the attention of the Chairman and Chief Executive Officer to potential situations of conflicts of interest identified in this manner.

He reports on these matters to the Board of Directors.

2. The Lead Director, after receiving the opinion of the Appointments and Governance Committee, may ask the Chairman of the Board of Directors to convene a meeting of the Board of Directors on any specified agenda, at any time and as often as required in the interests of the Company.

Under the conditions provided for in article IV of these regulations, the Lead Director may also receive a delegation of authority to convene a meeting of the Board of Directors at the request of at least one-third of its members.

3. The Lead Director, after receiving the opinion of the Appointments and Governance Committee, may propose the inclusion of additional points on the agenda for any Board meeting to the Chairman of the Board of Directors.
4. Once a year, the Lead Director calls a meeting of the members of the Board of Directors for a session to be held without the presence of the Group's executive directors (or former executive directors) or internal directors and employee representatives. He organizes and leads the discussions of this annual session which he chairs.
5. The Lead Director reviews the requests made by shareholders with regard to governance and makes sure that they are answered.
6. The Lead Director reports on his activities to the Board of Directors every year.
7. The Lead Director makes sure that a report is made to the shareholders on the governance issues falling within the scope of his responsibilities. A report on his activities is made in the Reference Document."

- B) provide that, within the scope of the annual evaluation of the Board, the Directors will be systematically asked to indicate whether it appears to them to be necessary for the Company's General Management organization to be re-examined.
- C) also provide, without prejudice to the provisions on convening the Board of Directors, which are set forth in the internal regulations of the Board of Directors, that the Lead Director, after receiving the opinion of the Appointments and Governance Committee, may ask the Chairman to convene the Board of Directors on a given

agenda; this right may be exercised at any time and as often as the Company's interests may require. The Chairman is bound by such a request.

In addition, certain governance measures promote exchanges between the Lead Director and the Directors and dialogue between the Lead Director and the shareholders (see page 97).

See page 109 for the 2018 report on the exercise of the Lead Director's term of office.

## 7. Role and tasks of the Board of Directors

The Board of Directors determines the major orientations of the Company's activities. Accordingly, it examines and approves **the Group's major strategic orientations**. It ensures the implementation of these orientations by the General Management.

The Board of Directors regularly reviews, in connection with the strategy which it has defined, opportunities and the financial, legal, operational, social and environmental risks, together with the measures taken accordingly. It ensures that a system has been implemented for the prevention and detection of corruption and influence peddling.

Subject to the powers attributed to the Shareholders' Meetings and within the limit of the corporate purpose, the Board deals with any issue concerning the smooth running of the Company and manages corporate

business pursuant to its decisions. The internal regulations stipulate that the **specific powers** attributed by law to the Board of Directors include, in particular, the choice of Executive Officers, the determination of the terms and conditions governing the remuneration and performance of their duties, the appointment of the Lead Director, the convening of the Shareholders' Meeting, the determination of the agenda and proposed resolutions, the preparation of the financial statements and Annual Management Report, as well as the determination of its internal rules (formation of Committees, distribution of Directors' fees, etc.). The Board also exercises **the powers delegated to it by the Shareholders' Meeting**, particularly with regard to the granting of stock options or award of performance shares, issues of marketable securities, share buyback or employee savings programs or simple bond issues.

## 8. Limits on powers

The internal regulations specify the rules limiting the powers of the Chairman and Chief Executive Officer, by defining the thresholds above which certain key decisions require prior authorization by the Board of Directors, in accordance with article 13 of the articles of association:

- sureties, endorsements and guarantees for an individual amount in excess of 100 million euros or for an annual aggregate amount in excess of 500 million euros;
- external sales or contributions (to non-controlled companies) of equity investments or lines of business, certain mergers, demergers or partial business transfers, completed for an individual amount in excess of 250 million euros or an annual aggregate amount, for each of these categories of transactions, in excess of 400 million euros; external sales or contributions of real estate assets for an individual amount in excess of 80 million euros or an annual aggregate amount in excess of 150 million euros;
- creation of pledges or security for an individual amount in excess of 80 million euros or an annual aggregate amount in excess of 150 million euros;

- commitments to invest, acquisitions which will be posted under "fixed assets" on the balance sheet, or subscriptions to share capital increases, for an individual amount in excess of 250 million euros or an annual aggregate amount in excess of 400 million euros; the Board of Directors is informed, if possible *ex ante* and in any event *ex post*, of transactions for an individual amount in excess of the threshold of 250 million euros, (i) involving purchases of items that cannot be posted under "fixed assets" on the balance sheet, such as electricity or natural gas purchases, and (ii) involving sales to third parties of goods or engineering or construction services;
- financing operations concerning the Group for an amount which is likely to substantially alter the Group's financial structure;
- operations which are likely to substantially alter the Group's strategy.

Furthermore, the Board shall be given prior information in the event of a fundamental modification of the information system, leading to development costs in excess of 250 million euros.

## 9. Functioning of the Board of Directors

**Informing the Directors:** the internal regulations define the methods for informing the Directors. They specify, in particular, that prior to Board meetings, a file of meeting documentation is sent out to Board members covering the principal items on the agenda, since 2013, the file is also accessible in electronic format. The Chairman and Chief Executive Officer, assisted, if need be, by members of the management teams, presents to the Board of Directors a quarterly report on the Company's management, the draft annual and interim financial statements and the various issues requiring the Board's authorization or opinion. For major substantive issues, a very detailed summary is prepared. Any member of the Board of Directors may request any additional information he/she considers necessary. He/she makes such a request to the Chairman of the Board.

**Conduct of meetings:** the internal regulations define the frequency of meetings and the rules for convening meetings and for participation by videoconference or telecommunications. They provide, in particular, for the Lead Director's right to ask for a meeting of the Board of Directors to be convened with any specified agenda and also for the conditions of the executive session attended by the members of the Board of Directors without the presence of the Group's executive Directors (or former executive Directors) or internal Directors and employee representatives, chaired by the Lead Director.

The Statutory Auditors are also heard during the meetings to review the financial statements.

During the meeting, a summary presentation of the items is then made, allowing considerable time for exchanges and discussions. The presentations give rise to questions and are followed by discussions. A round-the-table discussion is systematically held concerning the significant points, before moving to vote on the items on the agenda. Detailed written minutes are then sent to the members for their review and comments, before the approval of the Board of Directors at its next meeting.

**Formation of Committees:** the internal regulations define the task and operating procedures for the four Board Committees (a description of the Committees' tasks is provided at pages 105, 107, 109 et 111).

**Training measures:** the amended internal regulations corresponding to the revised AFEP/MEDEF Code stipulate that training relating to the Company's businesses and specific features and to the Corporate Social Responsibility business challenges is offered to the Directors, in particular by means of site visits or meetings with senior executives. More particularly, information on the Group's accounting, financial and operational specificities is offered to the members of the Audit and Accounts Committee. The Director representing the employees may, furthermore, receive training relating to his rights and obligations as a Director, in accordance with the applicable regulations. The form proposing a catalogue of training for the Directors has been updated in order to incorporate the training required by the amended internal regulations.

Each year, the Directors are asked about their training requirements and a training request form is systematically proposed once a year to each Director and to the new Directors. It consists of proposals for meetings with the heads of each of the major business lines and main central functions, and site visits.

Within this framework, the Directors may ask to meet Executive Committee members or ask for specific training for each business line, activity or geographical zone.

In 2018, at the time of the September meeting of the Board of Directors held in Saclay, the Directors visited the site of the Paris R&D Centre in the new Innovation Campus. The visits were organized around five R&D topics delivered by managers of the site or of the relevant business lines. Furthermore, at the time of the November meeting of the Board of Directors held at Airgas's registered office in Radnor near Philadelphia, the Directors effected two-day site visits. They therefore visited the American research centre (Delaware Innovation Campus). The Electronics activities also gave rise to a detailed presentation. The Directors also visited a branch office of Airgas and a regional distribution centre where the site managers gave them a presentation on the distribution chain and the activity of the sales force, and where they attended workshops on the digital developments. These visits also provided an opportunity for more informal meetings with numerous Group managers.

## 10. Participation of employee representatives on the Board

### 10.1. WITH A DELIBERATIVE VOTE

Philippe Dubrulle, the Director representing the employees is subject to all the provisions of the internal regulations governing the rights and obligations of the Directors described above. Appointed by the France Group Committee in 2014, Philippe Dubrulle's office was renewed by that same Committee, at its plenary session on December 6, 2017, for a term of four years which will expire at the close of the Shareholders' Meeting called to approve the financial statements for the 2021 fiscal year.

He sits on the Board with a deliberative vote. Since his appointment, he has had several training opportunities.

Pursuant to the applicable regulations, on the recommendation of the Appointments and Governance Committee, the Board of Directors has defined the amount of time allocated to the Director representing the employees for (i) the preparation of meetings (15 hours/meeting) and (ii) training (20 hours/year or 80 hours on a cumulative basis over the entire length of his term of office). This time is considered as actual working time and remunerated as such. It is recalled that, in 2016, the Director representing the employees had followed the training course provided by Sciences-Po in partnership with the IFA and obtained the Company director's certificate. As part of the renewal of the term of office of the Director representing the employees, the Board of



Directors has defined a new training program including in particular Corporate Social and Environmental Responsibility topics in addition to the internal trainings requested each year.

Within the scope of the agreement entered into with the various stakeholders (see below) and pursuant to the provisions in force within the Group, which apply to all the employees performing duties on Boards of Directors of the Group companies, it was agreed that the employee Director would not receive directors' fees.

Philippe Dubrulle participates on the Board Committee, which is in charge of reviewing the environmental and societal issues. He contributes in particular to this Committee, as part of the assignments which are entrusted to it concerning the definition and roll-out of the Group's actions on environmental and societal matters, the vision of the employees of the Group's operating entities. Philippe Dubrulle, who had made known his interest in issues relating to sustainable development, has sat on the Environment and Society Committee since it was formed, in May 2017.

The European Works Council is the competent body to appoint a second Director representing the employees, if a second post needs to be filled.

## 10.2. WITH AN ADVISORY VOTE

The law of June 14, 2013, which provides for the system of a Director representing the employees, in principle reduces the number of Central Works Council (now the Social and Economic Council) delegates participating on the Board with an advisory vote to one, inasmuch as

the number of members on the Board elected by the Shareholders' Meeting does not exceed 12.

However, at the request of the employee representatives and with the agreement of the Board of Directors, it was provided, in an agreement entered into with the various stakeholders, which was renewed in December 2017, that two Central Works Council delegates (and not one as provided by law) would continue to participate in meetings with an advisory vote; this participation is in addition to that of the employee Director who sits on the Board with a deliberative vote; the purpose of this agreement is to allow balanced representation of the most representative trade unions on the Board.

As a result of the above-mentioned agreement, two members of the Social and Economic Council, who are delegated by that Council, had the possibility to attend all the Board of Directors' meetings held during the 2018 fiscal year with an advisory vote. The delegates receive the same documents as those provided to the Directors on the occasion of these meetings. At meetings, the delegates are able to express their opinion on the questions discussed.

A preparatory meeting, in the presence of a member of the Executive Committee and the Secretary of the Board of Directors, is scheduled before each Board meeting. This preparatory meeting is the opportunity to go through the whole file for the Board meeting with the Director representing the employees and the Social and Economic Council delegates and to comment on the items on the agenda. It offers the participants the opportunity to raise their questions and make their initial comments.

# 11. Appraisal of the Board of Directors

The internal regulations stipulate that:

"The Board will ensure that an evaluation is carried out periodically of its composition, its organization and its functioning as well as those of its Committees. An update will be made by the Board on this topic once a year and a formal evaluation will be carried out at least every three years. Within the scope of the evaluation of the Board, the Directors will be asked to state whether it appears to them to be necessary for the choice of the company's general management organization to be re-examined."

An evaluation of the functioning of the Board of Directors is carried out every year, alternating, one year, between a full appraisal questionnaire leading to a summary showing the replies and the adoption of recommendations for action and, the next year, a questionnaire aimed at making an assessment of the actions implemented in light of the recommendations made.

The functioning of the Board of Directors and its Committees was fully evaluated in 2017. In this regard, a full appraisal questionnaire was submitted to the Board members and individual interviews were held with the Board's Secretary.

The summary of responses presented by the Chairman of the Appointments and Governance Committee to the February 2018 Board Meeting had revealed a very positive assessment overall of the functioning of the Board of Directors and its Committees. The members had highlighted, in particular, the quality of the files, of the information provided at the meetings and in-between meetings, the wide-ranging nature of the discussions at the Board Meetings and had considered the ability to speak freely to be excellent. They had also stated that they appreciated the on-site meetings, both for the quality of information provided there and for the discussions which are facilitated, as a result, between members and management. The members had also considered the implementation of an executive session to be positive (held without the presence of the executive Directors, former executive Directors or any internal members), permitting spontaneous discussion of any subjects desired by the participants. A few points to which attention needs to be paid could be seen from the evaluation, in particular concerning the mix of skills on the Board, given the new Group context after the acquisition of Airgas; the desire of certain Directors to improve even further the contacts between the Board and management; the organization, in connection with the implementation of the Environment and Society Committee, of joint sessions with the Audit Committee concerning issues which relate to both Committees (in particular concerning risk analysis).

A simplified assessment questionnaire was sent to the members of the Board of Directors at the end of 2018. This simplified questionnaire aims to ensure that the recommendations made in 2017 are monitored and enables the Directors to evaluate the actions implemented in 2018.

The answers provided by the Directors to the simplified questionnaire show a high level of satisfaction concerning (i) the site visits at the Board meetings held in Saclay (Paris R&D Centre) and in Philadelphia (Airgas sites and activities), the increase in contacts with management, (ii) the practice of the executive session, (iii) the combined role of the Chief Executive Officer in the current context and (iv) the review of high potentials / future managers in view of the future succession. The focal points concern in particular increasing the influence of the American

Directors and the joint meeting between the Audit Committee and the Environment and Society Committee (to be held in 2019).

In light of the collegiate nature of the Board, the assessment questionnaire concentrates on the collective contribution of members to the Board's operation. However, in order to improve the Group's practices by ensuring compliance with the AFEP/MEDEF Code, the questionnaire invites the Directors to make an evaluation of the participation by Directors in the reflections of the Board of Directors. Furthermore, the contribution by each Director is assessed by the Appointments and Governance Committee and then by the Board of Directors at the time of renewal of the terms of office of Directors and Committee members.

## 12. Executive session of the non-executive members of the Board of Directors

Pursuant to the provisions of the AFEP/MEDEF Code which recommend that at least one meeting per year is organized without the presence of the executive Directors, the internal regulations stipulate that:

"Once a year, the Lead Director calls a meeting of the members of the Board of Directors for a session to be held without the presence of the Group's executive Directors (or former executive Directors) or internal Directors and employee representatives. He organizes and leads the discussions of this annual session which he chairs."

In 2018, the executive session took place at the close of the September meeting of the Board of Directors. A report was provided to the Chairman and Chief Executive Officer.

## 13. The Board of Directors' work in 2018

In 2018, the Board of Directors met six times with an effective attendance rate, or telephone attendance rate, of 95.8% of its members.

The Board's activities related to the following issues:

### 13.1. MONITORING OF THE GROUP'S DAY-TO-DAY MANAGEMENT

Monitoring of the Group's day-to-day management is carried out particularly by:

- ▶ reviewing the quarterly activity reports, the annual and interim parent company and consolidated financial statements in the presence of the Statutory Auditors, which are used to determine the dividend distribution policy;
- ▶ reviewing the Group's financial position regularly, and more specifically: financing and debt management strategies;
- ▶ monitoring risks and the procedures for their prevention including a more in-depth review of certain risks based on the work of the Audit and Accounts Committee and the Environment and Society Committee and the review of opportunities;
- ▶ reviewing the minutes of the meetings of the four Committees;
- ▶ making decisions, in particular with respect to the investments necessary for the Group's medium-term development and corresponding financing capacities and the bond program;
- ▶ the share buyback/cancellation policy;
- ▶ the grant of stock options and the award of performance shares;
- ▶ reviewing, at each meeting, the report on acquisitions, sales and major projects in progress;
- ▶ reviewing employment-related documents: the social balance sheet (report on employee-related matters) and forward-planning documents;
- ▶ reviewing the composition of the Board of Directors, in particular with regard to the diversity policy which it has defined;
- ▶ preparing the Annual Shareholders' Meeting (agenda, proposed resolutions, Annual Management Report and other reports or sections contained in the Reference Document, which are prepared or approved by the Board of Directors; answers to shareholders' written questions);
- ▶ Human Resources issues; the annual deliberation with regard to the Company's professional gender and equal pay policy pursuant to the law of January 27, 2011 and the three-year professional gender equality agreement within L'Air Liquide S.A.;
- ▶ the annual review of ongoing regulated related-party agreements.

### 13.2. MONITORING OF THE GROUP'S MAIN STRATEGIES ON SIGNIFICANT ISSUES

Following the presentations made by General Management and certain senior executives, the Board of Directors closely considered the following in 2018:

- (i) questions relating to **strategy** and particularly the Group's objectives determined as part of the "NEOS" medium-term corporate program; review of the portfolio of businesses, an update on the achievement of the cost and growth synergies in respect of Airgas as compared with the objective and, in general, Airgas's activity in the context of the presentations made to the Board of Directors at the November meeting at Airgas's registered office in Radnor; setting of Climate objectives for the Group (see below the questions relating to Corporate Social and Environmental Responsibility); examination of ongoing transactions (acquisitions, sales); examination of the mergers taking place in the industry and the changes to the competitive environment linked to the Praxair-Linde merger; the implementation of a new IT tool to monitor and analyze financial and operational performance;
- (ii) the **governance** issues concerning the renewal of Benoît Potier's office as Chairman and Chief Executive Officer and, therefore, the maintenance of the combined roles of Chairman and Chief Executive Officer; the renewal of Jean-Paul Agon's office as Lead Director, the renewal of his office as Chairman of the Appointments and Governance Committee and the renewal of his office as a member of the Remuneration Committee; the appointment of Xavier Huillard as Chairman of the Remuneration Committee to replace Jean-Paul Agon; the supervision of the work of the Appointments and Governance Committee relating to the recruitment of Directors and the future succession of the Executive Officer; the renewal of some members of the Shareholder Relations working group and a review of the work carried out by that Group; the regulatory watch concerning in particular the draft law on growth and business transformation (PACTE);
- (iii) the implementation and monitoring of the **capital increase reserved for the Group's employees**;
- (iv) the questions relating to **Corporate Social and Environmental Responsibility** within the scope of the sustainable development program, including in particular the Group's Climate objectives based on the work of the Environment and Society Committee, in view of the announcement to the financial markets on November 30, 2018;
- (v) the amendment of the internal regulations of the Board of Directors in order to take into account the regulatory modifications and the revised AFEP/MEDEF Code.

### 13.3. FUNCTIONING OF THE CORPORATE GOVERNANCE BODIES

The functioning of the corporate bodies is organized in accordance with the recommendations of the AFEP/MEDEF Code of corporate governance, and the provisions of the internal regulations of the Board of Directors.

#### Concerning the Executive Officer

Benoît Potier's office as Chairman and Chief Executive Officer was renewed by decision of the Board of Directors on May 16, 2018.

#### Employment contract / corporate office of the Chairman and Chief Executive Officer

In accordance with the AFEP/MEDEF Code of corporate governance, which recommends that the Chairmen and Chief Executive Officers of listed companies do not combine an employment contract with their corporate office, Benoît Potier put an end to his employment contract as of May 5, 2010.

#### Remuneration

The Board of Directors assessed the performance of the senior Executive Officers in respect of the 2017 fiscal year and determined the amount of remuneration for the Executive Officers in respect of that fiscal year. The Board also determined the remuneration policy applicable to the Executive Officers as from 2018.

The Board also decided upon the remuneration policy for the Chairman and Chief Executive Officer for the 2019 fiscal year, in keeping with the 2018 policy. This policy is described in the section on remuneration set forth below on pages 139 et seq.

The elements of remuneration due or allocated to the Executive Officer in respect of 2018 described in this section are subject to the opinion of the shareholders at the Shareholders' Meeting on May 7, 2019.

The Annual Shareholders Meeting on May 7, 2019 will be invited to decide upon (i) the elements which make up the total remuneration and the benefits of any kind that may be paid or awarded to the Executive Officer in respect of the 2018 fiscal year ("Say on Pay *ex post*") and (ii) the remuneration policy for the Executive Officers for the 2019 fiscal year ("Say on Pay *ex ante*").

#### Shareholding obligation

The rules with regard to the holding of shares set by the Board of Directors are described in detail in the section on remuneration set forth below (see page 134).

## Concerning the Board of Directors

### Composition

Appointment – Renewal of terms of office:

- The Board proposed to the Shareholders' Meeting on May 16, 2018 to renew the terms of office of Benoît Potier, Jean-Paul Agon, Annette Winkler and Sin Leng Low, which expired at the close of the Shareholders' Meeting on May 16, 2018, for four years.
- Following the Shareholders' Meeting on May 16, 2018, the Board renewed the term of office of Benoît Potier as Chairman and Chief Executive Officer, Jean-Paul Agon as Lead Director, Chairman of the Appointments and Governance Committee and as a member of the Remuneration Committee, Annette Winkler as a member of the Appointments and Governance Committee and as a member of the Remuneration Committee and Sin Leng Low as a member of the Audit and Accounts Committee.

The Board meeting held at the close of the Shareholders' Meeting also appointed Xavier Huillard as Chairman of the Remuneration Committee and renewed Philippe Dubrulle, Director representing

the employees, as a member of the Environment and Society Committee.

- The Board proposed to the Shareholders' Meeting on May 7, 2019 to renew the terms of office of Siân Herbert-Jones and Geneviève Berger for four years, since those terms of office are due to expire at the close of the said Shareholders' Meeting.

### Directors' fees

The Board set the formula for distributing Directors' fees among its members for 2018 within the budget authorized by the Shareholders' Meeting of May 16, 2018 for a maximum amount of 1.15 million euros per fiscal year.

### Appraisal (see above)

Details of the assessment of the independence of each of the members of the Board, and the elements relating to the assessment of the implementation of the recommendations made by the directors in 2017 are set forth above at pages 94, 95, 96, and 101, 102.

## 14. The Committees of the Board of Directors

The Board of Directors has set up four Board Committees: the Audit and Accounts Committee, the Appointments and Governance Committee, the Remuneration Committee and the Environment and Society Committee.

### 14.1. THE AUDIT AND ACCOUNTS COMMITTEE

As at December 31, 2018, the Audit and Accounts Committee comprised **four members: Siân Herbert-Jones, Committee Chair, Thierry Peugeot, Sin Leng Low and Brian Gilvary. 75% of the members, including the Chair, are independent.**

The Committee members combine experience in business management with economic and financial expertise (see professional careers in the bibliographical memos on Directors on pages 113 et seq.). A qualified chartered accountant who worked in an audit firm for 13 years (PwC), Siân Herbert-Jones joined the Sodexo group in 1995, where she was Group Chief Financial Officer from 2001 until December 2015. Siân Herbert-Jones, in her capacity as Chair of the Audit and Accounts Committee, provides the Committee with her extensive financial expertise. Moreover, Brian Gilvary, the Chief Financial Officer of BP group, also provides the Committee with his expertise in this sector, given his considerable experience in Finance.

## Composition and tasks as defined by the internal regulations

The Committee must be comprised of three to five members of the Board of Directors and at least two-thirds of its members must be independent.

Given the new provisions of the AFEP/MEDEF Code which was revised in June 2018 relating in particular to the consideration by companies of the societal and environmental issues of their business and the transposition into French law of the Directive on non-financial reporting, the Board of Directors decided to expand the tasks of the Audit and Accounts Committee (see below). It is provided in this regard in the internal regulations, as amended by the Board, that the Committee reviews the procedures relating to the preparation and processing of the non-financial information and that the presentation of exposure to risks made by the management to this Committee is expanded to include risks of a societal and environmental nature.

### Tasks

"The purpose of the Committee is to prepare the decisions to be taken by the Board of Directors by examining the following issues and reporting on them to the Board:

#### By receiving reports:

Jointly and separately, in order to compare and combine the different points of view, from:

- the Finance & Management Control and Legal Divisions;
- the Internal Audit and Control Management;
- the external auditors.

#### Concerning the following points:

- existing organization and procedures in the Group;
- their actual functioning;
- how the financial statements and the accounts are drawn up.

#### In order to reach:

by comparing and combining the points of view collected and using their business judgment based on professional experience, a reasonable judgment concerning:

1. accounts and accounting principles used (their conformity in relation to the reference standards, a fair and complete reflection of the Group's situation, transparency, readability, consistency over time);
2. existence and functioning of control organizations and control procedures adapted to the Group, making it possible to identify and manage the risks incurred, including those of a societal and environmental nature, and to report on them;
3. organization of the internal audit function, the plans for assignments and actions in the internal audit field, the findings of these assignments and actions and the recommendations and ensuing measures taken;
4. choice and renewal of the external auditors, review of the tendering process, opinion on the selection of external auditors and the rotation of audit partners, review of proposed fees, information on the overall fees paid indicating the amount of fees paid for non-audit services;
5. procedures relating to the preparation and processing of the non-financial information.

#### The Committee:

1. Collects the observations of the executive management on these various issues. It hears the Chief Executive Officer or Senior Executive Vice Presidents at the committee's request or at the request of the persons concerned.
2. Makes recommendations, where applicable, to guarantee the integrity of the financial information preparation process.
3. Monitors the performance by the statutory auditors of their engagement.
4. Ensures compliance with the conditions of independence of the statutory auditors defined by the applicable regulations and examines every year with the statutory auditors the risks with regard to their independence and the safeguard measures taken to attenuate these risks.
5. Makes a recommendation to the Board of Directors on the statutory auditors proposed for appointment by the Shareholders Meeting, including at the time of renewal of the term of office.
6. Approves the provision by the statutory auditors or the members of its network of services other than the certification of the financial statements under the conditions provided for by the internal procedure applicable in this field.
7. Receives the additional report of the statutory auditors in accordance with the provisions of article 11 of Regulation (EU) No. 537/2014 of April 16, 2014 and discusses with them the essential questions resulting from the statutory audit of the financial statements which are set out in the additional report.
8. Reports to the Board of Directors on its work, informing it of any problems that may be encountered, observations made to the executive management and progress made in relation to these observations."

The Committee meets, in principle, three times a year, and always before the Board meetings during which the annual or interim financial statements are reviewed.

An initial verbal report is given to the Board by the Committee Chair. Written minutes of the meeting are transmitted to the

Directors. The Committee may ask to convene Group employees. It may meet with the Statutory Auditors or members of the Group Internal Control Department in person. It may call on external experts for assistance. The Chairman and Chief Executive Officer does not attend meetings of the Audit and Accounts Committee.



### The Audit and Accounts Committee's work in 2018

**The Audit and Accounts Committee met four times with an effective attendance rate, or attendance rate by telephone, of 87.5% of its members.**

The Committee reviewed the annual and interim consolidated and parent company financial statements; it took due note of the Company's financial situation, cash flow position and commitments. During the presentation by the Group Vice President Finance, the Committee more particularly analyzed the provisions, the "Other operating income and expenses" items, cash flow, taxation, risk exposure... It reviewed the drafts of the analyst presentation relating to the financial statements.

In addition, the Committee heard the presentations of the Statutory Auditors underlining the key points of the results and took note of their conclusions.

At the beginning of the year, the Committee reviewed the amount of fees paid to the Statutory Auditors in respect of the previous fiscal year.

The Committee took due note of the contents of the three draft reports issued by the Statutory Auditors, pursuant to European Regulation n° 537/2014. The reports on the statutory accounts and the consolidated financial statements include a description of the principal audit topics and are included in the Reference Document while the third, more detailed report is intended for the Audit Committee only.

The Committee monitored the achievement of the cost and growth synergies linked to the integration of Airgas, the Group's financing policy, debt and liquidity management. The Committee also reviewed the process for the production and disclosure of financial and accounting information.

Furthermore, specific presentations were made to the Committee on the following points: the state of progress of the digital protection actions within the Group; the Group purchasing policy and impacts of the Sapin 2 law; the management of business practices (including the monitoring of the actions required by the Sapin 2 law); the state of progress of the digital developments in the geographical zones; litigation and tax risks.

The Committee also heard regular reports on the main assignments carried out by the Group Internal Control Department, the follow-up of any corrective actions taken and the Group Internal Control Department's main assignments for the forthcoming fiscal year. The Committee also regularly monitored the process for deployment of the risk management procedure within the Group. It reviewed the Group's risk map and the changes made to it. The Committee reviewed the information provided in the Reference Document concerning the internal control and risk management procedures and recommended its approval by the Board of Directors.

In accordance with longstanding practice in the Group, the Committee is tasked with monitoring the management of all the risks identified by the Group, even if particular attention is paid to accounting or financial risks; a methodology for the monitoring of each type of risks (including, in particular, the identification of the management and control bodies and procedures) and an appropriate time scale (annual review or regular reviews at less frequent intervals, depending on the type of risks) were defined. At year-end, the Committee ensures

that all of the risks identified on the risk map and subject to regular review have been examined by the Audit Committee according to the frequency specified. The work program prepared for the fiscal year 2019 is consistent with this approach. It was presented to the Board for discussion. The Board discussed the topics that could be presented to the Board to improve the fit between the work of the Committee and that of the Board on this subject.

The Committee was informed of the work carried out internally concerning the preparation of the non-financial information, in connection in particular with the preparation of the declaration of non-financial performance included in this Reference Document, which is submitted to the Environment and Society Committee. The review of the procedures relating to the preparation and processing of this information, and the review of the environmental and societal risks will be the subject of a joint session between the Audit Committee and the Environment and Society Committee in 2019 based on the work carried out by the latter Committee on these topics. This joint session of the two Committees had been requested by the Directors in the context of the Board's evaluation questionnaire at the end of 2017.

The Audit Committee was also informed of the non-audit services which were approved in 2018 within the scope of the approval procedure for the Group's non-audit services, which was validated by the Board Meeting on July 29, 2016 and updated in February and June 2018.

Several days prior to each meeting, a file of meeting documentation, also available in electronic form, is sent out to Committee members. Each Committee meeting is preceded by a preparatory meeting attended by the Committee Chair, assisted by the Committee Secretary, the Group Vice President Finance and the Group Internal Audit Director. In order to prepare the meetings where financial statements are reviewed, the Committee Chair, assisted by the Committee Secretary, meets with the Statutory Auditors, without the presence of the Company representatives. During the meeting, each presentation made by the Group Vice President Finance, the Group Internal Audit Director, the senior executive specializing in the area under discussion or the Statutory Auditors, during the financial statement review meetings, is followed by discussion.

A verbal report and then written minutes of each meeting are prepared for the Board of Directors.

The Committee Chair receives summaries of the internal audit reports. In addition, after presentation meetings for the accounts for the fiscal year, the Committee members meet alone with the Statutory Auditors, without the presence of the Company representatives.

As recommended in the AFEP/MEDEF Code of corporate governance, the following measures are taken so that the time during which the financial statements are available to be reviewed is sufficient: preparatory meeting with the Committee Chair more than one week prior to the meeting, as provided for above; dispatch of files, now also available in electronic form, to Committee members five to seven days in advance. These measures enable the members to review the financial statements well in advance of the meeting. When compatible with the schedules of the members travelling from abroad, the Committee meetings relating to the financial statements are held the day before the Board meeting.



## 14.2. THE APPOINTMENTS AND GOVERNANCE COMMITTEE / THE LEAD DIRECTOR

As at December 31, 2018, the Appointments and Governance Committee had **three members: Jean-Paul Agon, Chairman of the Committee and Lead Director, Karen Katen and Annette Winkler. 100% of the Committee members are independent.**

### Composition and tasks as defined by the internal regulations

The Appointments and Governance Committee must be comprised of three to five members of the Board of Directors and the majority of its members must be independent, according to the assessment made by the Board. The Chairman and Chief Executive Officer attends Committee meetings and is closely involved in its discussions. However, he may not be present for any discussions of the Committee relating to him personally. The Committee meets at least three times a year. The conclusions of Committee meetings are presented by the Committee Chairman for discussion and decision-making at the next Board of Directors' Meeting.

#### Tasks

Pursuant to the internal regulations, the tasks of the Appointments and Governance Committee are as follows:

##### 1. Concerning the Board of Directors:

- make proposals to the Board of Directors for renewal and appointment of directors. This Committee looks for new members on the basis of its evaluation of the needs and developments expressed by the Board of Directors, and taking into consideration, in particular, the principle of attempting to achieve a balanced composition of the Board of Directors: representation between women and men, nationality, international experience, expertise, etc.;
- make proposals to the Board of Directors for the creation and composition of Board committees;
- periodically evaluate the structure, size and composition of the Board of Directors and submit to it recommendations regarding any potential change;
- the Committee periodically reviews the criteria applied by the Board to classify a Director as independent; once a year, it examines, on a case-by-case basis, the situation of each Director or each candidate for the duties of director in light of the criteria applied and makes proposals to the Board of Directors.

##### 2. Concerning the Chairman and Chief Executive Officer or the Chief Executive Officer, as the case may be:

- examine, as necessary and, in particular at the time of expiry of the term of office concerned, the renewal of the term of office of the Chairman and Chief Executive Officer, or the terms of office of both the Chairman and of the Chief Executive Officer;
- examine the changes in these duties and provide for solutions for their renewal, where applicable;
- examine the succession plan for members of the executive management applicable in particular in the case of an unforeseen vacancy;
- examine periodically developments with regard to the Senior Executive Vice Presidents, hear the Chairman and Chief Executive Officer (or the Chief Executive Officer) on the needs and the potential proposals for their replacement;
- more generally, ensure that it is kept informed by the Chairman and Chief Executive Officer (or the Chief Executive Officer) of planned changes in executive management resources (and, in particular, the Executive Committee).

##### 3. Concerning governance:

- examine, at the time of renewal of the term of office of the Chairman and Chief Executive Officer or of the terms of office of the Chairman and of the Chief Executive Officer, or when a request in that respect is made by directors within the framework of the evaluation of the Board, whether it is appropriate to continue to combine these roles (or to separate them);
- monitor the changes in the rules of corporate governance, in particular within the scope of the code to which the company refers and inform the Board of Directors of its conclusions; follow up on the application of the rules of corporate governance defined by the Board of Directors and make sure of the information given to the shareholders on this topic;
- prepare the evaluation of the way the Board operates provided for by the internal regulations;
- examine issues of ethics that the Audit and Accounts Committee, the Board of Directors or its Chairman may decide to refer to it;
- ensure the proper functioning of the governance bodies and in particular the transmission of information requested by independent Directors;
- assist, at their request, the Chairman and the Chief Executive Officer in their dealings with independent Directors, and be the instrument of dialogue aimed at preventing potential situations of conflict on the Board.

The Committee can request the assistance of outside experts, if necessary. The Company shall provide the Committee with the corresponding funding in such a case. The Committee can request the assistance of outside experts if necessary. The Company shall provide the Committee in such a case with the corresponding funding. The Lead Director, upon delegation from the Chairman of the Committee when he is not the Chairman of the Committee himself, conducts the Committee's work concerning the above-mentioned points of governance: the Lead Director can formulate all proposals and make any suggestions that he considers to be necessary in this field. More particularly, the Lead Director coordinates, within the Committee, the implementation of the procedures aimed at identifying and analyzing potential situations of conflicts of interest on the Board; he draws the attention of the Chairman of the Board of Directors to potential situations of conflicts of interest identified in this manner.

He reports on these matters to the Board of Directors."

The powers and tasks of the Lead Director are described in section 6 above.

## The Appointments and Governance Committee's work in 2018

**The Appointments and Governance Committee met three times in 2018 with an effective attendance rate, or attendance rate by telephone, of 100% of its members.**

### Concerning the Board of Directors

The Committee verified that the composition of the Board of Directors complied with the rules provided in the internal regulations. Taking into consideration the diversity policy discussed on pages 93 and 94, it made recommendations on the desirable future changes in the composition of the Board of Directors in the short and medium-term and continued to manage the search and assessment procedure for potential candidates.

It recommended proposing the renewal of the terms of office as Director of Benoît Potier, Jean-Paul Agon, Annette Winkler and Sin Leng Low to the Shareholders' Meeting on May 16, 2018 and the renewal of the terms of office of Geneviève Berger and Siân Herbert-Jones to the Shareholders' Meeting on May 7, 2019.

The Committee was informed of the renewal, by the France Group Committee, of the term of office of Philippe Dubrulle as Director representing the employees.

### Concerning the composition of the Committees, the Lead Director and the working group

The Committee reviewed the composition of the Committees and the Shareholder Relations working group. It recommended that Xavier Huillard, who was already a member of the Remuneration Committee, be appointed as Chairman of that Committee with effect from May 16, 2018 to replace Jean-Paul Agon. It also recommended that Jean-Paul Agon be maintained as Lead Director and as Chairman of the Appointments and Governance Committee.

### Concerning the Chairman and Chief Executive Officer

In connection with the renewal of Benoît Potier's term of office as Director proposed to the Shareholders' Meeting on May 16, 2018, the Committee reviewed the governance measures relating to the combined roles of Chairman and Chief Executive Officer. After taking note of the remarks made by shareholders, it recommended that additional governance measures should be implemented. The governance measures relating to the combined roles are detailed on pages 97 and 98.

The Committee reviewed the specific procedure and the scenario envisaged in the event of the replacement of the General Management in an emergency situation. This procedure is reviewed each year and updated if applicable. The Committee reviewed the Group organization and examined in detail the profiles of potential high achievers, with a particular view to a future succession.

### Concerning governance

The Committee recommended some modifications to the internal regulations in order to incorporate the amendments to the AFEP/MEDEF Code of June 2018 (including, in particular, the aspects relating to Corporate and Social Responsibility and to non-financial information, the anti-corruption policy and the obligation for a Director who has a conflict of interest to refrain from taking part in the discussion on that topic) and to article L. 225-37-4 of the French Commercial Code on the diversity policy within the Board of Directors. The internal regulations, as amended, were put online on the Company's site after they were adopted by the Board of Directors on September 25, 2018.

The Committee looked at the personal situation of each member of the Board of Directors in light of the independence criteria set forth in the internal regulations. In particular, it reviewed the chart summarizing the flows (purchases and sales) which occurred during the past fiscal year as between the companies in the Air Liquide group and those Group companies at which a Director of Air Liquide (or candidate proposed for such office) also exercises a term of office or an executive role and made its assessment in the light of both quantitative and qualitative criteria. Pursuant to the AFEP/MEDEF Code, as revised in June 2018, a table showing the situation of each Director in light of the independence criteria is contained at page 95.

The Committee recommended that the Board disclose in the Reference Document the level of attendance of each Director at the meetings of the Board of Directors and the Committees, as provided for in the AFEP/MEDEF Code, as revised in June 2018. The corresponding table is contained on page 96.

The Committee took note of the information provided by the Directors concerning their terms of office as Directors which are external to the Group.

It reviewed the recommendations of the Report of the Haut Comité de gouvernement d'entreprise of October 2018 and the AMF Annual Report on corporate governance published in November 2018 and made its recommendations concerning the practices followed by the Company. It examined the draft of this section of the Reference Document, incorporating part of the Report on corporate governance and recommended that it be adopted by the Board of Directors.

It examined the chart showing the deviations of the Group's practices as compared to the AFEP/MEDEF Code which is set out on page 112.

At the start of 2018, the Committee reviewed the summary of the replies to the evaluation questionnaire of the Board of Directors in respect of the 2017 fiscal year. At the end of the 2018 fiscal year, the Committee reviewed the contents of the simplified evaluation questionnaire for 2018, before it was sent to the Directors. Concerning the assessment of the Board of Directors, see pages 101 and 102.

The Board took due note of the principal provisions of the draft law on growth and business transformation concerning corporate governance.

The Committee reviewed the non-discrimination and diversity policy in leaderships and particularly information relating to the manner in which the Company tries to obtain a balanced representation of men and women on the Executive Committee. It notably took note of the results concerning the gender mix with regard to the 10% of positions which carry the most responsibility (see chapter 4, pages 280 and 281 of this Reference Document).

### Tasks of the Lead Director: report on his activities

Jean-Paul Agon has been Lead Director since May 3, 2017.

The Lead Director's activities during the fiscal year related to the following points:

- The Lead Director conducted the work of the Appointments and Governance Committee concerning the governance tasks entrusted to the Committee and in particular:
  - the governance measures relating to the combined roles of Chairman and Chief Executive Officer at Air Liquide and the proposal for additional measures;
  - a review of the Company's practices in light of the recommendations of the AFEF/MEDEF Code, the AMF and the Haut Comité de gouvernement d'entreprise included in their respective 2018 reports;
  - the preparation of the questionnaire for evaluation of the functioning of the Board, which included a specific section enabling each Director to give his/her opinion on the individual contributions of the Directors to the Board's reflections. The Lead Director presented to the Board in February 2019 a summary of the assessments made with regard to the functioning of the Board and the recommendations made by the Committee, which led to debate;
  - informing the Board of Directors on the regular contacts between the Chairman and Chief Executive Officer and the principal shareholders.

- A review of the expectations expressed by the shareholders at the Shareholders' Meeting on May 16, 2018 (renewal in 2018 of Benoît Potier's term of office as Chairman and Chief Executive Officer and the measures relating to these combined roles, remuneration of the Executive Officers). In-depth interviews were held with numerous institutional investors as from the autumn of 2018 in order to prepare for the Shareholders' Meeting on May 7, 2019.
- The Lead Director held detailed discussions with some shareholders concerning questions of governance.
- The Lead Director held very regular discussions with the Chairman and Chief Executive Officer with regard to all significant governance topics for the fiscal year; he also spoke at length with the independent Directors ensuring in particular that they were well-informed.
- The Lead Director chaired the executive session which was held at the end of the Board Meeting in September 2018 and was attended by all the Directors apart from the executive Directors (or former executive Directors) or internal Group Directors and employee representatives. The Lead Director held discussions with the Chairman and Chief Executive Officer on the matters raised during this executive session.
- Finally, the Lead Director attended three meetings with major shareholders.
- He reported to the Board on his activities in February 2019.

During the 2018 fiscal year, the Lead Director attended five Board meetings (out of six) and all the meetings of the Appointments and Governance Committee (three meetings) and the Remuneration Committee (three meetings).

### 14.3. THE REMUNERATION COMMITTEE

As at December 31, 2018, the Remuneration Committee had **three members: Xavier Huillard, Chairman of the Committee since May 16, 2018 (replacing Jean-Paul Agon), Jean-Paul Agon and Annette Winkler. 100% of the Committee members are independent.**

#### Composition and tasks as defined by the internal regulations

The Remuneration Committee must be comprised of three to five members of the Board of Directors and the majority of its members must be independent. The Committee meets at least three times a year. The conclusions of Committee meetings are presented by the Committee Chairman for discussion and decision-making at the next Board of Directors' meeting.

#### Tasks

Pursuant to the internal regulations, the tasks of the Remuneration Committee are as follows:

- examine the performance and all the components of remuneration including stock options, or other forms of deferred remuneration, pension plans and, in general, the conditions of employment of the Chairman and Chief Executive Officer or both the Chairman and the Chief Executive Officer as well as the Senior Executive Vice Presidents and make the corresponding recommendations to the Board of Directors;
- propose, where applicable, the remuneration of the Vice President or Vice Presidents;
- examine the remuneration and retirement policy applied to executive management and in particular to the Executive Committee;
- examine the proposals by the executive management concerning the grants of stock options and other incentive systems related to the share price to other Group employees and propose to the Board of Directors that they be granted;
- examine and propose to the Board of Directors the allocation of Directors' fees among Board members.

The Committee can request the assistance of outside experts, if necessary. The Company shall provide the Committee in such a case with the corresponding funding.

## The Remuneration Committee's work in 2018

**The Remuneration Committee met three times in 2018 with an attendance rate of 100% of its members.** The Chairman and Chief Executive Officer is not present for any discussions by the Committee relating to him personally. At Board Meetings, the Committee Chairman reports on the work of the Remuneration Committee. At the Shareholders' Meeting, the Committee Chairman reports on the Board's decisions concerning the remuneration policy applicable to the Group's Executive Officers.

### Remuneration of the Executive Officers/ long-term incentive policy

The Committee examined the principles of the remuneration policy applicable to the Executive Officers and its various components.

**For the 2018 fiscal year,** the Committee made recommendations concerning the remuneration policy for the Executive Officers and how it applies to Benoît Potier. It recommended that the repositioning of the remuneration for the Chairman and Chief Executive Officer should be completed in 2018, in order to take account of the increased level of responsibility resulting from the Group's new size after the Airgas acquisition. With regard to this point, see page 127.

It reviewed the draft resolution and presentation put to the *ex ante* vote of the Shareholders' Meeting on May 16, 2018 on the remuneration policy applicable to the Executive Officers as presented pursuant to article L. 225-37-2 of the French Commercial Code. When preparing the Shareholders' Meeting and in keeping with the changes made in 2017, it made additional proposals for improving the structure of the variable remuneration (weighting of each personal criterion) and recommended that rules be put in place for the pro rata calculation of the long-term remuneration tools in the event of the departure of the Executive Officers (for further details, see pages 127 et seq.).

At the time of renewal of the terms of office of Benoît Potier in 2018, the Committee reviewed all the regulated related-party agreements concerning him. It recommended, in particular, an amendment of the activation and performance conditions for the termination indemnity and also of the performance conditions which apply to the increase of Benoît Potier's conditional rights in connection with the defined benefit pension plan which he benefits from (pursuant to the "Macron" Law of August 6, 2015). In January 2019, the Committee prepared for the Board of Directors' meeting in February 2019 to record the increase in Benoît Potier's conditional rights for the 2018 fiscal year pursuant to this plan.

The Committee reviewed the draft resolution to be put to the Shareholders' Meeting on May 7, 2019 on the 2018 remuneration for the Executive Officer pursuant to article L. 225-100 II of the French Commercial Code (resulting from Law no. 2016-1691 of December 9,

2016 on transparency, the fight against corruption and the modernization of economic life).

The Committee reviewed the satisfaction of the performance conditions for the performance share and stock option plans.

The Committee reviewed the rules for holding shares which apply to the Executive Officers.

The Committee looked at the measures on transparency and communication and issued its recommendations.

**For the 2019 fiscal year,** the Committee made recommendations concerning the remuneration policy for the Executive Officers and how it applies to Benoît Potier. Since the repositioning of Benoît Potier's remuneration was completed in 2018, the Committee recommended that the level of his total annual target remuneration should be stabilized. The Committee reviewed the draft resolution and presentation to be put to the *ex ante* vote of the Shareholders' Meeting on May 7, 2019 on the remuneration policy for Executive Officers.

Following remarks made by shareholders, the Committee reviewed the performance criteria for the annual variable remuneration and the long-term incentives and recommended that these criteria be amended (see pages 140 to 141 of this Reference Document).

Since the Shareholders' Meeting on May 7, 2019 was asked to renew the authorizations to grant stock options and performance shares, the Committee recommended that the Board of Directors reduce the sub-limits on the grant of these remuneration tools to the Executive Officers in order to bring them closer to past practices (see page 142).

The Committee took due note of the principal provisions of the draft law on growth and business transformation (PACTE) relating to the remuneration of the corporate officers.

### Directors' fees

The Committee made recommendations concerning the level of directors' fees to be granted in respect of fiscal year 2018 within the total amount authorized by the Shareholders' Meeting.

### Corporate governance

The Committee took due note of the principal amendments to the AFEF/MEDEF Code, which was revised in June 2018, on the remuneration of Executive Officers.

The Committee reviewed the section below on remuneration, including the enclosed Report on corporate governance (the section on remuneration) and recommended their approval by the Board of Directors.

#### 14.4. THE ENVIRONMENT AND SOCIETY COMMITTEE

The Environment and Society Committee, which focuses on Corporate Social and Environmental Responsibility issues, was formed on May 3, 2017. As at December 31, 2018, it had **three members: Pierre Dufour, Chairman of the Committee, Geneviève Berger and Philippe Dubrulle.**

##### Composition and tasks as defined by the internal regulations

The Committee must comprise three to four members of the Board of Directors.

##### Tasks

"The Committee's tasks are as follows:

- Examine, and make recommendation regarding, the Group's strategy and commitments in the field of sustainable development;
- Monitor the deployment of the Group's environmental and societal actions. In this respect, it notably monitors the topics related to air quality, energy consumption, greenhouse gas emissions, as well as the actions engaged by the Foundation;
- Examine the environmental and societal risks in liaison with the Audit Committee and the impact of environmental and societal issues in terms of investment, economic performances and image;
- Monitor the reporting systems, the preparation of extra-financial information, the annual CSR report and, in general, any information required by the legislation in force with regard to CSR;
- Make an annual review of a summary of the extra-financial ratings made with regard to the Group."

The Committee shall meet, in principle, twice a year.

It reports on its work to the Board of Directors. The conclusions of the meetings of the Environment and Society Committee are presented by the Committee Chair for discussion and, if applicable, for a decision by the Board of Directors at a later Board meeting. The Committee may be assisted by external experts.

The Committee shall receive regular reports from the member of the Executive Committee who is responsible for sustainable development, concerning the Group's strategy on sustainable development and its implementation.

##### The Environment and Society Committee's work in 2018

**The Environment and Society Committee met three times in 2018, with an effective attendance rate, or attendance rate by telephone, of 100% of its members.**

At these meetings, the Committee reviewed, in particular, the Climate objectives defined by the Group which were published on November 30, 2018 at various stages of progress up until their finalization. In this regard, the Committee reviewed the work carried out internally which led to the definition of these objectives which constitute the climate strategy and form part of the Group's Sustainable Development strategy.

The Committee also took due note of the survey carried out at the Group concerning the Sustainable Development challenges involving the hub managers and the country executive managements.

The Committee reviewed the environmental and societal risk-mapping which forms part of the Group's general risk-mapping and takes into account the regulations concerning the duty of vigilance owed by parent companies.

It then reviewed the environmental and societal risks and the methods used to assess them. It was noted in this regard that the operations carried out in respect of the prevention of environmental and societal risks are subject to compliance with (i) the policies and procedures implemented by the Group which are compiled in the BLUEBOOK (action principles, HR policy, purchasing policy...), (ii) the local regulations and (iii) international standards.

The Committee reviewed the sustainable development Report included in the 2017 Reference Document. It also reviewed the elements contained in the declaration of non-financial performance included in the 2018 Reference Document and, in this regard, the procedures relating to the preparation and processing of the non-financial information.

In order to ensure proper coordination with the work of the Audit and Accounts Committee, a joint session will be organized in 2019, in order to review the environmental and societal risks, together with the procedures relating to the preparation and processing of the non-financial information.

The Committee read the report summarizing the Group's non-financial ratings.

The Committee also drew up a draft work program for 2019.

Each meeting gives rise to the preparation of a file, which is sent several days before the meeting and is also available in electronic format. At the meeting, each presentation made gives rise to discussion. An oral report and then written minutes of each meeting are prepared for the Board of Directors.

## 15. Application of the AFEP/MEDEF corporate governance Code: summary table

L' Air Liquide S.A. applies the AFEP/MEDEF Code (as revised in June 2018), apart from the following recommendations:

Recommendations	L' Air Liquide's S.A. practice and justification
<b>Independence criteria for the Directors</b> Article 8.5: In order to qualify as independent, a Director: must not have been "during the course of the previous five years, an employee or Executive Director of the Company; an employee, Executive Director or a Director of a company that the latter consolidates; an employee, Executive Director or Director of the parent company or a company consolidated within this parent company".	The Board of Directors considers that the former employees or Senior Executive Officers of the Company cannot be considered to be independent, even if their duties ended more than five years ago (see pages 94 to 95).
<b>Remuneration Committee</b> Article 17.1: "It is recommended [...] that one of its members be an employee Director."	A Director representing the employees appointed by the France Group Committee has participated in Board meetings since July 2014. Philippe Dubrulle, Director representing the employees is a member of the Board Committee which focuses on environmental and societal issues. He contributes to this Committee, as part of the tasks which are assigned to it concerning the definition and deployment of the Group actions on environmental and societal issues, the vision of the employees of the Group's operating entities. Philippe Dubrulle, who had made known his interest in sustainable development matters, has been a member of the Environment and Society Committee since its formation, in May 2017.
Article 17.3: "When the Report on the Remuneration Committee's work is presented, the Board should deliberate on the elements of remuneration of the Executive Officers in their absence."	At the Remuneration Committee meetings, the Chairman and Chief Executive Officer does not attend deliberations by the Committee relating to his personal case (see page 110).

## 16. Shareholder relations working group

In connection with the renewal of the Directors' terms of office, at the proposal of the Appointments and Governance Committee, the Board of Directors on July 27, 2017 decided to review the composition of the Shareholder Relations working group and appointed alongside Benoît Potier, as Chairman, Jean-Paul Agon, Xavier Huillard and Brian Gilvary for the remaining terms of their offices as Director. The Board meeting held at the close of the Shareholders' Meeting of May 16, 2018, renewed the terms of office of Benoît Potier and Jean-Paul Agon for the duration of their respective terms of office as Director.

During the past fiscal year, the tasks of the Shareholder Relations working group have essentially focused on shareholder strategy and Air Liquide's relations with its shareholders.

## 17. Participation by shareholders at the Shareholders' Meeting

Pursuant to article L. 225-37-4 9° of the French Commercial Code, it is specified that the specific terms and conditions relating to the participation of shareholders at the Shareholders' Meeting are set out in articles 5 to 10 and 18 and 19 of the Company's articles of association (set out on pages 342 et seq. of this Reference Document).

## 18. Delegations of authority granted by the Shareholders' Meeting

Pursuant to article L. 225-37-4 3° of the French Commercial Code, it is specified that the summary table of the valid delegations of authority granted by the Shareholders' Meeting in connection with increases in the share capital is set out on page 340 of this Reference Document.



# INFORMATION CONCERNING MEMBERS OF THE BOARD OF DIRECTORS AND EXECUTIVE MANAGEMENT

(as of December 31, 2018)

## Benoît POTIER

### Chairman and Chief Executive Officer

**Nationality:** French

Born on September 3, 1957

**Date of first appointment:** May 2000

**Start of current term:** May 2018

**End of current term:** 2022 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Number of shares owned as of December 31, 2018:** 337,382

**Business address:** Air Liquide – 75, quai d'Orsay – 75321 Paris Cedex 07 – France

### Career

A graduate of École Centrale de Paris, Benoît Potier joined Air Liquide in 1981 as a Research and Development engineer. After serving as a Project Manager in the Engineering & Construction Division, he was made Vice President of Energy Development in the Large Industries business line. In 1993, he became Director of Strategy & Organization and, in 1994, was put in charge of the Chemicals, Metal & Steel, Oil and Energy Markets. He was made an Executive Vice President of Air Liquide in 1995 with additional responsibilities over the Engineering & Construction Division and the Large Industries operations in Europe. Benoît Potier was appointed Chief Executive in 1997. He was appointed to the Board of Directors in 2000 and became Chairman of the Management Board in November 2001. In 2006, he was appointed Chairman and Chief Executive Officer of L'Air Liquide S.A.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Chairman and Chief Executive Officer:** L'Air Liquide S.A.\*, Air Liquide International, Air Liquide International Corporation (ALIC)
- **Director:** American Air Liquide Holdings, Inc., The Hydrogen Company (since March 2018)
- **Director:** Air Liquide Foundation

#### Positions or activities outside the Air Liquide Group

- **Director:** Danone\* (member of the Appointment and Remuneration Committee, member of the Strategy Committee, then Chairman of this Committee)
- **Director:** Siemens AG\* (member of the Appointment Committee) (since January 2018)
- **Co-Chair:** The Hydrogen Council
- **Chairman:** European Round Table (ERT) (until May 2018)
- **Member:** European Round Table (ERT) (since May 2018)
- **Director:** CentraleSupélec, Association nationale des sociétés par actions (ANSA)
- **Member of the Board:** Association française des entreprises privées (AFEP)
- **Member of the French Board:** INSEAD

### Positions and activities

#### held during the last five years and that have expired

#### 2017

- **Chairman:** Air Liquide Foundation (until March 2017)

#### 2014

- **Vice-Chairman:** European Round Table (ERT) (until June 2014)
- **Director:** Cercle de l'Industrie (until May 2014), La Fabrique de l'Industrie (until June 2014)

#### 2013

- **Member of the Supervisory Board:** Michelin\* (member of the Audit Committee) (until May 2013)

\* Listed company.

## Thierry PEUGEOT

### Director – Member of the Audit and Account Committee

**Nationality:** French

Born on August 19, 1957

**Date of first appointment:** May 2005

**Start of current term:** May 2017

**End of current term:** 2021 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2020)

**Number of shares owned as of December 31, 2018:** 2,011

**Business address:** Peugeot S.A. – 75, avenue de la Grande-Armée – 75116 Paris Cedex 16 – France

### Career

A graduate of ESSEC, Thierry Peugeot began his career with the Marrel Group in 1982 as Export Manager for the Middle East and English-speaking Africa for Air Marrel, and then Director of Air Marrel America. He joined Automobiles Peugeot in 1988 as Regional Manager of the South-East Asia zone, then Chief Executive Officer of Peugeot do Brasil in 1991 and Chief Executive Officer of Slica in 1997. In 2000, he became International Key Accounts Director of Automobiles Citroën and then, in 2002, Vice President of Services and Spare Parts before being appointed to the PSA Peugeot Citroën Vice Presidents Committee. Thierry Peugeot has been Chairman of the Supervisory Board of Peugeot S.A. between 2002 and 2014.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Audit and Accounts Committee since May 2012)

#### Positions or activities outside the Air Liquide Group

- **Senior Executive Vice President:** Société anonyme de participations
- **Director:** Établissements Peugeot Frères (member of the Accounts Committee)
- **Director:** Compagnie Industrielle de Delle
- **Permanent representative** of the Compagnie Industrielle de Delle on the LISI\* Board of Directors (member of the Remuneration Committee and President of the Appointments Committee)
- **Chairman:** CITP
- **Chairman:** SIV
- **Chairman and Chief Executive Officer:** SID
- **Honorary Chairman:** Association nationale des sociétés par actions (ANSA)

### Positions and activities

#### held during the last five years and that have expired

#### 2016

- **Director:** Faurecia\* (Member of the Strategic Committee) (until May 2016)

#### 2015

- **Director:** Société FFP\* (until May 2015)
- **Senior Executive Vice President:** Établissements Peugeot Frères (until April 2015)

#### 2014

- **Chairman of the Supervisory Board:** Peugeot S.A.\* (until April 2014)
- **Member of the Supervisory Board:** Peugeot S.A.\* (until July 2014)
- **Vice Chairman of the Supervisory Board:** Gefco (until December 2014)
- **Chairman:** Association nationale des sociétés par actions (ANSA) (until July 2014)

\* Listed company.

## Karen KATEN

### Independent Director – Member of the Appointments and Governance Committee

**Nationality:** American

Born on August 22, 1949

**Date of first appointment:** May 2008

**Start of current term:** May 2016

**End of current term:** 2020 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2019)

**Number of shares owned as of December 31, 2018:** 2,186

**Business address:** EW – 280 Park Avenue, 27<sup>th</sup> Floor East – New York, NY 10017 – USA

### Career

Karen Katen, a US citizen, is a graduate of the University of Chicago (BA in Political Science and MBA). In 1974, she joined Pfizer and carried out various management and executive positions during more than 30 years. In her last position with Pfizer, she was Vice-Chairman of Pfizer Inc. and President of Pfizer Human Health, the Group's main operating department. Karen Katen played a major role in the introduction of new medicines for the treatment of cardiovascular and mental diseases, as well as diabetes and cancer. She also successfully oversaw the integration of Warner Lambert (acquired in 2000) and Pharmacia (acquired in 2003) in the Pfizer Group. Having retired from Pfizer in March 2007, she was Chairman of the Pfizer Foundation. Currently she is a Senior Advisor at Essex Woodlands Health Ventures, a healthcare venture and growth equity firm.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Appointments and Governance Committee since May 2012)

#### Positions or activities outside the Air Liquide Group

- **Director:** Home Depot\* (until May 2018)
- **Chairman of the Board:** Armgo Pharma
- **Chairman and Director:** Rand Corporation's Health Board of Advisors
- **Director:** The Economic Club of New York Board of Trustees, Peterson Institute for International Studies
- **Senior Advisor:** EW Health Partners
- **Trustee:** University of Chicago
- **Trustee:** University of Chicago Graduate School of Business

### Positions and activities

#### held during the last five years and that have expired

#### 2016

- **Director:** IMS Health, Takada Global Advisory Board

#### 2015

- **Director:** Catamaran Inc.\* (until July 2015), Harris Corporation\*

#### 2013

- **Director:** Catalyst

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Jean-Paul AGON

**Independent Director – Lead Director – Chairman of the Appointments and Governance Committee – Member of the Remuneration Committee**

**Nationality:** French

Born on July 6, 1956

**Date of first appointment:** May 2010

**Start of current term:** May 2018

**End of current term:** 2022 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Number of shares owned as of December 31, 2018:** 1,609

**Business address:** L'Oréal – 41, rue Martre – 92110 Clichy – France

### Career

A graduate of HEC Business School, Jean-Paul Agon began his career with the L'Oréal Group in 1978. From 1981 to 1997, he held various Senior Management positions first as General Manager of L'Oréal Greece and General Manager of L'Oréal Paris, then International Managing Director for Biotherm International, Managing Director for L'Oréal Germany and finally Managing Director for L'Oréal Asia Zone. From 2001 to 2005, he was Chairman and Chief Executive Officer of L'Oréal USA as well as several subsidiaries of the L'Oréal Group in the USA. In 2005, he was appointed Deputy Chief Executive Officer of the L'Oréal Group, and became Chairman and Chief Executive Officer of the Group in 2006. He is Chairman and Chief Executive Officer of L'Oréal since March 2011.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L' Air Liquide S.A.\* (Lead Director since May 2017; member of the Appointments and Governance Committee since May 2015, then Chairman of this Committee since May 2017; member of the Remuneration Committee since May 2012 – Chairman of this Committee from May 2015 to May 2018)

#### Positions or activities outside the Air Liquide Group

- **Chairman and Chief Executive Officer:** L'Oréal\*
- **Chairman:** L'Oréal Foundation

### Positions and activities

#### held during the last five years and that have expired

#### 2014

- **Director:** L'Oréal USA Inc. (United States)
- **Director:** Galderma Pharma S.A. (Switzerland) (since July 2014)

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Siân HERBERT-JONES

### Independent Director – Chairman of the Audit and Account Committee

**Nationality:** British

Born on September 13, 1960

**Date of first appointment:** May 2011

**Start of current term:** May 2015

**End of current term:** May 2019 <sup>(a)</sup>

**Number of shares owned as of December 31, 2018:** 913

### Career

Holder of a Master of Art degree in History from Oxford University and a graduate from the Institute of Chartered Accountants in England and Wales, Siân Herbert-Jones first practiced for 13 years with the firm of PriceWaterhouseCoopers, in the London office from 1983-1993 in particular in the capacity of Corporate Finance Manager, then in the Paris office from 1993 to 1995 in the capacity of Mergers & Acquisitions Manager. She then joined the Sodexo Group in 1995 in which she was successively in charge of international development from 1995 to 1998 and the Group's Treasury Department from 1998 to 2000 then Deputy Chief Financial Officer in 2000. From 2001 to December 21, 2015, she was Chief Financial Officer; and member of the Executive Committee of the Sodexo Group. Since 2016, she holds several positions within Board of Directors of large companies and also pursues other consulting activities in societal and environmental fields.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (Chairman of the Audit and Accounts Committee since May 2015; member of this Committee since May 2013)

#### Positions or activities outside the Air Liquide Group

- **Director:** Cap Gemini\* (member of the Audit and Risks Committee); Bureau Veritas\* (member of the Audit and Risks Committee); Compagnie Financière Aurore Internationale (Sodexo Group – Belgium)

### Positions and activities

#### held during the last five years and that have expired

#### 2017

- **Member of the Appointments and Remuneration Committee:** Veritas\* (until May 2017)

#### 2015

- **Chief Financial Officer and member of the Executive Committee:** Sodexo Group\* (until December 2015)
- **Chairman:** Etin SAS (France); Sodexo Etinbis SAS (France); Sofinsod SAS (France)
- **Director:** Sodexo Awards Co, Sodexo Japan Kabushiki Kaisha Ltd., Sodexo Mexico SA de CV, Sodexo Mexico Servicios de Personal SA de CV, Sodexo Remote Sites the Netherlands B.V., Sodexo Remote Sites Europe Ltd., Universal Sodexo Eurasia Ltd., Sodexo, Inc., Sodexo Management, Inc., Sodexo Remote Sites USA, Inc., Sodexo Services Enterprises LLC, Universal Sodexo Services de Venezuela SA, Universal Sodexo Empresa de Servicios y Campamentos SA, Sodexo Global Services UK Ltd.
- **Member of the Management Board:** Sodexo en France SAS (France), Sodexo Entreprises SAS (France), Sodexo Pass International SAS (France), One SAS (France)
- **Permanent representative of Sofinsod SAS** on the Supervisory Board of One SCA (France)

(a) Renewal of term proposed to the Shareholders' Meeting of May 7, 2019.

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Pierre DUFOUR

### Director – Chairman of the Environment and Society Committee

**Nationality:** Canadian

Born on March 28, 1955

**Date of first appointment:** May 2012

**Start of current term:** May 2016

**End of current term:** 2020 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2019)

**Number of shares owned as of December 31, 2018:** 85,361

### Career

A graduate of École polytechnique, Montréal University, Stanford University (California) and Harvard University (Massachusetts), Pierre Dufour began his career in 1976 at Lavalin Inc. (now SNC-Lavalin Inc.), a leading engineering contractor in Montreal, Canada. From 1991 to 1997, he was Chief Executive Officer of SNC-Lavalin Inc. Pierre Dufour joined Air Liquide in 1997 as Vice President of Worldwide Engineering before his promotion to Group Industrial Director in 1998, overseeing the technical aspects of Group operations worldwide. In 2000, he was appointed Chairman and Chief Executive Officer of American Air Liquide Holdings Inc., in Houston, Texas and joined Air Liquide Group's Executive Committee. He was appointed Senior Executive Vice President in 2007 and appointed to the Board of Directors in 2012. In charge of the Frankfurt hub since inception in 2014, he is also responsible for the World Business Line Large Industries as well as Engineering & Construction, plus the Asia Pacific region. Since 2016, he is also Chairman of Airgas, Inc. Pierre Dufour has decided to claim his pension entitlement and left his executive positions within the Air Liquide Group by the end of 2017. Pierre Dufour will continue to be a Director of L'Air Liquide S.A.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (Chairman of the Environment and Society Committee since May 2017)
- **Director:** Airgas, Inc. (until December 2018)

#### Positions or activities outside the Air Liquide Group

- **Director:** Archer Daniels Midland Company\* (member of the Audit Committee and the Compensation / Succession Committee); National Grid Plc.\* (member of the Safety, Environment and Health Committee, Remuneration Committee and Nominations Committee) (until July 2018)

### Positions and activities held during the last five years and that have expired

#### 2017

- **Senior Executive Vice President:** L'Air Liquide S.A.\* (until May 2017)
- **Senior Executive Vice President and Director:** Air Liquide International (until June 2017)
- **Chairman of the Board of Directors:** Airgas, Inc. (until March 2017)
- **Chairman and Director:** American Air Liquide Inc. (until May 2017)
- **Director:** American Air Liquide Holdings, Inc. (until May 2017), Société d'Oxygène et d'Acétylène d'Extrême-Orient (SOAEO) (until June 2017)
- **Managing Director:** Air Liquide Global Management Services GmbH (until July 2017)

#### 2015

- **Chairman of the Board of Directors and Director:** Air Liquide Middle East (until December 2015)

#### 2013

- **Director:** Air Liquide Japan (until December 2013)

\* Listed company.



## Sin Leng Low

### Independent Director – Member of the Audit and Account Committee

**Nationality:** Singaporean

Born on June 9, 1952

**Date of first appointment:** May 2014

**Start of current term:** May 2018

**End of current term:** 2022 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Number of shares owned as of December 31, 2018:** 1,371

**Business address:** Nanyang Academy of Fine Arts – 80 Bencoolen Street – Singapore 189655

### Career

Sin Leng Low is a graduate of the University of Alberta (Canada) in Electrical engineering, has a Master of Business Administration from the Catholic University of Leuven (Belgium) and completed the Advanced Management Program at Harvard Business School (USA). After spending part of her career in the Singapore government administrative service, Sin Leng Low held the duties of Executive Vice President at electricity provider Singapore Power and Managing Director of its telecommunications subsidiary from 1995 to 2000. In 2000, she joined energy, water, marine and urban development group Sembcorp Industries, where she successively held the positions of Group Chief Operating Officer and Executive Chairman of the subsidiary spearheading the industrialization and urbanization development business in China, Vietnam and Indonesia until end 2012, and Senior Advisor for four years.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Audit and Accounts Committee since May 2015)

#### Positions or activities outside the Air Liquide Group

- **Member of the Board of Trustees:** Singapore University of Technology & Design (SUTD)
- **Chairman and Director:** Nanyang Academy of Fine Arts (NAFA)
- **Chairman:** Nanyang Fine Arts Foundation Limited, NAFA International Pte Ltd.
- **Executive Board member:** China Cultural Center

### Positions and activities

#### held during the last five years and that have expired

#### 2016

- **Senior Advisor:** Sembcorp Development Ltd. (until December 2016)
- **Chairman:** Sino-Singapore (Chengdu) Innovation Park Development Co., Ltd. (in which Sembcorp Development holds a 25% stake indirectly through a joint venture: Singapore-Sichuan Investment Holding Pte Ltd.) (until December 2016)
- **Director:** Singapore-Sichuan Investment Holding Pte Ltd. (a 50/50 partnership between Sembcorp Development and Singbridge Pte Ltd. which is wholly owned by Singapore Temasek group) (until December 2016)

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Annette WINKLER

**Independent Director – Member of the Remuneration Committee – Member of the Appointments and Governance Committee**

**Nationality:** German

Born on September 27, 1959

**Date of first appointment:** May 2014

**Start of current term:** May 2018

**End of current term:** 2022 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Number of shares owned as of December 31, 2018:** 685

**Business address:** Villa Kayser – Uhlbacher Strasse 7 – 70329 Stuttgart – Germany

### Career

Doctor in Economics from the University of Frankfurt (Germany), Annette Winkler became the Managing Shareholder of a medium-sized construction company. In 1995, she joined the Mercedes-Benz group, where she held a variety of positions and in particular that of Senior Director / Head Public Relations and Communications. After spending two years as Head of the Mercedes-Benz sales and service outlet in Braunschweig, she became Chief Executive Officer of DaimlerChrysler Belgium and Luxembourg (1999-2005), then Vice President of Global Business Management & Wholesale Europe (2006-2010). Vice President of Daimler AG, since 2010 she is Chief Executive Officer of smart (with overall responsibility for the brand, also in charge of the smart factory in Lorraine).

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Remuneration Committee since May 2015; member of the Appointments and Governance Committee since May 2017)

#### Positions or activities outside the Air Liquide Group

- **Vice President:** Daimler AG\*, head of smart (until September 2018) <sup>(a)</sup>
- **Member of the Counsel for Foreign Economic Affairs** of the German Ministry for Economics

### Positions and activities

held during the last five years and that have expired

-

(a) From January 2019: member of the Supervisory Board of Mercedes-Benz South Africa.

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Philippe DUBRULLE

### Director representing the employees – Member of the Environment and Society Committee

**Nationality:** French

Born on June 23, 1972

**Date of first appointment by the Group Committee in France:** June 2014

**Start of current term:** May 2018

**End of current term:** 2022 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Business address:** Air Liquide Advanced Technologies – 2 rue de Clémencièrre, 38360 – Sassenage – France

### Career

An engineering graduate from École Supérieure de l'Énergie et des Matériaux, Philippe Dubrulle has held various positions as an engineer, Product Manager and International Sales Manager at several aeronautical group both in France and abroad. He joined Air Liquide Group in 2008. Based in Sassenage, he is an employee of the subsidiary Air Liquide Advanced Technologies. He is Programmes & Services Manager, Aerospace & Defense. Philippe Dubrulle was appointed as the Director representing the employees by the Group Committee in France on June 18, 2014, his office was renewed by that same Committee, at its plenary session on December 6, 2017. A Member of the French Institute of Directors, he has been a Certified Company Director – ASC France since November 2016.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Environment and Society Committee since May 2017)
- **Programmes & Services Manager, Aerospace & Defense:**  
Air Liquide Advanced Technologies

### Positions and activities

#### held during the last five years and that have expired

\* Listed company.

## Geneviève BERGER

### Independent Director – Member of the Environment and Society Committee

**Nationality:** French

Born on January 26, 1955

**Date of first appointment:** May 2015

**Start of current term:** May 2015

**End of current term:** May 2019 <sup>(a)</sup>

**Number of shares owned as of December 31, 2018:** 550

**Business address:** Firmenich SA – Route des Jeunes, 1 – P.O. Box 239, CH – 1211 Geneva 8 – Switzerland

### Career

With a Ph.D. in physics, Doctor of Medicine and with a Ph.D. human biology, Geneviève Berger was Director of the mixed laboratory for parametric imaging CNRS-Broussais Hôtel-Dieu from 1991 to 2000. She was General Manager of the CNRS between 2000 and 2003. She served as University Professor and Hospital Managing Director at La Pitié-Salpêtrière between 2003 and 2008 before joining Unilever as Chief Research and Development Officer and then Chief Science Officer from 2008 to 2014. She has been the Head of the research department at the Swiss company Firmenich since July 1, 2015.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Environment and Society Committee since May 2017)

#### Positions or activities outside the Air Liquide Group

- **Head of the Research Department:** Firmenich
- **Non-executive Director and member of the Scientific Committee:** AstraZeneca\*

### Positions and activities

#### held during the last five years and that have expired

#### 2015

- **Non-executive Director:** Merz (until March 2015)

#### 2014

- **Scientific Director:** Unilever

(a) Renewal of term proposed to the Shareholders' Meeting of May 7, 2019.

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Brian GILVARY

### Independent Director – Member of the Audit and Account Committee

**Nationality:** British

Born on February 12, 1962

**Date of first appointment:** May 2016

**Start of current term:** May 2016

**End of current term:** 2020 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2021)

**Number of shares owned as of December 31, 2018:** 1,215

**Business address:** BP p.l.c. – 1 St James's Square – London SW1Y 4PD – United Kingdom

### Career

A British citizen, holder of a PhD in mathematics from the University of Manchester (UK), Brian Gilvary joined BP group in 1986 where he has spent his entire career. Following a variety of roles in the upstream, downstream and trading of the oil and gas business in Europe and the United States, he became the Downstream's Chief Financial Officer and Commercial Director from 2002 to 2005. From 2005 until 2009 he was Chief Executive of the integrated supply and trading function. In 2010 he was appointed Deputy Group Chief Financial Officer with responsibility for the finance function. Brian Gilvary was appointed Chief Financial Officer of BP on January 1, 2012. Having worked in both upstream and downstream, he has a strong experience of BP oil and gas business and a significant expertise of finance and trading.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Audit and Accounts Committee since May 2017)

#### Positions or activities outside the Air Liquide Group

- **Chief Financial Officer and Director:** BP p.l.c.\*
- **Director:** BP Capital Markets p.l.c., BP Car Fleet Limited, BP Corporate Holdings Limited, BP Finance p.l.c., BP Global Investments Limited, BP Holdings North America Limited, BP International Limited, BP P.L.C. (Member of the "Results Committee"), The BP Share Plans Trustees Limited
- **Chairman:** The 100 Group
- **Non-executive Director:** Royal Navy Board
- **Non-executive Director:** Francis Crick Institute
- **Member:** Trilateral Commission

### Positions and activities

#### held during the last five years and that have expired

#### 2016

- **External advisor:** HM Treasury Financial Management Review Board

\* Listed company.

N.B.: For information regarding independence criteria, please refer to this Reference Document – page 94.

## Xavier HUILLARD

### Independent Director – Chairman of the Remuneration Committee

**Nationality:** French

Born on June 27, 1954

**Date of first appointment:** May 2017

**Start of current term:** May 2017

**End of current term:** 2021 (Shareholders' Meeting to approve the financial statements for the fiscal year ending December 31, 2020)

**Number of shares owned as of December 31, 2018:** 8,467

**Business address:** VINCI – 1, cours Ferdinand de Lesseps – 92851 Rueil-Malmaison Cedex – France

### Career

Xavier Huillard is a graduate of the École polytechnique and the École nationale des ponts et chaussées. He has spent most of his working life in the construction industry in France and abroad. He joined Sogea in December 1996 as Deputy Chief Executive Officer in charge of international activities and specific projects, and then became its Chairman and Chief Executive Officer in 1998. He was appointed Deputy General Manager of VINCI in March 1998 and was Chairman of VINCI Construction from 2000 to 2002. He was appointed Senior Executive Vice President of VINCI and was Chairman and Chief Executive Officer of VINCI Energies from 2002 to 2004, then Chairman of VINCI Energies from 2004 to 2005. Xavier Huillard became Director and Chief Executive Officer of VINCI in 2006 and was appointed Chairman of the Board of Directors and Chief Executive Officer of VINCI on May 6, 2010. He was Chairman of the Institut de l'Entreprise from January 2011 to January 2017. Xavier Huillard is Chairman of Vinci Concessions since June 20, 2016.

### Positions and activities held during 2018

#### Functions within the Air Liquide Group

- **Director:** L'Air Liquide S.A.\* (member of the Remuneration Committee since May 2017 and Chairman of this Committee since May 2018)

#### Positions or activities outside the Air Liquide Group

- **Chairman and Chief Executive Officer:** VINCI\*
- **Permanent representative** of VINCI on the Board of Directors of Aéroports de Paris\* (member of the Remuneration, Nomination and Governance Committee)
- **Chairman of the Supervisory Board:** VINCI Deutschland GmbH
- **Permanent representative of VINCI** on the Board of Directors of VINCI Energies, and of Fabrique de la Cité
- **Permanent representative of Snel** on the Board of Directors of ASF
- **Permanent representative of VINCI Autoroutes** on the Board of Directors of Cofiroute
- **Chairman:** Fondation d'entreprise VINCI pour la Cité
- **Director:** Kansai Airports
- **Member of the bureau:** Institut de l'entreprise
- **Vice-Chairman:** Aurore Association
- **Chairman:** VINCI Concessions SAS

### Positions and activities held during the last five years and that have expired

#### 2017

- **Chairman:** Institut de l'Entreprise (until January 2017)

#### 2015

- **Permanent representative of VINCI** on the Board of Directors of Eurovia

#### 2014

- **Chairman:** Vinci Concessions Management SAS
- **Non-voting Director** on the Board of Directors of Aéroport de Paris\*

#### 2013

- **Director:** VINCI Plc.; Vinci Investments Ltd.

\* Listed company.

N.B. For information regarding independence criteria, please refer to this Reference Document – page 94.



## — REMUNERATION OF THE EXECUTIVE OFFICERS — AND DIRECTORS OF L'AIR LIQUIDE S.A.

(pursuant to article L. 225-37-3 of the French Commercial Code)

This section describes the remuneration and the benefits granted to the corporate officers during the 2018 fiscal year in accordance with article L. 225-37-3 of the French Commercial Code and the remuneration structure adopted for the 2019 fiscal year as approved by the Board of Directors on February 13, 2019. To determine all the components of the remuneration for the Executive Officers, as proposed by the Remuneration Committee, the Board of Directors takes into account the principles of completeness, balance, comparability, consistency, comprehensibility and proportionality as recommended by the AFEP/MEDEF Code of corporate governance. Taking account of several external studies, the Board of Directors adopts a **remuneration policy which provides strong incentives for the Executive Officers and is related to the steady operating performance which the shareholders expect from Air Liquide over time.**

This remuneration policy includes **incentive elements reflecting the Group's strategy which is steered toward profitable long-term growth, while acting responsibly with regard to all stakeholders.** In a highly capital-intensive industry, profitable long-term growth requires constant attention to be paid to each investment decision and to the competitiveness of every transaction, while maintaining an ongoing effort over time in favor, in particular, of safety and security, innovation, employee training and development, together with the environment. In this context, the elements taken into account for the determination of the remuneration are as follows:

- a **short-term component**, comprising a fixed remuneration and a variable remuneration;
- a **long-term incentive (hereinafter the "LTI")** through the grant of share subscription options and performance shares, both tools being subject in full to the same performance conditions calculated over three years;
- **other benefits** attached to the performance of the Executive Officers' terms of office, including:
  - a **defined benefit pension plan** which applies to eligible senior managers and Executive Officers, subject to performance conditions for Benoît Potier since May 16, 2018 (the date of renewal of his term of office),
  - a **collective life insurance plan**,
  - a **death and disability benefits plan**,
  - **commitments to pay an indemnity in the event of the termination of duties at the Company's** initiative, in certain circumstances, subject to performance conditions calculated over a three-year period,
  - entitlement to **unemployment insurance for company managers and corporate officers**, in the absence of an employment contract with the Group.

A full description of all these components of remuneration is set out below, and, when such commitments are subject to the regulated agreements and commitments procedure, they are also described in the Statutory Auditors' Special Report on pages 327 et seq. In accordance with the AFEP/MEDEF Code, the remuneration components of the Executive Officers are made public after the Board meeting during which they are approved.

The information included in this document takes into account the provisions of the AFEP/MEDEF Code of corporate governance for listed companies, as interpreted by the Haut Comité de Gouvernement d'Entreprise (French High Committee on Corporate Governance) (Application guide for the AFEP/MEDEF Code; Activity report of the Haut Comité de Gouvernement d'Entreprise in October 2018) and the AMF's recommendations included in the Guide on the preparation of reference documents and the AMF Report on corporate governance and the remuneration of Executive Officers of listed companies dated November 26, 2018. For a summary of the application of the AFEP/MEDEF Code, see the summary table in the Report on corporate governance, at page 112 of this Reference Document.

Pursuant to article L. 225-100 II of the French Commercial Code, the Annual Shareholders' Meeting on May 7, 2019 is invited to decide upon the elements which make up the total remuneration and the benefits of all kinds paid or granted to each Executive Officer in respect of 2018 (see the tables at pages 150 et seq. below). Furthermore, in accordance with article L. 225-37-2 of the French Commercial Code, the principles and criteria for the determination, distribution and allocation of the fixed, variable and exceptional elements of the total remuneration and the benefits of all kinds that may be granted to the Executive Officers, as described in the presentation contained at pages 156 et seq., are subject to the approval of the Annual Shareholders' Meeting.

## 1. Summary of the remuneration of the Executive Officer

Table 1 below presents a summary of all remuneration components paid to the Executive Officer with regard to fiscal years 2016, 2017 and 2018. They are then more fully described in the following tables.

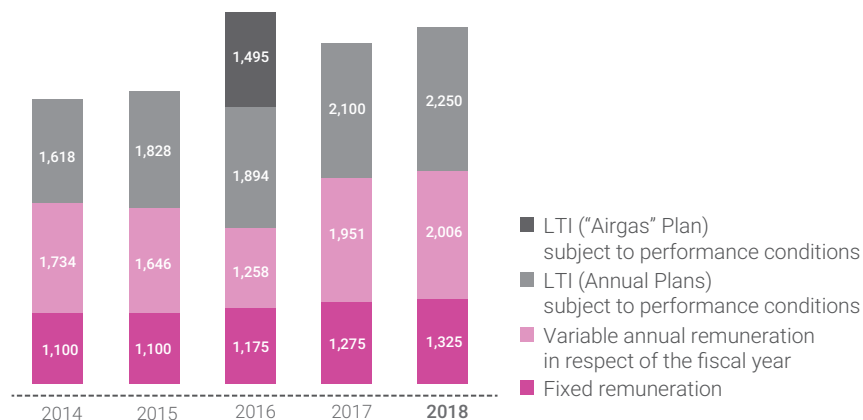
TABLE 1 – SUMMARY OF THE REMUNERATION AND STOCK OPTIONS AND PERFORMANCE SHARES GRANTED TO THE EXECUTIVE OFFICER

<i>(in thousand of euros, rounded off)</i>	2016	2017	2018
<b>Benoît Potier – Chairman and Chief Executive Officer:</b>			
Remuneration due in respect of the fiscal year (see breakdown in Table 2)	2,443	3,236	3,341
Value of stock options granted during the fiscal year (see breakdown in Table 4)	619	425	450
Value of performance shares granted during the fiscal year (see breakdown in Table 6):			
■ Annual Plan	1,275 <sup>(a)</sup>	1,675	1,800
■ July 29, 2016 "Airgas" Plan	1,495	N/A	N/A
<b>TOTAL</b>	<b>5,832</b>	<b>5,336</b>	<b>5,591</b>

*(a) November 29, 2016 plan.*

### BREAKDOWN OF THE REMUNERATION OF THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER OVER THE LAST FIVE YEARS

*(in thousands of euros, rounded off)*



As an annualized average, Benoît Potier's remuneration (fixed, variable and LTI<sup>(a)</sup>) has increased by +6.9% over 3 years, by +4.2% over 5 years and by +2.6% over 10 years.

*(a) Excluding the "Airgas" Plan.*

## 2. 2018 – Total annual remuneration (fixed portion, variable portion, LTI) of the Chairman and Chief Executive Officer

### SUMMARY OF THE PRINCIPLES AND CRITERIA APPROVED BY THE ANNUAL SHAREHOLDERS' MEETING IN 2018

The principles and criteria for the determination, distribution and allocation of the fixed, variable and exceptional elements included in the remuneration and the benefits of all kinds, which are awarded to the Chairman and Chief Executive Officer because of his office, as decided upon by the Board of Directors on February 14, 2018 and presented in the Company's 2017 Reference Document (pages 201 to 208) were **approved by the Annual Shareholders' Meeting on May 16, 2018** (13<sup>th</sup> resolution).

This policy is in line with the policy introduced in 2017, after the **acquisition of Airgas, which was a major, transforming event for the Group**. It reflects the increased level of responsibility of the Group's senior executive and is adapted to the Group's new context, remains competitive and is an incentive to promote the Group's performance over the medium to long-term, in compliance with the Company's interests and the interests of all the stakeholders.

The principal elements of this policy are as follows:

- in accordance with a recurring practice at Air Liquide, the **fixed remuneration represents approximately 25%, the variable remuneration 35% and the LTI 40% of the total annual remuneration**. Accordingly, **the weight of the variable remuneration and the LTI, which are subject to performance conditions, represents approximately 75% of this remuneration**;
- the variable part is expressed as a **target variable remuneration and as a maximum** (as a % of the fixed remuneration). For the quantifiable criteria, the target variable remuneration corresponds to an achievement of 100% of the target objective set at the start of the year. The fixed target objectives are demanding and are completely consistent with the trajectory of the NEOS company program;
- a **greater relative weight is given to the quantifiable criteria** as compared to the qualitative criteria. There were three quantifiable criteria for 2018, including ROCE and revenue, which are some of the strategic objectives in the NEOS plan;
- a **weighting is now given to each of the qualitative criteria** in order to meet the expectations of certain shareholders.

With regard to the **LTI**, following remarks made by certain shareholders, the Board now applies the principle of **proration on the basis of actual presence at the Group** for any Executive Officer, in the event of a departure<sup>(a)</sup> between the initial allocation and the expiry of the period of assessment of the performance conditions. As before, no allocation is granted in the year of departure.

In the Group's new context following the acquisition of Airgas, it had also been decided to **reposition the remuneration** of the Chairman and Chief Executive Officer for 2017/2018, subject to a good performance, a successful integration of Airgas and the achievement of the Airgas synergies in line with the forecasts for the end of 2017. Since the conditions for this repositioning have been achieved, in accordance with the principles approved by the Shareholders' Meeting, the total annual target remuneration for 2018 has increased by +5.2% as compared to 2017. As announced, this **repositioning is now finalized**.

The elements of Benoît Potier's remuneration in respect of 2018, as determined by the Board of Directors pursuant to the principles and criteria approved by the Annual Shareholders' Meeting on May 16, 2018, are described below.

(a) A departure for reasons other than a resignation or removal from office for serious cause which continue to result in the loss of the LTI.

## 2.1. SHORT-TERM BENEFITS

The gross annual remuneration before tax paid by the Company (and all Group companies) to the Chairman and Chief Executive Officer, including the benefits in kind, amounts, for fiscal years 2016, 2017 and 2018, to the figures shown in the following Table 2:

TABLE 2 – SUMMARY OF THE EXECUTIVE OFFICER'S REMUNERATION

	2016		2017		2018	
	Amounts due	Amounts paid	Amounts due	Amounts paid	Amounts due	Amounts paid
<i>(in thousands of euros, rounded off)</i>						
<b>Benoît Potier – Chairman and Chief Executive Officer</b> <sup>(a) (b)</sup>						
■ Fixed remuneration	1,175	1,175	1,275	1,275	1,325	1,325
including Directors' fees	-	-	-	-	-	-
■ Variable annual remuneration	1,258	1,646	1,951	1,258	2,006	1,951
■ Benefits in kind	10	10	10	10	10	10
<b>TOTAL</b>	<b>2,443</b>	<b>2,831</b>	<b>3,236</b>	<b>2,543</b>	<b>3,341</b>	<b>3,286</b>

(a) Pursuant to the recommendations of the AFEP/MEDEF Code of corporate governance, Benoît Potier resigned from his employment contract in May 2010. Benoît Potier receives all of his remuneration for his corporate office.

(b) During 2018, the Group paid contributions to third parties, for the benefit of Benoît Potier, pursuant to the supplementary defined contribution pension plan (9,500 euros), pursuant to the collective life insurance contract (211,831 euros) and pursuant to the collective death and disability benefit plan (4,673 euros). The total sum of these contributions amounts to 226,003 euros. These plans are described in further detail below.

### 2.1.1. Fixed remuneration for 2018

In accordance with the principles and criteria determined by the Board of Directors on February 14, 2018 and approved by the Annual Shareholders' Meeting on May 16, 2018, the fixed remuneration was determined taking account of the level of responsibilities, the experience in executive management function and market practices.

The amount of the fixed remuneration for the Executive Officer is shown in the following table. Over the last five years, this fixed remuneration has undergone an average annual increase of +3.8% (see the graph on page 126).

<i>(in thousands of euros)</i>	2017	2018	2017/2018 change
Benoît Potier	1,275	1,325	+3.9%

### 2.1.2. Variable remuneration for 2018 for the Chairman and Chief Executive Officer

The principles and criteria for the variable remuneration, as decided upon by the Board of Directors on February 14, 2018 were approved by the Annual Shareholders' Meeting on May 16, 2018 (13<sup>th</sup> resolution). The Board of Directors on February 13, 2019 assessed the performance of the Executive Officer in 2018.

The **criteria for the variable remuneration, their weighting and their rate of achievement** are detailed in the following summary table (see page 131).

#### A. (Quantifiable) financial criteria

The variable remuneration for 2018 is based on **three financial criteria**: increase in recurring earnings per share (hereinafter "**recurring EPS**"), Return on Capital Employed after tax (hereinafter "**ROCE**"), growth in **consolidated revenue**. These criteria are detailed in the following summary table (page 131).

The increase in EPS criterion makes it possible to take into account **all the items in the income statement**. The criterion of the ROCE, which makes it possible to measure the return on capital employed, is relevant for **a highly capital-intensive industry**. The criterion of an increase in sales reflects the **momentum in the activity**.

These three criteria – revenue, EPS and ROCE – reflect **the balance achieved each year between profitable growth and return on investment**.

The criteria of ROCE and growth in revenue are part of the four objectives in the NEOS strategic plan.

For each criterion, the Board of Directors of February 14, 2018 had defined a target objective. The **objectives were exacting** and were **completely consistent with the trajectory of the NEOS company program** which targets, for the period 2016-2020, an average annualized growth in Group revenue of **+6% to +8%** (including a scope impact linked to the consolidation of Airgas corresponding to +2% as an annualized average) and a **return on capital employed (ROCE) of more than 10% in 2021-2022**.

For each financial criterion, a formula adopted by the Board makes it possible to calculate the amount of the variable remuneration due (within a maximum limit) by taking into account, on the basis of the consolidated financial statements for the fiscal year, the value achieved for the criterion as compared to the target objective set. Thus, in the event of a performance that exceeds the objective set, the value of the variable remuneration is adjusted upward within the maximum limit set for each criterion. **In the event of a performance that is below the lower limit set for each objective, the variable remuneration corresponding to this criterion is equal to zero.**

**The objectives are not made public for confidentiality reasons.** Nevertheless, the rate of achievement of each objective for the variable remuneration (as a percentage of the fixed remuneration and as a percentage of the target variable remuneration allocated to that criterion) is communicated in the summary table below (page 131).

The results for **2018** were **above the target for the recurring EPS and revenue criteria and slightly below the target for the ROCE** (see summary table on page 131).

## B. (Qualitative) personal criteria

The variable remuneration for 2018 is also based on the following (qualitative) personal criteria:

- **Corporate Social Responsibility (hereinafter "CSR")**
  - Safety and reliability: continue efforts to improve safety in terms of the lost time accident frequency rate and vigilance concerning the prevention of road traffic and business related accidents,
  - Deployment of the Corporate Sustainability Program – Definition and communication of the CSR objectives for the Group, in line with the NEOS Program;
- **Organization/Human Resources:** continuation of the policy to develop talent, in particular for the advancement of young managers – Organization of future succession plans;
- **Individual performance:** this criterion responds to the Board of Directors' desire to keep a part of the variable remuneration subject to the Board's assessment, in order to take account of the unpredictability of the environment. This may be beneficial to the Executive Officer if the Company is facing an unfavorable environment which was not anticipated at the time the objectives were set, or disadvantageous if the environment ultimately turns out to be more favorable than anticipated.

A **weighting is now given to each of the (qualitative) personal criteria**, as detailed in the summary table below (page 131). A target and a maximum weight is set for each of them.

For **2018**, the performance, concerning the (qualitative) personal objectives, was held to be **excellent**. The Board of Directors noted the following elements:

### CSR criteria:

#### ➤ **Safety and reliability:**

With regard to safety, 2018 is a somewhat paradoxical year, with:

- a historically low lost time accident frequency rate of 1.29 compared to an average of 1.63 over the last five years. This indicator has dropped significantly;
- unfortunately, several fatal accidents, with three deaths from among Air Liquide's employees and five at subcontractors. They have been analyzed in detail at the Group's Executive Committee meetings: special preventative measures have been implemented during the course of the year with regard to road traffic risks, which remain the principal cause of accidents, in particular those which resulted in fatal accidents. Action plans have been rolled out in the relevant operations and geographical areas and an awareness campaign has been carried out throughout the whole Group.

Concerning reliability, the Group's IMS (Industrial Management System) program which was implemented over 10 years ago has profoundly changed the way of working, and has consolidated the management processes for safety, reliability, environmental protection and industrial risk control. Based on the experience acquired, a project was launched in 2018 to adapt the IMS, in order to improve its efficiency and its implementation at all Group entities.

#### ➤ **Corporate Sustainability Program:**

The Environment and Society Committee, formed in 2017, met on three occasions in 2018 and continued its work and recommendations concerning, in particular, the Climate objectives which were published on November 30, 2018, the Group's sustainable development issues, the assessment of the environmental and societal risks and the review of the vigilance plan.

Air Liquide has for many years been dedicated to an approach designed to foster responsible growth, aiming in particular to limit its CO<sub>2</sub> emissions and those of its customers. Air Liquide announced its Climate objectives on November 30, 2018, including in particular the reduction of its carbon intensity by 30% between 2015 and 2025, with a global approach including its assets, customers and the ecosystems. These objectives are the most ambitious in the sector and are in line with the NEOS company program. This announcement was the theme for an investor day and the subject of global communication at the Group. A campaign has been launched to roll out the objectives in operations.

Benoît Potier is co-Chairman of the Hydrogen Council. This Council, formed in 2017, brings together more than 50 leaders in the energy, transport and industry sectors to promote hydrogen in order to achieve the climate change objectives, and held, for the first time, a meeting in China.

### **Organization and Human Resources :**

The talent development policy has been pursued. Regular reviews of talent, at the level of operating clusters (groups of countries) and up to the highest level of the Company, have led to a certain number of moves. These reviews have also been implemented at Airgas, where the roll-out of the Group's processes and policies is continuing.

The succession plans for the Company's key positions have also been reviewed.

Dedicated reviews with the Executive Committee and the Appointments and Governance Committee have taken place regarding talent with the greatest potential.

Diversity objectives for 2025 (at both Group and entity levels) have been defined and shared (the proportion of women and of different nationalities in "Executive" positions, the gender mix of teams, etc.), together with objectives to hire young graduates, which is a key factor in the creation of talent pools.

The development program for technical talent, TCL (Technical Career Leaders), also received particular attention in 2018 with the appointment of two Senior Fellows (the highest form of recognition on the program), of leading international experts from the Airgas teams and an improvement in the gender mix with the appointment of the first female Fellow. This program is an essential factor for innovation, and makes a significant contribution over the long term to ensuring the Group's reliability and safety.

In parallel to NEOS Customer Experience program, a program has been launched which focuses on employees' responsiveness and commitment.

### **Individual performance :**

Individual performance was considered to be excellent. The Group's results are very good in an uncertain economic and geopolitical context. As regards the acquisition of Airgas, the synergies are more than one year ahead of schedule. Moreover, following the acquisition, it can be noted in Airgas teams the expression of a strong feeling that they belonged to the Group and that their career prospects had expanded. Furthermore, Benoît Potier's strong personal commitment to the development of the Hydrogen Energy business was noted.



## SUMMARY TABLE OF THE VARIABLE REMUNERATION FOR 2018

		Target <sup>(a)</sup>		Maximum		Rate of achievement <sup>(e)</sup>		
Indicator	Measure	As a % of the fixed remuneration	As a % based on 100	As a % of the fixed remuneration	As a % based on 100	As a % of the target remuneration for this criterion	As a % of the fixed remuneration	As a % based on 100
Financial criteria (quantifiable) including:		105	70	122	73	-	108.6	71.8
Recurring earnings per share (recurring EPS) <sup>(b)</sup>	Increase in recurring EPS	40	26.7	47	28.1	113.1	45.2	30
Return on capital employed, after tax (ROCE)	Value <sup>(d)</sup>	45	30	52	31.1	94	42.3	28
Revenue <sup>(c)</sup>	Comparable growth in consolidated revenue	20	13.3	23	13.8	105.5	21.1	14
Personal criteria (qualitative) including:		45	30	45	27	-	42.8	28.2
CSR	<div><div></div> Safety and reliability: continue efforts to improve safety in terms of the lost time accident frequency rate and vigilance concerning the prevention of road traffic and business-related accidents</div> <div><div></div> Deployment of the Corporate Sustainability Program – Definition and communication of the CSR objectives for the Group, in line with the NEOS company program</div>	15	10	15	9	90	13.5	9
Organization / Human Resources	Continuation of the policy to develop talent, in particular for the advancement of young managers – Organization of future succession plans	15	10	15	9	95	14.3	9
Individual performance	Assessment by the Board of Directors, in light in particular of the external environment for the year	15	10	15	9	100	15	10
TOTAL (FINANCIAL AND PERSONAL CRITERIA)		150	100	167	100	-	151	100

(a) The target corresponds to 100% achievement of the performance criterion.

(b) Excluding the foreign exchange impact and significant exceptional items.

(c) Excluding significant scope impact, foreign exchange impact and energy.

(d) As at December 31, 2018.

(e) As per decision of the Board of Directors on February 13, 2019.

Overall, the total amount of the variable remuneration is at the target, **up by +2.8%** as compared to the variable remuneration for 2017.

As an annualized average, Benoît Potier's variable remuneration has increased by +6.8% over 3 years, by +6.1% over 5 years and by +3.0% over 10 years.

The total amount of the variable remuneration due for the 2018 fiscal year in respect of the term of office will be paid in 2019, after approval of the financial statements by the Annual Shareholders' Meeting it being noted that its payment is conditional on approval by an Annual Shareholders' Meeting of the elements of Benoît Potier's remuneration for 2018, under the conditions provided by article L. 225-100 of the French Commercial Code.

### 2.1.3. Total fixed and variable remuneration – Changes

Benoît Potier's total **fixed and variable remuneration** for 2018 is **up by +3.3%** as compared to 2017.

This variation reflects the last phase of the repositioning of the target remuneration in 2017-2018 in the Group's new context following the acquisition of Airgas, this repositioning being finalized in 2018.

As an annualized average, Benoît Potier's fixed and variable remuneration has increased by +6.6% over 3 years, by +5.1% over 5 years and by +2.9% over 10 years.

### 2.1.4. Other elements of annual remuneration for 2018

The benefits in kind paid for the benefit of the Executive Officer in 2018 include the use of a company car and the contributions to the unemployment insurance for company managers and corporate officers.

In addition, the Group paid to third parties, for Benoît Potier, the contributions to the supplementary defined contribution pension plan, to the Group life insurance plan and the additional death and disability benefits plan. The amount of these contributions is stated in the footnotes to Table 2 (page 128).

## 2.2. STOCK OPTIONS AND PERFORMANCE SHARES

### 2.2.1. 2018 stock option and performance share plans

#### A. Principles of grant for 2018

For the Executive Officer, the grant for 2018 forms part of the 2018 remuneration policy defined by the Board of Directors on February 14, 2018 and approved by the Annual Shareholders' Meeting on May 16, 2018 (Cf. policy described on page 127).

In such circumstances, it had been agreed by the Board of Directors on February 14, 2018 that the grant of stock options/performance shares to Benoît Potier in 2018 would represent an IFRS value of approximately 2,250 thousand euros, an increase of +7.14% as compared to 2017.

#### B. Performance conditions of the 2018 Plans

All the stock options and performance shares granted to any beneficiary are subject to performance conditions which apply to both the stock option and performance share plans and are calculated over three years.

The performance conditions, which apply to the plans decided upon in the autumn, are set by the Board of Directors at the start of the year, at the February meeting, in order to comply with a reference period of three full years.

For reasons of confidentiality, the exact objectives set for each performance condition are made public *ex post*, at the end of the Board of Directors' meeting in February following the end of the three fiscal years during which the performance must be achieved. The rate of achievement of the performance conditions and the percentage of stock options that vest/performance shares definitively awarded are also published at the end of this Board meeting.

The performance conditions applicable to the stock option and performance share plans implemented in 2018 were adopted by the Board of Directors on February 14, 2018.

Accordingly, the number of stock options which can be exercised out of the total number of options which will be allocated, together with the number of performance shares definitively awarded pursuant to the 2018 Plans will depend:

- (i) **for 65% of the stock options/performance shares granted**, on the rate of achievement of an objective, set by the Board, consisting of the average annual rates of growth in Group undiluted net earnings per share, excluding foreign exchange impact and significant exceptional items ("**Recurring EPS**") for the fiscal years 2018, 2019 and 2020.

At the objective set, the grant is 100%, and then decreases on a straight-line basis to **zero, if there is no growth in the EPS**.

This objective has been set, as for the 2017 Plans, at a level of growth included within the bracket of +6% to +10% per year. The exact objective will be communicated *ex post*;

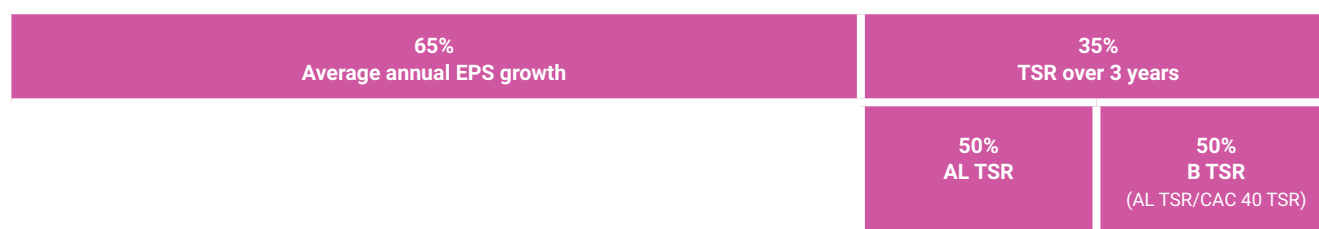
**(ii) for 35% of the stock options/performance shares granted,**

- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on an objective of total shareholder return set by the Board, defined as the average annual growth rate of an investment in Air Liquide shares, reinvested dividends, for fiscal years 2018, 2019 and 2020 ("**AL TSR**"). The objective of absolute TSR is set in accordance with historic performances. At the objective set, the grant is 100%, then decreases on a straight-line basis, to a lower limit,
- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on the rate of total shareholder return from an investment in Air Liquide shares, reinvested dividends – sourced from Bloomberg ("**B TSR**"), as compared to the CAC 40 TSR index, reinvested dividends (sourced from Bloomberg) for the fiscal years 2018, 2019 and 2020.

The rate of achievement will be **0%**, if the average of the Air Liquide TSR is lower than the average of the CAC 40 TSR, 50% if it is equal to the average of the CAC 40 TSR and 100%, if it is at least higher than 2% of the average of the CAC 40 TSR on the basis of a straight-line change. Any grant for a performance lower than the average of the CAC 40 TSR is impossible.

The rate of achievement of the performance conditions will be recorded by the Board at the time when the financial statements are adopted for the 2020 fiscal year. The result achieved and the percentage of performance shares awarded/stock options which can be exercised will also be communicated.

**DIAGRAM SHOWING THE PERFORMANCE CONDITIONS APPLICABLE TO ALL THE STOCK OPTIONS AND PERFORMANCE SHARES IN 2018**

**C. Rules specific to the Executive Officers**

The grant to the Executive Officers is examined by the Remuneration Committee at the same time as the allocation to Group employees and is decided by the Board of Directors. It is made within the scope of plans, adopted at pre-established periods in the autumn, in the form of share subscription options granted without any discount, and performance shares.

The grant of stock options and performance shares is examined in light of the total amount of the Executive Officer's annual remuneration, taking into account several external market surveys and ensuring that the interests of the shareholders are respected.

Every year, before the grant of stock options and performance shares, it is verified that the conditions provided for in articles L. 225-186-1 and L. 225-197-1 of the French Commercial Code aimed at involving all the staff in France in the Company's performance are satisfied. In 2018, all the Company's employees and 99% of the employees in the Group's French entities are covered by an incentive plan or a special or voluntary profit-sharing plan.

**Limits on grants to the Executive Officers**

Within the scope of the sub-limits authorized for 38 months<sup>(a)</sup> by the Annual Shareholders' Meeting, the Board of Directors sets lower annual limits for the grants to the Executive Officers, expressed (i) as a percentage of the share capital and (ii) as a multiple of their remuneration, in accordance with the recommendations of the AFEP/MEDEF Code.

The limits set by the Board of Directors for 2018 are identical to those for 2017 and are as follows:

- the total number of performance shares granted to the sole Executive Officer in 2018 cannot give rise to a number of shares in excess of 0.012% of the share capital (it being understood that an allocation sub-limit of 0.15% of the share capital for 38 months was set by the Annual Shareholders' Meeting on May 12, 2016);
- the total number of stock options granted to the sole Executive Officer in 2018 cannot give rise to a number of shares in excess of 0.035% of the share capital (it being understood that an allocation sub-limit of 0.3% of the share capital for 38 months was set by the Annual Shareholders' Meeting on May 12, 2016);
- the maximum aggregate IFRS value of the stock options and performance shares granted to the Executive Officer cannot exceed (all 2018 stock option and performance share plans combined) approximately 1.5 times the amount of the Executive Officer's maximum gross annual remuneration (fixed + variable maximum), it being noted that the stock options and performance shares granted represent approximately 40% of the total target annual remuneration.

<sup>(a)</sup> Last authorized by the Combined Shareholders' Meeting on May 12, 2016 (18<sup>th</sup> and 19<sup>th</sup> resolutions).

### Implementation of the proration principle

Pursuant to the decision made by the Board on February 14, 2018, the 2018 grant of LTI to the Executive Officer is subject to the principle of a pro rata calculation.

In practice, if the Executive Officer leaves for a reason other than his resignation or removal from office for serious cause<sup>(a)</sup>, the total allocation rate (after applying the performance conditions) would be reduced pro rata the number of months' actual presence of the Executive Officer at the Group during the period of assessment of the performance criteria.

The Executive Officer will remain subject to all the provisions of the plans and, more specifically, those relating to the duration of the vesting, lock-up and holding periods in respect of the shares and stock options granted.

Furthermore, no grant is made to the Executive Officer in the year of his departure, in accordance with the AFEP/MEDEF Code.

### Shareholding and share ownership obligations

#### Shareholding obligation pursuant to the French Commercial Code

On the recommendation of the Remuneration Committee, the Board defined the shareholding obligations resulting from articles L. 225-185 and L. 225-197-1 of the French Commercial Code applicable to the shares resulting from the exercise of stock options and performance shares respectively as from September 28, 2015, as follows:

For each stock option/performance share plan granted to the Executive Officers with effect from September 28, 2015, the Executive Officers shall hold, in registered form, until the termination of their duties, a minimum quantity of shares corresponding to 50% of the capital gain on acquisition, net of social security charges and tax, resulting from each exercise of stock options/each definitive award of performance shares.

However, this percentage will be lowered to 5%, as soon as the quantity of shares held by the Executive Officer resulting from the exercise of stock options or the definitive award of performance shares (all plans combined since the 2007 plan for Benoît Potier) represents a minimum amount equal to at least three times the Executive Officer's gross annual fixed remuneration.

This rule is regularly reviewed by the Board at the time of each grant. In 2018, the Board of Directors decided to maintain this rule in identical form.

The previous obligations to hold shares resulting from the exercise of stock options, decided by the Board of Directors on May 9, 2007, which apply with effect from the grant of stock options on May 9, 2007 for Benoît Potier, remain in force with regard to the relevant stock options plans, up until the September 22, 2014 stock option plan inclusive.

It was reported to the Board of Directors on February 13, 2019 that this rule was applied with regard to the exercise of options pursuant to the 2010 stock option plan.

#### Additional shareholding obligation – Recommendation made by the AFEP/MEDEF Code

In addition, the internal rule defined by the Board of Directors since 2008 remains in effect, pursuant to which the Chairman and Chief Executive Officer must hold, in a registered share account, a number of shares equivalent to twice his gross annual fixed remuneration and one time the gross annual fixed remuneration for a Senior Executive Vice President. This obligation will remain in force, until it is exceeded by the effect of the aforementioned rules resulting from the French Commercial Code. The number of shares required to be held is assessed as of January 1 and July 1 of each year. The Board noted that the valuation of the shares held as at January 1 and July 1, 2018 and as at January 1, 2019 by the Chairman and Chief Executive Officer was much greater than the amounts required and concluded that the shareholding obligation was complied with by the Executive Officer.

Recommendations encouraging the ownership of a minimum number of Company shares equivalent to 0.5 times their gross fixed annual remuneration, have also been made to members of the Executive Committee since 2009.

### Other rules applicable to the Executive Officers

- Obligations regarding the restriction on the exercise of stock options and the sale of performance shares during the "black-out periods" prior to the publication of the financial statements, as defined by the Company. These abstention periods open 30 days before the date of publication of the annual and half-yearly consolidated results and 15 days before the date of publication of the financial information relating to the 1<sup>st</sup> and 3<sup>rd</sup> quarters. They end on the date of publication of the information at close of business.
- Commitment not to carry out hedging transactions with regard to the risk concerning stock options/shares resulting from the exercise of stock options and concerning the performance shares awarded, throughout the length of their term of office.

<sup>(a)</sup> Resignation and removal from office for serious cause result in the loss of the LTI.

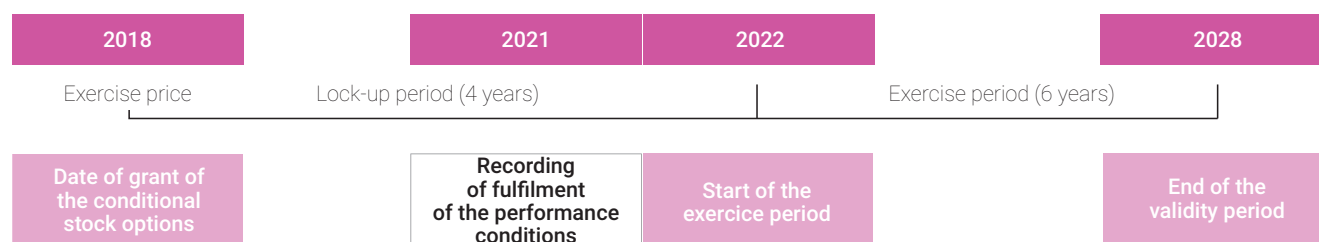
## 2.2.2. Grants to the Executive Officer within the scope of the September 25, 2018 plans

### A. Options granted to the Executive Officer on September 25, 2018

#### Plan Regulations

The September 25, 2018 Plan regulations, and in particular the performance conditions, are the same for all the beneficiaries of stock options within the Group, it being specified that the Executive Officer is subject to additional conditions as described above. The term of the plan is ten years and includes a lock-up period of four years during which the stock options cannot be exercised. Furthermore, a requirement of continued presence at the Group at the time of exercise of the options is also defined.

#### Stock option plan mechanism



#### Volume

Table 4 below shows the number and value of the share subscription options granted to the Executive Officer by the Board of Directors on September 25, 2018.

TABLE 4 – SHARE SUBSCRIPTION OPTIONS GRANTED DURING THE 2018 FISCAL YEAR TO THE EXECUTIVE OFFICER

	Plan grant date	Option type	Number of options granted	Option value (pursuant to IFRS 2) <sup>(a)</sup>	Exercise price (in euros)	Exercise period	Performance conditions
<b>Benoît Potier</b>	09/25/2018	Share subscription options	23,690	449,714	107	09/25/2022 – 09/24/2028	2 performance conditions calculated over 3 years: ■ Recurring EPS ■ Total Shareholder Return, including an element of relative comparison

(a) As at September 25, 2018. See page 167.

The stock options granted to the Executive Officer in 2018 represent 0.0055% of the number of shares making up the share capital. This grant is made by the Company to the exclusion of any other Group company.

*Options exercised during the 2018 fiscal year and remaining to be exercised as at December 31, 2018*

TABLE 5 – SHARE SUBSCRIPTION OPTIONS EXERCISED DURING THE 2018 FISCAL YEAR BY THE EXECUTIVE OFFICER

	Plan grant date	Number of options exercised during the fiscal year	Exercise price (in euros)*
Benoît Potier	06/28/2010	121,179	60.28

\* Exercise price on the date of exercise.

*Total adjusted stock options remaining to be exercised by the Executive Officer as at December 31, 2018*

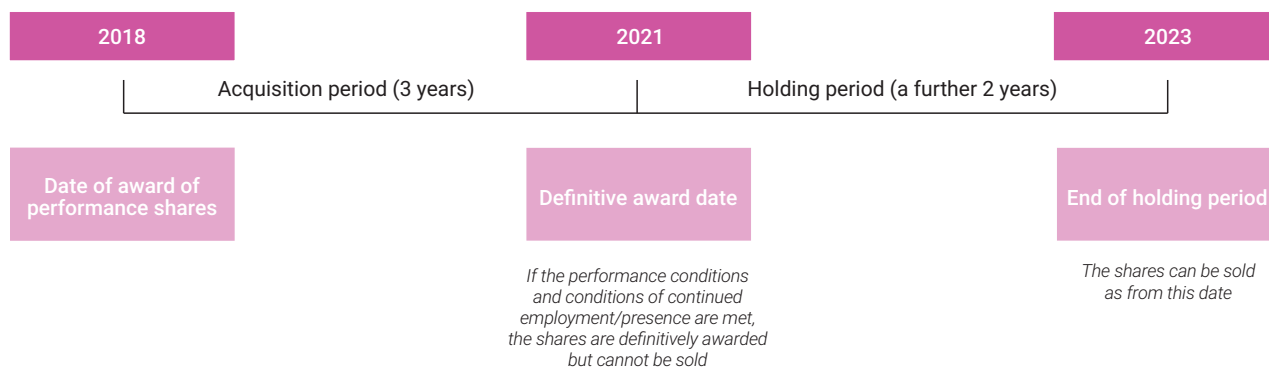
	Total number of outstanding adjusted options	Average price (in euros)
Benoît Potier	611,731	80.98

For more details on the adjusted number of stock options by plan, see table page 167.

**B. Performance shares awarded to the Executive Officer on September 25, 2018***Plan Regulations*

The grant to the Executive Officer is governed by the September 25, 2018 "France" performance share plan which applies to all the beneficiaries in France. This Plan comprises:

- a three-year vesting period;
- followed by a two-year holding period during which the shares cannot be sold.

*Performance share mechanism - France Plan*

The condition of continued presence required in order to be able to benefit from the performance shares at the end of the vesting period is, for an Executive Officer, aligned with that applicable to him in the stock option plans, the loss of rights occurring in the event of resignation or removal from office for serious cause.

The Executive Officer is also subject to additional conditions as described above.



**Volume**

The table below shows the number and value of the performance shares awarded to Benoît Potier on September 25, 2018.

TABLE 6 – PERFORMANCE SHARES AWARDED DURING THE 2018 FISCAL YEAR TO THE EXECUTIVE OFFICER

	Plan grant date	Number of performance shares awarded	Value of the performance shares (pursuant to IFRS 2) <sup>(a)</sup> (in euros)	Definitive award date	Availability date	Performance conditions
Benoît Potier	09/25/2018	18,230	1,800,249	09/25/2021	09/25/2023	2 performance conditions calculated over 3 years: ■ Recurring EPS ■ Total Shareholder Return, including an element of relative comparison

(a) As at September 25, 2018. See page 171.

The performance shares awarded to Benoît Potier on September 25, 2018 represent 0.0043% of the number of shares making up the share capital. This award is made by the Company to the exclusion of any other Group company.

**Performance shares that became available in 2018**

TABLE 7 – PERFORMANCE SHARES THAT BECAME AVAILABLE DURING THE 2018 FISCAL YEAR FOR THE EXECUTIVE OFFICER

Not currently applicable; the 1<sup>st</sup> performance share plan for which the Executive Officer was beneficiary was implemented in 2015: the performance shares resulting from this plan will become available in 2020.

**C. On a combined basis (September 25, 2018 stock option and performance share plans)**

On a combined basis, the grants decided by the Board on September 25, 2018 to Benoît Potier are as follows:

	Volume	Value pursuant to IFRS 2 <sup>(a)</sup> (in euros)	% of share capital
Benoît Potier	23,690 stock options	449,714	0.0055
	18,230 performance shares	1,800,249	0.0043
<b>TOTAL</b>		<b>2,249,963</b>	<b>N/A</b>

(a) As at September 25, 2018. See pages 167 and 171.

**2.2.3. Recording of the achievement of the performance conditions under the November 29, 2016 stock option and performance share plans (Annual plans)**

The Board of Directors of L'Air Liquide S.A., at its meeting on November 29, 2016, decided the annual performance share and stock option plans for 2016.

On the basis of the financial statements adopted for the 2018 fiscal year submitted for the approval of the Annual Shareholders' Meeting on May 7, 2019, the Board of Directors recorded, at its meeting on February 13, 2019, the rate of achievement of the performance conditions which apply to all the stock options and performance shares awarded to any beneficiary under the November 29, 2016 stock option and performance share plans.

The **annual 2016 plans** provided that the number of stock options which could effectively be exercised in respect of the total number of stock options granted, together with the number of performance shares definitively awarded, would depend on the rate of achievement of the following objectives:

- (i) **for 65% of the stock options/performance shares granted**, an objective of the average of the annual rate of growth in the **Recurring EPS excluding the impact of foreign exchange and exceptional items** for the fiscal years 2016, 2017 and 2018 set at +8% (a) in order to be able to exercise all the stock options and (b) in order for all the shares to be awarded, and then decreasing on a straight-line basis to 0% growth.

In order to take account of the impact of the Airgas acquisition and its financing, the following principle had been adopted:

- to calculate the Recurring EPS on the basis of 2016 pro forma financial statements, making it possible to take into account comparable data for the periods concerned (2016, 2017, 2018),
- to increase the objective of the average of the annual rate of growth over this period. This objective, which was previously +5% per year, had thus been set at a level of growth included within the bracket of +6% to +10% per year, i.e. +8%.

The Board of Directors recorded that the average of the annual rate of growth of the recurring EPS over the aforementioned period amounted to +8.05%, i.e. an objective achieved as to 100%;

- (ii) **for 35% of the stock options/performance shares granted**, an objective of shareholder return:

- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): an objective defined as the average annual growth rate of an investment in Air Liquide shares for the fiscal years 2016, 2017 and 2018 ("AL TSR"), set at 8% (a) in order to be able to exercise all the stock options and (b) in order for all the shares to be awarded, and then decreasing on a straight-line basis to 4%.

The Board of Directors recorded that this growth, over the aforementioned period, amounted to 5.6% per annum, i.e. an objective achieved as to 40%;

- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): the rate of total shareholder return from an investment in Air Liquide shares, reinvested dividends – sourced from Bloomberg ("B TSR"), as compared to a reference index made up:
  - as to half by the CAC 40 index, reinvested dividends (sourced from Bloomberg), and
  - as to half by the total shareholder return of the companies in the industrial gas sector – Peers, reinvested dividends (sourced from Bloomberg),
- in respect of the fiscal years 2016, 2017 and 2018.

**The objective with regard to the relative part of TSR was based on the average of the two indexes. The rate of achievement of the performance conditions was 0% if Air Liquide TSR was lower than the average of the two indexes, 50% if it was equal to the average of the two indexes and 100% if it was more than 3% higher than the average of the two indexes, on the basis of a straight-line change. Any grant for a performance lower than the average of the two indexes was impossible.**

The rate of return for Air Liquide over the aforementioned period is 8.33%. That of the CAC 40 index over the same period is 4.4% and that of the companies in the business sector amounts to 10.8%. Consequently, the difference between the rate of return for Air Liquide and the average rate of return for the CAC 40 and Peers indices amounts to 0.73%, i.e. an objective achieved as to 62.13%.

Accordingly, the Board of Directors recorded that the rate of achievement of the performance conditions for the November 29, 2016 stock option plan and the November 29, 2016 share performance plan amounts to 82.87%. For further details on the definitive award to Benoît Potier, see table on pages 167 and 171 of this Reference Document.

#### 2.2.4. Recording of the achievement of the performance conditions under the July 29, 2016 performance share plans (Airgas Plans)

The Board of Directors, at its meeting on July 29, 2016, decided to make a specific grant of performance shares intended to show the Company's recognition for the work carried out by all the teams who contributed to the successful completion of the Airgas acquisition.

For each of these "Airgas" Plans ("France" Plan and "World" Plan), the Board adopted performance conditions calculated over three fiscal years and identical to those used for the November 29, 2016 stock option and performance share plans (see description above).

On the basis of the financial statements for the 2018 fiscal year submitted for the approval of the Annual Shareholders' Meeting of May 7, 2019, the Board of Directors on February 13, 2019 recorded the rate of achievement of the **performance conditions**, which apply to the whole of the performance shares granted to any beneficiary and which were determined at the time of the grant of the July 29, 2016 **Airgas performance share plans. This rate amounts to 82.87%.**

Pursuant to the decision of the Board of Directors on July 27, 2017, specifically for **Benoît Potier**, an **additional performance condition** was added, based on the rate of achievement of the synergies after the Airgas acquisition. The Board meeting which will approve the 2019 financial statements will assess the level of performance achieved for this additional condition.

### 3. 2019: Total annual remuneration (fixed remuneration, variable remuneration, LTI) of the Chairman and Chief Executive Officer

#### 3.1. REMUNERATION POLICY APPLICABLE TO THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER

The remuneration policy which applies to Benoît Potier was determined by the Board of Directors on February 13, 2019, on the recommendation of the Remuneration Committee, in accordance with the principles approved by the Annual Shareholders' Meetings on May 3, 2017 and May 16, 2018. It is **adapted to the Group's context, remains competitive and incorporates incentives which reflect the Group's strategy which is steered towards long-term, profitable growth while acting responsibly in compliance with the Company's interests and the interests of all the stakeholders.**

It is noted that, in 2017, a decision had been made to **progressively change the remuneration policy** for the Chairman and Chief Executive Officer in order to reflect the increased level of the Executive Officer's responsibility following the Group's change in size linked to the acquisition of Airgas. **Since this repositioning was completed in 2018, the Board of Directors decided to maintain the fixed remuneration for 2019 at the same level as for 2018 and thus to stabilize the level of the total target annual remuneration.**

In this context, the structure of the total annual remuneration for 2019 is in line with that for previous fiscal years, some improvements having been made following remarks from shareholders. This structure is as follows:

- A **proportionate balance between the three remuneration components** (fixed, variable and elements of long-term motivation or "LTI") so that, in accordance with recurring practice at Air Liquide:
  - the weight of the **variable remuneration and the LTI, which are subject to performance conditions, continues to represent approximately 75%** of the total annual remuneration;
  - as part of the balance between the aforementioned three components, a slightly greater weight continues to be given to the LTI. Accordingly, **the fixed remuneration represents approximately 25%, the variable remuneration 35% and the LTI 40% of the total remuneration.**
- **Criteria for the variable remuneration and the LTI:** taking into account remarks made by shareholders, the Board decided, on the recommendation of the Remuneration Committee, to change the performance criteria to which these two remuneration tools are subject with effect from 2019. Accordingly, the **EPS** criterion will henceforth only be taken into account in one remuneration tool: it remains a criterion for the annual **variable remuneration**, but is no longer included in the performance criteria for the LTI. Furthermore, the **ROCE** becomes a criterion for the **long term** remuneration (LTI) as a replacement for the EPS. The revenue criterion is maintained as a criterion for the variable remuneration.
- **Upper limits on the grant of LTI to the Executive Officers:** the Annual Shareholders' Meeting on May 7, 2019 is asked to decide upon the renewal of the authorizations for the grant of stock options and performance shares (see draft resolutions 13 and 14, at pages 322 et seq.). At this time and following remarks from shareholders, the Board of Directors proposes that the Shareholders' Meeting **reduce by one-third** each of the **sub-limits on the grants to the Executive Officers** submitted to the Annual Shareholders' Meeting in order to bring them closer to the historical levels of grants by the Board. Consequently, subject to the approval of the resolutions by the Shareholders' Meeting, the number of stock options granted to the Executive Officers may not exceed 0.2% of the share capital (instead of 0.3% previously) and the number of performance shares granted to the Executive Officers may not exceed 0.1% of the share capital (instead of 0.15% previously). As before, the Board of Directors also sets annual grant limits, which remain significantly below these sub-limits, it being noted that, as stated above, the LTI must represent approximately 40% of the Executive Officer's annual remuneration.
- The **other principles which apply to the annual variable remuneration are unchanged.** Accordingly:
  - the variable part continues to be expressed as a **target variable remuneration** (as a percentage of the fixed remuneration) with a maximum. The total target variable remuneration represents approximately 90% of the total maximum variable remuneration, for a very good performance. Consequently, for a fixed remuneration of 100, the target is 150% and the maximum is 167%;
  - concerning the weighting of the various criteria adopted (see table below):
    - a **greater relative weight is still given to the quantifiable criteria** as compared to the qualitative criteria,
    - Quantifiable criteria: as before, each quantifiable criterion is given a target weighting (expressed as a percentage of the fixed remuneration) corresponding to a 100% achievement of the target objective set at the start of the year, and a maximum weighting (expressed as a percentage of the fixed remuneration),
    - Qualitative criteria:
      - as in 2018, in order to meet shareholder expectations, a **weighting is given to each of the qualitative criteria**,
      - the qualitative criteria continue to be based, as to two-thirds, on three to four categories or sub-categories of objectives which are defined each year and, as to one-third, on an assessment of the individual performance;

- the target weighting and the maximum weighting are communicated *ex ante*; the actual weight of each criterion in determining the variable remuneration due in respect of the fiscal year shall be established in accordance with the performance measured for each criterion in light of the target objective, based on applying a formula for the financial criteria and on the assessment of the Executive Officer's performance by the Board of Directors on the recommendation of the Remuneration Committee for the qualitative criteria. The rate of achievement of the objectives for the variable remuneration, expressed as a percentage of the fixed remuneration and as a percentage of the target variable remuneration for this criterion, will be communicated *ex post*.

- Finally, the **other principles which apply to the LTI are also unchanged** (the proration of the LTI in the event of the Executive Officer's departure during the period of assessment of the performance conditions, the level of requirement of the objectives, the rules which are specific to the Executive Officers as described in paragraph 3.2.3 – C).

### 3.2. IMPLEMENTATION FOR THE 2019 REMUNERATION

Applying the principles and objectives noted above, on the recommendation of the Remuneration Committee, the Board of Directors, at its meeting on February 13, 2019, adopted the components of Benoît Potier's remuneration for 2019 as follows:

#### 3.2.1. Fixed remuneration

The fixed remuneration is set at 1,325,000 euros, **identical to that for 2018**. The average annual increase in the fixed remuneration over the last five years is +3.8%.

#### 3.2.2. Variable remuneration

The Board of Directors, on the recommendation of the Remuneration Committee, decided that the criteria for the variable remuneration for 2019 would be as follows:

- **Two quantifiable financial criteria**, which were already included in the criteria for the variable remuneration for 2018:
  - increase in the recurring earnings per share (excluding the impact of foreign exchange and significant exceptional items) (hereinafter **"recurring EPS"**);
  - comparable growth in **consolidated revenue** (excluding significant scope impact and the impact of foreign exchange and energy).

The weighting of each criterion is shown in the table below.

Following remarks made by shareholders, the Remuneration Committee carried out a detailed review of the criteria for the variable remuneration and the LTI and made its recommendations. Based on this, the Board considered that the ROCE is more a long-term indicator and that it is more appropriate to include it as a performance criterion for the LTI. Consequently, the Board decided that the ROCE would no longer be included in the criteria for the annual variable remuneration.

The criterion of an increase in the **recurring EPS** makes it possible to take into account **all the items in the income statement**. The criterion of an **increase in sales** reflects the **momentum of the activity**. The two criteria, growth in revenue and the recurring EPS, reflect the Group's ambition to achieve **profitable growth**. Moreover, the **NEOS** company program also incorporates **efficiency objectives**, the achievement of which contributes to the increase in the recurring EPS.

For each criterion, the Board of Directors has defined a target objective, which is not made public for confidentiality reasons.

The **target objectives set are demanding**. They are **completely consistent with the trajectory of the NEOS company program** which aims, for the period 2016-2020, at an average annualized **growth in Group revenue of +6% to +8%**, including a scope impact linked to the consolidation of Airgas corresponding to +2% as an annualized average.

For each financial criterion, a formula adopted by the Board makes it possible to calculate the amount of the variable remuneration due (within a maximum limit) by taking into account, on the basis of the consolidated financial statements for the fiscal year, the value achieved for the criterion as compared to the target objective set. Thus, in the event of a performance that exceeds the objective set, the value of the variable part is adjusted upward within the maximum limit set for each criterion. **In the event of a performance that is below the lower limit set for each objective, the fraction of the variable remuneration corresponding to this criterion is equal to zero.**

- **(Qualitative) personal criteria**, a weighting being allocated to each of them. They are detailed in the table below and relate:
  - as to one-third, to **Corporate Social Responsibility** (hereinafter **"CSR"**);
  - as to one-third, to **organization and to Human resources**;
  - as to one-third, to **individual performance**. This criterion responds to the Board of Directors' desire to keep a part of the variable remuneration subject to the Board's assessment, in order to take account of the unpredictability of the environment. This may be beneficial to the Executive Officer if the Company is facing an unfavorable environment which was not anticipated at the time the objectives were set, or disadvantageous if the environment ultimately turns out to be more favorable than anticipated.

An identical target and maximum weight is set for each qualitative criteria.

The summary table below provides details of the criteria for the variable remuneration, together with the target and maximum weights for each element.

Indicator	Target <sup>(a)</sup>		Maximum	
	As a % of the fixed remuneration	As a % based on 100	As a % of the fixed remuneration	As a % based on 100
<b>Financial criteria (quantifiable) including:</b>	<b>105</b>	<b>70</b>	<b>122</b>	<b>73</b>
Increase in recurring earnings per share (recurring EPS) <sup>(b)</sup>	75	50	87	52
Comparable growth in consolidated revenue <sup>(c)</sup>	30	20	35	21
<b>Personal criteria (qualitative) including:</b>	<b>45</b>	<b>30</b>	<b>45</b>	<b>27</b>
<b>CSR:</b>	15	10	15	9
■ Safety and reliability: continue efforts to improve safety (lost time accident frequency rate, road traffic accidents and job-related accidents)				
■ Continue the roll-out of the sustainable development strategy (implementation of the Group's Climate objectives – Air Liquide Foundation – Diversity)				
<b>Organization / Human Resources</b> (talent development, succession plans)	15	10	15	9
<b>Individual performance:</b> assessment by the Board of Directors, notably in light of the external environment for the year	15	10	15	9
<b>TOTAL (FINANCIAL AND PERSONAL CRITERIA)</b>	<b>150</b>	<b>100</b>	<b>167</b>	<b>100</b>

(a) The target corresponds to 100% achievement of the performance criterion.

(b) Excluding the foreign exchange impact and significant exceptional items. Excluding the effect of applying the IFRS 16 standard as from January 1, 2019.

(c) Excluding significant scope impact, foreign exchange impact and energy.

The total amount of the variable remuneration due for the 2019 fiscal year in respect of the term of office will be paid in 2020, after approval of the financial statements by the Annual Shareholders' Meeting, it being noted that its payment is conditional on the approval by an Annual Shareholders' Meeting of the elements of Benoît Potier's remuneration for 2019, under the conditions provided by article L. 225-100 of the French Commercial Code.

### 3.2.3. Long-term remuneration components

#### A. Principles of grant

The performance share and stock option plans are aimed, in addition to the grant of incentives and profit-sharing, at involving the employees more in the Company's performance and constitute a long-term motivation factor, aligned with the interests of the shareholders for value creation over time.

The following principles were adopted by the Board of Directors on February 13, 2019 for the allocation program for the autumn of 2019:

- The Board confirmed that, according to the principle adopted in 2016, the award of performance shares and options to the Executive Officer and the changes therein over time will be assessed in terms of the IFRS value (and not in terms of the volumes granted), for all stock option and performance share plans combined.

For 2019, the Board of Directors intends to grant to Benoît Potier LTI representing an IFRS value of approximately 2.25 million euros, which is **stable by comparison with the 2018 grant**, representing 40.4% of the total target remuneration for 2019, in accordance with the remuneration policy.

- All the stock options and performance shares granted are subject to **performance conditions that apply to both** the stock option and performance share plans and are calculated over a period of **three years**. The performance conditions, which apply to the plans decided upon in the autumn, are set by the Board of Directors at the start of the year, at the February meeting, in order to comply with a reference period of three full years.

Following remarks made by shareholders, the Remuneration Committee carried out a detailed review of the criteria for the annual variable remuneration and the LTI and made its recommendations. Based on this, the Board considered that the **ROCE** is more a **long-term** indicator and that it is more appropriate to include it as a performance criterion for the LTI. Consequently, the Board decided that the EPS would no longer be included in the criteria for the LTI but would continue to be a criterion for the annual variable remuneration.

In a highly capital-intensive industry, profitable long-term growth requires constant attention to be paid to each investment decision and to the competitiveness of every transaction. The ROCE criterion thus makes it possible to measure the return on capital employed and constitutes a key indicator with regard to Air Liquide's activity.

The total shareholder return (AL TSR and relative TSR) is maintained as a second performance criterion for the LTI. It makes it possible to promote the alignment of the Executive Officer's interests with the interests of the shareholders.

The **demanding objectives** set for each performance condition are made public *ex post*, at the end of the Board Meeting in the month of February following the end of the three fiscal years during which the performance has to be achieved. The rate of achievement for the performance conditions and the percentage of stock options that vest/performance shares acquired are also published at the end of this Board Meeting.

## B. Performance conditions

As a consequence of the above, the performance conditions which apply to all the beneficiaries of the stock option and performance share plans which will be allocated in 2019 have been determined by the Board of Directors on February 13, 2019. The number of stock options which can be exercised out of the total number of options which will be allocated, together with the number of performance shares definitively allocated pursuant to the 2019 Plans will depend:

- (i) **for 60% of the stock options/performance shares granted**, on the rate of achievement of an objective, set by the Board, consisting of the Return on capital employed after tax (ROCE<sup>(a)</sup>) recorded at the end of the 2021 fiscal year.

At the objective set, the grant is 100%, then decreases on a straight-line basis, to a lower limit below which there will be no grant. This **lower limit** corresponds to a ROCE level which is **200 bps less** than the objective set, which provides a degree of flexibility, making it possible to take advantage of external growth opportunities.

The objective has been set within the **trajectory of the NEOS company program** which aims at a ROCE of more than 10% in 2021-2022.

- (ii) **for 40% of the stock options/performance shares granted**,

- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on an objective of total shareholder return set by the Board, defined as the average annual growth rate of an investment in Air Liquide shares, reinvested dividends, for fiscal years 2019, 2020 and 2021 ("**AL TSR**"). The objective of absolute TSR is set in accordance with historic performances. At the objective set, the grant is 100%, then decreases on a straight-line basis, to a lower limit,
- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on the rate of total shareholder return from an investment in Air Liquide shares, reinvested dividends – sourced from Bloomberg ("**B TSR**"), as compared to the **CAC 40 TSR index, reinvested dividends (sourced from Bloomberg)**, for fiscal years 2019, 2020 and 2021.

The rate of achievement will be **0%, if the average of the Air Liquide TSR is lower than the average of the CAC 40 TSR**, 50% if it is equal to the average of the CAC 40 TSR and 100%, if it is at least higher than 2% of the average of the CAC 40 TSR on the basis of a straight-line change. Any grant for a performance lower than the average of the CAC 40 TSR is impossible.

The rate of achievement of the performance conditions will be recorded by the Board at the time when the financial statements are adopted for the 2021 fiscal year.

## C. Rules specific to the Executive Officers

The rules specific to the Executive Officers are unchanged compared to 2018, with the exception of the **sub-limits on the grants to the Executive Officers** submitted to the Annual Shareholders' Meeting. As part of the renewal of the authorizations for the grant of stock options and performance shares, the Board of Directors proposes that the Shareholders' Meeting **reduce by one-third** each of the **sub-limits on the grants to the Executive Officers** submitted to the Annual Shareholders' Meeting in order to bring them closer to the historical levels of grants by the Board. Consequently, subject to the approval of the resolutions by the Annual Shareholders' Meeting on May 7, 2019, the number of stock options granted to the Executive Officers may not exceed 0.2% of the share capital (instead of 0.3% previously) and the number of performance shares granted to the Executive Officers may not exceed 0.1% of the share capital (instead of 0.15% previously).

For more details regarding other rules specific to the Executive Officers, see page 133.

(a) The Return on Capital Employed after tax ("ROCE") will be calculated as follows: ((Net profit after tax before deduction of minority interests – net cost of debt after taxes) for the period 2021)/weighted average of (shareholders' equity + minority interests + net indebtedness) at the end of the three last semesters (H2 2021, H1 2021 and H2 2020)), these aggregates being adjusted for the impact of the currency variation as compared to the exchange rate for 2018 and for the application of the new IFRS 16 standard.



## 4. Long-term commitments

The long-term commitments set out below which Benoît Potier benefits from are taken into account for the determination of his total remuneration.

### 4.1. COMPANY'S PENSION AND SIMILAR BENEFIT OBLIGATIONS

In addition to the mandatory basic and supplementary pension schemes (Agirc/Arrco) with which he is, or was affiliated, Benoît Potier has been authorized to benefit from various supplementary social benefit schemes set up by L'Air Liquide S.A.

#### 4.1.1. Defined benefit pension plan

##### A. Description of the defined benefit pension plan

Pursuant to articles L. 911-1 and L. 911-2 of the French Social Security Code, and in accordance with article L. 137-11 of the same Code, L'Air Liquide S.A. set up a collective defined benefit pension plan "S" for the benefit of the **senior managers and executives and Executive Officers**:

- (i) whose remuneration exceeds 24 times the annual social security ceiling (PASS);
- (ii) who have a total of three years' length of service with the Air Liquide Group, in accordance with the AFEF/MEDEF Code of corporate governance; and
- (iii) who do not have the capacity of a participant under the supplementary defined benefit pension plan with guaranteed cover ("garantie de ressources") which was closed in 1996.

Benoît Potier's rights under this plan:

- (i) may be applied for if the beneficiary **definitively ends his professional career with the Company** and decides to claim his mandatory basic and supplementary pension (Arrco and Agirc) entitlements, whether or not at the full rate.

In the event of termination of his corporate office at the Company's initiative, a beneficiary who is over 55 years of age and has at least five years' length of service shall retain his rights, if he does not resume any professional activity until his retirement. The condition of ending his career at the Company is then considered to be met, as he has not performed any activity after leaving the Company. This rule, which is in line with the position of the social security administration reflects the Human Resources policy at Air Liquide, for which long careers within the Group constitute a key element; given the length of service of the potential beneficiaries of this plan, some of whom have spent the whole of their career at the Group, it would not be justified for them to lose the benefit of this plan in the event of a forced departure (except in the event of gross or wilful misconduct) at the end of their careers.

Furthermore, in accordance with the position of the social security administration, the rules also provide for the maintenance of the potential rights of the beneficiaries in the event of a disability of the 2<sup>nd</sup> or 3<sup>rd</sup> category;

- (ii) will be equal to **1% for each year of service** of the average of the three best years in the last five years of remuneration exceeding 24 times the annual social security ceiling ("PASS") (the "Reference Remuneration"). The basis for calculation of the pension annuity will be limited to the fixed and variable remuneration only, to the exclusion of any other form of remuneration, whether paid by the Company or by any French or foreign subsidiary. For this calculation, the average of the total variable portions taken into account cannot exceed 100% of the average of the total fixed portions taken into account. Where applicable, an annuity equal to 60% of the aforementioned benefits will be paid to the surviving spouse, subject to certain conditions, notably with regard to age;
- (iii) will be **capped**, in all cases, as they are for all the senior managers and executives benefiting from the defined benefit plan, and for all pension plans combined, whether public or private, in France or abroad, at **45%** of the Reference Remuneration. Should this ceiling be reached, the amount paid under the defined benefit plan would be reduced accordingly;
- (iv) have been the subject of:
  - contributions paid to an insurance body, that are deductible from the corporate income tax base, and
  - provisions in the Group's consolidated financial statements;
- (v) are estimated, as at December 31, 2018, at 590,847 euros gross per year, Benoît Potier having a total of **36** years' length of service in the Group;
- (vi) will be subject to the employer's contribution due on pension annuities provided for by article L. 137-11 of the French Social Security Code at a rate of 32%.

The application of this plan to Benoît Potier has been authorized by decisions of the Board of Directors on February 12, 2010 and February 17, 2014 and approved, in resolutions specific to Benoît Potier, by the Annual Shareholders' Meeting on May 5, 2010 (9<sup>th</sup> resolution) and May 7, 2014 (10<sup>th</sup> resolution).

At the time of renewal of his office as Chairman and Chief Executive Officer, pursuant to article L. 225-42-1 of the French Commercial Code, as amended by Law n° 2015-990 of August 6, 2015, the Board of Directors on February 14, 2018 decided to make the increase, in respect of each fiscal year, in his conditional pension rights under the defined benefit pension plan S which Benoît Potier benefits from, subject to conditions relating to Benoît Potier's performance assessed in light of the Company's performance (see description below). This commitment was approved by the Annual Shareholders' Meeting on May 16, 2018 in a resolution specific to Benoît Potier (10<sup>th</sup> resolution).

## B. Performance conditions applicable to the annual increase in Benoît Potier's conditional rights

Since the renewal of his office as Chairman and Chief Executive Officer on May 16, 2018, the increase, in respect of each fiscal year, in Benoît Potier's conditional rights under the defined benefit pension plan S which he benefits from, will depend, and the amount of that increase will be adjusted in accordance with, the average annual gap between the Return On Capital Employed (ROCE) and the Weighted Average Cost of Capital (WACC) (net equity method), calculated (on the basis of the certified consolidated financial statements, approved by the Shareholders' Meeting) for the last three fiscal years prior to the said fiscal year.

For the purposes of this calculation, the gap between the ROCE and the WACC will be measured for each fiscal year and the average of the three annual gaps will be calculated for the last three fiscal years prior to the said fiscal year.

The proportion of the annual increase in the conditional rights will be determined as shown in the table below, with a growth of the increase per linear segments between each of the thresholds between 100 bps and 300 bps inclusive:

Average of the annual gaps (ROCE – WACC) over three years in bps <sup>(a)</sup>	Proportion of increase
≥ 300	100%
250	66%
200	50%
100	25%
< 100	0%

(a) bps: basis points.

It is specified that the Air Liquide pension plan S is more restrictive than the new article L. 225-42-1 paragraph 8 of the French Commercial Code. Pursuant to this article, the conditional rights cannot increase annually by an amount which is 3% higher than the annual remuneration used as a reference for the calculation of the annuity paid under this plan, whilst Air Liquide's S plan provides that the pension rights will be equal to 1% per year of service (see the description of the plan set forth above).

Compliance with the conditions set forth above will be verified on an annual basis, before the Ordinary Shareholders' Meeting convened to approve the financial statements for the last completed fiscal year, by the Board of Directors which shall determine the increase, in respect of that fiscal year, in the conditional rights which the Chairman and Chief Executive Officer benefits from.

The decision of the Board of Directors on February 14, 2018 which makes the increase in Benoît Potier's pension rights under the defined benefit pension plan subject to performance conditions has no effect on the conditional rights which had been granted to Benoît Potier up until the renewal of his office as Chairman and Chief Executive Officer on May 16, 2018.

Pursuant to article L. 225-42-1 of the French Commercial Code, this decision was published on the Company's website on February 16, 2018.

**In respect of 2018** (the period from the renewal of the office as Chairman and Chief Executive Officer to the end of the fiscal year), the Board of Directors recorded, on February 13, 2019, that the performance condition had been 100% achieved with an increase of 1%, corresponding to a potential acquisition of an additional 1% of the reference remuneration for the relevant year.

If amendments are made to the regulations governing the defined benefit pension plans S, the Board of Directors might have to amend the existing defined benefit pension plan or put an alternative system in place. This alternative system, if implemented, would be subject to performance conditions in accordance with the AFEP/MEDEF Code.

### 4.1.2. Defined contribution pension plans

- Pursuant to articles L. 911-1 and L. 911-2 of the French Social Security Code, and in accordance with article L. 242-1, paragraphs 6 and 7 of the same Code, the Air Liquide Group has set up, at several companies including L'Air Liquide S.A. a **defined contribution pension plan for the benefit of all the employees**.

The Board authorized the application of this defined contribution pension plan to Benoît Potier in his capacity as Chairman and Chief Executive Officer.

The pension entitlements of Benoît Potier under this plan:

- may be applied for, at the earliest, when he has claimed his pension entitlements under the French general social security scheme;
- are or have been financed by monthly contributions broken down as follows: 50% borne by the Company and 50% borne by the beneficiary;

- these contributions are assessed on bracket A (the portion of remuneration that is less than 1 PASS) at a rate of 2.32%, and on brackets B and C (those portions of remuneration amounting, respectively, to between 1 PASS and 4 times the PASS and between 4 times the PASS and 8 times the PASS) at a rate of 6.50%. Furthermore, they are deductible from the corporate income tax base, are subject to the social levy at the rate of 20%, and are excluded from the basis for assessment of the social security contributions, within the limit of the higher of the following two values: 5% of the PASS or 5% of the remuneration taken into account within the limit of 5 times the PASS;
- are estimated, as at December 31, 2018, at 6,607 euros gross per year.

The individual application of this plan to Benoît Potier was authorized by a decision of the Board of Directors on February 12, 2010, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 5, 2010 (9<sup>th</sup> resolution).

During the 2018 fiscal year, the amount paid by the Company to the third party responsible for managing the aforementioned supplementary defined contribution pension plan for the benefit of Benoît Potier is stated in the footnotes to Table 2 (see page 128).

- In addition, pursuant to articles L. 911-1 and L. 911-2 of the French Social Security Code, and in accordance with article L. 242-1, sections 6 and 7 of the same Code, L' Air Liquide S.A. set up a **defined contribution pension plan for the benefit of the senior managers and executives**, defined by reference to a collective bargaining agreement coefficient, and of Executive Officers who have at least one year's length of service. Since 2015, **Benoît Potier no longer benefits from this defined contribution pension plan** set up for the benefit of the senior managers and executives, the contribution paid for his benefit having been transferred to the life insurance plan (see below).

Benoît Potier's pension entitlements under this plan:

- may be applied for, at the earliest, when he has claimed his pension entitlements under the French general social security scheme;
- were financed by annual contributions paid in their entirety by the Company. These contributions were last set at 2.5% of the portion of remuneration that is lower than 8 times the PASS. Furthermore, they were subject to the same tax and social security treatment as those paid pursuant to the defined contribution pension plan set up for the benefit of all the staff (see above);
- are estimated, as at December 31, 2018, at 177,556 euros gross per year.

## 4.2. OTHER LIFE BENEFITS

### 4.2.1. Life insurance plan

As the Executive Officers are no longer beneficiaries of the defined contribution pension plan for senior managers and executives (see above), L' Air Liquide S.A. has entered into a collective life insurance contract which enables them to create savings which are available at any time.

The insurance contract provides that the beneficiaries can ask for the payment of a single capital sum or conversion of the capital into a life annuity.

In the event of a conversion of the capital into a life annuity, Benoît Potier's rights under this plan:

- are estimated, as at December 31, 2018, at 42,236 euros gross per year,
- are, or were, financed by contributions paid by the Company to an insurance body and which concern the brackets of remuneration ranging from 0 to 24 times the PASS.

The opening of this plan, for the 3<sup>rd</sup> bracket (16 to 24 times the PASS) and then the 2<sup>nd</sup> bracket (8 to 16 times the PASS), and finally its extension to the 1<sup>st</sup> bracket (0 to 8 times the PASS) of the reference remuneration, at an unchanged cost for the Company, responded to a concern for good management. The contributions paid by the Company to the third-party plan manager are assessed on the basis of the portions of the reference remuneration of the beneficiaries corresponding to each of the three brackets, in accordance with conditions identical to those of the previous plan.

These contributions are deductible from the corporate income tax base and are subject to social security contributions.

For Benoît Potier, the signature of this contract, for the 3<sup>rd</sup> and then the 2<sup>nd</sup> bracket, was authorized by the Board of Directors on November 20, 2012 and February 13, 2013, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 7, 2013 in a specific resolution (7<sup>th</sup> resolution). The extension of the plan to the 1<sup>st</sup> bracket concerning the band of reference remuneration amounting to between 0 and 8 times the annual social security ceiling was authorized by a decision made by the Board of Directors on November 20, 2014, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 6, 2015 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution).

The amount paid by the Company in 2018 to the insurance plan manager pursuant to the life insurance plan for the benefit of Benoît Potier is disclosed in the footnotes to Table 2 (see page 128).

#### 4.2.2. Death and disability benefits plan

Benoît Potier benefits from the additional "incapacity, disability, death" benefits plan, unified as from January 1, 2015, covering all the personnel and the Executive Officers who are duly authorized to benefit from such plan, which provides in particular for:

- the grant to the beneficiaries:
  - of additional daily indemnities in the event of incapacity and a disability annuity set, all benefits combined, at a maximum annual amount of 444,998 euros, and
  - of a death benefit, the maximum amount of which is set at 120 times the PASS in the event of an accident.

The life insurance contract entered into with the insurer specifies the limits of the incapacity/disability and death benefits for the same insured party;
- the payment in full, by the Company, of the contributions calculated as a percentage of the reference remuneration which is capped at:
  - 16 times the PASS for the incapacity and disability cover, and
  - 24 times the PASS for the death cover.

The contribution rate amounts to 0.85% of the reference remuneration up to 16 PASS and to 0.65% between 16 and 24 PASS<sup>(a)</sup>. These contributions are deductible from the corporate income tax base, are subject to the social levy at a rate of 8%, and are excluded from the basis for assessment of the social security contributions, within the limit of an amount equal to the sum of 6% of the PASS and 1.5% of the remuneration taken into account within the limit of 12% of the PASS.

The individual application to Benoît Potier of this unified benefit plan covering all the personnel, in respect of his duties as Chairman and Chief Executive Officer, was authorized by decision of the Board of Directors on November 20, 2014, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 6, 2015 in a specific resolution (7<sup>th</sup> resolution).

The amount of the contribution paid in 2018 by L'Air Liquide S.A. in respect of the benefit plan for the benefit of Benoît Potier, is disclosed in the footnotes to Table 2 (see page 128).

## 5. Commitments relating to termination of duties

### 5.1. TERMINATION INDEMNITIES

In accordance with article L. 225-42-1 of the French Commercial Code and the AFEP/MEDEF Code of corporate governance, the Board of Directors, at its meeting on February 14, 2018<sup>(b)</sup>, set the terms of the agreement applicable to Benoît Potier, along the following main lines:

- only the cases of forced departure of Benoît Potier from his terms of office as Chairman and Chief Executive Officer (removal from office, request for resignation) related to a change of strategy or a change in control (in the latter case, the termination indemnity is due, if the departure occurs within 6 months of the change of control) may give rise to an indemnity;
- the amount of the indemnity in any of these cases is set at 24 months of gross fixed and variable remuneration;
- the amount of the indemnity due decreases gradually as Benoît Potier, in his capacity as Chairman and Chief Executive Officer, approaches the age limit defined in the Company's articles of association; in the event of a forced departure in the 24 months preceding the date of departure due to the age limit set by the articles of association, the amount of the indemnity due will be capped at the number of months' gross remuneration separating the date of forced departure from the date when he reaches such age limit; in any event, no indemnity shall be paid should the beneficiary claim his pension entitlements on the date of his forced departure;
- the right to payment of the indemnity is subject to the achievement of the performance conditions, the proportion of the indemnity due decreasing depending on the rate of achievement of such conditions (see below for details of the performance conditions).

#### Performance conditions applicable to the termination indemnity:

The Board of Directors decided that the payment of the termination indemnity concerning Benoît Potier is subject to compliance, duly acknowledged by the Board of Directors at the time of or subsequent to the termination of his duties, with conditions related to the beneficiary's performance assessed in light of the Company's performance, defined as of today as follows:

Entitlement to the indemnity referred to above shall depend on, and the amount of the indemnity paid will be adjusted on the basis of the average of the annual gap between the Return On Capital Employed after tax (ROCE) and the Weighted Average Cost of Capital (WACC) (assessed using

(a) The contribution rate of this collective plan was reduced in 2018, as well as the call rate (following the resizing of the profit sharing reserve).

(b) For the record, in order to take account of the expectations of certain shareholders, the Board of Directors on February 14, 2018 amended the terms of the agreement applicable to Benoît Potier before the renewal of his term of office in 2018. The Board thus decided (i) to remove the non-renewal of office from the list of events of forced departure which grant an entitlement to the indemnity; (ii) that when the departure is related to a change of control, the termination indemnity is only due if the departure occurs within six months of the change of control, as compared to 24 months previously; (iii) to review the performance conditions, the thresholds for an increase having been made more exacting than before.

the net equity method), calculated (on the basis of the certified consolidated financial statements approved by the Shareholders' Meeting) with respect to the last three fiscal years prior to the fiscal year during which the departure occurs. For the purposes of this calculation, the gap between ROCE and WACC will be measured with regard to each fiscal year, and will be calculated the average of the three annual gaps for the last three fiscal years prior to the fiscal year during which such departure takes place.

Given the fundamental importance, in the highly capital-intensive industrial gas industry, of the management and control of investment processes, this gap makes it possible to measure the regular creation of value over the three years prior to the departure.

The proportion of the indemnity due will be established as indicated in the table below with an increase in the indemnity by straight-line segments between each of the thresholds between 100 bps and 300 bps inclusive:

Average over 3 years of the annual (ROCE – WACC) gaps in bps <sup>(a)</sup>	Proportion of indemnity due
≥ 300	100%
250	66%
200	50%
100	25%
< 100	0%

(a) bps: basis points.

The decision of the Board of Directors on February 14, 2018 relating to this indemnity was made in accordance with the regulated agreements and commitments procedure and published on the Company's website on February 16, 2018. It was approved by the Annual Shareholders' Meeting on May 16, 2018 in a specific resolution (9<sup>th</sup> resolution).

## 5.2. UNEMPLOYMENT INSURANCE FOR COMPANY MANAGERS AND CORPORATE OFFICERS

Pursuant to a decision made by the Board of Directors in May 2006, Benoît Potier benefits, in his capacity as an Executive Officer, from the unemployment insurance for company managers and corporate officers taken out by the Company. The contributions paid by the Company are added back to Benoît Potier's remuneration as benefits in kind.

This decision had been approved by the Annual Shareholders' Meeting on May 9, 2007, in accordance with the regulated agreements procedure (7<sup>th</sup> resolution).

The Board of Directors confirmed, at its meeting in May 2018, that Benoît Potier continues to benefit from this unemployment insurance within the scope of the latest renewal of his duties.

TABLE 8 (SEE PAGE 166), TABLE 9 (SEE PAGE 168) AND TABLE 10 (PAGE 170)

TABLE 11

The table shown below presents a summary of the commitments relating to the termination of the duties of the Executive Officers, as set out above.

Executive Officer	Employment contract	Supplementary pension plan (see details above)	Indemnities or benefits due or that may be due on termination or a change of duties (see details above)	Indemnity relating to a non-competition clause
<b>Benoît Potier</b> Chairman and Chief Executive Officer Start date of term of office: 2006 Date of renewal of term of office: 2018 Date of end of term of office: 2022	NO	Defined benefit pension plan for senior managers and executives and Executive Officers: YES Defined contribution pension plan for the benefit of all the employees and Executive Officers: YES Defined contribution pension plan for senior managers and executives: NO	Termination indemnity: YES ■ Applicable in the event of a forced departure related to a change of strategy or control; ■ Maximum amount of 24 months of gross fixed and variable remuneration; ■ Subject to performance conditions; ■ Reduction as he approaches the age limit in the articles of association, exclusion if the beneficiary claims his pension entitlements on the date of forced departure.	NO

NB: the stock options and the performance shares are lost in the event of a resignation or removal from office for serious cause during the vesting period. In other cases of departure, the principle of proration applies depending on the Executive Officer's actual presence during the period of assessment of the performance conditions (see page 134).

## 6. Remuneration of the non-executive Directors – Directors' fees

### 6.1. DIRECTORS' FEES PAID IN 2017, 2018 AND 2019

TABLE 3 – DIRECTORS' FEES AND OTHER REMUNERATION RECEIVED BY THE GROUP'S NON-EXECUTIVE AND NON-EMPLOYEE DIRECTORS

<i>(in thousands of euros, rounded off to the nearest whole figure)</i>	Amounts paid in 2017 in respect of 2016	Amounts paid in 2018 in respect of 2017	Amounts paid in 2019 in respect of 2018
Thierry Desmarest <sup>(a)</sup>	105	47	N/A
Thierry Peugeot	69	68	72
Karen Katen	71	65	77
Jean-Paul Agon <sup>(b)</sup>	85	101	99
Siân Herbert-Jones <sup>(c)</sup>	89	88	92
Sin Leng Low	102	96	83
Annette Winkler	76	80	90
Geneviève Berger	63	67	76
Brian Gilvary <sup>(d)</sup>	47	74	71
Xavier Huillard <sup>(e)</sup>	N/A	45	73
Pierre Dufour <sup>(f)</sup>	N/A	58	80
<b>TOTAL</b>	<b>707</b>	<b>789</b>	<b>812</b>

(a) Term of office ended on May 3, 2017. The disclosed amounts include additional remuneration of 10,000 euros for acting as Chairman of the Appointments and Governance Committee and the remuneration (20,000 euros) for acting as Lead Director (prorata in 2017).

(b) The disclosed amounts include additional remuneration of 10,000 euros for acting as Chair of the Remuneration Committee until 2018 and, as from 2017, as Chair of the Appointments and Governance Committee. As from 2017, the amount also include an additional remuneration of 20,000 euros (prorata in 2017) for acting as Lead Director.

(c) The disclosed amounts include additional remuneration of 20,000 euros for acting as Chair of the Audit and Accounts Committee.

(d) Term of office begun on May 12, 2016.

(e) Term of office begun on May 3, 2017. As from 2018, the disclosed amounts include additional remuneration of 10,000 euros for acting as Chair of the Remuneration Committee (prorata).

(f) Pierre Dufour receives directors' fees since July 14, 2017, date on which his executive duties in the Group ended.

The non-executive Directors did not receive any remuneration other than that mentioned in the above table.

The Chairman and Chief Executive Officer does not receive any directors' fees in respect of his office as Director so long as he performs executive duties within L'Air Liquide S.A.

Within the scope of the agreement entered into with the various stakeholders and pursuant to the provisions in force at the Group, which apply to all employees who serve on the Boards of Directors of Group companies, it was agreed that the employee Director would not receive directors' fees.

### 6.2. CRITERIA

The maximum amount of directors' fees to be allocated in total to the members of the Board of Directors was set by the Annual Shareholders' Meeting on May 16, 2018 at 1.15 million euros per fiscal year (14<sup>th</sup> resolution).

The allocation formula adopted by the Board of Directors comprises fixed remuneration and variable remuneration based on lump-sum amounts per meeting, thereby taking into account the actual participation of each Director in the work of the Board and its Committees/working group, as well as a fixed amount per trip for Directors travelling from abroad.



For 2018, the amounts adopted (unaltered by comparison with 2017) can be broken down as follows:

### 6.2.1. Fixed remuneration (for an entire fiscal year)

- Each member receives fixed annual remuneration set at 20,000 euros.
- The Chairman of the Audit and Accounts Committee receives additional fixed annual remuneration of 20,000 euros.
- The Chairmen of the Appointments and Governance Committee, the Remuneration Committee and the Environment and Society Committee receive additional fixed annual remuneration of 10,000 euros.
- The Lead Director receives additional fixed annual remuneration of 20,000 euros.

### 6.2.2. Variable remuneration

Attendance at the various meetings is remunerated as follows:

■ a meeting of the Board of Directors	5,500 euros
■ a meeting of the Audit and Accounts Committee	4,500 euros
■ a meeting of the Appointments and Governance Committee	3,500 euros
■ a meeting of the Remuneration Committee	3,500 euros
■ a meeting of the Environment and Society Committee	3,500 euros
■ a meeting of the "Shareholder Relations" working group	3,000 euros
■ one trip for a non-resident:	
- in Europe	3,000 euros
- Intercontinental	6,000 euros

Participation by telephone is remunerated at one-half of the lump-sum amounts set for each meeting.

Travel expenses incurred by non-French residents at the time of their trips to meetings are reimbursed by the Company.

The variable remuneration relating to participation at Board and Committee meetings prevails over the fixed remuneration.

The distribution policy for directors' fees is regularly reviewed and readjusted, if necessary, to ensure that the remuneration is competitive from an international standpoint, in order to benefit from the best and most suitable skills in the business sector and geographical area, and to ensure that the values which have led to the Group's long-term success are maintained.

## 7. Elements of the 2018 remuneration of the Executive Officer on which the Annual Shareholders' Meeting of May 7, 2019 is invited to vote

(Pursuant to article L. 225-100 II of the French Commercial Code)

### ELEMENTS OF THE TOTAL REMUNERATION AND BENEFITS OF ANY KIND PAID OR AWARDED TO BENOÎT POTIER IN RESPECT OF THE 2018 FISCAL YEAR AND ON WHICH THE ANNUAL SHAREHOLDERS' MEETING ON MAY 7, 2019 IS INVITED TO VOTE

#### Elements of the remuneration paid or awarded to Benoît Potier in respect of the 2018 fiscal year

	Amounts	Comments
<b>Fixed remuneration</b>	€1,325,000	<p>The remuneration policy applicable to the Chairman and Chief Executive Officer was adopted by the Board of Directors on February 14, 2018 and <b>approved by the Annual Shareholders' Meeting on May 16, 2018</b>. It is in line with the policy introduced in 2017, after the <b>acquisition of Airgas, which was a major, transforming event for the Group</b>. It reflects the increased level of responsibility of the Group's Executive Officer and is adapted to the Group's new context, remains competitive and is an incentive to promote the Group's performance over the medium to long-term, in accordance with the Company's interests and the interests of all the stakeholders.</p> <p>In this connection, the fixed remuneration is determined taking account of the level of responsibilities, the experience in the management duties and market practices. It represents approximately 25% of the total annual remuneration.</p> <p>In the Group's new context following the acquisition of Airgas, it had been decided to <b>reposition the remuneration</b> of the Chairman and Chief Executive Officer for 2017/2018, subject to a good performance, a successful integration of Airgas and the achievement of the Airgas synergies in line with the forecasts for the end of 2017. Since the conditions for this repositioning have been achieved, in accordance with the principles approved by the Shareholders' Meeting, the total annual target remuneration for 2018 has increased by +5.2% as compared to 2017, the fixed remuneration increasing by +3.9%. As announced, <b>this repositioning is now finalized</b>. Over the last five years, Benoît Potier's fixed remuneration has undergone an average annual increase of +3.8%.</p>
<b>Annual variable remuneration</b>	€2,005,653	<p><b>The target variable remuneration is equal to 150% of the fixed remuneration.</b></p> <p>The variable remuneration is limited to 167% of the fixed remuneration.</p> <p>The target variable remuneration is linked in 2018:</p> <ul style="list-style-type: none"> <li>■ For 105% of the fixed remuneration (with a maximum of 122% of the fixed remuneration), to <b>three (quantifiable) financial criteria</b> which are based on: (i) for 40% (a max. of 47%) of the fixed remuneration, an objective of increase in the recurring earnings per share (excluding foreign exchange impact and significant exceptional items) (hereinafter "recurring EPS"); (ii) for 45% (a max. of 52%) of the fixed remuneration, an objective of Return on Capital Employed after tax (hereinafter "ROCE") as at December 31, 2018 and (iii) for 20% (a max. of 23%) of the fixed remuneration, an objective of comparable growth in consolidated revenue (excluding significant scope impact, foreign exchange impact and energy).</li> </ul> <p>The increase in <b>EPS criterion</b> makes it possible to take into account <b>all the items in the income statement</b>. The criterion of the ROCE, which makes it possible to measure the return on capital employed, is relevant for <b>a highly capital-intensive industry</b>. The criterion of an increase in sales reflects the <b>momentum in the activity</b>. These three criteria – revenue, EPS and ROCE – reflect <b>the balance achieved each year between profitable growth and return on investment</b>.</p> <p>The criteria of ROCE and growth in revenue are part of the four objectives in the NEOS company program.</p> <p>For each criterion, the Board of Directors had defined an <b>exacting target objective</b> which is completely consistent with the trajectory of the <b>NEOS company program</b>.</p> <p>For each criterion, a formula makes it possible to calculate the amount of the variable remuneration due (within a maximum limit) taking into account the value achieved for the criterion as compared to the target objective set (the target variable remuneration corresponding to a 100% achievement of the target objective set).</p> <p>The objectives are not made public for confidentiality reasons. Nevertheless, the rate of achievement of each objective for the variable remuneration (as a % of the fixed remuneration and as a % of the target variable remuneration for this criterion) is communicated hereafter;</p>

Amounts	Comments
	<p>■ For 45% of the fixed remuneration (target variable and maximum remuneration), to <b>(qualitative) personal criteria</b> linked: (i) as to one-third, to Corporate Social Responsibility ("CSR") (safety and reliability – deployment of the Corporate Sustainability Program and the definition and communication of the CSR objectives for the Group); (ii) as to one-third, to organization and Human resources (development of talents, future succession plans); and (iii) as to one-third, to <b>individual performance</b> (this criterion responds to the Board of Directors' desire to keep a part of the variable remuneration subject to the Board's assessment, in order to take account of the unpredictability of the environment. This may be beneficial to the Executive Officer if the Company is facing an unfavorable environment which was not anticipated at the time the objectives were set, or disadvantageous if the environment ultimately turns out to be more favorable than anticipated).</p> <p><b>Assessment for 2018:</b></p> <p>Concerning the <b>(quantifiable) financial criteria</b>, the results for 2018 were above the target for the <b>recurring EPS and revenue criteria and slightly below the target for the ROCE</b>. The amount of the variable remuneration relating to these criteria is as follows:</p> <ul style="list-style-type: none"> <li>■ Recurring EPS: 45.2% of the fixed remuneration, representing 113.1% of the target remuneration for this criterion,</li> <li>■ ROCE: 42.3% of the fixed remuneration, representing 94% of the target remuneration for this criterion,</li> <li>■ Revenue: 21.1% of the fixed remuneration, representing 105.5% of the target remuneration for this criterion.</li> </ul> <p>The performance concerning the <b>(qualitative) personal objectives</b> was held to be <b>excellent</b>. The amount of the variable remuneration relating to these criteria is as follows:</p> <ul style="list-style-type: none"> <li>■ CSR: 13.5% of the fixed remuneration, representing 90% of the target remuneration for this criterion,</li> <li>■ Organization/Human Resources: 14.3% of the fixed remuneration, representing 95% of the target remuneration for this criterion,</li> <li>■ Individual performance: 15% of the fixed remuneration, representing 100% of the target remuneration for this criterion.</li> </ul> <p>The amount of the variable remuneration relating to the personal objectives is thus 43% of the fixed remuneration, representing 95% of the target remuneration for the personal objectives.</p> <p>When assessing the personal criteria, the Board of Directors noted the following elements:</p> <ul style="list-style-type: none"> <li>■ <b>CSR criteria:</b> <ul style="list-style-type: none"> <li>- <b>Safety and reliability:</b> With regard to safety, 2018 is a somewhat paradoxical year, with: <ul style="list-style-type: none"> <li>- a historically low lost time accident frequency rate of 1.29 compared to an average of 1.63 over the last five years. This indicator has dropped significantly;</li> <li>- unfortunately, several fatal accidents, with three deaths from among Air Liquide's employees and five at subcontractors. They have been analyzed in detail at the Group's Executive Committee meetings: special preventative measures have been implemented during the course of the year with regard to road traffic risks, which remain the principal cause of accidents, in particular those which resulted in fatal accidents. Action plans have been rolled out in the relevant operations and geographical areas and an awareness campaign has been carried out throughout the whole Group.</li> </ul> <p>Concerning reliability, the Group's IMS (Industrial Management System) program which was implemented over 10 years ago has profoundly changed the way of working, and has consolidated the management processes for safety, reliability, environmental protection and industrial risk control. Based on the experience acquired, a project was launched in 2018 to adapt the IMS, in order to improve its efficiency and its implementation at all Group entities.</p> </li> <li>- <b>Corporate Sustainability Program:</b> The Environment and Society Committee, formed in 2017, met on three occasions in 2018 and continued its work and recommendations concerning, in particular, the Climate objectives which were published on November 30, 2018, the Group's sustainable development issues, the assessment of the environmental and societal risks and the review of the vigilance plan.</li> </ul> <p>Air Liquide has for many years been dedicated to an approach designed to foster responsible growth, aiming in particular to limit its CO<sub>2</sub> emissions and those of its customers. Air Liquide announced its Climate objectives on November 30, 2018, including in particular the reduction of its carbon intensity by 30% between 2015 and 2025, with a global approach including its assets, customers and the ecosystems. These objectives are the most ambitious in the sector and are in line with the NEOS company program. This announcement was the theme for an investor day and the subject of global communication at the Group. A campaign has been launched to roll out the objectives in operations.</p> <p>Benoît Potier is co-Chairman of the Hydrogen Council. This Council, formed in 2017, brings together more than 50 leaders in the energy, transport and industry sectors to promote hydrogen in order to achieve the climate change objectives, and held, for the first time, a meeting in China.</p> </li> </ul>

Amounts	Comments
	<p>■ <b>Organization and Human Resources</b></p> <p>The talent development policy has been pursued. Regular reviews of talent, at the level of operating clusters (groups of countries) and up to the highest level of the Company, have led to a certain number of moves. These reviews have also been implemented at Airgas, where the roll-out of the Group's processes and policies is continuing.</p> <p>The succession plans for the Company's key positions have also been reviewed.</p> <p>Dedicated reviews with the Executive Committee and the Appointments and Governance Committee have taken place regarding talent with the greatest potential.</p> <p>Diversity objectives for 2025 (at both Group and entity levels) have been defined and shared (the proportion of women and of different nationalities in "Executive" positions, the gender mix of teams, etc.), together with objectives to hire young graduates, which is a key factor in the creation of talent pools.</p> <p>The development program for technical talent, TCL (Technical Career Leaders), also received particular attention in 2018 with the appointment of two Senior Fellows (the highest form of recognition on the program), of leading international experts from the Airgas teams and an improvement in the gender mix with the appointment of the first female Fellow. This program is an essential factor for innovation, and makes a significant contribution over the long term to ensuring the Group's reliability and safety.</p> <p>In parallel to NEOS Customer Experience program, a program has been launched which focuses on employees' responsiveness and commitment.</p> <p>■ <b>Individual performance</b></p> <p>Individual performance was considered to be excellent. The Group's results are very good in an uncertain economic and geopolitical context. As regards the acquisition of Airgas, the synergies are more than one year ahead of schedule. Moreover, following the acquisition, it can be noted in Airgas teams the expression of a strong feeling that they belonged to the Group and that their career prospects had expanded. Furthermore, Benoît Potier's strong personal commitment to the development of the Hydrogen Energy business was noted.</p> <p>Overall, the total amount of the variable remuneration is at the target, <b>up by +2.8%</b> as compared to the variable remuneration for 2017.</p> <p>As an annualized average, Benoît Potier's variable remuneration has increased by +6.8% over 3 years, by +6.1% over 5 years and by +3% over 10 years.</p> <p>The total amount of the variable remuneration due for the 2018 fiscal year in respect of the term of office will be paid in 2019, after approval of the financial statements by the Annual Shareholders' Meeting it being noted that its payment is conditional on approval by an Annual Shareholders' Meeting of the elements of Benoît Potier's remuneration for 2018, under the conditions provided by article L. 225-100 of the French Commercial Code.</p>
<b>There is no deferred annual variable remuneration mechanism, multi-annual variable remuneration mechanism or exceptional remuneration.</b>	
<b>Stock options, performance shares or any other long-term element of remuneration</b>	<p>23,690 stock options</p> <p>Accounting valuation of the options (according to IFRS 2 norm): €449,714</p> <p>18,230 performance shares</p> <p>Accounting valuation of the performance shares (according to IFRS 2 norm): €1,800,249</p> <p><b>September 25, 2018 plans (stock options and performance shares)</b></p> <p><b>Principles of grant for 2018</b></p> <p>For the Executive Officer, the grant for 2018 forms part of the 2018 remuneration policy defined by the Board of Directors on February 14, 2018 and approved by the Annual Shareholders' Meeting on May 16, 2018.</p> <p>In such circumstances, it had been agreed by the Board of Directors on February 14, 2018 that the allocation of stock options/performance shares to Benoît Potier in 2018 would represent an IFRS value of approximately 2,250 thousand euros, an increase of +7.14% as compared to 2017.</p> <p><i>The IFRS value for the stock options and the performance shares awarded pursuant to the September 25, 2018 Plans amounts to 2,249,963 euros.</i></p> <p><b>Limits on the grants to Executive Officers</b></p> <p>Within the scope of the sub-limits authorized by the Annual Shareholders' Meeting for 38 months <sup>(a)</sup>, the Board of Directors sets lower annual limits for the grants to the Executive Officers, expressed (i) as a percentage of the share capital and (ii) as a multiple of their remuneration, in accordance with the recommendations of the AFEP/MEDEF Code.</p>

(a) Most recently at the Combined Shareholders' Meeting on May 12, 2016 (18<sup>th</sup> and 19<sup>th</sup> resolutions).

Amounts	Comments
	<p>The limits set by the Board of Directors for 2018 are identical to those for 2017 and are as follows:</p> <ul style="list-style-type: none"> <li>(i) the total number of performance shares granted in 2018 to the sole Executive Officer cannot give rise to a number of shares exceeding 0.012% of the share capital (it being understood that an allocation sub-limit of 0.15% of the share capital for 38 months was set by the Annual Shareholders' Meeting on May 12, 2016);</li> <li>(ii) the total number of stock options granted in 2018 to the sole Executive Officer cannot give rise to a number of shares exceeding 0.035% of the share capital (it being understood that a sub-limit on any grants of 0.3% of the share capital for 38 months was set by the Annual Shareholders' Meeting on May 12, 2016);</li> <li>(iii) the maximum aggregate IFRS value of the stock options and performance shares granted to the Executive Officer cannot exceed (all 2018 stock option and performance share Plans combined) approximately 1.5 times the amount of the Executive Officer's maximum gross annual remuneration (fixed and variable maximum), it being noted that the stock options and performance shares granted represent approximately 40% of the total target annual remuneration.</li> </ul> <p><b>Performance conditions</b></p> <p>The stock options and performance shares awarded are all accompanied by <b>performance conditions</b> which are common to both tools and are calculated over three years. They are based in 2018 on:</p> <ul style="list-style-type: none"> <li>(i) <b>as to 65%:</b> the rate of achievement of an objective consisting of the average annual rates of growth in Group undiluted net earnings per share, excluding foreign exchange impact and excluding significant exceptional items ("<b>Recurring EPS</b>") for the 2018, 2019 and 2020 fiscal years. At the objective set, the grant is 100% and then decreases on a straight-line basis <b>to zero if there is no growth in EPS</b>. This objective was set, as for the 2017 Plans, at a level of growth included within a range of +6% to +10% per year. The precise objective will be communicated <i>ex post</i>;</li> <li>(ii) <b>as to 35%:</b> <ul style="list-style-type: none"> <li>- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): of an objective of total shareholder return set by the Board, defined as the average annual growth rate of an investment in Air Liquide shares for the 2018, 2019 and 2020 fiscal years ("<b>AL TSR</b>"). The objective of absolute TSR is set in accordance with historic performances. At the objective set, the grant is 100% and then decreases on a straight-line basis to a lower limit,</li> <li>- for 50% of the stock options/performance shares referred to in sub-paragraph (ii): of the rate of total shareholder return from an investment in Air Liquide shares, reinvested dividends – sourced from Bloomberg ("<b>B TSR</b>"), as compared to the CAC 40 TSR index, reinvested dividends (sourced from Bloomberg) for the 2018, 2019 and 2020 fiscal years.</li> </ul> </li> </ul> <p>The rate of achievement will be <b>0% if the average Air Liquide TSR is lower than the average CAC 40 TSR</b>, 50% if it is equal to the average CAC 40 TSR and 100% if it is at least higher than 2% of the average CAC 40 TSR on the basis of a straight-line change. Any grant for a performance lower than the average CAC 40 TSR is impossible.</p> <p><b>Other conditions/shareholding obligation</b></p> <p><b>The shareholding obligation defined</b> pursuant to the French Commercial Code applies both to shares resulting from the exercise of stock options and performance shares that have vested. It is completed by an internal rule which requires Benoît Potier to hold a number of shares which is equivalent to twice his annual fixed remuneration.</p> <p>Benoît Potier has made a commitment not to carry out any hedging transactions during his term of office.</p> <p><b>Plan Regulations:</b></p> <p>The stock option plan consists of a term of ten years and a condition of continued presence. The France performance share plan comprises (i) a three-year vesting period; (ii) followed by a two-year holding period during which the shares cannot be transferred, as well as a condition of continued presence aligned with that for the stock option plan.</p>
<b>Other elements</b>	N/A No allocation.
<b>Directors' fees</b>	N/A Benoît Potier does not receive any directors' fees in respect of his term of office as Director.
<b>Other benefits</b>	€10,075 The benefits in kind (accounting valuation) include the use of a company car and the payment to a third-party of the unemployment insurance contributions for company managers and corporate officers.

**Elements of the remuneration due or awarded to Benoît Potier in respect of the 2018 fiscal year which are or were submitted for a vote by the Annual Shareholders' Meeting in accordance with the regulated agreements and commitments procedure**

	Amounts	Comments												
Termination indemnity	€0 received	<p>The terms of the agreement applicable to Benoît Potier, since the renewal of his office as Chairman and Chief Executive Officer in 2018 are as follows: (i) only the cases of forced departure related to a change of strategy or a change in control may give rise to an indemnity; (ii) the amount of the indemnity is set at 24 months of gross fixed and variable remuneration; (iii) it decreases gradually as he approaches the age limit defined in the articles of association; (iv) the entitlement to the indemnity is subject to performance conditions which were amended in 2018, the thresholds for increases having been made more exacting: the amount of the indemnity paid will be adjusted on the basis of the average annual gap between the Return On Capital Employed after tax (ROCE) and the Weighted Average Cost of Capital (WACC) (assessed using the net equity method) with respect to the last three fiscal years prior to the departure. This gap, in a highly capital-intensive business activity, makes it possible to measure the regular creation of value. An average gap of 300 basis points between ROCE and WACC over three years is required to be able to benefit from the total indemnity.</p> <p>The proportion of the indemnity due shall be established as follows, with an increase by straight-line segments between each of the thresholds inclusive:</p> <table><tr><th>Average over three years of the annual (ROCE – WACC) gaps in bps <sup>(a)</sup></th><th>Proportion of indemnity due</th></tr><tr><td>≥ 300</td><td>100%</td></tr><tr><td>250</td><td>66%</td></tr><tr><td>200</td><td>50%</td></tr><tr><td>100</td><td>25%</td></tr><tr><td>&lt; 100</td><td>0%</td></tr></table> <p>(a) bps: basis points.</p> <p>The decision of the Board of Directors on February 14, 2018 taken in accordance with the regulated agreements and commitments procedure of the “TEPA” Law was approved by the Annual Shareholders’ Meeting on May 16, 2018 in a specific resolution (9<sup>th</sup> resolution). It is re-examined and submitted for the approval of the Annual Shareholders’ Meeting on each renewal of Benoît Potier’s term of office.</p>	Average over three years of the annual (ROCE – WACC) gaps in bps <sup>(a)</sup>	Proportion of indemnity due	≥ 300	100%	250	66%	200	50%	100	25%	< 100	0%
Average over three years of the annual (ROCE – WACC) gaps in bps <sup>(a)</sup>	Proportion of indemnity due													
≥ 300	100%													
250	66%													
200	50%													
100	25%													
< 100	0%													
Non-competition indemnity: there is no commitment with regard to a non-competition indemnity.														
Supplementary pension plans	€0 received	<p><b>Pension commitment pursuant to a defined benefit pension plan</b></p> <p>For that portion of the remuneration which exceeds 24 times the annual social security ceiling (PASS), pursuant to a defined benefit pension plan, Benoît Potier potentially benefits from a supplementary pension annuity equal to 1% for each year of service of the reference remuneration paid by the Company. The defined benefit pension plan only applies, if the beneficiary is still with the Company at the time of his retirement and decides to claim his pension entitlements, whether or not at the full rate; in the event of the termination of the term of office at the Company’s initiative (except in the event of gross or wilful misconduct), the beneficiary may retain his rights, if he is over 55 years of age and if he does not resume any professional activity until he retires. This rule, which reflects the Human Resources policy at Air Liquide, encouraging long careers within the Group, is in line with the position of the social security administration. Benoît Potier joined the Group in 1981.</p> <p>The total pension benefits, under all plans combined, are capped at 45% of the reference remuneration. Should this ceiling be reached, the amount paid under the defined benefit pension plan would be reduced accordingly.</p> <p>The application of this plan to Benoît Potier has been authorized by decisions of the Board of Directors on February 12, 2010 and February 17, 2014 and approved, in resolutions specific to Benoît Potier, by the Annual Shareholders’ Meeting on May 5, 2010 (9<sup>th</sup> resolution) and May 7, 2014 (10<sup>th</sup> resolution).</p> <p>At the time of renewal of his office as Chairman and Chief Executive Officer, pursuant to article L. 225-42-1 of the French Commercial Code, as amended by Law n° 2015-990 of August 6, 2015, the Board of Directors on February 14, 2018 decided to make the increase, in respect of each fiscal year, in his conditional pension rights under the defined benefit pension plan S which Benoît Potier benefits from, subject to conditions relating to Benoît Potier’s performance assessed in light of the Company’s performance (see description below). This commitment was approved by the Annual Shareholders’ Meeting on May 16, 2018 in a resolution specific to Benoît Potier (10<sup>th</sup> resolution).</p>												



Amounts	Comments												
	<p><b>Performance conditions applicable to the annual increase in Benoît Potier's conditional rights:</b></p> <p>Since the renewal of his office as Chairman and Chief Executive Officer on May 16, 2018, the increase, in respect of each fiscal year, in Benoît Potier's conditional rights under the defined benefit pension plan S which he benefits from, will depend, and the amount of that increase will be adjusted in accordance with, the average annual gap between the Return On Capital Employed (ROCE) and the Weighted Average Cost of Capital (WACC) (net equity method), calculated (on the basis of the certified consolidated financial statements, approved by the Shareholders' Meeting) for the last three fiscal years prior to the said fiscal year. For the purposes of this calculation, the gap between the ROCE and the WACC will be measured for each fiscal year and the average of the three annual gaps will be calculated for the last three fiscal years prior to the said fiscal year.</p> <p>The proportion of the annual increase in the conditional rights will be determined as shown in the table below, with a growth of the increase per linear segments between each of the thresholds between 100 bps and 300 bps inclusive:</p> <table> <tr> <th>Average of the annual gaps (ROCE – WACC) over three years in bps <sup>(a)</sup></th><th>Proportion of increase</th></tr> <tr> <td>≥ 300</td><td>100%</td></tr> <tr> <td>250</td><td>66%</td></tr> <tr> <td>200</td><td>50%</td></tr> <tr> <td>100</td><td>25%</td></tr> <tr> <td>&lt; 100</td><td>0%</td></tr> </table> <p>(a) bps: basis points.</p> <p><b>In respect of 2018</b> (the period from the renewal of the office as Chairman and Chief Executive Officer to the end of the fiscal year), the Board of Directors recorded, on February 13, 2019, that the performance condition had been 100% achieved with an increase of 1%, corresponding to a potential acquisition of an additional 1% of the reference remuneration for the relevant year.</p> <p><b>Pension commitment pursuant to a defined contribution pension plan</b></p> <p>Benoît Potier benefits from the defined contribution pension plan which applies to all the employees and the Executive Officers, the contribution to which is paid in equal shares by the employer and the beneficiary on the remuneration which does not exceed 8 times the PASS. The application of this plan to Benoît Potier was authorized by the Board of Directors on February 12, 2010 and approved by the Annual Shareholders' Meeting on May 5, 2010 (9<sup>th</sup> resolution).</p> <p><b>The amount of the contributions paid in 2018 pursuant to the supplementary defined contribution pension plan for the benefit of Benoît Potier amounts to 9,500 euros.</b></p>	Average of the annual gaps (ROCE – WACC) over three years in bps <sup>(a)</sup>	Proportion of increase	≥ 300	100%	250	66%	200	50%	100	25%	< 100	0%
Average of the annual gaps (ROCE – WACC) over three years in bps <sup>(a)</sup>	Proportion of increase												
≥ 300	100%												
250	66%												
200	50%												
100	25%												
< 100	0%												
Group life insurance plan	<p>€0 received</p> <p>Since the Executive Officers are no longer beneficiaries of the defined contribution pension plan for senior managers, a collective life insurance plan was entered into which makes it possible to create savings for the benefit of the beneficiary which are available at any time. The contributions paid by the Company are calculated on identical terms to those of the previous plan. The opening of this plan, for the third bracket (16 to 24 PASS) and then the second bracket (8 to 16 PASS), and finally its extension to the first bracket (0 to 8 PASS) of the reference remuneration, at an unchanged cost for the Company, responded to a concern for good management.</p> <p>For Benoît Potier, the signature of this contract was authorized by decisions of the Board of Directors on November 20, 2012 and February 13, 2013, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 7, 2013 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution). The extension of the plan to the first bracket was authorized by decision of the Board of Directors on November 20, 2014, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 6, 2015 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution).</p> <p><b>The amount of the contributions paid in 2018 pursuant to the life insurance plan for the benefit of Benoît Potier is 211,831 euros.</b></p>												
Group death and disability plan	<p>€0 received</p> <p>Benoît Potier benefits from the supplementary death and disability plan, unified with effect from January 1, 2015, covering the whole of the personnel and the Executive Officers who are duly authorized to benefit from it, in which (a) the remuneration taken into account for the calculation of the contributions is capped at (i) 16 times the annual social security ceiling for the incapacity and disability cover, (ii) 24 times the annual social security ceiling for the death cover; and (b) the rate of the employer's contribution was reduced in 2018 and amounts to 0.85% up to 16 times the annual social security ceiling and to 0.65% between 16 and 24 times the annual social security ceiling.</p> <p>The individual application to Benoît Potier, in respect of his duties as Chairman and Chief Executive Officer, of this unified death and disability benefits plan covering all the personnel, was authorized by decision of the Board of Directors on November 20, 2014, in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 6, 2015 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution).</p> <p><b>The amount of the contribution paid in 2018 pursuant to the death and disability plan for the benefit of Benoît Potier is 4,673 euros.</b></p>												

## 8. Principles and criteria for the determination, distribution and allocation of the fixed, variable and exceptional elements which make up the total remuneration and the benefits of any kind which may be granted to the Executive Officers

(submitted for the approval of the Annual Shareholders' Meeting pursuant to article L. 225-37-2 of the French Commercial Code)

This Executive Officer remuneration policy describes the principles and criteria for the determination, distribution and allocation of the fixed, variable and exceptional elements which make up the total remuneration and the benefits of any kind which are granted to the Executive Officers in respect of their corporate office.

This remuneration policy is in line with the policies approved by the Annual Shareholders' Meetings on May 3, 2017 and May 16, 2018. It was adopted by the Board of Directors on February 13, 2019, upon the recommendation of the Remuneration Committee. In order to take account of comments made by shareholders and on the recommendation of this Committee, the Board of Directors decided to amend the criteria for the variable remuneration and the long-term incentives (or "LTI") and to propose to the Annual Shareholders' Meeting on May 7, 2019 that it reduce the upper limits on the grants of stock options and performance shares to the Executive Officers.

In accordance with article L. 225-37-2 of the French Commercial Code, the principles and criteria set out in this section are submitted for the approval of the Ordinary Annual Shareholders' Meeting on May 7, 2019, in the 9<sup>th</sup> resolution entitled "Approval of the remuneration policy applicable to the Executive Officers".

### 8.1. GENERAL PRINCIPLES AND STRUCTURE OF THE TOTAL ANNUAL REMUNERATION

#### 8.1.1. General principles

Traditionally, the remuneration policy adopted by the Board of Directors includes incentive elements reflecting the Group's strategy, which is steered toward profitable long-term growth, while acting responsibly in the interests of the Company and the interests of all the stakeholders. In a highly capital-intensive industry, profitable long-term growth requires constant attention to be paid to each investment decision and to the competitiveness of every transaction, while maintaining an ongoing effort over time in favor, in particular, of safety and security, innovation, employee training and development, together with the environment. In this context, the elements taken into account for the determination of the remuneration are as follows:

- a short-term component, comprising a fixed remuneration and a variable remuneration;
- a long-term incentive through the grant of share subscription options and performance shares, both tools being subject in full to the same performance conditions calculated over three years;
- other benefits attached to the performance of the Executive Officer's term of office, including:
  - a defined benefit pension plan which applies to eligible senior managers and Executive Officers, subject to performance conditions in respect of Benoît Potier since May 16, 2018 (the date of renewal of his term of office),
  - a collective life insurance plan,
  - a death and disability benefits plan,
  - commitments to pay an indemnity in the event of the termination of duties at the Company's initiative, in certain circumstances, subject to performance conditions calculated over a three-year period,
  - entitlement to unemployment insurance for company managers and corporate officers, in the absence of an employment contract with the Group.

To determine the remuneration policy, the Board of Directors takes into account the principles of completeness, balance, comparability, consistency, comprehensibility and proportionality as recommended by the AFEF/MEDEF Code of corporate governance.

The remuneration policy reflects the increased level of responsibility of the Group's senior executive and is adapted to the Group's context, remains competitive and is an incentive to promote the Group's performance over the medium to long-term, in compliance with the Company's interests and the interests of all the stakeholders.

This remuneration policy, which is applicable to the Chairman and Chief Executive Officer, applies whether the Group's senior Executive Officer acts as the Chairman and Chief Executive Officer or, if circumstances so require, the Chief Executive Officer of the Company. In such circumstances, a Chairman who does not also have the duties of Chief Executive Officer would receive fixed remuneration to the exclusion of any variable remuneration.

Furthermore, if such a situation were to arise, the remuneration policy applicable to a Senior Executive Vice President would be determined on the basis of the policy applicable to a Chief Executive Officer of the Company, after taking account, however, of the difference in the level of responsibility, consistent with the earlier practices applied at the Company for this type of Executive Officer.

### 8.1.2. Structure of the total annual remuneration

In keeping with the remuneration policy approved in 2017 and in 2018 by the Annual Shareholders' Meeting, the structure of the total annual remuneration is as follows:

- A **proportionate balance is maintained between the three components of remuneration** (fixed remuneration, variable remuneration and LTI) so that, in accordance with recurring practice at Air Liquide:
  - the weight of the variable remuneration and the combined elements of long-term incentive continues to represent approximately 75% of the total annual remuneration; and that
  - in the balance between the three above-mentioned elements, slightly greater weight continues to be given to the LTI. Accordingly, the fixed remuneration represents approximately 25%, the variable remuneration 35% and the LTI 40% of the total remuneration.
- **Criteria for the variable remuneration and the LTI:** taking into account remarks made by shareholders, the Board decided, on the recommendation of the Remuneration Committee, to change the performance criteria to which these two remuneration tools are subject with effect from 2019. Accordingly, the **EPS** criterion will henceforth only be taken into account in one remuneration tool: it remains a criterion for the annual **variable remuneration**, but is no longer included in the performance criteria for the LTI. Furthermore, the **ROCE** becomes a criterion for the **long term** remuneration (LTI) as a replacement for the EPS. The revenue criterion is maintained as a criterion for the variable remuneration.
- **Upper limits on the grant of LTI to the Executive Officers:** the Annual Shareholders' Meeting on May 7, 2019 is asked to decide upon the renewal of the authorizations for the grant of stock-options and performance shares (see draft resolutions 13 and 14, at pages 322 et seq.). At this time and following remarks from shareholders, the Board of Directors proposes that the Shareholders' Meeting **reduce by one-third** each of the **sub-limits on the grants to the Executive Officers** submitted to the Annual Shareholders' Meeting in order to bring them closer to the historical levels of grants by the Board. Consequently, subject to the approval of the resolutions by the Shareholders' Meeting, the number of stock options granted to the Executive Officers may not exceed 0.2% of the share capital (instead of 0.3% previously) and the number of performance shares granted to the Executive Officers may not exceed 0.1% of the share capital (instead of 0.15% previously). As before, the Board of Directors also sets the annual grant limits, which remain significantly below these sub-limits, it being noted that, as stated above, the LTI must represent approximately 40% of the Executive Officer's annual remuneration.
- The **other principles which apply to the annual variable remuneration are unchanged:**
  - (i) the variable part continues to be expressed as a target variable remuneration (150% of the fixed remuneration) and as a maximum (167% of the fixed remuneration);
  - (ii) concerning the weighting of the various criteria adopted:
    - a greater relative weight is still given to the quantifiable criteria as compared to the qualitative criteria,
    - Quantifiable criteria: as before, each quantifiable criterion is assigned a target weighting (expressed as a percentage of the fixed remuneration) corresponding to a 100% achievement of the target objective set at the beginning of the year, and a maximum weighting (expressed as a percentage of the fixed remuneration),
    - Qualitative criteria:
      - as in 2018, in order to meet shareholder expectations, a **weighting is allocated to each of the qualitative criteria**,
      - the qualitative criteria continue to be based, as to two-thirds, on three to four categories or sub-categories of objectives which are defined each year and, as to one-third, on an assessment of the individual performance;
    - the target weighting and the maximum weighting are communicated *ex ante*; the actual weight of each criterion for the determination of the variable remuneration due in respect of the fiscal year will be established on the basis of the performance measured for each criterion in light of the target objective, on the basis of the application of a formula for the financial criteria and the assessment of the Executive Officer's performance by the Board of Directors upon the recommendation of the Remuneration Committee for the qualitative criteria. The rate of achievement of the objectives for the variable remuneration as a percentage of the fixed remuneration and, hence as a percentage of the target variable remuneration for this criterion, will be communicated *ex post*.
- Finally, the **other principles which apply to the LTI are also unchanged** (the prororation of the LTI in the event of the Executive Officer's departure during the period of assessment of the performance conditions, the level of requirement of the objectives and the rules which are specific to the Executive Officers as described below).

## 8.2. IMPLEMENTATION FOR THE DETERMINATION OF THE 2019 REMUNERATION

By applying the principles defined above, the criteria for the determination, distribution and allocation of the elements which make up the Executive Officer's total remuneration for 2019 are as follows:

### 8.2.1. Fixed remuneration

The fixed remuneration is determined on the basis of the level of responsibility, the experience in the executive management function and market practices. The fixed remuneration will represent approximately 25% of the total target annual remuneration.

### 8.2.2. Variable remuneration

The variable remuneration will be based on:

- **two quantifiable financial criteria**, which were already included in the criteria for the variable remuneration for 2018:
  - increase in the **recurring earnings per share** (excluding the impact of foreign exchange and significant exceptional items) (hereinafter "recurring EPS"),
  - comparable growth in **consolidated revenue** (excluding significant scope impact and the impact of foreign exchange and energy).

The weighting of each criterion is shown in the table below.

Following remarks made by shareholders, the Remuneration Committee carried out a detailed review of the criteria for the variable remuneration and the LTI and made its recommendations. Based on this, the Board considered that the ROCE is more a long-term indicator and that it is more appropriate to include it as a performance criterion for the LTI. Consequently, the Board decided that the ROCE would no longer be included in the criteria for the annual variable remuneration.

For each criterion, the Board of Directors has defined a target objective, which is not made public for confidentiality reasons. Nonetheless, the rate of achievement of the objectives for the variable remuneration as a percentage of the fixed remuneration and as a percentage of the target variable remuneration allocated to that criterion, will be communicated *ex post*.

For each financial criterion, a formula adopted by the Board makes it possible to calculate the amount of the variable remuneration due (within a maximum limit) by taking into account, on the basis of the consolidated financial statements for the fiscal year, the value achieved for the criterion as compared to the target objective set. Thus, in the event of a performance that exceeds the objective set, the value of the variable part is adjusted upward within the maximum limit set for each criterion. In the event of a performance that is below the lower limit set for each objective, the fraction of the variable remuneration corresponding to this criterion is equal to zero;

- **(qualitative) personal criteria**, a weighting being allocated to each of them. They relate:
  - as to one-third, to **Corporate Social Responsibility** (hereinafter "CSR"),
  - as to one-third, to **organization and to Human Resources**,
  - as to one-third, to **individual performance**. This criterion responds to the Board of Directors' desire to keep a part of the variable remuneration subject to the Board's assessment, in order to take account of the unpredictability of the environment. This may be beneficial to the Executive Officer if the Company is facing an unfavorable environment which was not anticipated at the time the objectives were set, or disadvantageous if the environment ultimately turns out to be more favorable than anticipated.

An identical target and maximum weight is set for each qualitative criteria.

The allocation key for the quantifiable/qualitative criteria and, within each category, the target (corresponding to the 100% achievement of the objective set) and the maximum weights for each element, determined by applying the principles set forth above, is as follows:

Indicator	Target		Maximum	
	As a % of the fixed remuneration	As a % based on 100	As a % of the fixed remuneration	As a % based on 100
<b>Financial criteria (quantifiable) including:</b>	<b>105</b>	<b>70</b>	<b>122</b>	<b>73</b>
Recurring EPS	75	50	87	52
Consolidated revenue	30	20	35	21
<b>Personal criteria (qualitative) including:</b>	<b>45</b>	<b>30</b>	<b>45</b>	<b>27</b>
CSR (safety and reliability / Sustainable Development)	15	10	15	9
Organization / Human Resources	15	10	15	9
Individual performance	15	10	15	9
<b>TOTAL (FINANCIAL AND PERSONAL CRITERIA)</b>	<b>150</b>	<b>100</b>	<b>167</b>	<b>100</b>

The total amount of the variable remuneration due for the 2019 fiscal year in respect of the term of office will be paid in 2020, after approval of the financial statements by the Annual Shareholders' Meeting, it being noted that its payment is conditional on approval by an Annual Shareholders' Meeting of the elements of the Executive Officer's remuneration for 2019, under the conditions provided for in article L. 225-100 of the French Commercial Code.

### 8.2.3. Other elements of annual remuneration

The benefits in kind include the use of a company car as well as contributions to the unemployment insurance for company managers and corporate officers.

In accordance with the Group's internal practice, the Chairman of the Board of Directors, like any other Executive Officer, does not receive any Directors' fees, if he holds executive duties at L'Air Liquide S.A.

### 8.2.4. Long-term remuneration components

#### A. Principles of grant

- In accordance with the principle adopted in 2016, the Board confirmed that the award of performance shares and options to the Executive Officers and the changes therein over time will be assessed in terms of the IFRS value (and not in terms of the volumes granted), for all stock option and performance share plans combined.
- All the stock options and performance shares granted are subject to **performance conditions** that apply to both the stock option and performance share plans and are calculated over a period of **three years**. The performance conditions applicable to the plans decided upon in the autumn are set by the Board of Directors at the start of the year, at the Board meeting in February, in order to have a reference period of three full years.
- Following remarks made by shareholders, the Remuneration Committee carried out a detailed review of the criteria for the annual variable remuneration and the LTI and made its recommendations. Based on this, the Board considered that the **ROCE** is more a **long-term** indicator and that it is more appropriate to include it as a performance criterion for the LTI. Consequently, the Board decided that the EPS would no longer be included in the criteria for the LTI but would continue to be a criterion for the annual variable remuneration.

The total shareholder return (AL TSR and relative TSR) is maintained as a second performance criterion for the LTI.

The exact objectives set for each performance condition are made public *ex post*, at the close of the Board of Directors' meeting in February following the end of the three fiscal years during which the performance must be achieved. The rate of achievement of the performance conditions and the percentage of stock options that vest/performance shares definitively awarded are also published at the end of this Board meeting.

#### B. Performance conditions

As a consequence of the above, the performance conditions which apply to all the beneficiaries of the stock option and performance share plans which will be allocated in 2019 have been determined by the Board of Directors on February 13, 2019. The number of stock options which can be exercised out of the total number of options which will be allocated, together with the number of performance shares definitively allocated pursuant to the 2019 Plans will depend:

- (i) **for 60% of the stock options/performance shares granted**, on the rate of achievement of an objective, set by the Board, consisting of the Return on capital employed after tax ("ROCE"<sup>(a)</sup>) recorded at the end of the 2021 fiscal year.

At the objective set, the grant is 100%, then decreases on a straight-line basis, to a lower limit below which there will be no grant. This **lower limit** corresponds to a ROCE level which is **200 bps less** than the objective set, which provides a degree of flexibility, making it possible to take advantage of external growth opportunities.

The objective has been set within the **trajectory of the NEOS company program** which aims at a ROCE of more than 10% in 2021-2022;

- (ii) **for 40% of the stock options/performance shares granted**,
  - for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on an objective of total return for the shareholder set by the Board, defined as the average annual growth rate of an investment in Air Liquide shares, reinvested dividends, for fiscal years 2019, 2020 and 2021 ("**AL TSR**"). The objective of an absolute TSR is set in accordance with historic performances. At the objective set, the grant is 100%, then decreases on a straight-line basis, to a lower limit,
  - for 50% of the stock options/performance shares referred to in sub-paragraph (ii): on the rate of total shareholder return from an investment in Air Liquide shares, reinvested dividends – sourced from Bloomberg ("**B TSR**"), as compared to the **CAC 40 TSR index, reinvested dividends (sourced from Bloomberg)**, for fiscal years 2019, 2020 and 2021.

The rate of achievement will be **0%, if the average of the Air Liquide TSR is lower than the average of the CAC 40 TSR**, 50% if it is equal to the average of the CAC 40 TSR and 100%, if it is at least higher than 2% of the average of the CAC 40 TSR on the basis of a straight-line change. Any grant for a performance lower than the average of the CAC 40 TSR is impossible.

The rate of achievement of the performance conditions will be recorded by the Board at the time when the financial statements are adopted for the 2021 fiscal year.

(a) The Return on Capital Employed after tax ("ROCE") will be calculated as follows: ((Net profit after tax before deduction of minority interests - net cost of debt after taxes) for the period 2021)/weighted average of (shareholders' equity + minority interests + net indebtedness) at the end of the three last semesters (H2 2021, H1 2021 and H2 2020)), these aggregates being adjusted for the impact of the currency variation as compared to the exchange rate for 2018 and for the application of the new IFRS 16 standard.

### C. Rules specific to the Executive Officers

The grant to the Executive Officers is examined by the Remuneration Committee at the same time as the allocation to Group employees and is decided by the Board of Directors. It is made within the scope of plans, adopted at pre-established periods in the autumn, in the form of share subscription options granted without any discount, and performance shares.

#### ► Limits on the grants to Executive Officers

As part of the renewal of the authorizations for the grant of stock options and performance shares, the Board of Directors proposes that the Shareholders' Meeting **reduce by one-third** each of the **sub-limits on the grants to the Executive Officers** submitted to the Annual Shareholders' Meeting in order to bring them closer to the historical levels of grants by the Board. Consequently, subject to the approval of the resolutions by the Annual Shareholders' Meeting on May 7, 2019, the number of stock options granted to the Executive Officers may not exceed 0.2% of the share capital (instead of 0.3% previously) and the number of performance shares granted to the Executive Officers may not exceed 0.1% of the share capital (instead of 0.15% previously).

Within the scope of these sub-limits authorized by the Annual Shareholders' Meeting<sup>(a)</sup>, the Board of Directors sets lower annual limits for the grants to the Executive Officers, expressed (i) as a percentage of the share capital and for each Executive Officer (ii) as a multiple of their remuneration, in accordance with the recommendations of the AFEP/MEDEF Code. Accordingly, the total aggregate IFRS value of the LTI granted cannot exceed 1.5 times the amount of the Executive Officer's maximum gross annual remuneration, it being noted moreover that, in accordance with the 2019 remuneration policy referred to above, the grant of LTI represents approximately 40% of the Executive Officer's total annual remuneration.

#### ► Shareholding and share ownership obligations

##### – Shareholding obligation pursuant to the French Commercial Code

On the recommendation of the Remuneration Committee, the Board defined the shareholding obligations resulting from articles L. 225-185 and L. 225-197-1 of the French Commercial Code applicable to the shares resulting from the exercise of stock options and performance shares respectively as from September 28, 2015. They lead to the obligation, for the Executive Officer, to hold, in registered form, until the termination of his duties, a minimum quantity of shares corresponding to 50% of the capital gain on acquisition, net of social security charges and tax, resulting from each exercise of stock options/each definitive award of performance shares.

This percentage will be lowered to 5%, as soon as the quantity of shares held by the Executive Officer represents an amount equal to at least three times the Executive Officer's gross annual fixed remuneration.

##### – Additional shareholding obligation – Recommendation made by the AFEP/MEDEF Code

In addition, the internal rule defined by the Board of Directors since 2008, pursuant to which the Chairman and Chief Executive Officer must hold in a registered share account a number of shares equivalent to twice his gross annual fixed remuneration (one time the annual fixed remuneration for a Senior Executive Vice President) remains in effect. This obligation will remain in force until it is exceeded by the effect of the aforementioned rules resulting from the French Commercial Code. The number of shares required to be held is assessed as of January 1 and July 1 of each year.

#### ► Other rules applicable to the Executive Officers

- **Condition of presence:** loss of the stock options/rights to the performance shares in the process of being acquired, in the event of resignation or removal from office for serious cause.

- Implementation, with effect from 2018, of the **principle of a proration on the basis of the actual presence of the Executive Officer**, in the event of a departure during the period of assessment of the performance conditions.

This principle will apply (i) to the Executive Officers, (ii) in all cases of a departure for a reason other than resignation or removal from office for serious cause.

Accordingly, in practice, the total allocation rate (after applying the performance conditions) will be reduced on a prorated basis to the number of months' actual presence of the Executive Officer at the Group during the period of assessment of the performance criteria.

The Executive Officer remains subject to all the provisions of the plans and, more specifically, those relating to the duration of the vesting, lock-in and holding periods in respect of the shares and stock options granted.

In addition, no grant will be made to an Executive Officer in the year of his departure, in accordance with the AFEP/MEDEF Code.

- **Obligations regarding the restriction** on the exercise of stock options and the sale of performance shares during the "black-out periods" prior to the publication of the financial statements, as defined by the Company. These abstention periods open 30 days before the date of publication of the annual and half-yearly consolidated results and 15 days before the date of publication of the financial information relating to the 1<sup>st</sup> and 3<sup>rd</sup> quarters. They end on the date of publication of the information at close of business.
- **Commitment not to carry out hedging transactions** with regard to the risk concerning stock options/shares resulting from the exercise of stock options and concerning the performance shares awarded, throughout the length of their term of office.

(a) Submitted for the approval of the Combined Shareholders' Meeting on May 7, 2019 (13<sup>th</sup> and 14<sup>th</sup> resolutions).



### 8.2.5. Other elements of remuneration

The Board of Directors takes into account, in the overall assessment and determination of the Executive Officers' remuneration, the other elements of remuneration submitted for the approval of the Annual Shareholders' Meeting within the scope of the regulated agreements and commitments procedure.

For the record, in the case of Benoît Potier, these elements are as follows:

#### A. Long-term commitments

At the Company, the long-term commitments relating to the Executive Officers are usually as follows:

- a defined benefit pension plan which applies to eligible senior managers and Executive Officers, subject to performance conditions for Benoît Potier since May 16, 2018 (the date of renewal of his term of office);
- a collective life insurance plan;
- a death and disability benefits plan;
- commitments to pay an indemnity in the event of the termination of duties at the Company's initiative, in certain circumstances, subject to performance conditions calculated over a three-year period;
- entitlement to unemployment insurance for company managers and corporate officers, in the absence of an employment contract with the Group.

In the case of Benoît Potier, these commitments are as follows:

#### *The Company's pension obligations*

Benoît Potier has been authorized to benefit from various supplementary social protection schemes set up by L'Air Liquide S.A., as follows:

##### ➤ Defined benefit pension plan

For that portion of the remuneration which exceeds 24 times the annual social security ceiling (PASS), pursuant to a defined benefit pension plan, Benoît Potier potentially benefits from a supplementary pension annuity equal to 1% for each year of service of the reference remuneration paid by the Company. The defined benefit pension plan only applies if the beneficiary is still with the Company at the time of his retirement and decides to claim his pension entitlements, whether or not at the full rate; in the event of the termination of the term of office at the Company's initiative (except in the event of gross or wilful misconduct), the beneficiary may retain his rights, if he is over 55 years of age and if he does not resume any professional activity until he retires. This rule, which reflects the Human Resources policy at Air Liquide, encouraging long careers within the Group, is in line with the position of the social security administration. Where applicable, an annuity equal to 60% of the aforementioned benefits will be paid to the surviving spouse, under certain conditions, notably with regard to age. Benoît Potier joined the Group in 1981.

Total pension benefits, under all pension plans combined, are capped at 45% of the reference remuneration. Should this ceiling be reached, the amount paid under the defined benefit plan would be reduced accordingly.

The application of this plan to Benoît Potier was notably authorized by a decision of the Board of Directors on February 17, 2014 in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 7, 2014 in a specific resolution for Benoît Potier (10<sup>th</sup> resolution).

Pursuant to article L. 225-42-1 of the French Commercial Code, as amended by Law n°2015-990 dated August 6, 2015, known as the "Macron Law", the Board of Directors decided on February 14, 2018 that, with effect from the renewal of his term of office as Chairman and Chief Executive Officer in 2018, the increase, in respect of each fiscal year, in the conditional pension rights under the defined benefit pension plan S, which Benoît Potier benefits from, would be subject to conditions linked to the performance of Benoît Potier, assessed in light of the Company's performance. This commitment was approved by the Shareholders' Meeting on May 16, 2018 in a specific resolution for Benoît Potier (10<sup>th</sup> resolution). Consequently, since the renewal of Benoît Potier's office as Chairman and Chief Executive Officer in 2018, the increase, in respect of each fiscal year, in Benoît Potier's conditional rights under the defined benefit pension plan S which he benefits from, will depend, and the amount of that increase will be adjusted in accordance with, the average of the annual gap between the Return On Capital Employed after tax (ROCE) and the Weighted Average Cost of Capital (WACC) (net equity method), calculated (on the basis of the certified consolidated financial statements, approved by the Shareholders' Meeting) for the last three fiscal years prior to the said fiscal year.

For the purposes of this calculation, the gap between the ROCE and the WACC will be measured for each fiscal year and the average of the three annual gaps will be calculated for the last three fiscal years prior to the said fiscal year.

The proportion of the annual increase in the conditional rights is determined as shown in the table below, with a growth of the increase per linear segments between each of the thresholds between 100 bps and 300 bps inclusive:

Average of the annual gaps (ROCE – WACC) over three years in bps <sup>(a)</sup>	Proportion of increase
≥ 300	100%
250	66%
200	50%
100	25%
< 100	0%

(a) bps: basis points.

If amendments are made to the regulations governing the defined benefit pension plans S, the Board of Directors might have to amend the existing defined benefit pension plan or put an alternative system in place. This alternative system, if implemented, would be subject to performance conditions in accordance with the AFEP/MEDEF Code.

#### ► Defined contribution pension plan

Benoît Potier benefits from the defined contribution pension plan which applies to all the employees and the Executive Officers, the contribution to which is paid in equal shares by the employer and the beneficiary on that remuneration which does not exceed 8 times the PASS.

The individual application of this plan to Benoît Potier was authorized by decision of the Board of Directors on February 12, 2010 in accordance with the regulated agreements and commitments procedure, and approved by the Shareholders' Meeting on May 5, 2010 (9<sup>th</sup> resolution).

#### Other benefits

##### ► Life insurance plan

As Benoît Potier is no longer a beneficiary of the defined contribution pension plan for senior managers, a collective life insurance policy was entered into which enables them to create savings on behalf of the beneficiary which are available at any time.

The Executive Officer's rights under this plan are financed by contributions paid by the Company to an insurance body and concern the brackets of remuneration ranging from 0 to 24 times the PASS.

The opening of this plan, for the third bracket (16 to 24 times PASS) and then the second bracket (8 to 16 times PASS), and finally its extension to the first bracket (0 to 8 times PASS) of the reference remuneration, at an unchanged cost for the Company, responded to a concern for good management. The contributions paid to the third-party plan manager are assessed on the basis of the portions of the beneficiaries' reference remuneration which correspond to each of the three brackets, in accordance with conditions which are identical to those of the previous plan.

For Benoît Potier, the signature of this contract, for the third and then the second bracket, was authorized by decisions of the Board of Directors on November 20, 2012 and February 13, 2013 in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 7, 2013 in a specific resolution (7<sup>th</sup> resolution). The extension of the plan to the first bracket concerning the band of reference remuneration amounting to between 0 and 8 times the annual social security ceiling was authorized by decision of the Board of Directors on November 20, 2014, in accordance with the regulated agreements and commitments procedure, and approved by the Shareholders' Meeting on May 6, 2015 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution).

##### ► Death and disability benefits plan

Benoît Potier benefits from the additional "incapacity, disability, death" benefits plan, unified as from January 1, 2015, covering all the personnel and the Executive Officers duly authorized to benefit from such plan in which (a) the remuneration taken into account for the calculation of the contributions is capped at (i) 16 times the annual social security ceiling for the incapacity and disability cover, (ii) 24 times the annual social security ceiling for the death cover; and (b) the rate of the employer's contribution was reduced in 2018 and amounts to 0.85% up to 16 times the annual social security ceiling and to 0.65% between 16 and 24 times the annual social security ceiling.

The individual application to Benoît Potier, in respect of his duties as Chairman and Chief Executive Officer, of this unified death and disability benefits plan covering all the personnel, was authorized by decision of the Board of Directors on November 20, 2014 in accordance with the regulated agreements and commitments procedure, and approved by the Annual Shareholders' Meeting on May 6, 2015 in a specific resolution for Benoît Potier (7<sup>th</sup> resolution).

## B. Commitments relating to termination of duties

### Termination indemnities

In accordance with article L. 225-42-1 of the French Commercial Code and the AFEP/MEDEF Code of corporate governance, the Board of Directors, at its meeting on February 14, 2018, set the terms of the agreement applicable to Benoît Potier, along the following main lines:

- only the cases of forced departure of Benoît Potier from his terms of office as Chairman and Chief Executive Officer (removal from office, request for resignation) related to a change of strategy or a change in control (in the latter case, the termination indemnity is due, if the departure occurs within 6 months of the change of control) may give rise to an indemnity;
- the amount of the indemnity in any of these cases is set at 24 months of gross fixed and variable remuneration;
- the amount of the indemnity due decreases gradually as Benoît Potier, in his capacity as Chairman and Chief Executive Officer, approaches the age limit defined in the Company's articles of association; in the event of a forced departure in the 24 months preceding the date of departure due to the age limit set by the articles of association, the amount of the indemnity due will be capped at the number of months' gross remuneration separating the date of forced departure from the date when he reaches such age limit; in any event, no indemnity shall be paid should the beneficiary claim his pension entitlements on the date of his forced departure;
- the right to payment of the indemnity is subject to the achievement of the performance conditions, the proportion of the indemnity due decreasing depending on the rate of achievement of such conditions (see below for details of the performance conditions).

The decision of the Board of Directors on February 14, 2018 relating to this indemnity was made in accordance with the regulated agreements and commitments procedure and published on the Company's website on February 16, 2018. It was approved by the Annual Shareholders' Meeting on May 16, 2018 in a specific resolution (9<sup>th</sup> resolution).

### Performance conditions applicable to the termination indemnity

The Board of Directors decided that the payment of the termination indemnity concerning Benoît Potier is subject to compliance, duly acknowledged by the Board of Directors at the time of or subsequent to the termination of his duties, with conditions related to the beneficiary's performance assessed in light of the Company's performance, defined as of today as follows:

Entitlement to the indemnity referred to above shall depend on, and the amount of the indemnity paid will be adjusted on the basis of the average of the annual gap between the Return On Capital Employed after tax (ROCE) and the Weighted Average Cost of Capital (WACC) (assessed using the net equity method), calculated (on the basis of the certified consolidated financial statements approved by the Shareholders' Meeting) with respect to the last three fiscal years prior to the fiscal year during which the departure occurs. For the purposes of this calculation, the gap between ROCE and WACC will be measured with regard to each fiscal year, and will be calculated the average of the three annual gaps for the last three fiscal years prior to the fiscal year during which such departure takes place.

The proportion of the indemnity due will be established as indicated in the table below with an increase in the indemnity by straight-line segments between each of the thresholds between 100 bps and 300 bps inclusive:

Average over 3 years of the annual (ROCE – WACC) gaps in bps <sup>(a)</sup>	Proportion of indemnity due
≥ 300	100%
250	66%
200	50%
100	25%
< 100	0%

(a) bps: basis points.

### Unemployment insurance for company managers and corporate officers

By decision of the Board of Directors in May 2006, Benoît Potier benefits, in his capacity as Executive Officer, from the unemployment insurance for company managers and corporate officers taken out by the Company. The contributions paid by the Company are added back to Benoît Potier's remuneration as benefits in kind.

This decision had been approved by the Annual Shareholders' Meeting on May 9, 2007, in accordance with the regulated agreements procedure (7<sup>th</sup> resolution).

The Board of Directors confirmed, at its meeting in May 2018, that Benoît Potier continues to benefit from this unemployment insurance within the scope of the latest renewal of his duties.

## DESCRIPTION OF THE STOCK OPTION AND PERFORMANCE SHARE PLANS

### 1. Allotment policy

The Company implements, each year in principle:

- a plan for the grant of stock options to its Executive Officers and its employees; and
- performance share plans for its employees since 2008, and which have been open to the Executive Officers and the members of the Executive Committee since 2015.

These grants are decided upon by the Board of Directors pursuant to the authorizations granted by the Annual Shareholders' Meeting, and most recently by the Combined Annual Shareholders' Meeting on May 12, 2016 for a period of 38 months.

The introduction of performance share plans has enabled the Company since 2008 to have a medium-term instrument of remuneration with complimentary features to those of the long-term instrument of remuneration constituted by the stock options, and to expand the scope of the beneficiaries.

The system for the stock options and performance share plans is aimed at three sets of beneficiaries:

- the Company's Executive Officer, who receives stock options and performance shares and for whom the Board has decided that the grant of performance shares and stock options and changes in that grant over time would continue to be assessed in light of the IFRS value (and not in terms of the volumes granted), taking account of all stock options and performance share plans combined;
- the members of the Executive Committee and the Group's managers who hold positions with a high level of responsibilities or who make special contributions to the Group, who benefitted up until today from a mixed allocation of stock options and performance shares now exclusively receive an allocation in the form of performance shares (a few of the Group's managers still benefit from a mixed allocation of stock options and performance shares, the performance shares remain to be preponderant);
- the specific contributors, such as those employees distinguished by the quality of their conduct in exceptional situations, the inventors and innovators, the middle managers, as well as an expanded category of new employee beneficiaries, who benefit solely from performance shares.

The criteria used to draw up the lists of the beneficiary employees reflect the jobs and the geographical areas in which the Group carries out its activities and the specific contribution, the particular potential, or indeed the individual or collective conduct of the persons concerned, which has been noted in exceptional situations. The lists of beneficiary employees are also drawn up with the desire to ensure a certain rotation and an expansion of the beneficiary population. Accordingly, 28.03% of the beneficiaries of the Plans dated September 25, 2018 are employees who had not been awarded stock options/performance shares during the last five years.

#### ALLOTMENTS OF STOCK OPTIONS AND PERFORMANCE SHARES ON SEPTEMBER 25, 2018:

Total number of performance shares/ equivalent in performance shares	418,234
% of the share capital	N/A
Number of grants <sup>(a)</sup>	1,734
% of employees	2.59%

(a) Including 1,697 distinct beneficiaries.

Performance conditions apply to all the stock options and performance shares which are awarded to all the beneficiaries. They are described on pages 132 and 133.

The aggregate total as at December 31, 2018 of the outstanding performance shares whose definitive allocation date has not yet occurred and the outstanding stock options which have not yet been exercised corresponds to a number of shares representing less than 1.09% of the share capital on that same date.

## 2. Stock option plans

### **(Information to be regarded as the Special Report of the Board of Directors within the meaning of article L. 225-184 of the French Commercial Code)**

Pursuant to the decisions of the Board of Directors, following the authorizations of the Annual Shareholders' Meeting and on the recommendation of the Remuneration Committee, the Company has adopted plans granting a certain number of stock options to certain employees of the Company and its subsidiaries worldwide, including the Executive Officers.

These options are granted for a price that may not be lower than the average of the opening trading prices over the 20 trading days prior to the date they are granted. The maximum exercise period is eight years for options granted until June 28, 2010 inclusive, and 10 years as from the October 14, 2011 stock option plan.

The options cannot be exercised before a minimum period of four years after they are awarded. The Board of Directors has the power to terminate this lock up period, if there is a public bid for the Company's shares or a merger or takeover of the Company.

The outstanding options thus awarded by the Board of Directors in the context of the authorizations voted by the Shareholders' Meetings and which have not yet been exercised amounted, after adjustment, to 3,119,897 options (at an average price of 81.76 euros) as at December 31, 2018, i.e. 0.73% of the shares which make up the capital, including 611,731 options (at an average price of 80.98 euros) awarded, during his term of office, to the Executive Officer present as at December 31, 2018.

Out of the total stock options whose issue was authorized by the Annual Shareholders' Meeting on May 12, 2016, there remained a potential allocation of 8,298,309 options as at December 31, 2018.

TABLE 8 – SUMMARY OF THE ONGOING STOCK OPTION PLANS IN 2018

	2010	2011	2012	2012	2013	2014	2015	2016	2017	2018	Total
Date of authorization by the EGM	05/05/10	05/05/10	05/05/10	05/05/10	05/07/13	05/07/13	05/07/13	05/12/16	05/12/16	05/12/16	-
Date of Board meeting	06/28/10	10/14/11	05/11/12 <sup>(e)</sup>	09/27/12	09/26/13	09/22/14	09/28/15	11/29/16	09/20/17	09/25/18	-
Total number of share subscription options granted <sup>(d)</sup>	532,760	675,680	6,000	704,791	768,866	868,385	467,194	143,240	73,540	73,380	-
of which Benoît POTIER <sup>(a)</sup>	88,000	88,000	-	88,000	100,000	100,000	70,000	60,000	23,100	23,690	-
of which Pierre DUFOUR <sup>(a)</sup>	50,000	50,000	-	50,000	57,000	57,000	39,900	-	-	-	-
Of which the top ten employee beneficiaries (excluding Executive Officers)	165,000	172,000	-	183,000	208,000	212,000	92,090	23,160	7,160	6,540	-
Number of beneficiaries	305	578	1	672	727	863	399	243	204	217	-
% of share capital represented by each grant	0.19%	0.24%	NS	0.23%	0.25%	0.25%	0.14%	0.04%	0.02%	0.02%	-
Rate of achievement of performance conditions <sup>(f)</sup>	100%	98%	100%	90.50%	94.90%	83.38%	82.50%	82.87%	To be recorded in February 2020	To be recorded in February 2021	-
Option exercise period start date	06/28/14	10/14/15	05/11/16	09/27/16	09/26/17	09/22/18	09/28/19	11/29/20	09/20/21	09/25/22	-
Expiration date	06/27/18	10/13/21	05/10/22	09/26/22	09/25/23	09/21/24	09/27/25	11/28/26	09/19/27	09/24/28	-
Subscription price in euros	83.00	87.00	97.00	96.61	102.00	97.00	105.00	93.00	104.00	107.00	-
As at 12/31/2018, subscription price in euros <sup>(b)</sup>	60.28	63.18	70.44	77.36	81.68	85.66	92.73	84.34	94.32	107.00	-
As at 12/31/2018, adjusted number of stock options <sup>(b)</sup>	694,675	891,257	8,265	861,330	927,743	963,779	526,896	157,862	81,184	73,380	-
As at 12/31/2018, number of shares subscribed <sup>(d)</sup>	674,904	371,925	8,265	244,672	164,832	40,265	3,045	-	-	-	-
As at 12/31/2018, number of stock options cancelled <sup>(b)(c)</sup>	19,771	76,392	-	91,961	58,957	194,189	113,693	29,230	1,105	-	-
<b>NUMBER OF STOCK OPTIONS REMAINING <sup>(b)</sup> ON DECEMBER 31, 2018</b>	-	<b>442,940</b>	-	<b>524,697</b>	<b>703,954</b>	<b>729,325</b>	<b>410,158</b>	<b>128,632</b>	<b>80,079</b>	<b>73,380</b>	<b>3,093,165*</b>
<b>As of % of the share capital</b>											<b>0.72%</b>
											<b>429,423,434</b>

(a) Stock options granted (historical data).

(b) Adjusted to take into account share capital increases through free share issues (2017, 2014, 2012, 2010) and the share capital increase in cash on October 11, 2016.

(c) Loss of exercise rights.

(d) Number of shares or stock options (historical data).

(e) Pursuant to a delegation by the Board of Directors on May 9, 2012.

(f) The stock options granted to the Executive Officers depend on the following performance conditions:

- the objectives set are made public ex post. For the 2016 plan, the objectives set are described on pages 137 et seq. For the 2018 plan, the terms of the performance conditions are described on pages 132 and 133;

- the May 2012 plan, which concerns one employee, is based on an objective of an average gap between ROCE and WACC (weighted average cost of capital over seven years).

\* Number of stock options after applying the rate of achievement of the performance conditions recorded by the Board on February 13, 2019 (2016 plan). As of December 31, 2018 the outstanding options which have not yet been exercised amounted to 3,119,987 options; after applying the rate of achievement of the performance conditions, it amounts to 3,093,165 options.



DETAIL OF THE CURRENT OPTION PLANS FOR BENOÎT POTIER

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of stock options granted <sup>(a)</sup>	88,000	88,000	88,000	100,000	100,000	70,000	60,000	23,100	23,690
Adjusted number of stock options granted <b>before</b> applying the rate of achievement of the performance conditions <sup>(b)</sup>	97,025	97,024	97,052	110,283	102,700	79,263	66,161	25,471	23,690
Rate of achievement of the performance conditions	100.00%	98.00%	90.50%	94.90%	83.38%	82.50%	82.87%	To be recorded in February 2020	To be recorded in February 2021
<b>Number of stock options after applying the rate of achievement of the performance conditions</b>	<b>97,025</b>	<b>94,986</b>	<b>87,832</b>	<b>104,659</b>	<b>85,631</b>	<b>65,391</b>	<b>54,827</b>	-	-
Adjustments impact after applying the rate of achievement of the performance conditions	24,154	23,637	11,631	13,854	8,788	-	-	-	-
Adjusted total number of stock options granted <b>after</b> applying the rate of achievement of the performance conditions	121,179	118,623	99,463	118,513	94,419	65,391	54,827	-	-

(a) Stock options granted (historical data).

(b) To take into account, if applicable, capital increase through free share issues (2017, 2014, 2012, 2010) and the capital increase in cash in October 11, 2016.

N.B: see on page 136 the adjusted number of stock options remaining to be exercised by the Executive Officer as at December 31, 2018.

## 2.1. STOCK OPTIONS GRANTED IN 2018 (SEPTEMBER 25, 2018 PLAN)

Pursuant to the authorization of the Combined Shareholders' Meeting on May 12, 2016, the Board of Directors granted, in its meeting on September 25, 2018, 73,380 stock options, representing 0.017 of the share capital in terms of the number of shares, at a unit price of 107 euros, without discount, i.e. a price which is equal to the average of the opening trading prices for the Air Liquide share during the 20 trading days prior to their allocation, rounded down to the nearest euro, to 217 beneficiaries, i.e. 0.32% of the employees.

The IFRS individual fair value for the stock options granted to the Group's employees and Executive Officer pursuant to the September 25, 2018 Plan amounts to 18.98 euros (see details of this IFRS value, in Note 22.5 "Share-based payments" in the consolidated financial statements).

The stock options awarded pursuant to the September 25, 2018 Plan are subject to the performance conditions calculated over three years and described at pages 132 and 133.

For the 2018 allocation, the rate of achievement of the performance conditions will be recorded by the Board of Directors at the meeting to approve the financial statements for the 2020 fiscal year.

A condition of presence at the Group at the time of exercise of the options is also provided for.

The special conditions which also apply to the Executive Officer in connection with the allocation of stock options awarded in 2018 are detailed at pages 133 and 134.

## Distribution between the various categories of beneficiaries

In 2018	Number of beneficiaries	Number of options
Executive officers of L' Air Liquide S.A.	1	23,690
Senior managers (who are not corporate officers of L' Air Liquide S.A.) and other beneficiaries of a mixed allocation	216	49,690

Table 9

TABLE 9.1 – OPTIONS GRANTED TO THE 10 EMPLOYEES (EXCLUDING EXECUTIVE OFFICERS) WHO WERE GRANTED THE HIGHEST NUMBER OF STOCK OPTIONS

In 2018	Number of stock options	Average price (in euros)
For L' Air Liquide S.A.	0	N/A
For L' Air Liquide S.A. and its subsidiaries	6,540	107

## 2.2. STOCK OPTIONS EXERCISED IN 2018

Part of the stock options granted in 2010 to 2015 by the Board of Directors were exercised during the 2018 fiscal year as to a total of 630,355 shares at an average price of 66.64 euros.

TABLE 9.2 – STOCK OPTIONS EXERCISED BY THE 10 EMPLOYEES OF L' AIR LIQUIDE S.A. AND ITS SUBSIDIARIES (EXCLUDING EXECUTIVE OFFICERS) WHO HAD THE HIGHEST NUMBER OF OPTIONS EXERCISED

Grant date	Number of stock options exercised	Average price (in euros)
06/28/2010	104,334	60.28
10/14/2011	41,297	63.18
09/27/2012	9,476	77.36
09/26/2013	10,441	81.68
09/22/2014	2,000	85.66
<b>TOTAL</b>	<b>167,548</b>	<b>63.60</b>

TABLE 9.3 – STOCK OPTIONS EXERCISED BY THE 10 EMPLOYEES OF L' AIR LIQUIDE S.A. (EXCLUDING EXECUTIVE OFFICERS) WHO HAD THE HIGHEST NUMBER OF OPTIONS EXERCISED

Grant date	Number of stock options exercised	Average price (in euros)
06/28/2010	73,512	60.28
10/14/2011	29,551	63.18
09/27/2012	6,276	77.36
09/26/2013	2,512	81.68
<b>TOTAL</b>	<b>111,851</b>	<b>62.46</b>

## Rate of achievement of the performance conditions for the stock options plan dated November 29, 2016

Based on the financial statements approved for the 2018 fiscal year, subject to the approval of the next Annual Shareholders' Meeting, the Board of Directors on February 13, 2019 recorded the rate of achievement of the performance conditions defined at the time of the allocation of the stock options plan dated November 29, 2016. Consequently, the total proportion of the options which can be exercised amounts to 82.87% (for further details, see pages 137 et seq.).

## 3. Performance share plans

(Information to be regarded as the Special Report of the Board of Directors within the meaning of article L. 225-197-4 of the French Commercial Code)

### 3.1. DESCRIPTION

In order to retain and more dynamically motivate talented employees and award their medium-term performance, an additional remuneration system was set up in 2008 involving performance share awards.

The Annual Shareholders' Meeting authorized the Board to grant performance shares to the Group's employees, within an upper allocation limit equal to 0.5% of the share capital over 38 months; pursuant to this upper limit, it sets the limit on the number of shares which can be awarded to the Executive Officers over the same period, which amounts to 0.15% of the share capital since 2013.

For each allocation, the Board determines two different plan regulations (the "France" Plan and the "World" Plan) which govern the award of performance shares to the beneficiaries determined by the Board of Directors. The "France" and "World" Plans essentially differ in terms of the condition of presence which is required – paragraph a) below and the corresponding absence of an obligation to hold shares for the "World" Plan – paragraph c) below.

The performance shares are accompanied by:

- a) a condition of presence during the acquisition period: the shares granted to a beneficiary will only be definitively acquired, if he continues to be an employee or Executive Officer of a Group company during an acquisition period, which is calculated from the award date, of three years for the beneficiaries of the "France" Plan and four years for the beneficiaries of the "World" Plan. In the event of a retirement, the beneficiary shall retain his rights and the condition of presence will no longer be required;
- b) performance conditions which relate, since the first allocation in 2008, to the whole of the performance shares awarded to any beneficiary; see the performance conditions in the summary table of the awards of performance shares below;
- c) a holding requirement: with effect from the definitive allocation date, the beneficiaries of the "France" Plan have an obligation to hold the shares for an additional two years during which the said shares cannot be transferred (other than in the event of a death or disability).

To date, the performance shares delivered are treasury shares issued as part of the Company's buyback program (see pages 310 and 311).

The outstanding performance shares awarded by the Board of Directors pursuant to the authorizations voted by the Shareholders' Meetings, whose definitive allocation date has not yet occurred amounted, after adjustment, to 1,539,577 shares as at December 31, 2018, i.e. 0.36% of the shares which make up the share capital.

Out of the total performance shares whose allocation has been authorized by the Annual Shareholders' Meeting on May 12, 2016 for 38 months, 835,188 performance shares remained potentially available for allocation as at December 31, 2018.

TABLE 10 – SUMMARY OF THE ONGOING PERFORMANCE SHARE PLANS IN 2018

	Performance shares 2013	Performance shares 2014	Performance shares 2015	PPR Plan Performance shares 2015	"Airgas" Plan performance shares 2016	Performance shares 2016	Performance shares 2017	Performance shares 2018	Total
Date of authorization by the EGM	05/07/2013	05/07/2013	05/06/2015	05/06/2015	05/12/2016	05/12/2016	05/12/2016	05/12/2016	-
Date of award by the Board meeting	09/26/2013	09/22/2014	09/28/2015	09/28/2015	07/29/2016	11/29/2016	09/20/2017	09/25/2018	-
Total number of performance shares awarded <sup>(a)</sup>	122,595	140,472	287,172	1,132	75,230	426,346	416,579	393,774	-
of which Benoît POTIER	-	-	10,000	-	20,000 <sup>(e)</sup>	17,800	17,980	18,230	-
of which Pierre DUFOUR	-	-	5,700	-	10,000	-	-	-	-
of which the top ten employee beneficiaries (excluding Executive Officers) receiving the highest number of shares	2,500	2,500	36,166	1,132	22,425	63,046	71,363	69,100	-
Share capital represented by each award	0.04%	0.04%	0.08%	0.00%	0.02%	0.11%	0.11%	0.09%	-
Number of beneficiaries	1 077	1 248	1 744	5	89	1 955	1 832	1 734	-
Performance conditions ("France" and "World" Plans), over a period of three years	Objective of growth in recurring EPS for FY 2015 as compared to 2012	Objective of growth in recurring EPS for FY 2016 as compared to 2013	■ EPS ■ TSR, including an element of relative comparison	Annual gap between Return on Capital Employed (ROCE) and weighted average cost of capital (WACC)	■ Recurring EPS ■ TSR, including an element of relative comparison	■ Recurring EPS ■ TSR, including an element of relative comparison	■ Recurring EPS ■ TSR, including an element of relative comparison	■ Recurring EPS ■ TSR, including an element of relative comparison	-
Number of performance shares cancelled before definitive award	13,645	21,459	72,264	-	15,140	95,824	9,966	-	-
Rate of achievement of the performance condition <sup>(b)(d)</sup>	92,10%	97,12%	82,50%	100%	82,87%	82,87%	To be recorded in 2020	To be recorded in 2021	-
<b>"France" Plan</b>									
Definitive award date	09/26/2016	09/22/2017	09/28/2018	09/28/2018	07/29/2019	11/29/2019	09/20/2020	09/25/2021	-
End of holding period	09/26/2018	09/22/2019	09/28/2020	09/28/2020	07/29/2021	11/29/2021	09/20/2022	09/25/2023	-
Number of performance shares after definitive award	34,954	39,962	80,660	1,132	-	733	18	-	-
Adjusted number of performance shares after definitive award <sup>(c)</sup>	39,936	39,962	91,612	1,270	-	733	18	-	-
<b>Adjusted number of performance shares in acquisition period <sup>(e)</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>50,558</b>	<b>156,420</b>	<b>180,286</b>	<b>164,946</b>	<b>-</b>
<b>"World" Plan</b>									
Definitive award date (no additional holding period)	09/26/2017	09/22/2018	09/28/2019	-	07/29/2020	11/29/2020	09/20/2021	09/25/2022	-
Number of performance shares after definitive award	70,674	82,912	367	-	-	-	-	-	-
Adjusted number of performance shares after definitive award <sup>(c)</sup>	74,667	95,103	377	-	-	-	-	-	-
<b>Adjusted number of performance shares in acquisition period <sup>(e)</sup></b>	<b>-</b>	<b>-</b>	<b>158,227</b>	<b>-</b>	<b>19,529</b>	<b>217,339</b>	<b>270,360</b>	<b>228,828</b>	<b>-</b>
<b>ADJUSTED NUMBER OF PERFORMANCE SHARES DEFINITELY AWARDED ("FRANCE" AND "WORLD") <sup>(c)</sup></b>	<b>114,603</b>	<b>135,065</b>	<b>91,989</b>	<b>1,270</b>	<b>-</b>	<b>733</b>	<b>18</b>	<b>-</b>	<b>-</b>
<b>ADJUSTED NUMBER OF PERFORMANCE SHARES IN ACQUISITION PERIOD ("FRANCE" AND "WORLD") <sup>(e)</sup></b>	<b>-</b>	<b>-</b>	<b>158,227</b>	<b>-</b>	<b>70,087*</b>	<b>373,759*</b>	<b>450,646</b>	<b>393,774</b>	<b>1,446,493*</b>

(a) Number of performance shares expressed in historical data.

(b) The objectives set are made public ex post. For the 2016 plans, the objectives set are described page 137 et seq.

(c) Adjusted to take into account share capital increases through free share issues (2017, 2014, 2012, 2010) and the share capital increase in cash on October 11, 2016.

(d) The number of performance shares definitively awarded depends upon rate of achievement of the performance conditions which ranges from 0% to 100%. If the objective set is achieved or exceed, the award is 100% (no additional award in the event of an overperformance).

(e) Pursuant to the decision of the Board of Directors on July 27, 2017 concerning Benoît Potier specifically, an additional performance condition was added, based on the rate of achievement of the synergies following the Airgas acquisition. The Board meeting which will approve the 2019 financial statements will assess the level of performance achieved for this additional condition.

\* Number of performance shares after applying the rate of achievement of the performance conditions recorded by the Board on February 13, 2019 (2016 plans). As of December 31, 2018 the outstanding performance shares which have not yet been definitively awarded amounted to 1,539,577 shares; after applying the rate of achievement of the performance conditions, it amounts to 1,446,493 shares.

## DETAIL OF THE PERFORMANCE ACTION PLANS UNDERWAY FOR BENOÎT POTIER

	Performance shares 2015	"Airgas" Plan performance shares 2016	Performance shares 2016	Performance shares 2017	Performance shares 2018
Number of performance shares awarded <sup>(a)</sup>	10,000	20,000	17,800	17,980	18,230
Adjusted number of performance shares awarded, before applying the rate of achievement of the performance conditions <sup>(b)</sup>	11,324	22,647	19,626	19,644	18,230
Rate of achievement of performance conditions	82.50%	To be recorded in February 2020*	82.87%	To be recorded in February 2020	To be recorded in February 2021
Adjusted number of performance shares on the definitive award date	9,342	-	16,264	-	-

(a) Number of shares (historical data).

(b) In order to take into account share capital increases through free share issues (2017, 2014) and the share capital increase in cash on October 11, 2016.

\* Pursuant to the decision of the Board of Directors on July 27, 2017 concerning Benoît Potier specifically, an additional performance condition was added, based on the rate of achievement of the synergies following the Airgas acquisition. The Board meeting which will approve the 2019 financial statements will assess the level of performance achieved for this additional condition.

### 3.2. PERFORMANCE SHARE PLANS DATED SEPTEMBER 25, 2018

Pursuant to the authorization of the Combined Shareholders' Meeting on May 12, 2016, in connection with the "France" and "World" Plans dated September 25, 2018, the Board of Directors made a conditional allocation of a total of 393,774 shares representing 0.09 of the share capital in terms of the number of shares to 1,697 distinct beneficiaries (164,946 shares allocated to the beneficiaries of the "France" Plan and 228,828 shares allocated to the beneficiaries of the "World" Plan).

The IFRS individual fair value for these performance shares amounts to 98.75 euros for the "France" Plan and to 94.81 euros for the "World" Plan (see details of this IFRS value in Note 22.5 "Share-based payments" in the consolidated financial statements).

Subject to the satisfaction of the condition of presence and the performance conditions, these shares will definitively be vested in the beneficiaries on September 25, 2021 for the "France" Plan (but cannot be sold prior to September 25, 2023) and on September 25, 2022 for the "World" Plan.

For both these Plans, the Board adopted performance conditions to be calculated over three fiscal years, which are **identical to those set for the stock options** (for a full description, see pages 132 and 133).

The rate of achievement for the performance conditions will be recorded by the Board of Directors at its meeting to approve the financial statements for the 2020 fiscal year.

### 3.3. DISTRIBUTION BETWEEN THE VARIOUS CATEGORIES OF BENEFICIARIES (2018 PERFORMANCE SHARES PLANS)

#### Performance share plans dated September 25, 2018

September 25, 2018	Number of beneficiaries	Number of shares
Executive Officers of L'Air Liquide S.A.	1	18,230
Senior managers (who are not Executive Officers of L'Air Liquide S.A.)	133	153,247
Other managers and employees, special contributors (including new beneficiaries)	1,600	222,297

### 3.4. SHARES ALLOCATED TO THE 10 EMPLOYEES (EXCLUDING EXECUTIVE OFFICERS OF L'AIR LIQUIDE S.A.). WHO HAVE BEEN AWARDED THE HIGHEST NUMBER OF SHARES

#### Performance share plan dated September 25, 2018

September 25, 2018	Number of shares
For L'Air Liquide S.A.	40,910
For L'Air Liquide S.A. and its subsidiaries	69,100

### 3.5. RATE OF ACHIEVEMENT OF THE PERFORMANCE CONDITIONS FOR THE PERFORMANCE SHARE PLANS DATED NOVEMBER 29, 2016 (ANNUAL PLANS) AND JULY 29, 2016 (AIRGAS PLANS)

Based on the financial statements approved for the 2018 fiscal year and subject to the approval of the next Annual Shareholders' Meeting, the Board of Directors on February 13, 2019 recorded the rate of achievement of the performance conditions defined at the time of allocation of the performance share plan dated November 29, 2016. Consequently, the total proportion of the shares which have definitively vested in the beneficiaries is 82.87% (for more details, see page 138).

The Airgas plan dated July 29, 2016 was subject to same performance conditions as the annual plans dated November 29, 2016. Consequently, the Board of Directors recorded that the proportion of the shares which have definitively vested in the beneficiaries is 82.87%. Pursuant to the decision of the Board of Directors on July 27, 2017 concerning Benoît Potier specifically, an additional performance condition was added, based on the rate of achievement of the synergies following the Airgas acquisition. The Board meeting which will approve the 2019 financial statements will assess the level of performance achieved for this additional condition.



## — EMPLOYEE SAVINGS AND SHARE OWNERSHIP —

For many years, Air Liquide has pursued an active policy promoting employee profit-sharing and incentive schemes in connection with the Group's growth and the development of employee share ownership in the Company's capital.

### 1. Profit-sharing

Profit-sharing and incentive schemes have been organized for many years in Group companies in France and paid almost 48.6 million euros for 2017 performance. This year these schemes cover over 98% of employees in France.

Under the main Company Savings Plans, Group employees in France can make payments to dedicated and diversified investment funds, managed by equal-representation supervisory boards, on a voluntary basis or based on profit-sharing, incentives and, where applicable, contributions, and thus benefit from the preferential tax regime applicable in consideration for locking-in their assets over a period of five years.

In 2018, L'Air Liquide S.A. paid 6.47 million euros to 1,196 beneficiaries in respect of profit-sharing and incentives. Company contributions to the Company Savings Plan are negotiated every year and amounted to nearly 1.05 million euros in 2018. These payments correspond to an average amount of 6,180 euros per employee excluding employer contribution.

In 2018, L'Air Liquide S.A. employees invested 83% of their profit-sharing and incentives in savings plans, respectively in bond-weighted assets (43%) and equity-weighted assets (57%).

A total of 30% of employee savings was invested in corporate mutual fund holding only Air Liquide shares.

### 2. Employee share ownership

The Group is keen to involve its employees in its development. These employee share ownership transactions contribute significantly to increasing employee motivation and sense of belonging to the Group.

Since 1986, the Company has regularly performed share capital increases reserved for Group employees, for which subscription is offered at a preferential rate. The most recent capital increase, conducted in November 2018, resulted in the subscription of 1,049,529 shares by 19,078 Group employees, representing 29.4% of the eligible employees in 72 countries (for details of this operation, see the Supplementary Report page 174).

In France, the shares subscribed in these capital increases are also eligible for the preferential tax regime applicable provided that they are blocked over a period of five years, while those held abroad are governed by the legal regulations prevailing in each relevant country.

At the end of 2018, the share of capital held by Group employees and former employees was estimated at 2.4%, of which 1.7% corresponds (within the meaning of article L. 225-102 of the French Commercial Code) to shares subscribed by employees under employee-reserved capital increases or held through mutual funds. The percentage of Group employees holding L'Air Liquide S.A. shares totaled more than 43% of the workforce.

Air Liquide wishes to pursue this strategy and further the development of its employee share ownership, by regularly offering share capital increases to employees.

### 3. Increase in capital reserved for employees (2018) – Supplementary report

To the Shareholders,

We set out below the supplementary report pursuant to article R. 225-116 of the French Commercial Code, on the use we have made of the delegation of authority you granted to the Board of Directors, at the Combined Shareholders' Meeting of the Company on May 3, 2017, in the fifteenth resolution, for a maximum period of 26 months, in order, in accordance with the provisions of article L. 225-138-1 of the French Commercial Code and articles L. 3331-1 et seq. of the French Labor Code, to increase the share capital, on one or more occasions, within the limit of 5.5 million shares with a par value of 5.50 euros each, the subscription of such shares being reserved for the employees of the Company and French or foreign companies that are related to it within the meaning of articles L. 225-180 of the French Commercial Code and article L. 3344-1 of the French Labor Code, who adhere to a company or group savings plan.

#### 3.1. AUTHORIZATIONS AND DECISIONS

We wish to remind you that, pursuant to this delegation of authority by the Shareholders' Meeting:

- by decision dated May 16, 2018 and confirmed on July 27, 2018, the Board of Directors decided on the principle of a capital increase limited to 1,500,000 shares in favor of the employees of the Group who have adhered to a company or group savings plan in accordance with the provisions of articles L. 3331-1 et seq. of the French Labor Code and article L.225-138-1 of the French Commercial Code;
- for this purpose, the Board of Directors at the aforementioned meetings, delegated to the Chairman and Chief Executive Officer all the necessary powers to decide on the completion of this capital increase and implement this transaction and in particular:
  - to decide on the list of companies eligible for the transaction;
  - to set the subscription price (including, where applicable, the subscription prices applicable locally);
  - to set the terms and conditions and deadline for paying up the shares subscribed;
  - to adopt the dates for the opening and closing of the subscription period;
  - to record the creation of the new shares and completion of the corresponding capital increase;
  - to deduct the expenses, duties and fees incurred due to the issue, where applicable, from the amount of the corresponding issue premium;
  - to amend the articles of association accordingly;
  - and to do everything that is useful and necessary for the implementation of the transaction.

Accordingly, making use of the delegation of authority granted by the Board of Directors, the Chairman and Chief Executive Officer decided, on October 30, 2018, to carry out this transaction, set the opening and closing dates for the subscription period and set the subscription price for the new Air Liquide shares within the scope of the increase in capital reserved for employees.

#### 3.2. MAIN FEATURES OF THE TRANSACTION

The increase in capital reserved for employees falls within the scope, provided for by the applicable legal and regulatory provisions, of the France Share Purchase Plan (PE France) and the International Group Share Purchase Plan (PEGI) currently in force.

The subscription to this increase in capital was open to employees of French and foreign companies of the Group that were more than 50%-owned by L'Air Liquide S.A. in terms of share capital or voting rights and who have adhered to the PE France or the PEGI, on condition that these employees have been employed for at least three months at the date of the end of the subscription period (stricter conditions with regard to length of service are set by certain countries pursuant to local regulations).

It is to be noted that, pursuant to decisions made by the Chairman and Chief Executive Officer on March 30, 2009, November 2, 2010, October 29, 2013 and March 16, 2016 certain companies, of which L'Air Liquide S.A. directly or indirectly held 40%-50%, were allowed to adhere to the PE France or the PEGI.

Pursuant to a decision by the Chairman and Chief Executive Officer on October 30, 2018, the same right was also given to Group companies located in China, the United Kingdom and the United Arab Emirates, the employees of which were eligible for the 2018 transaction.

However, for reasons connected to the local context, employees of the Group's foreign subsidiaries in the following countries were not able to participate in the transaction: Algeria, Angola, Bahrain, Brunei, Mozambique and Vietnam.

The subscription price was set at 87.09 euros (92.53 euros for the United States) per share, the amount corresponding to the average of the opening trading prices of the Air Liquide share over the 20 trading days prior to the date of the decision of the Chairman and Chief Executive Officer setting the dates of the subscription period, i.e. 108.85 euros per share (the "Reference Price"); this amount was then reduced by 20% (15% for the United States) and rounded up to the nearest euro cent.

The maximum subscription amount per eligible employee was limited to 25% of the gross annual remuneration of each subscriber in accordance with the regulations on employee savings plans (with this limit including in France all other voluntary payments made into employee savings plans or employee retirement savings plans in 2018). An additional employer contribution in shares was proposed by L'Air Liquide S.A. and the French subsidiaries that have adhered to the France Share Purchase Plan and adopted the 2018 amendment agreement with regard to this point, on the basis of one free share for four shares subscribed with a maximum of three free shares per employee.

The subscription period for the shares was open from November 5, 2018 to November 16, 2018 inclusive.

Pursuant to the powers given him by the Board of Directors at its meetings on May 16, 2018 and July 27, 2018, the increase in capital was recorded by the Chairman and Chief Executive Officer on December 7, 2018.

The total number of new shares issued is 1,049,529 with a par value of 5.50 euros each, for a total number of 19,078 subscribers.

The new shares issued are Air Liquide ordinary shares of the same class and that are immediately assimilated to the Air Liquide shares already admitted for trading on the Euronext Paris market (Compartment A). They will be admitted for trading on the Euronext Paris market under the same ISIN code (FR0000120073) as the existing Air Liquide shares and shall grant entitlement to any dividend distribution decided by the Shareholders' Meeting after the date of the decision of the Chairman and Chief Executive Officer recording the increase in capital. The new shares will be subject to all the provisions of the articles of association.

### 3.3. IMPACT OF THE ISSUE OF 1,049,529 SHARES ON THE SITUATION OF SHAREHOLDERS AND THEIR PERCENTAGE OF SHAREHOLDERS' EQUITY AND THEORETICAL IMPACT ON THE STOCK MARKET VALUE OF THE SHARE

#### A. Impact on the shareholder's holding in the Company's share capital

On the basis of the share capital of L'Air Liquide S.A. at December, 7 2018 prior to the increase in capital reserved for employees, namely 428,344,317 shares, the impact of the issue on the shareholding of a shareholder who owns 1% of the share capital of L'Air Liquide S.A. prior to the issue and not subscribing to the issue is as follows:

	Percentage of capital held by the shareholder	
	Undiluted basis	Diluted basis <sup>(a)</sup>
Prior to the issue of new shares resulting from this capital increase	1%	0.990%
After the issue of new shares resulting from this capital increase	0.998%	0.987%

(a) The calculations are made on the basis of an assumption of the exercise of all the Company's dilutive instruments existing as at December, 7 2018 which may be exercised, taking into account an average of the last share prices of the Air Liquide share over the last 20 trading days and amounting to 105.24 euros.

#### B. Impact of the issue on the percentage of the Company's shareholders' equity

On the basis of the Company's shareholders' equity as shown by the individual financial statements at December 31, 2018, the impact of the issue on the percentage of shareholders' equity for the holder of one Air Liquide share prior to the issue and not subscribing to the issue is as follows:

	Percentage of shareholders' equity (in euros)	
	Undiluted basis	Diluted basis <sup>(a)</sup>
Prior to the issue of new shares resulting from this capital increase	29.32	29.59
After the issue of new shares resulting from this capital increase	29.46	29.72

(a) The calculations are made on the basis of an assumption of the exercise of all the Company's dilutive instruments existing as at December, 7 2018 which may be exercised, taking into account an average of the last share prices of the Air Liquide share over the last 20 trading days and amounting to 105.24 euros.

#### C. Theoretical impact on the stock market value of the Air Liquide share

The theoretical impact of the issue of 1,049,529 shares at the issue price on the stock market value of the share is calculated as follows:

- Theoretical share price prior to the transaction = average of the last 20 opening trading prices of the Air Liquide share prior to the decision by the Chairman and Chief Executive Officer setting the dates of the subscription period (calculated as the average of the last opening trading prices of the share between October 2, 2018 and October 29, 2018). This theoretical price amounts to 108.85 euros.
- Share price after the transaction = [(average of the last 20 opening trading prices of the share prior to the transaction x number of shares prior to the transaction) + (issue price x number of new shares)] / (number of shares prior to the transaction + number of new shares).

The average issue price of the reserved capital increase amounts to 87.69 euros.

In light of these assumptions, the theoretical stock market value of the share post-transaction would amount to 108.80 euros for a theoretical value of the share price prior to the transaction of 108.85 euros.

It is specified that this theoretical approach is given purely as an indication and does not in any way prejudge future trends in the share price.

Paris, February 13, 2019

The Board of Directors of L'Air Liquide S.A.

## 4. Statutory Auditors' supplementary report on the increase in capital reserved for employees who are members of a Company or Group savings plan

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.  
This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in accordance with article R. 225-116 of the French Commercial Code (*Code de commerce*), we hereby present you an additional report to our March 3, 2017 report, on the issue of ordinary shares and other equity securities giving rights to the share capital reserved for the employees of the Company and of any French or foreign companies related to it within the meaning of article L. 225-180 of the French Commercial Code (*Code de commerce*) and article L. 3344-1 of the French Labor Code (*Code du travail*), provided that such employees are members of a company or group savings plan, as approved by the Extraordinary Shareholders' Meeting of May 3, 2017.

This Meeting delegated authority to your Board of Directors to decide on such an operation within a period of 26 months and for a maximum amount of 30,250,000 euros (i.e. 5.5 million shares at a par value of 5.50 euros), overall limit stipulated in the fifteenth and sixteenth resolution of the Extraordinary Shareholders' Meeting of May 3, 2017.

Under this delegation of authority, at its May 16, 2018 meeting, confirmed as at July 27, 2018, the Board of Directors decided a share capital increase reserved for the employees members of a company or group savings plan with a limit of 1,500,000 shares and granted full powers to your Chairman and Chief Executive Officer to proceed with this operation

Exercising this delegation, your Chairman and Chief Executive Officer decided on October 30, 2018, to proceed with this operation.

The subscription to this increase in capital was opened to employees of French and foreign companies of the Group in which L'Air Liquide holds over 50% of the capital or voting rights and members of the France Employees Savings Plan (PE France) or the International Group Savings Plan (PEGI), on condition that these employees have been employed for at least three months at the closing date of the subscription period (stricter seniority conditions are set by certain countries pursuant to local regulations).

It is to be noted that, pursuant to decisions made by the Chairman and Chief Executive Officer on March 30, 2009, November 2, 2010, October 29, 2013 and March 16, 2016 certain companies, in which L'Air Liquide S.A. directly or indirectly holds 40% to 50%, were allowed to join to the PE France or the PEGI.

By decision of the Chairman and Chief Executive Officer on October 30, 2018, this ability was also granted to Group companies located in China, the United Kingdom and the United Arab Emirates, whose employees were allowed to enter the scope of the 2018 operation.

On December 7, 2018, your Chairman and Chief Executive Officer noted the issuing of 1,049,529 shares with a par value of 5.50 euros and a subscription price of 87.09 euros (92.53 euros for the United States).

It is the Board of Directors' responsibility to prepare a report in accordance with articles R. 225-115 and R.225-116 of the French Commercial Code (*Code de commerce*). It is our responsibility to express an opinion on the fairness of the information taken from the financial statements, on the proposed cancellation of shareholders' preferential subscription rights and on certain other information relating to this issue, contained in this report.

We have performed the procedures we considered necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in verifying:

- the fairness of the financial information taken from the consolidated financial statements approved by the Board of Directors. We have audited these financial statements in accordance with professional standards applicable in France;
- compliance of the terms and conditions of the operation with respect to the delegation of authority granted by the Extraordinary Shareholders' Meeting;
- the information provided in the Board of Directors' additional report on the methods for calculating the issue price and its final amount.

We have no matters to report as to:

- the compliance of the terms and conditions of the operation with respect to the delegation of authority granted by the Extraordinary Shareholders' Meeting of May 3, 2017 and the accompanying information provided to shareholders;
- the methods for calculating the issue price and its final amount;
- the presentation of the impact of the issuance on the position of holders of equity securities and other securities granting access to the Company's share capital, as expresses in relation to shareholders' equity and the market value of the shares;
- the proposed cancellation of preferential subscription rights, upon which you have voted.

Neuilly-sur-Seine and Paris-La Défense, February 28, 2019

The Statutory Auditors  
French original signed by

PricewaterhouseCoopers Audit  
Olivier Lotz Séverine Scheer

ERNST & YOUNG et Autres  
Jeanne Boillet Emmanuelle Mossé

## — TRANSACTIONS INVOLVING COMPANY SHARES — PERFORMED BY EXECUTIVE OFFICERS IN ACCORDANCE WITH ARTICLE L. 621-18-2 OF THE FRENCH MONETARY AND FINANCIAL CODE

In 2018, the following transactions involving Company shares were performed by Executive Officers and members of Executive Management, pursuant to article L. 621-18-2 of the French Monetary and Financial Code:

	Nature of the transactions	Date of transaction	Average price (in euros)
Brian Gilvary	Purchase of 596 shares of L' Air Liquide S.A.	January 11, 2018	107.30
Fabienne Lecorvaisier	Exercise of 22,034 options of L' Air Liquide S.A.	February 20, 2018	60.28
Fabienne Lecorvaisier	Sale of 22,034 shares of L' Air Liquide S.A.	February 20, 2018	102.10
Benoît Potier	Sale of 10,158 shares of L' Air Liquide S.A.	March 21, 2018	100.70
Benoît Potier	Sale of 22,600 shares of L' Air Liquide S.A.	March 23, 2018	98.86
Benoît Potier	Sale of 21,958 shares of L' Air Liquide S.A.	March 27, 2018	100.10
Benoît Potier	Sale of 21,456 shares of L' Air Liquide S.A.	March 28, 2018	100.00
Benoît Potier	Exercise of 109,097 options of L' Air Liquide S.A.	April 5, 2018	60.28
Benoît Potier	Sale of 6,860 shares of L' Air Liquide S.A.	April 27, 2018	106.43
Benoît Potier	Exercise of 12,082 options of L' Air Liquide S.A.	May 4, 2018	60.28
Pierre Dufour	Sale of 20,000 shares of L' Air Liquide S.A.	May 23, 2018	112.75
Pierre Dufour	Sale of 20,000 shares of L' Air Liquide S.A.	July 10, 2018	110.27
Benoît Potier	Definitive free share award of 9,342 shares of L' Air Liquide S.A.	September 28, 2018	
Fabienne Lecorvaisier	Definitive free share award of 4,360 shares of L' Air Liquide S.A.	September 28, 2018	
Fabienne Lecorvaisier	Subscription of 133 shares of L' Air Liquide S.A.	December 7, 2018	87.58

## FACTORS THAT MAY HAVE AN IMPACT IN THE EVENT OF A TAKEOVER BID

Pursuant to article L. 225-100-3 of the French Commercial Code, the factors that may have an impact in the event of a takeover bid are set forth below.

### 1. Board of Directors' powers

The share buyback authorization currently granted to the Company excludes any buybacks during a period of bidding on the Company's shares.

Furthermore, the following delegations of authority granted to the Board of Directors are suspended during periods of takeover bids:

- the delegation of authority granted to the Board of Directors by the Shareholders' Meeting of May 16, 2018 to increase the share capital through capitalization of additional paid-in capital, reserves, profits or any other amounts;
- the delegation of authority granted to the Board of Directors by the Shareholders' Meeting of May 3, 2017 to increase the share capital via the issuance of ordinary shares or marketable securities and the delegation which would replace it subject to the approval of the Shareholders' Meeting of May 7, 2019.

Some provisions relating to the regulations of the stock options plans are also applicable in the event of a takeover bid launched on the Company's shares – page 165 of this Reference Document.

### 2. Agreements that may be modified or terminated in the event of a change of control of the Company

Several bond issues under the Group's EMTN program include a clause providing that, under certain circumstances, the early repayment of such bonds may be requested in the event of a change of control of the Company:

- private placement issued in January 2008 maturing in January 2038 (15 billion yen, or 119.2 million euros equivalent <sup>(a)</sup>);
- bond issued in June 2010 maturing in June 2020 (500 million euros);
- private placement issued in December 2011 maturing in December 2019 (15.5 billion yen, or 123.2 million euros equivalent <sup>(a)</sup>);
- private placement issued in January 2012 maturing in March 2019 (200 million US Dollars, or 174.7 million euros equivalent <sup>(a)</sup>);
- bond issued in October 2012 maturing in October 2021 (500 million euros);
- bond issued in March 2013 maturing in September 2023 (300 million euros);
- bond issued in June 2013 maturing in June 2019 (250 million euros);
- private placement issued in January 2014 maturing in January 2026 (150 million euros);
- private placement issued in March 2014 maturing in March 2029 (100 million euros);
- bond issued in June 2014 maturing in June 2024 (500 million euros);
- private placement issued in September 2014 maturing in September 2022 (130 million swiss francs, or 115.4 million euros equivalent <sup>(a)</sup>);
- bond issued in January 2015 maturing in January 2022 (500 million renminbis, or 63.5 million euros equivalent <sup>(a)</sup>);
- bond issued in June 2015 maturing in June 2025 (500 million euros);
- bond issued in April 2016 maturing in April 2022 (300 million euros);
- bonds issued in June 2016 maturing in June 2020 (500 million euros), maturing in June 2022 (500 million euros), maturing in June 2024 (500 million euros), maturing in June 2028 (1,000 million euros).

(a) Converted at closing rate as of December 31, 2018, with 1 EUR = 125.85 JPY, 1 EUR = 1.145 USD, 1 EUR = 7.875 CNY and 1 EUR = 1.127 CHF.



Two bonds (or private placements) issued outside of the Group's EMTN program include a clause providing that, under certain circumstances, the early repayment of such bonds may be requested in the event of a change of control of the Company:

- US Private Placements issued in September 2012, maturing in September 2022 (400 million US dollars, or 349.3 million euros equivalent <sup>(a)</sup>), September 2024 (200 million US dollars, or 174.7 million euros equivalent <sup>(a)</sup>) and September 2027 (100 million US dollars, or 87.3 million euros equivalent <sup>(a)</sup>);
- US public bond (144a format) issued in September 2016, maturing in September 2019 (750 million US dollars, or 655.0 million euros equivalent <sup>(a)</sup>), maturing in September 2021 (1,000 million US dollars, or 873.4 million euros equivalent <sup>(a)</sup>), maturing in September 2023 (750 million US dollars, or 655.0 million euros equivalent <sup>(a)</sup>), maturing in September 2026 (1,250 million US dollars, or 1,091.7 million euros equivalent <sup>(a)</sup>) and maturing in September 2046 (750 million US dollars, or 655.0 million euros equivalent <sup>(a)</sup>).

Three bonds issued by Airgas, Inc include a clause providing that, under certain circumstances, the early repayment of such bonds may be requested in the event of a change of control of Airgas, Inc:

- bond issued in February 2013 maturing in February 2020 (275 million dollars, or 240.2 million euros equivalent <sup>(a)</sup>);
- bond issued in November 2012 maturing in November 2022 (250 million dollars, or 218.3 million euros equivalent <sup>(a)</sup>);
- bond issued in July 2014 maturing in July 2024 (300 million dollars, or 262.0 million euros equivalent <sup>(a)</sup>).

Some credit agreements of the Group include a clause providing that, under certain circumstances, the early repayment of the advances made under those credit agreements may be requested in the event of a change of control of the Company.

### 3. Agreements providing indemnities for Board members or employees if they resign or are dismissed without good and sufficient cause or if their employment ends due to a takeover bid

The indemnities granted to the Company's corporate officers in the event of a termination of their office are detailed on pages 163 et seq. of this Reference Document.

(a) Converted at closing rate as of December 31, 2018, with 1 EUR = 125.85 JPY, 1 EUR = 1.145 USD, 1 EUR = 7.875 CNY and 1 EUR = 1.127 CHF.





# 3

## FINANCIAL STATEMENTS

### CONSOLIDATED FINANCIAL STATEMENTS

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## CONSOLIDATED FINANCIAL STATEMENTS

### Consolidated income statement

For the year ended December 31

(in millions of euros)	Notes	2017	2018
<b>Revenue</b>	<b>(3)</b>	<b>20,349.3</b>	<b>21,011.1</b>
Other income	(4)	221.5	188.4
Purchases	(4)	(7,720.8)	(8,276.4)
Personnel expenses	(4)	(4,138.3)	(4,145.8)
Other expenses	(4)	(3,570.0)	(3,562.5)
<b>Operating income recurring before depreciation and amortization</b>		<b>5,141.7</b>	<b>5,214.8</b>
Depreciation and amortization expense	(4)	(1,777.9)	(1,766.3)
<b>Operating income recurring</b>		<b>3,363.8</b>	<b>3,448.5</b>
Other non-recurring operating income	(5)	219.8	4.6
Other non-recurring operating expenses	(5)	(563.3)	(166.4)
<b>Operating income</b>		<b>3,020.3</b>	<b>3,286.7</b>
Net finance costs	(6)	(421.9)	(303.4)
Other financial income	(6)	32.5	13.6
Other financial expenses	(6)	(100.0)	(62.9)
Income taxes	(7)	(207.3)	(730.7)
Share of profit of associates	(15)	5.2	4.1
<b>NET PROFIT FROM CONTINUING OPERATIONS</b>		<b>2,328.8</b>	<b>2,207.4</b>
<b>NET PROFIT FROM DISCONTINUED OPERATIONS</b>	<b>(8)</b>	<b>(37.2)</b>	<b>-</b>
<b>PROFIT FOR THE PERIOD</b>		<b>2,291.6</b>	<b>2,207.4</b>
■ Minority interests		92.0	94.0
■ Net profit (Group share)		2,199.6	2,113.4
<b>Basic earnings per share (in euros)</b>	<b>(9)</b>	<b>5.16</b>	<b>4.95</b>
<b>Diluted earnings per share (in euros)</b>	<b>(9)</b>	<b>5.14</b>	<b>4.93</b>
<b>Basic earnings per share from continuing operations (in euros)</b>		<b>5.25</b>	<b>4.95</b>
<b>Diluted earnings per share from continuing operations (in euros)</b>		<b>5.22</b>	<b>4.93</b>
<b>Basic earnings per share from discontinued operations (in euros)</b>	<b>(8)</b>	<b>(0.09)</b>	<b>-</b>
<b>Diluted earnings per share from discontinued operations (in euros)</b>	<b>(8)</b>	<b>(0.08)</b>	<b>-</b>

Accounting principles and notes to the financial statements begin on page 189.

## Statement of net income and gains and losses recognized directly in equity

For the year ended December 31

<i>(in millions of euros)</i>	2017	2018
<b>Profit for the period</b>	<b>2,291.6</b>	<b>2,207.4</b>
Items recognized in equity		
Change in fair value of financial instruments	(71.4)	(60.7)
Change in foreign currency translation reserve	(1,379.5)	384.9
<b>Items that may be subsequently reclassified to profit</b>	<b>(1,450.9)</b>	<b>324.2</b>
Actuarial gains/ (losses)	(89.0)	36.1
<b>Items that may not be subsequently reclassified to profit</b>	<b>(89.0)</b>	<b>36.1</b>
<b>Items recognized in equity, net of taxes</b>	<b>(1,539.9)</b>	<b>360.3</b>
<b>Net income and gains and losses recognized directly in equity</b>	<b>751.7</b>	<b>2,567.7</b>
■ Attributable to minority interests	62.8	98.6
■ Attributable to equity holders of the parent	688.9	2,469.1



## Consolidated balance sheet

For the year ended December 31

ASSETS (in millions of euros)	Notes	2017	2018
Goodwill	(11)	12,840.4	13,345.0
Other intangible assets	(12)	1,611.1	1,598.7
Property, plant and equipment	(13)	18,525.9	19,248.2
<b>Non-current assets</b>		<b>32,977.4</b>	<b>34,191.9</b>
Non-current financial assets	(14)	541.6	524.9
Investments in associates	(15)	128.2	142.1
Deferred tax assets	(16)	258.4	282.8
Fair value of non-current derivatives (assets)	(26)	130.5	75.9
<b>Other non-current assets</b>		<b>1,058.7</b>	<b>1,025.7</b>
<b>TOTAL NON-CURRENT ASSETS</b>		<b>34,036.1</b>	<b>35,217.6</b>
Inventories and work-in-progress	(17)	1,333.7	1,460.1
Trade receivables	(18)	2,900.0	2,500.4
Other current assets	(20)	863.5	892.0
Current tax assets		199.5	140.7
Fair value of current derivatives (assets)	(26)	38.4	44.2
Cash and cash equivalents	(21)	1,656.1	1,725.6
<b>TOTAL CURRENT ASSETS</b>		<b>6,991.2</b>	<b>6,763.0</b>
<b>TOTAL ASSETS</b>		<b>41,027.3</b>	<b>41,980.6</b>

EQUITY AND LIABILITIES (in millions of euros)	Notes	2017	2018
Share capital		2,356.2	2,361.8
Additional paid-in capital		2,821.3	2,884.5
Retained earnings		9,077.3	10,544.4
Treasury shares		(136.5)	(121.0)
Net profit (Group share)		2,199.6	2,113.4
<b>Shareholders' equity</b>		<b>16,317.9</b>	<b>17,783.1</b>
<b>Minority interests</b>		<b>400.5</b>	<b>424.3</b>
<b>TOTAL EQUITY (a)</b>	<b>(22)</b>	<b>16,718.4</b>	<b>18,207.4</b>
Provisions, pensions and other employee benefits	(23, 24)	2,593.3	2,410.7
Deferred tax liabilities	(16)	1,807.7	1,955.9
Non-current borrowings	(25)	12,522.4	11,709.6
Other non-current liabilities	(27)	238.5	250.0
Fair value of non-current derivatives (liabilities)	(26)	2.3	18.4
<b>TOTAL NON-CURRENT LIABILITIES</b>		<b>17,164.2</b>	<b>16,344.6</b>
Provisions, pensions and other employee benefits	(23, 24)	332.7	325.1
Trade payables	(28)	2,446.4	2,714.5
Other current liabilities	(27)	1,623.9	1,639.8
Current tax payables		194.2	171.2
Current borrowings	(25)	2,504.6	2,550.9
Fair value of current derivatives (liabilities)	(26)	42.9	27.1
<b>TOTAL CURRENT LIABILITIES</b>		<b>7,144.7</b>	<b>7,428.6</b>
<b>TOTAL EQUITY AND LIABILITIES</b>		<b>41,027.3</b>	<b>41,980.6</b>

(a) A breakdown of changes in shareholders' equity and minority interests is presented on pages 187 and 188.

## Consolidated cash flow statement

For the year ended December 31

(in millions of euros)	Notes	2017	2018
<b>Operating activities</b>			
<b>Net profit (Group share)</b>		<b>2,199.6</b>	<b>2,113.4</b>
<b>Minority interests</b>		<b>92.0</b>	<b>94.0</b>
Adjustments:			
■ Depreciation and amortization		1,782.9	1,766.3
■ Changes in deferred taxes <sup>(a)</sup>		(350.4)	55.3
■ Changes in provisions		298.9	(89.5)
■ Share of profit of associates	(15)	(0.2)	(4.1)
■ Profit/loss on disposal of assets		4.5	(9.6)
■ Net finance costs <sup>(b)</sup>		105.7	212.4
<b>Cash flows from operating activities before changes in working capital</b>		<b>4,133.0</b>	<b>4,138.2</b>
Changes in working capital	(19)	188.3	612.9
Others		(67.3)	(34.7)
<b>Net cash flows from operating activities</b>		<b>4,254.0</b>	<b>4,716.4</b>
<b>Investing activities</b>			
Purchase of property, plant and equipment and intangible assets	(12, 13)	(2,182.5)	(2,249.2)
Acquisition of consolidated companies and financial assets		(140.4)	(129.2)
Proceeds from sale of property, plant and equipment and intangible assets		472.9	98.0
Proceeds from sale of financial assets		4.3	5.1
Dividends received from equity affiliates		-	5.1
<b>Net cash flows used in investing activities</b>		<b>(1,845.7)</b>	<b>(2,270.2)</b>
<b>Financing activities</b>			
Dividends paid <sup>(c)</sup>			
■ L' Air Liquide S.A.		(1,031.2)	(1,159.4)
■ Minority interests		(67.6)	(75.3)
Proceeds from issues of share capital <sup>(c)</sup>		70.0	138.1
Purchase of treasury shares <sup>(c)</sup>		(158.4)	(63.6)
Net financial interests paid <sup>(b)</sup>		-	(167.1)
Increase (decrease) in borrowings <sup>(b)</sup>		(1,085.4)	(1,149.8)
Transactions with minority shareholders		(4.4)	(1.4)
<b>Net cash flows from (used in) financing activities</b>		<b>(2,277.0)</b>	<b>(2,478.5)</b>
Effect of exchange rate changes and change in scope of consolidation		(46.1)	65.2
<b>Net increase (decrease) in net cash and cash equivalents</b>		<b>85.2</b>	<b>32.9</b>
<b>NET CASH AND CASH EQUIVALENTS AT THE BEGINNING OF THE PERIOD</b>		<b>1,430.5</b>	<b>1,515.7</b>
<b>NET CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD</b>		<b>1,515.7</b>	<b>1,548.6</b>

(a) Changes in deferred taxes reported in the consolidated cash flow statement do not include changes in deferred taxes relating to disposals of assets and capitalized finance costs.

(b) The net finance costs of 2017 only included the amount related to the acquisition of Airgas.

(c) A breakdown of dividends paid, share capital increases and treasury share purchases is provided on pages 187 and 188.

The analysis of net cash and cash equivalents at the end of the period is as follows:

(in millions of euros)	Notes	2017	2018
Cash and cash equivalents	(21)	1,656.1	1,725.6
Bank overdrafts (included in current borrowings)		(140.4)	(177.0)
<b>NET CASH AND CASH EQUIVALENTS</b>		<b>1,515.7</b>	<b>1,548.6</b>

## Consolidated statement of changes in equity

### CONSOLIDATED STATEMENT OF CHANGES IN EQUITY FROM JANUARY 1, 2018 TO DECEMBER 31, 2018

(in millions of euros)	Notes	Share capital	Additional paid-in capital	Retained earnings (including net profit)	Fair value of financial instruments	Translation reserves	Treasury shares	Shareholders' equity	Minority interests	Total equity
<b>Equity and minority interests as of January 1, 2018</b>		2,356.2	2,821.3	12,602.8	(197.8)	(1,128.1)	(136.5)	16,317.9	400.5	16,718.4
<b>Profit for the period</b>				2,113.4				2,113.4	94.0	2,207.4
Items recognized directly in equity				36.1	(60.7)	380.3		355.7	4.6	360.3
<b>Net income and gains and losses recognized directly in equity <sup>(a)</sup></b>				2,149.5	(60.7)	380.3		2,469.1	98.6	2,567.7
Increase (decrease) in share capital		9.2	123.0					132.2	5.9	138.1
Distribution	(10)			(1,160.0)				(1,160.0)	(75.3)	(1,235.3)
Cancellation of treasury share <sup>(c)</sup>		(3.6)	(59.8)				63.4			
Purchases/Disposals of treasury shares <sup>(c)</sup>							(63.3)	(63.3)		(63.3)
Share-based payments				30.9			15.4	46.3		46.3
Transactions with minority shareholders recognized directly in equity				(37.8)				(37.8)	(5.4)	(43.2)
Others <sup>(e)</sup>				78.7				78.7		78.7
<b>EQUITY AND MINORITY INTERESTS AS OF DECEMBER 31, 2018</b>		2,361.8 <sup>(b)</sup>	2,884.5 <sup>(d)</sup>	13,664.1	(258.5)	(747.8)	(121.0) <sup>(c)</sup>	17,783.1	424.3	18,207.4

(a) The statement of net income and gains and losses recognized directly in equity is presented on page 184.

(b) Share capital as of December 31, 2018 was made up of 429,423,434 shares at a par value of 5.50 euros. During the fiscal year, movements affecting share capital were as follows:

- creation of 630,355 shares in cash with a par value of 5.50 euros resulting from the exercise of options;
- share capital decrease by canceling 654,000 shares, bought under the approval of the Combined Shareholders' Meeting on May 16, 2018;
- creation of 1,049,529 shares in cash with a par value of 5.50 euros resulting from the capital increase reserved for employees.

(c) The number of treasury shares as of December 31, 2018 totaled 1,456,504 (including 1,234,488 held by L'Air Liquide S.A.). During the fiscal year, movements affecting treasury shares were mainly as follows:

- acquisitions, net of disposals, of 631,500 shares;
- cancelation of 654,000 shares by capital decrease;
- allocation of 186,694 shares as part of performance shares to employees and Group management;

(d) During the fiscal year, movements affecting "Additional paid-in capital" were as follows:

- increase related to capital increases for 123.0 million euros;
- decrease related to the cancelation of treasury shares for -59.8 million euros.

(e) Others mainly include the impact of the restatement related to hyperinflation in Argentina.

## CONSOLIDATED STATEMENT OF CHANGES IN EQUITY FROM JANUARY 1, 2017 TO DECEMBER 31, 2017

<i>(in millions of euros)</i>	Share capital	Additional paid-in capital	Retained earnings (including net profit)	Fair value of financial instruments	Translation reserves	Treasury shares	Shareholders' equity	Minority interests	Total equity
<b>Equity and minority interests as of January 1, 2017</b>	2,138.8	3,103.3	11,515.5	(126.4)	222.3	(111.7)	16,741.8	383.2	17,125.0
<b>Profit for the period</b>			2,199.6				2,199.6	92.0	2,291.6
Items recognized directly in equity			(88.9)	(71.4)	(1,350.4)		(1,510.7)	(29.2)	(1,539.9)
<b>Net income and gains and losses recognized directly in equity <sup>(a)</sup></b>			2,110.7	(71.4)	(1,350.4)		688.9	62.8	751.7
Increase (decrease) in share capital	4.5	46.2					50.7	18.9	69.6
Free share attribution	219.0	(219.0)							
Distribution			(1,031.3)				(1,031.3)	(67.6)	(1,098.9)
Cancellation of treasury shares	(6.1)	(109.2)				115.3			
Purchase/Disposal of treasury shares						(158.1)	(158.1)		(158.1)
Share-based payments			25.0			9.4	34.4		34.4
Transactions with minority shareholders recognized directly in equity			(10.1)				(10.1)	3.3	(6.8)
Others			(7.0)			8.6	1.6	(0.1)	1.5
<b>EQUITY AND MINORITY INTERESTS AS OF DECEMBER 31, 2017</b>	2,356.2	2,821.3	12,602.8	(197.8)	(1,128.1)	(136.5)	16,317.9	400.5	16,718.4

(a) The statement of net income and gains and losses recognized directly in equity is presented on page 184.

## Accounting principles

### BASIS FOR PREPARATION OF THE CONSOLIDATED FINANCIAL STATEMENTS

Due to its listing on the Paris Stock Exchange and pursuant to EC Regulation No. 1606/2002 of July 19, 2002, the consolidated financial statements of the Air Liquide Group for the year ended December 31, 2018 have been prepared in accordance with IFRS (International Financial Reporting Standards), as endorsed by the European Union as of December 31, 2018, and with IFRSs without use of the carve-out option, as published by the IASB (International Accounting Standards Board). The IFRS standards and interpretations as adopted by the European Union are available at the following website:

[https://ec.europa.eu/info/law/international-accounting-standards-regulation-ec-no-1606-2002/amending-and-supplementary-acts/acts-adopted-basis-regulatory-procedure-scrutiny-rps\\_en](https://ec.europa.eu/info/law/international-accounting-standards-regulation-ec-no-1606-2002/amending-and-supplementary-acts/acts-adopted-basis-regulatory-procedure-scrutiny-rps_en)

The Group has not anticipated any new standards, amendments to existing standards or new interpretations published by the IASB but not yet approved or not yet mandatory in the European Union, as of December 31, 2018.

The financial statements are presented in millions of euros. They were approved by the Board of Directors on February 13, 2019. They will be submitted for approval to the Shareholders' Meeting on May 7, 2019.

### NEW IFRS AND INTERPRETATIONS

#### 1. Standards, interpretations and amendments endorsed by the European Union whose application is mandatory as of January 1, 2018

The following texts have no material impact on the Group financial statements:

- IFRS 15 "Revenue from contracts with customers", issued on May 28, 2014, including the amendment to IFRS 15 "Effective Date of IFRS 15", issued on September 11, 2015 and clarifications to IFRS 15 issued on April 12, 2016:

The accounting principles relating to the revenue recognition are described in the section 3 of accounting policies.

- IFRS 9 "Financial Instruments", issued on July 24, 2014:

This standard replaces IAS 39 which was applicable until December 31, 2017. The main changes introduced by this new standard are as follows:

- the impairment model for assets which must comply with a unique model named "expected credit losses" instead of the model named 'incurred credit losses';
- the hedge accounting requirements, better aligned with the Group' strategy of risk management;
- classification and valuation of the financial assets, depending on the asset management by the entity.

The accounting principles relating to financial instruments are described in the section 6 of accounting policies.

- IFRIC 22 "Foreign Currency Transactions and Advance Consideration", issued on December 8, 2016.

Additionally, the following texts will not have any impact on the Group financial statements:

- amendments to IFRS 2 "Classification and measurement of share-based payment transactions", issued on June 20, 2016;
- annual improvements to IFRSs 2014-2016 Cycle, issued on December 8, 2016.

Finally, the following texts are not applicable to the Group:

- amendments to IFRS 4 "Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts", issued on September 12, 2016;
- amendments to IAS 40 "Transfers of Investment Property", issued on December 8, 2016.

#### 2. Standards, interpretations and amendments endorsed by the European Union whose application is optional in 2018

The Group financial statements for the year ended December 31, 2018 do not include any potential impacts from the standards, interpretations and amendments endorsed by the European Union as of December 31, 2018 for which adoption is only mandatory as of fiscal years beginning after January 1, 2018. These texts are as follows:

- IFRS 16 "Leases", issued on January 13, 2016, for which adoption is only mandatory as of January 1, 2019:

As explained in section 3 of accounting policies, Air Liquide supplies its Large Industries customers directly by pipelines or from different plants connected by a network. In these cases, the assets are not identified under the meaning of IFRS 16 "Leases" and no lease contract is contained in the contracts with customers. When the customer's gas supply comes from a dedicated plant, the Group may decide on the use of these plants under the meaning of IFRS 16 "Leases". For Industrial Merchant, Healthcare and Electronics customers, Air Liquide supplies gas with its own equipment. Customers have no right of control on the identified assets under the meaning of IFRS 16 "Leases". Consequently, these gas supply contracts do not contain leases. Thus, the application of IFRS 16 "Leases" will have no impact on the accounting treatment of these contracts.

The application of IFRS 16 relating to the contracts concluded by the Group as a lessee consists in recognition on the balance sheet of all lease contracts without distinction between finance and operating leases (the accounting policies for leases under IAS 17 are described in the section 5.g of accounting policies). According to IFRS 16, any contract containing a lease leads to recognition on the lessee's balance sheet of a right-of-use of the leased asset and a lease liability related to commitments for future lease payments.

In the course of its activity, the Group enters as a lessee in contracts mainly for the following types of assets:

- land, buildings and offices;
- transportation equipment, in particular for Industrial Merchant and Healthcare business lines;
- other equipment.

The Group has analyzed the above-mentioned contracts in the following purposes:

- to identify whether they contain a lease under IFRS 16:

A contract is, or contains, a lease if it conveys the right to control the use of an identified asset for a period of time in exchange of consideration. In particular, the Group has concluded that transportation contracts which confer to the supplier the substantive right to substitute the vehicle throughout the period of use and/or the control on the choice of the route, the driver and maintenance policy, are service contracts and do not meet the definition of a lease under IFRS 16.

- to determine the main assumptions retained to evaluate the right-of-use and the lease liability, in particular, lease term and discount rate used for evaluation of the lease liability:

Lease term is the non-cancellable period for which a lessee has the right to use an underlying asset, together with periods covered by an option to extend or to terminate the lease if the Group is reasonably certain to exercise (for options to extend) or not to exercise (for options to terminate) such options. The probability to exercise or not an option has been determined by type of contracts or on a case-by-case basis according to contractual terms, regulatory environment and the nature of the underlying asset (in particular, its technical specificity and strategic location).

The discount rate used for evaluation of the lease liability is the lessee's incremental borrowing rate. Due to the centralized financing in the Group, it corresponds for each subsidiary to the interest rate for intragroup borrowings determined according to the currency of the lease contract, the country and the lease term.

The Group will apply IFRS 16 starting from January 1, 2019. Pursuant different transition options for the first application of IFRS 16, the Group has opted for modified retrospective transition method, which consists in recognition at the date of initial application:

- on the one hand, of the lease liability measured at the present value of the remaining lease payments, using the discount rate at the transition date;
- and on the other hand, of the right-of-use measured for the amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments as well as of any provision for onerous leases recognized in the balance sheet as of December 31, 2018.

According to modified retrospective method, the Group will not perform restatement of prior year's financial statements.

In addition, the Group has chosen not to apply IFRS 16:

- to the lease contracts having a lease terms of 12 months or less;
- to the lease contracts for which the underlying asset is of low value, in particular, office and telephony equipment, computers and small IT equipment. Lease contracts for data centers are analyzed on a case-by-case basis.

Data collection and quantitative analysis of the impacts on the Group's financial statements are being finalized. The Group estimates that the first application of IFRS 16 would lead to a recognition as of January 1, 2019 of a lease liability within a range of 1.3-1.5 million euros. The Group does not expect any significant impact on the net profit resulting from application of IFRS 16.

Additionally, the Group does not expect any material impact resulting from application of the following texts:

- amendments to IFRS 9 "Prepayment Features with Negative Compensation", issued on October 12, 2017;
- IFRIC 23 "Uncertainty over Income Tax Treatments", issued on June 7, 2017.

### 3. Standards, interpretations and amendments not yet endorsed by the European Union

The impacts on the financial statements of texts published by the IASB as of December 31, 2018 and not yet endorsed by the European Union are currently being analyzed. These texts are as follows:

- amendments to IAS 28 "Long-term Interests in Associates and Joint Ventures", issued on October 12, 2017;
- annual improvements to IFRSs 2015-2017 Cycle, issued on December 12, 2017;
- amendments to IAS 19 "Plan Amendment, Curtailment or Settlement", issued on February 7, 2018;
- amendments to references to the Conceptual Framework in IFRS Standards, issued on March 29, 2018;
- amendments to IFRS 3 "Definition of a business", issued on October 22, 2018;
- amendments to IAS 1 and IAS 8 "Disclosure Initiative – Definition of Material", issued on October 31, 2018.

Additionally, the following texts are not applicable to the Group:

- IFRS 17 "Insurance Contracts", issued on May 18, 2017.

### USE OF ESTIMATES AND ASSUMPTIONS

The preparation of the financial statements requires Group or subsidiary management to make estimates and use certain assumptions which have a significant impact on the carrying amounts of assets and liabilities recorded in the consolidated balance sheet, the notes related to these assets and liabilities, the profit and expense items in the income statement and the commitments relating to the period-end. Balance sheet, income statement and cash flow statement line items could differ should the subsequent actual results differ from the estimates. The most significant estimates and assumptions concern namely:

- the estimated useful life of property, plant and equipment used for calculation of depreciation and amortization: these estimates are described in section 5.e of the accounting policies;
- the assumptions used to determine provisions for employee retirement benefit obligations: the actuarial assumptions used (employee turnover, mortality, retirement age, salary increase, etc.), and the discount rates used to determine the present value of obligations, as described in section 11.b of the accounting policies and in note 24.3;

- the estimates and assumptions concerning assets' impairment tests, as described in section 5.f. of the accounting policies and in note 11.2;
- the methods used to recover deferred tax assets on the balance sheet;
- the risk assessment to determine the amount of provisions for contingencies and losses;
- the accounting methods for the margin of the Engineering & Construction contracts that are set out in section 3.b of the accounting policies.

## ACCOUNTING POLICIES

The consolidated financial statements were prepared under the historical cost convention, except for financial assets and liabilities measured at fair value through profit or loss or through other comprehensive income in accordance with IAS 32/IFRS 9. The carrying amount of other assets and liabilities hedged against fair value risk is adjusted to take into account the changes in fair value attributable to the hedged risks. In addition, the principles of fairness, going concern, and consistency were applied.

### 1. CONSOLIDATION METHODS

The consolidation methods used are:

- full consolidation method for subsidiaries;
- assets, liabilities, expenses and revenue of joint operations are recognized in relation to the Group's interest in these entities;
- equity method for joint ventures and associates.

#### a. Subsidiaries

All the subsidiaries or companies in which the Air Liquide Group exercises exclusive control are fully consolidated. Control exists when all the following conditions are met:

- the Group has existing rights that give it the current ability to direct the relevant activities;
- the Group is exposed, or has rights, to variable returns from its involvement with the entity;
- the Group has the ability to use its power over the entity so that it affects the amount of the returns.

Companies are fully consolidated from the date the Group obtains control and until the date on which control is transferred outside the Group.

#### b. Joint operations

Joint operations are joint arrangements whereby the Air Liquide Group has joint control with one or several parties through a contractual agreement, which gives it rights to the assets and obligations for the liabilities of the entity.

Assets, liabilities, expenses and revenue of joint operations are recognized in relation to the Group's interest in these entities. These amounts are recorded on each relevant line of the financial statements as for the consolidated entities.

#### c. Joint ventures

Joint ventures are joint arrangements whereby the Air Liquide Group has joint control with one or several parties through a contractual agreement, which gives it rights to the net assets of the entity.

Joint ventures are consolidated using the equity method. Under this one, the net assets and net profit of a company are recognized pro rata to the interest held by the Group in the share capital.

On acquisition of an investment in a joint venture, goodwill relating to the joint venture is included in the carrying amount of the investment.

#### d. Associates

Associates are investments over which the Air Liquide Group has significant influence (generally when the Group has more than a 20% interest), but no control.

Associates are consolidated using the equity method. Under this one, the net assets and net profit of a company are recognized pro rata to the interest held by the Group in the share capital.

On acquisition of an investment in an associate, the goodwill relating to the associate is included in the carrying amount of the investment.

The financial statements of subsidiaries, joint arrangements and associates are prepared as of December 31.

#### e. Inter-company transactions

All inter-company receivables and payables, income and expenses and profits or losses are eliminated.



## 2. TRANSLATION OF THE FINANCIAL STATEMENTS OF COMPANIES WHOSE FUNCTIONAL CURRENCY IS NOT THE EURO

The functional currency of an entity is the currency of the primary economic environment in which it carries out its operations. In the majority of cases, the functional currency corresponds to the local currency. However, a functional currency other than the local currency can be retained for certain entities, provided that it represents the currency of the main transactions carried out by the entity and that it ensures faithful representation of its economic environment.

At the balance sheet date, the financial statements of companies whose functional currency is not the euro are translated into euros as follows:

- balance sheet items, at the official year-end exchange rates;
- income statement and cash flow statement items, using the average exchange rate over the period for each currency.

Exchange differences are recognized under a separate item "Translation reserves" in gains and losses recognized directly in equity.

Cumulative foreign exchange gains and losses as of January 1, 2004 arising from the translation into euros of the financial statements of subsidiaries whose functional currency is not the euro have been maintained as a separate component of equity.

On removal from the scope of consolidation, the cumulative exchange differences of a company whose functional currency is not the euro are recognized in the income statement.

Since July 1, 2018, Argentina appears among hyperinflationary countries. The impacts of hyperinflation of this country for 2018 financial year are not significant for the Group.

## 3. REVENUE RECOGNITION

The analysis of revenue recognition is based on the Group's activities, as follows:

### a. Gas & Services

The supply of gas involves local production in order to limit transport costs. Therefore, Air Liquide gas production units are located throughout the world and can supply several types of customers and industries, with the relevant volumes and services required:

#### Large Industries

This business is characterized by the supply of large quantities of gas contracted for a period of 15 years or longer with a limited number of customers. The Group guarantees a high level of reliability and availability of gas supply with continued service, over the long-term. In return, these contracts include guaranteed minimum volumes through firm purchase clauses (take-or-pay). Due to the volume of gas to be supplied, Air Liquide supplies its Large Industries customers directly by pipelines, from a dedicated plant or different plants connected by a network.

These plants represent significant investments that are generally made in a way to share the production assets with the other business lines of the Group, particularly the Industrial Merchant business, or intended to serve the customers in an industrial basin that is connected on a pipeline network. In these cases, the assets are not identified under the meaning of IFRS 16 "Leases" and no lease contract is contained in the contracts with customers. When the customer's gas supply comes from a dedicated plant, the Group may decide on the use of these plants under the meaning of IFRS 16 "Leases". Consequently, the gas supply contracts for the Large Industries business do not contain leases.

Customers of the Large Industries business simultaneously receive and consume the benefits granted by the gas supply service or its availability. As a result, the revenue recognition related to these contracts occurs when the gas is supplied or when the reserved capacity is made available.

#### Industrial Merchant, Healthcare and Electronics

The Industrial Merchant business relies mainly on the gas production capacity of Large Industries and thereafter develops its own distribution logistics. This business is characterized by a wide range of customers and markets. The contract terms can be up to five years for cylinders and liquid gas supply and up to 15 years for small on-site gas generators.

Healthcare business supplies medical gases, hygiene products, services as well as medical devices to hospitals and patients in their homes. It also produces and distributes healthcare specialty ingredients for the cosmetics, pharmaceutical and vaccine markets.

The Electronics business supplies its customers with (i) carrier gases with a business model based on long-term contracts and on guaranteed minimum volumes with take-or-pay type clauses, (ii) electronics specialty materials in the form of pure or mixed gases, (iii) advanced materials, (iv) equipment and installations and (v) services notably on-site quality control and fluid management services.

For safety and quality reasons, Air Liquide supplies gas with its own equipment (small generators, storage tank, cylinders). Customers have no right of control on the identified assets under the meaning of IFRS 16 "Leases". Consequently, the gas supply contracts for these businesses do not contain leases and the revenue recognition occurs as follows:

- gas supply: the revenue recognition occurs when the gas is supplied or when the reserved capacity is made available;
- sale of standard equipment and materials: the revenue recognition occurs when the control of these equipment and materials is transferred, which generally takes place at their delivery;
- specific equipment and installations: the transfer of control occurs over the time, together with their construction. Consequently, the revenue recognition occurs based on the stage of completion of the contracts at the balance sheet date;
- service: the revenue recognition occurs when the service is provided.

## b. Engineering & Construction

Air Liquide enters into contracts to design and build production units worldwide for third-party customers.

The control of installations is transferred progressively with their design / construction. Consequently, the revenue recognition is based on the stage of completion of the contracts at the balance sheet date. The costs associated are recognized as an expense in the period when incurred. The stage of completion is assessed by using the ratio of contract costs incurred at the balance sheet date versus total estimated contract costs.

The margin realized at the stage of completion is recognized only when it can be reliably measured. When it is probable that total contract costs will exceed total contract revenue, the expected loss is immediately recognized as a provision for onerous contracts.

## c. Global Markets & Technologies

The Global Markets & Technologies business focuses on new markets requiring a global approach. This business is growing mainly within the following markets:

- new markets relating to the energy transition, as well as space, aerospace, and extreme cryogenics markets. As a consequence of its nature, the analysis of the revenue recognition on this market is done on a case-by-case basis depending on the nature of performance obligations;
- gas usages by the actors in the maritime sector, namely offshore oil and gas platforms, offshore wind turbines, or cryogenic transportation by sea. The analysis carried out for Industrial Merchant is applicable to this market.

## 4. TAXES

### a. Income tax expense

The tax rate is calculated on the basis of the fiscal regulations enacted or substantively enacted at the fiscal year closing date in each of the countries where the Group's companies carry out their business.

The Group's applicable tax rate corresponds to the average of the theoretical tax rates in force in each of the countries, weighted according to profit obtained in each of these countries.

The average effective tax rate is calculated as follows: (current and deferred income tax expense) / (net profit before tax less share of profit of associates, dividends received and net profit from discontinued operations).

### b. Deferred taxes

Deferred taxes are recognized for all temporary differences between the carrying amount of assets and liabilities and their tax base (excluding non-deductible goodwill and the other exceptions provided in IAS 12), the tax loss carryforwards and the unused tax credits. Deferred tax assets are recognized on all deductible temporary differences provided that it is highly probable that the tax benefits will be realized in future years.

Deferred taxes are calculated at the tax rate applicable when the temporary difference is reversed and allowed under local regulations at the period-end date. The liability method is applied and any changes to the tax rates are recognized in the income statement, except those related to items directly recognized in equity.

Deferred tax assets and liabilities are offset if the entities have a legally enforceable right to offset and if they relate to income tax levied by the same taxation authority. Deferred taxes are not discounted.

Deferred taxes are mainly due to temporary differences between the tax and economic depreciation of assets, the carryforward of tax losses and provisions not immediately deductible for tax purposes, such as employee benefit provisions.

When the Group decides not to distribute profits retained by the subsidiary within the foreseeable future, no deferred tax liability is recognized.

## 5. NON-CURRENT ASSETS

### a. Goodwill and business combinations

#### Business combinations as of January 1, 2010

The Group has prospectively applied IFRS 3 revised and IAS 27 revised since January 1, 2010.

When the Group obtains control of an acquiree, the business combination is accounted for by applying the acquisition method on the acquisition date, in accordance with IFRS 3 revised:

- the identifiable assets acquired and the liabilities and contingent liabilities assumed are measured at fair value;
- any minority interests in an acquiree are measured as the minority interest's proportionate share of the acquiree's net identifiable assets or at fair value. This option is applied on a case-by-case basis;
- the consideration transferred and any contingent consideration are measured at fair value;
- acquisition-related costs are recorded as expenses in the periods in which they are incurred.

For a business combination achieved in stages, any previously held equity interests in the acquiree are measured at the acquisition-date fair value. Any resulting gains or losses are recognized in profit or loss.

The measurement period of a business combination shall not exceed 12 months as of the acquisition date. Any adjustments, after the measurement period, of the consideration transferred and the fair values of acquired assets and assumed liabilities are recorded in the income statement.

On the acquisition date, goodwill is recognized in the consolidated balance sheet as the difference between:

- the consideration transferred plus the amount of minority interests in the acquiree and the fair value of the previously held equity interest; and,
- the fair value of the identifiable assets acquired and the liabilities and contingent liabilities assumed.

Negative goodwill is recognized immediately through profit or loss.

### Business combinations prior to January 1, 2010

Business combinations achieved prior to January 1, 2010 have been accounted for in accordance with the former versions of IFRS 3 and IAS 27. These standards had already adopted the acquisition method in the version published by the IASB in March 2004. The main provisions which differ from the revised standards are as follows:

- minority interests were measured based on their share of the net identifiable assets of the acquiree and the fair value measurement option did not exist;
- earn-outs were included in the acquisition cost, without time limits, when the payment was deemed probable and the amount could be reliably measured;
- acquisition-related costs were recorded in the cost of the business combination.

For an acquisition achieved in stages, the fair value remeasurement of any previously held net asset was recognized in equity.

For an acquisition of minority interests in a previously held company, the difference between the acquisition cost and the net carrying amount of the minority interests was recorded in goodwill.

At the time of the transition to IFRS and in accordance with the exemption offered by IFRS 1, the Group decided not to apply IFRS 3 "Business combinations" retrospectively for acquisitions that took place prior to January 1, 2004.

Goodwill is allocated to cash-generating units (CGUs) or groups of cash-generating units that benefit from business combination synergies. Subsequently, goodwill is not amortized but is tested for impairment annually or more frequently if there are any indications of impairment, in accordance with the method described in section 5.f.

### b. Research and Development expenditures

Research and Development expenditures include all costs related to the scientific and technical activities, patent work, education and training necessary to ensure the development, manufacturing, start-up, and commercialization of new or improved products or processes.

According to IAS 38, development costs shall be capitalized if, and only if, the Group can meet all of the following criteria:

- the project is clearly identified and the related costs are itemized and reliably monitored;
- the technical and industrial feasibility of completing the project is demonstrated;
- there is a clear intention to complete the project and to use or sell the intangible asset arising from it;
- the Group has the ability to use or sell the intangible asset arising from the project;
- the Group can demonstrate how the intangible asset will generate probable future economic benefits;
- the Group has adequate technical, financial and other resources to complete the project and to use or sell the intangible asset.

When these conditions are not satisfied, development costs generated by the Group are recognized as an expense when incurred.

Research expenditure is recognized as an expense when incurred.

### c. Internally generated intangible assets

Internally generated intangible assets primarily include the development costs of information management systems. These costs are capitalized only if they satisfy the criteria as defined by IAS 38 and described above.

Internal and external development costs on management information systems arising from the development phase are capitalized. Significant maintenance and improvement costs are added to the initial cost of assets if they specifically meet the capitalization criteria.

Internally generated intangible assets are amortized over their useful lives.

### d. Other intangible assets

Other intangible assets include separately acquired intangible assets such as software, licenses, and intellectual property rights. They also include the technology, brands and customer contracts valued upon the acquisition of companies in accordance with IFRS 3 "Business Combinations".

With the exception of certain brands, intangible assets are amortized using the straight-line method over their useful lives. Information management systems are generally amortized over a period comprised between five and eight years and customer contracts over a maximum period of 25 years, considering the probabilities of renewal.

### e. Property, plant and equipment

Land, buildings and equipment are carried at their acquisition cost less any accumulated depreciation and impairment losses.

In the event of mandatory dismantling or asset removals, related costs are added to the initial cost of the relevant assets and provisions are recognized to cover these costs.

Interest costs on borrowings to finance the construction of property, plant, and equipment are capitalized during the period of construction when they relate to the financing of industrial projects over a twelve-month construction period, or longer.

Where parts of an item of property, plant and equipment have different useful lives, they are accounted separately and depreciated over their own useful lives.

Repair and maintenance costs are recognized as expenses when incurred. The costs of major inspections and overhauls are recognized as a separate component of the asset and are depreciated over the period between two major overhauls.

Depreciation is calculated according to the straight-line method over the estimated useful lives as follows:

- buildings: 20 to 30 years;
- cylinders: 10 to 40 years;
- production units: 15 to 20 years;
- pipelines: 15 to 35 years;
- other equipment: 5 to 30 years.

The estimated useful lives are reviewed regularly and changes in the estimates are recorded prospectively from the date of change.

Land is not depreciated.

## f. Impairment of assets

The Group regularly assesses whether there are any indications of asset impairment. If such indications exist, an impairment test is performed to assess whether the carrying amount of the asset is greater than its recoverable amount, defined as the higher of the fair value less costs to sell (net fair value) and the value in use.

Impairment tests are performed systematically once a year for goodwill and intangible assets with indefinite useful lives.

Assets that do not generate largely independent cash flows are grouped according to the cash-generating units (CGUs) to which they belong. A cash-generating unit is an identifiable group of assets that generates cash inflows that are largely independent of the cash inflows of other assets or groups of assets. They are mainly determined on a geographical basis and by reference to the markets in which the Group operates.

In practice, the Group performs impairment tests at various levels pursuant to these principles:

- dedicated and on-site plants are tested individually;
- pipelines and plants that provide these pipelines are tested at the network level;
- liquid gas and hydrogen/CO plants are grouped together according to the plants' customer market;
- other assets are allocated to cash-generating units or groups of cash-generating units.

The cash-generating units of the Gas & Services activity are determined on a geographical basis. The Other activities are managed at a worldwide level (Engineering & Construction and Global Markets & Technologies).

Goodwill is allocated to cash-generating units or groups of cash-generating units that benefit from business combination synergies and which represent the levels at which goodwill is monitored by the Group.

When performing impairment tests on cash-generating units or groups of cash-generating units comprising goodwill, the Group uses the market multiples approach to determine if the goodwill is subject to impairment. Insofar as the fair value is not significantly greater than the net carrying amount of the cash-generating unit or group of cash-generating units, the Group confirms the recoverable amount of the cash-generating unit or group of cash-generating units using the estimated cash flow approach (value in use).

For other cash-generating units or groups of cash-generating units, and assets whose value is tested on an individual basis, the Group determines the recoverable amount using the estimated cash flow approach (value in use).

The market multiples used are determined based on the market value of the Air Liquide Group. The differences between the resulting multiples and those of comparable companies are not material.

The growth rates, taken into account with respect to the cash flow estimates for cash-generating units or groups of cash-generating units, are determined based on the activity and geographical location of the CGU considered.

In assessing value in use for property, plant and equipment, the estimated future cash flows are discounted to their present value. Cash flows are measured over the asset's estimated period of use, taking into account customer contract terms and technical obsolescence.

The discount rate depends on the nature, the location of the asset and the customer market. It is determined according to the minimum level of profitability expected from the investment considering industrial and commercial risks and credit terms.

When the recoverable amount of an asset, a cash-generating unit or a group of cash-generating units is lower than its carrying amount, an impairment loss is recognized immediately through profit and loss. An impairment loss of a cash-generating unit is first allocated to goodwill.

When the recoverable amount exceeds the carrying amount again, the previously recognized impairment loss is reversed to the income statement, with the exception of impairment losses on goodwill, which cannot be reversed.

## g. Leases

### Finance leases

Leases of property, plant and equipment that transfer virtually all the risks and rewards of ownership to the Group are classified as finance leases. Items of property, plant and equipment acquired under finance leases are depreciated over the shorter of the asset's useful life or the lease term.

The sum of the present value of minimum lease payments for leased assets is recorded in the balance sheet under "Property, plant and equipment". The debt corresponding to the lessor appears on the balance sheet as a financial liability.

### Operating leases

Leases where the lessor retains substantially all the risks and rewards incidental to ownership are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged to the income statement on a straight-line basis over the lease term.

IFRIC 4 "Determining Whether an Arrangement Contains a Lease" has no impact on the Group consolidated financial statements. In fact, the risks and rewards arising from the use of assets potentially affected by this interpretation are not transferred to the Group's customers. Consequently, the gas supply contracts related to these assets are not classified as finance leases.

## 6. FINANCIAL INSTRUMENTS

### a. Non-current financial instruments

#### Non-consolidated investments

Investments in non-consolidated companies that are not accounted for using the equity method are classified as assets measured at fair value.

These investments are not held for trading, consequently, at initial recognition, the Group may make an irrevocable election to present in other comprehensive income subsequent changes in the fair value. In this case, changes in fair value are not reclassified to net result upon disposal of these investments.

Dividends from these investments are recognized in other financial income.

#### Loans and other financial assets

Loans and other financial assets are initially recognized at their fair value and subsequently carried at amortized cost. Impairment tests are performed at each closing date. Any impairment losses are recognized immediately in the income statement.

### b. Trade and other receivables

Trade and other receivables are measured at their transaction price upon initial recognition and then at amortized cost less any impairment losses based on expected credit losses model.

Expected credit losses are estimated on the basis of a matrix consisting in using historical loss rates adjusted depending on actual observable conditions. Expected credit losses are estimated at each closing date in the following manner:

- segregating trade receivables into appropriate groups, in particular depending on the activities of the Group, type and size of client and its market segment;
- within each group of trade receivables, determining of age-bands;
- for each age-band identification of losses realized in previous financial year;
- adjusting if necessary historical loss rate depending on actual observable conditions in order to take into account, in particular, current market conditions, type of client, credit management practices of the Group as well as specific information concerning individual customers;
- application of loss rates estimated in this way to each age-band of trade receivables.

For all construction contracts in progress at the year-end, the gross amounts payable by and to customers represent the sum of costs incurred plus profits recognized using the percentage of completion method, equivalent to total revenue recorded using the percentage of completion method, less the amount of advances received.

Amounts payable by customers are presented in trade receivables. Amounts due to customers are presented in other current liabilities.

#### Assignments of trade receivables

Assignments of trade receivables are derecognized in the balance sheet when:

- the Group transfers the contractual rights to receive the cash flows related to these receivables to the assignee; or
- the Group retains the contractual rights to receive the cash flows related to these receivables, but assumes a contractual obligation to pay the cash flows to the assignee in an arrangement that cumulatively meets the following three conditions:
  - the Group has no obligation to pay to the assignee unless it collects the equivalent amount;
  - the Group is prohibited from selling or pledging the receivables other than as security for the obligation to pay cash flows to the assignee;
  - the Group has an obligation to remit any cash flows it collects on behalf of the assignee without material delay;
- and the Group transfers substantially all the risks and awards of ownership of the receivables.

### c. Cash and cash equivalents

Cash and cash equivalents include cash balances, current bank accounts, and short-term highly liquid investments that are readily convertible into cash and do not present a material risk of a change in value.

Short-term investments include temporary cash investments maturing in less than three months (commercial paper, certificates of deposit and money market funds) whose minimum long-term rating is A (S&P) or A2 (Moody's).

As cash investments maturing in less than three months are exposed to a negligible risk of a change in value, they are recognized at historical cost (including accrued interest) which is considered to approximate fair value.



#### d. Current and non-current borrowings

Borrowings include bonds and other bank borrowings (including borrowings arising from finance leases and the put options granted to minority shareholders).

At inception, borrowings are recognized at fair value corresponding to the net proceeds collected. At each balance sheet date, except for put options granted to minority shareholders (see section 10 "Minority Interests"), they are measured at amortized cost using the effective interest rate (EIR) method. Under this method, the borrowing cost includes the redemption premiums and issuance costs initially deducted from the nominal amount of the borrowing in liabilities.

Borrowings maturing in less than one year are classified as current borrowings.

Borrowings hedged by interest rate swaps are recognized on a hedge accounting basis.

#### e. Derivative assets and liabilities

Derivative financial instruments are mainly used to manage exposures to foreign exchange, interest rate and commodity risks relating to the Group's financial and operating activities. For all these transactions, the Group applies hedge accounting and documents, at the inception of the transaction, the type of hedging relationship, the hedging instruments, and the nature and term of the hedged item.

Applying hedge accounting has the following consequences:

- fair value hedges for existing assets and liabilities: the hedged portion of the item is carried at fair value in the balance sheet. Any changes in fair value are recognized in the income statement, where they are offset by the corresponding changes in fair value of the hedging instruments (except for the impact of premiums/discounts);
- future cash flow hedges: the effective portion of the change in fair value of the hedging instrument is recorded directly in equity (other comprehensive income), while the change in the fair value of the hedged item is not recognized in the balance sheet. The change in fair value of the ineffective portion is recognized in other financial income or expenses. When the hedged transactions occur and are recorded, amounts recorded in other comprehensive income are reclassified in the income statement;
- hedges of net investments in a foreign entity: the effective portion of the changes in fair value of the derivative instrument is recognized in gains and losses recognized directly in equity under "Translation reserves". The ineffective portion of changes in fair value is recognized in "Other financial income and expenses". Once the foreign entity subject to the net investment hedge is sold, the loss or profit initially recognized in translation reserves is recognized in profit or loss, within the gain or loss generated.

However, in limited circumstances, certain types of derivatives do not qualify for hedge accounting; they are carried at fair value through "Other financial income and expenses" with an offsetting entry in financial assets and financial liabilities.

The fair value of assets, liabilities and derivatives is based on the market price at the balance sheet date.

### 7. ASSETS HELD FOR SALE AND DISCONTINUED OPERATIONS

#### a. Assets classified as held for sale

Non-current assets or 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 classification occurs when the Group takes the decision to sell them and that the sale is considered highly probable. The assets and liabilities held for sale are presented on different lines of the balance sheet. They are measured at the lower of their carrying amount or fair value less costs to sell.

Assets classified as held for sale are no longer depreciated (amortized) as of the date they are classified as assets or disposal groups held for sale.

When the Group is engaged in a sale process involving the loss of control of the subsidiary, all the assets and liabilities of this subsidiary are classified as being held for sale, independently of whether or not the Group retains a residual interest in the entity after its sale.

#### b. Discontinued operations

A discontinued operation is a clearly identifiable component that the Group either has abandoned or that is classified as held for sale:

- representing a separate major line of business or geographical area of operations;
- being part of a single coordinated plan to dispose of a separate major line of business or geographical area of operations; or,
- being a subsidiary acquired exclusively with a view to resale.

Once the criteria are met, the profit and loss and the cash flow from discontinued operations are presented separately in the income statement and the consolidated cash flow statement for each period.

## 8. INVENTORIES AND WORK-IN-PROGRESS

Inventories are measured at the lower of cost or net realizable value. Cost includes raw materials, direct and indirect labor costs and other costs incurred in bringing the inventories to their present location and condition.

Net realizable value is the estimated selling price in the normal course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

## 9. SHARE CAPITAL, RESERVES AND TREASURY SHARES

Air Liquide's share capital is composed of ordinary shares.

Retained earnings include the following items:

- ▶ translation reserves: exchange differences arising from the translation into euros of financial statements prepared by foreign subsidiaries whose functional currency is not the euro are recorded in translation reserves. Fair value changes in net investment hedges of these foreign subsidiaries are also recorded in this reserve;
- ▶ fair value of financial instruments: this item records accumulated fair value changes in the effective portion of cash flow hedge derivatives (transactions not yet recognized in the accounts);
- ▶ actuarial gains and losses: all actuarial gains and losses and adjustments arising from the asset ceiling, net of deferred taxes, are recognized in consolidated reserves in the period in which they occur.

When the Group buys back its own shares, they are classified as treasury shares at the purchase price and presented as a deduction from equity for the consideration paid. The profit or loss from the sale of treasury shares is recognized directly in equity, net of tax.

Furthermore, acquisitions or disposals of minority interests, without change in control, are considered as transactions with the Group's shareholders. Thus, the difference between the price paid to increase the percentage of interest in entities that are already controlled and the additional share of equity thus acquired is recognized in Shareholders' equity. Similarly, a decrease in the Group's percentage interest in a controlled entity is accounted for as an equity transaction with no impact on profit or loss.

Disposals of shares with loss of control give rise to the recognition in disposal gains or losses of the change in fair value calculated for the total investment at the date of disposal. Any investments retained, where applicable, will be measured at fair value at the date when control is lost.

## 10. MINORITY INTERESTS

Transactions with minority interests, without impact on the control, are considered as transactions with the Group's shareholders and are registered in shareholders' equity.

In accordance with IAS 32, put options granted to minority shareholders are recorded as borrowings at the option's estimated strike price.

The share in the net assets of subsidiaries is reclassified from "Minority interests" to "Borrowings".

Due to the absence of any specific IFRS guidance, the Group has elected to recognize the consideration for the difference between the strike price of the option granted and the value of the minority interests reclassified as borrowings as follows:

- ▶ for options granted prior to January 1, 2010, in goodwill;
- ▶ for options granted after January 1, 2010, in shareholders' equity – Group share.

Minority interests in profit and loss do not change and still reflect present ownership interests.

## 11. PROVISIONS

### a. Provisions

Provisions are recognized when:

- ▶ the Group has a present obligation as a result of a past event;
- ▶ it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation;
- ▶ a reliable estimate can be made of the amount of the obligation.

Restructuring provisions include only the direct costs arising from the restructuring and are recognized in the period in which the Group has approved a detailed and formal restructuring plan and the restructuring has either begun or been announced. When these plans involve termination benefits, the resulting provisions are recognized at the earlier of the following dates:

- ▶ when the Group can no longer withdraw the offer of those benefits;
- ▶ when the provision of the related restructuring is recognized.

A provision for losses on contracts is recognized when the expected benefits from the contract are lower than the cost of satisfying the obligations under the contract.

### b. Pensions and employee benefits

The Group provides its employees with various pension plans, termination benefits, jubilees and other post-employment benefits for both active and retired employees. The characteristics of each plan vary according to the laws and regulations applicable in each country as well as each subsidiary policy.

These benefits are covered by two types of plan:

- ▶ defined contribution plans;
- ▶ defined benefit plans.

The Group grants both defined benefit and defined contribution plans.



Defined contribution plans are plans under which the employer's sole obligation is to pay regular contributions. The employer's obligation is limited to payment of the planned contributions. The employer does not grant any guarantees on the future level of benefits paid to the employee or retiree (means-based obligation). The annual pension expense is equal to the contribution paid during the fiscal year which relieves the employer from any further obligation. It is recognized in "Personnel expenses".

Defined benefit plans are those by which the employer guarantees the future level of benefits defined in the agreement, most often depending on the employee's salary and seniority ("result-based obligation"). Defined benefit plans can be:

- either financed by contributions to a fund specialized in managing the amounts received;
- or managed internally.

In the case of defined benefit plans, retirement and similar obligations are measured by independent actuaries, according to the projected unit credit method. The actuarial calculations mainly take into account the following assumptions: salary increases, employee turnover, retirement date, life expectancy, inflation and appropriate discount rates for each country.

Defined benefit plans are covered by external pension funds in certain cases. The assets of these plans are mostly invested in bonds or equities carried at their fair value.

All actuarial gains and losses as well as any adjustment arising from the asset ceiling are recognized in the period in which they occur.

Actuarial assumptions used vary according to the demographic and economic conditions prevailing in each country where the Group has pension plans.

Discount rates used to measure the present value of the Company's obligations and the net interest cost are determined by reference to market yields on High-Quality corporate bonds. Where there is no deep market in such bonds, the market yields on government bonds with the same maturity at the valuation date shall be used. In the Euro zone, the United States, the United Kingdom and Canada, discount rates were determined using tools designed by independent actuaries. Their database uses several hundred different corporate bonds with a minimum AA-rating and maturities ranging from one to 30 years. Cash flows of expected benefits are subsequently discounted using rates associated to each maturity.

Valuations are carried out annually by independent actuaries for significant plans and every three years for other plans unless there are material changes in assumptions or major events that necessitate a new calculation.

Impacts related to defined benefit plans are registered as follows:

- the service cost, the gain relating to curtailments and settlements, and the actuarial gains and losses from other long-term benefits and recognized in "Personnel expenses";
- net interest cost for defined benefits is registered in "Other financial income and expenses";
- past service cost is recorded in profit or loss according to the nature of the change to the plan that generated it (i.e. either in "Personnel expenses" or in "Other financial income and expenses");
- actuarial gains and losses from defined benefit plans, retirement termination payments, and medical plans are recorded in "Gains and losses recognized directly in equity".

## 12. FOREIGN CURRENCY TRANSACTIONS AND BALANCES

Foreign currency transactions are recognized according to the following principles:

- foreign currency transactions are translated by each company into its functional currency at the exchange rate prevailing on the date of the transaction;
- at year-end, monetary assets and liabilities denominated in foreign currencies are translated into the functional currency at the closing exchange rate.

Exchange differences relating to commercial transactions are recognized in operating profit. For financial transactions, exchange differences are recognized in financial income and expenses except for differences resulting from the hedge of a net investment in a foreign entity that are directly recognized in equity until the net investment is removed from the consolidation scope.

## 13. CONTINGENT ASSETS AND LIABILITIES

Contingent assets and liabilities arise from past events, the outcome of which depends on future uncertain events.

Contingent liabilities represent:

- possible obligations arising from past events whose existence will be confirmed only by the occurrence of uncertain future events not wholly within the control of the entity; or,
- present obligations that arise from past events, but that are not recognized because it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation or because the amount of the obligation cannot be measured with sufficient reliability.

Contingent assets and liabilities that are material are disclosed in the notes to the consolidated financial statements, except for contingent liabilities assumed in a business combination, which are recognized in accordance with IFRS 3 revised.

## 14. GOVERNMENT GRANTS

Government grants received are initially recognized in "Other non-current liabilities". They are then recognized as income in the income statement for the period:

- on the same basis as the subsidized assets are depreciated in the case of government grants related to assets;
- deducted from the costs intended to be compensated in the case of government grants other than those related to assets.

The Group analyzes the substance of government incentives delivered through the tax system and selects an accounting treatment coherent with such substance.

## 15. SHARE-BASED PAYMENTS

The Group grants stock options and performance shares to Executive Officers and some employees.

Stock options and performance shares are measured at fair value on the grant date. Their fair value is recognized as a "Personnel expense" in the income statement with a corresponding increase in equity, and amortized on a straight-line basis over the vesting period.

The valuation is performed by an independent expert, using mathematical models appropriate to the characteristics of each plan. It takes into account the market vesting conditions associated to each one. The fair value measured at the grant date is not subject to re-evaluation due to changes in market conditions.

Vesting conditions, other than market ones, have no impact on the fair value measurement of services received but adjust the expense that is recognized according to the number of equity instruments actually granted.

The dilution effect of non-vested stock option plans and performance share allocations is reflected in the calculation of diluted earnings per share.

For employee savings plans, the capital increases reserved for employees and performed under conditions that differ from market conditions result in the recognition of an expense. This expense corresponds to the contribution paid by the entity and the discount on the share price less the cost of non-transferability for the employees.

### Share subscription option plans

Options are valued using the following main underlying assumptions:

- volatility: implicit;
- risk-free interest rate: zero-coupon benchmark rate at the plan issue date and matching the various maturities retained;

- dividend growth rate: based on the historical average annual growth rate;
- employee resignation rate: that of individuals belonging to the same age group as the plan beneficiaries. The resignation rate is used to extrapolate the number of options which will not be exercised due to the resignation of beneficiaries;
- the probability of achieving the market vesting conditions.

### Performance shares allocation plans

Performance shares are measured at fair value, taking into account a discount on non-transferable shares. The cost of non-transferability is measured as the cost of a two-step strategy consisting in the forward sale of shares being non-transferable for four years (or five years depending on the plan) and the purchase on the spot market of the same number of shares funded by an amortizable loan with an in fine capital repayment.

Valuation is based upon the following main underlying assumptions:

- risk-free interest rate: four-year zero-coupon benchmark rate (or five-year depending on the plan) at the plan issue date plus a credit margin that would be proposed to employees;
- dividend growth rate: based on the historical average annual growth rate;
- employee resignation rate: that of individuals belonging to the same age group as the plan beneficiaries. This resignation rate is used to extrapolate the shares which will not be allocated due to the resignation of beneficiaries;
- the probability of achieving the market vesting conditions.

## 16. GREENHOUSE GAS EMISSION QUOTAS

In certain countries, the Group is subject to greenhouse gas emission quota systems.

In the absence of any specific IFRS guidance, the Group has elected to apply the ANC Regulation No. 2012-03. The Group does not buy CO<sub>2</sub> quotas for the purpose of generating profits from fluctuations in price; therefore, at each closing date:

- a liability is recognized if the greenhouse gas emissions are higher than the CO<sub>2</sub> quotas held by the Group. It corresponds to the cost of CO<sub>2</sub> quotas in shortfall to cover the greenhouse gas already emitted; or,
- an asset is recognized if the greenhouse gas emissions are lower than the CO<sub>2</sub> quotas held by the entity. It corresponds to the CO<sub>2</sub> quotas available to cover the future greenhouse gas emissions, valued at historical cost.

## Basis for presentation of financial information

### 1. SEGMENT INFORMATION

The Group is structured according to the following activities: Gas & Services, Engineering & Construction and Global Markets & Technologies.

The Group's main operational decision-making body is the Executive Management assisted by the Executive Committee.

The Gas & Services activity is organized by geographical area, which is the responsible level for operations management and performance monitoring. These geographical areas are as follows:

- Europe;
- Americas;
- Asia Pacific;
- Middle East and Africa.

Within the Gas & Services segment, the geographical areas determine sales policies and development projects in liaison with the four business lines (Large Industries, Industrial Merchant, Healthcare and Electronics).

The Engineering & Construction segment is managed separately on a worldwide scale. The segment designs, develops and builds industrial gas production plants for the Group and third parties. It also designs and manufactures plants in the traditional, renewable and alternative energy sectors.

The Global Markets & Technologies segment is also managed separately on a worldwide scale. It focuses on new markets which require a global approach, drawing on science, technologies, development models, and usages related to digital transformation.

Research and Development and corporate activities do not meet the operating segments definition and are thus presented within reconciliation.

The information communicated in the tables covering segment information is presented according to the same accounting principles as those used for the Group consolidated financial statements.

Revenue is analyzed by geographical area of production (country of origin).

Inter-segment revenue between Gas & Services, Engineering & Construction and Global Markets & Technologies activities corresponds to the sales between these operating segments.

The Group operating performance is assessed on the basis of each segment's recurring operating income.

Segment assets include non-current assets, with the exception of "Deferred tax assets", "Investments in associates", "Fair value of non-current derivatives (assets)", as well as "Inventories and work-in-progress", "Trade receivables" and "Other current assets".

Segment liabilities correspond to "Provisions, pensions and other employee benefits", "Trade payables", "Other current liabilities" and "Other non-current liabilities".

Segment profits, assets and liabilities consist of amounts directly attributable to each segment, provided they can be allocated to the segment on a reasonable basis.

### 2. NET INDEBTEDNESS

Net indebtedness includes:

- current and non-current borrowings minus the fair value of hedging derivative assets to cover borrowings;

reduced by:

- cash and cash equivalents, as defined in section 6.c., minus the fair value of hedging derivative instruments recorded in liabilities to cover loans.

### 3. INFORMATION ON INTERESTS IN JOINT ARRANGEMENTS OR ASSOCIATES

The materiality of the interests in joint arrangements or associates is assessed according to the following criteria:

- contribution of the entity to the Group's operating income recurring;
- share of these interests in the Group's net assets;
- dividends paid to these interests.

### 4. INFORMATION ON MINORITY INTERESTS

The materiality of the minority interests is assessed according to an analysis of:

- the minority interests' share in the Group's net assets;
- the contribution to the Group's operating income recurring of the subsidiary having minority interests;
- dividends paid to minority interests.

### 5. OPERATING INCOME RECURRING

The Group's operating performance is measured based on operating income or loss recurring determined in accordance with ANC recommendation No. 2013-03.

### 6. OTHER NON-RECURRING OPERATING INCOME AND EXPENSES

Material non-recurring operations that could affect operating performance readability are classified under "Other non-recurring operating income" and "Other non-recurring operating expenses". They may include:

- gains or losses on the disposal of activities or groups of assets;
- acquisition-related and integration-related costs relating to business combinations;
- restructuring costs resulting from plans whose unusual and material nature distort the readability of the operating income recurring;
- significant provisions and impairment losses for property, plant and equipment and intangible assets;
- incurred or estimated costs relating to significant political risks or litigations.

## 7. NET EARNINGS PER SHARE

### a. Basic earnings per share

Basic earnings per share is calculated by dividing net profit (Group share) attributable to ordinary shareholders of Air Liquide by the weighted average number of shares outstanding during the year, excluding ordinary shares purchased by Air Liquide and recognized in equity.

### b. Diluted earnings per share

Diluted earnings per share take into account share subscription options and performance shares allocated to employees and Executive Officers if:

- the issue price, adjusted for unrecognized expenses at the year-end pursuant to IFRS 2, is lower than the Air Liquide annual average share price;
- the performance requirements meet the criteria set out in IAS 33 § 52.

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## Note 1 Significant events

There were no significant event during fiscal year 2018.

## Note 2 Segment information

### 2.1. INCOME STATEMENT FOR THE YEAR ENDED DECEMBER 31, 2018

(in millions of euros)	Gas & Services					Engineering & Construction	Global Markets & Technologies	Reconciliation	Total
	Europe	Americas	Asia Pacific	Middle East and Africa	Sub-total				
<b>Revenue</b>	<b>7,111.4</b>	<b>7,982.1</b>	<b>4,358.5</b>	<b>654.9</b>	<b>20,106.9</b>	<b>430.2</b>	<b>474.0</b>		<b>21,011.1</b>
Inter-segment revenue						241.7	366.5	(608.2)	
<b>Operating income recurring</b>	<b>1,367.9</b>	<b>1,369.4</b>	<b>836.9</b>	<b>104.8</b>	<b>3,679.0</b>	<b>(3.7)</b>	<b>49.8</b>	<b>(276.6)</b>	<b>3,448.5</b>
incl. depreciation and amortization	(581.1)	(676.9)	(355.9)	(66.2)	(1,680.1)	(18.2)	(36.0)	(32.0)	(1,766.3)
Other non-recurring operating income									4.6
Other non-recurring operating expenses									(166.4)
Net finance costs									(303.4)
Other financial income									13.6
Other financial expenses									(62.9)
Income taxes									(730.7)
Share of profit of associates									4.1
<b>Profit for the period</b>									<b>2,207.4</b>
Purchase of intangible assets and property, plant and equipment	(675.9)	(861.2)	(461.2)	(73.3)	(2,071.6)	(6.1)	(133.0)	(38.5)	(2,249.2)

### 2.2. INCOME STATEMENT FOR THE YEAR ENDED DECEMBER 31, 2017

(in millions of euros)	Gas & Services					Engineering & Construction	Global Markets & Technologies	Other activities	Reconciliation	Total
	Europe	Americas	Asia Pacific	Middle East and Africa	Sub-total					
<b>Revenue</b>	<b>6,775.5</b>	<b>8,149.8</b>	<b>4,081.7</b>	<b>634.9</b>	<b>19,641.9</b>	<b>335.1</b>	<b>372.3</b>			<b>20,349.3</b>
Inter-segment revenue						214.2	332.6		(546.8)	
<b>Operating income recurring</b>	<b>1,309.3</b>	<b>1,365.2</b>	<b>803.8</b>	<b>109.0</b>	<b>3,587.3</b>	<b>(23.4)</b>	<b>42.2</b>		<b>(242.3)</b>	<b>3,363.8</b>
incl. depreciation and amortization	(593.5)	(690.6)	(361.3)	(54.2)	(1,699.6)	(18.3)	(30.2)		(29.8)	(1,777.9)
Other non-recurring operating income										219.8
Other non-recurring operating expenses										(563.3)
Net finance costs										(421.9)
Other financial income										32.5
Other financial expenses										(100.0)
Income taxes										(207.3)
Share of profit of associates										5.2
<b>Net profit from continued operations</b>										<b>2,328.8</b>
<b>Net profit from discontinued operations</b>										<b>(37.2)</b>
<b>Profit for the period</b>										<b>2,291.6</b>
Purchase of intangible assets and property, plant and equipment	(577.3)	(690.4)	(508.8)	(154.3)	(1,930.8)	(74.9)	(120.4)	(4.4)	(52.0)	(2,182.5)

## 2.3. BALANCE SHEET AS OF DECEMBER 31, 2018

(in millions of euros)	Gas & Services					Engineering & Construction	Global Markets & Technologies	Reconciliation	Total
	Europe	Americas	Asia Pacific	Middle East and Africa	Sub-total				
<b>Segment assets</b>	<b>9,999.2</b>	<b>18,653.5</b>	<b>6,990.3</b>	<b>1,551.9</b>	<b>37,194.9</b>	<b>745.4</b>	<b>1,148.5</b>	<b>480.4</b>	<b>39,569.2</b>
Goodwill	3,056.2	8,524.8	1,316.1	99.0	12,996.1	231.4	117.5		13,345.0
Intangible assets and property, plant and equipment, net	5,262.7	8,871.4	4,469.6	1,129.6	19,733.3	196.9	564.7	352.0	20,846.9
Other segment assets	1,680.3	1,257.3	1,204.6	323.3	4,465.5	317.1	466.3	128.4	5,377.3
Non-segment assets									2,411.4
<b>Total assets</b>									<b>41,980.6</b>
<b>Segment liabilities</b>	<b>2,393.7</b>	<b>1,596.9</b>	<b>1,026.9</b>	<b>245.9</b>	<b>5,263.4</b>	<b>875.3</b>	<b>335.6</b>	<b>865.8</b>	<b>7,340.1</b>
Non-segment liabilities									16,433.1
Equity including minority interests									18,207.4
<b>Total equity and liabilities</b>									<b>41,980.6</b>

## 2.4. BALANCE SHEET AS OF DECEMBER 31, 2017

(in millions of euros)	Gas & Services					Engineering & Construction	Global Markets & Technologies	Reconciliation	Total
	Europe	Americas	Asia Pacific	Middle East and Africa	Sub-total				
<b>Segment assets</b>	<b>9,900.9</b>	<b>18,290.8</b>	<b>6,657.1</b>	<b>1,563.7</b>	<b>36,412.5</b>	<b>799.0</b>	<b>1,033.1</b>	<b>371.6</b>	<b>38,616.2</b>
Goodwill	3,038.1	8,125.7	1,242.9	98.7	12,505.4	219.7	115.3		12,840.4
Intangible assets and property, plant and equipment, net	5,237.4	8,489.7	4,329.9	1,143.9	19,200.9	207.6	475.3	253.2	20,137.0
Other segment assets	1,625.4	1,675.4	1,084.3	321.1	4,706.2	371.7	442.5	118.4	5,638.8
Non-segment assets									2,411.1
<b>Total assets</b>									<b>41,027.3</b>
<b>Segment liabilities</b>	<b>2,422.6</b>	<b>1,559.4</b>	<b>916.8</b>	<b>237.7</b>	<b>5,136.5</b>	<b>767.9</b>	<b>303.1</b>	<b>1,027.3</b>	<b>7,234.8</b>
Non-segment liabilities									17,074.1
Equity including minority interests									16,718.4
<b>Total equity and liabilities</b>									<b>41,027.3</b>

The Research and Development and Holdings activities (corporate) are presented in the "Reconciliation" column. Operating income recurring of the Engineering & Construction activity includes financial income generated from advances received from customers. It is included in net finance costs in the consolidated income statement. The adjustment arising from the presentation difference is included in the "Reconciliation" column.



## 2.5. OTHER INFORMATION ON GEOGRAPHICAL AREAS

2018 (in millions of euros)	France	Europe excl. France	United States	Americas excl. United States	Asia Pacific	Middle East and Africa	Total
Revenue	2,718.0	4,960.8	6,905.2	1,223.5	4,548.7	654.9	21,011.1
Non-current assets <sup>(a)</sup>	2,541.7	6,776.2	16,035.5	1,716.5	5,902.2	1,361.9	34,334.0
<i>incl. Investments in associates</i>	<i>29.8</i>	<i>5.5</i>	<i>9.0</i>	<i>-</i>	<i>11.7</i>	<i>86.1</i>	<i>142.1</i>

(a) Excluding non-current financial assets, deferred taxes and non-current derivative assets.

2017 (in millions of euros)	France	Europe excl. France	United States	Americas excl. United States	Asia Pacific	Middle East and Africa	Total
Revenue	2,588.5	4,644.2	7,003.3	1,280.9	4,197.4	635.0	20,349.3
Non-current assets <sup>(a)</sup>	2,315.1	6,856.0	15,193.4	1,730.3	5,688.7	1,322.1	33,105.6
<i>incl. Investments in associates</i>	<i>18.1</i>	<i>10.2</i>	<i>8.1</i>	<i>0.2</i>	<i>12.0</i>	<i>79.6</i>	<i>128.2</i>

(a) Excluding non-current financial assets, deferred taxes and non-current derivative assets.

Due to the substantial number of customers served by the Group (almost two million worldwide), their significant diversity in multiple sectors and their wide geographical dispersion, the Group's main customer represents only 1.7% of Air Liquide's revenue.

## Note 3 Revenue

In 2018, consolidated revenue amounted to 21,011.1 million euros, up 3.3% compared to 2017. Revenue was up + 6.9% after adjusting for the cumulative impact of foreign exchange fluctuations. The foreign exchange fluctuations essentially stemmed from the depreciation of the US dollar, the Argentina pesos and the Brazilian real against the euro.

## Note 4 Operating income recurring and expenses

Operating income recurring and expenses include purchases, personnel expenses, depreciation and amortization, other recurring income and other recurring expenses.

The Group purchases mainly consist of electricity, natural gas as well as industrial and medical products.

## 4.1. OTHER INCOME

Other income is primarily made up of net proceeds from the sale of property, plant, and equipment and intangible assets and various indemnities.

## 4.2. PERSONNEL EXPENSES

(in millions of euros)	2017	2018
Wages and social security charges	(3,998.1)	(3,992.5)
Defined contribution pension plans	(69.7)	(75.3)
Defined benefit pension plans <sup>(a)</sup>	(36.1)	(38.4)
Share-based payments	(34.4)	(39.6)
<b>TOTAL</b>	<b>(4,138.3)</b>	<b>(4,145.8)</b>

(a) In 2017, the expense relating to defined benefit plans included a positive effect of settlements, plan amendments and past service cost amounting to +6.3 million euros (see note 24 on employee benefit obligations on page 223).

Fully consolidated companies employed 66,000 individuals as of December 31, 2018 (65,200 individuals as of December 31, 2017).

## 4.3. OTHER OPERATING EXPENSES

Other operating expenses primarily include transport and distribution costs, sub-contracting costs, operating leases and insurance premiums.

#### 4.4. RESEARCH AND DEVELOPMENT EXPENDITURES

In 2018, innovation costs amounted to 300.0 million euros (292.0 million euros in 2017) including Research and Development costs of 195.0 million (184.0 million euros in 2017).

#### 4.5. DEPRECIATION AND AMORTIZATION EXPENSE

(in millions of euros)	2017	2018
Intangible assets	(173.9)	(173.1)
Property, plant and equipment (PP&E) <sup>(a)</sup>	(1,604.0)	(1,593.2)
<b>TOTAL</b>	<b>(1,777.9)</b>	<b>(1,766.3)</b>

(a) Including the depreciation expense after deduction of investment grants released to profit.

### Note 5 Other non-recurring operating income and expenses

(in millions of euros)	2017	2018
<b>Expenses</b>		
Reorganization, restructuring and realignment programs costs	(73.2)	(54.3)
Integration costs related to the acquisition of Airgas	(86.6)	(32.2)
Acquisition costs	(3.6)	(6.8)
Political risks and legal procedures	(68.3)	(31.1)
Impairment of assets	(234.1)	(15.1)
Others	(97.5)	(26.9)
<b>TOTAL OTHER NON-RECURRING OPERATING EXPENSES</b>	<b>(563.3)</b>	<b>(166.4)</b>
<b>Income</b>		
Net gain on the disposals of activities or group of assets	116.6	4.0
Gain on refund of 3% contribution paid	103.0	-
Others	0.2	0.6
<b>TOTAL OTHER NON-RECURRING OPERATING INCOME</b>	<b>219.8</b>	<b>4.6</b>
<b>TOTAL</b>	<b>(343.5)</b>	<b>(161.8)</b>

In 2018, the Group recognized:

- Airgas integration costs mainly corresponding to long-term incentives specifically implemented as part of this operation;
- Costs resulting from realignment programs for 54.3 million euros, mainly relating to Gas & Services;
- Costs mainly related to the consequences of the early termination of contracts in Iran included in Political risks and legal procedures for 20.4 million euros.

In 2017, the Group recognized:

- a gain related to the refund of the additional 3% contribution on cash dividends for 103.0 million euros following the favorable decision of the European Court of Justice on May 17, 2017 and the French Constitutional Council on October 6, 2017 leading to the cancelation of this additional contribution on cash dividends introduced by the Amended Finance Act enacted in August 2012 on cash dividends;
- following a strategic review of its activities and its portfolio of assets in connection with NEOS company program:
  - capital gains on disposals calculated in accordance with IFRS 10 paragraph 25 amounting to 116.6 million euros, including in particular the disposal of Airgas Refrigerants Inc. (United States) on October 10, 2017 and the disposal of the companies Air Liquide Dalian Co., Ltd., Air Liquide Lifan Co., Ltd. et Air Liquide Yichun Co., Ltd. (China) on December 22, 2017;
  - impairment of assets amounting to -234.1 million euros.

## Note 6 Net finance costs and other financial income and expenses

### 6.1. NET FINANCE COSTS

<i>(in millions of euros)</i>	2017	2018
Finance costs	(429.0)	(315.0)
Financial income from short-term investments and loans	7.1	11.6
<b>TOTAL</b>	<b>(421.9)</b>	<b>(303.4)</b>

The average net finance costs, excluding the non-recurring gain for 54.4 million euros described in note 25.5, stood at 3.0% in 2018 (3.2% in 2017).

Capitalized finance costs amounted to 56.4 million euros in 2018 (66.5 million euros in 2017).

### 6.2. OTHER FINANCIAL INCOME AND EXPENSES

<i>(in millions of euros)</i>	2017	2018
Other financial income <sup>(a)</sup>	32.5	13.6
<b>TOTAL OTHER FINANCIAL INCOME</b>	<b>32.5</b>	<b>13.6</b>
Other financial expenses	(76.6)	(43.5)
Interest expense on the net defined benefit liability	(23.4)	(19.4)
<b>TOTAL OTHER FINANCIAL EXPENSES</b>	<b>(100.0)</b>	<b>(62.9)</b>

(a) In 2017, other financial income include interests on arrears related to the gain following the refund of 3% contribution paid for +15.2 million euros as described in note 5.

## Note 7 Income taxes

### 7.1. CHANGE IN THE US TAX RATE

In December 2017, the US Congress adopted the US Tax Cuts & Jobs Act of 2017 tax reform, which was signed on December 22 by the President of the United States for final adoption. The federal corporate income tax rate was reduced from 35% to 21% for fiscal years beginning on January 1, 2018. Moreover, the accumulated undistributed retained earnings of foreign subsidiaries of US holding companies will be subject to a flat tax of 15.5% (cash reserves) or 8% (other reserves).

Consequently, the Group recognized in 2017 a net deferred tax income of 508.1 million euros in "tax expense", leading to a 20.1% decrease in the effective tax rate. This notably includes estimates of -140 million euros for tax on accumulated undistributed retained earnings of foreign subsidiaries of US holding companies. In 2018, no material corrections have been made to the 2017 estimates. The release of final regulation from the US Department of Treasury will enable to confirm these estimates.

### 7.2. INCOME TAX EXPENSE

<i>(in millions of euros)</i>	2017	2018
<b>Current tax</b>		
Income tax expense payable	(541.1)	(656.8)
<b>TOTAL CURRENT TAX</b>	<b>(541.1)</b>	<b>(656.8)</b>
<b>Deferred tax</b>		
Temporary differences <sup>(a)</sup>	(338.4)	(83.2)
Impact of tax rate changes <sup>(b)</sup>	672.2	9.3
<b>TOTAL DEFERRED TAX</b>	<b>(333.8)</b>	<b>(73.9)</b>
<b>TOTAL</b>	<b>(207.3)</b>	<b>(730.7)</b>

(a) Including in particular in 2017, the estimates of -140 million euros for tax on accumulated undistributed retained earnings of foreign subsidiaries of US holding companies as described in note 7.1.

(b) Including, in 2017, the gross income related to the US tax reform corresponding to a tax rate change impact of 648.1 million euros as described in note 7.1.

**7.3 RECONCILIATION BETWEEN THE STANDARD TAX RATE AND THE GROUP EFFECTIVE TAX RATE**

(in %)	2017	2018
<b>Standard tax rate</b>	<b>31.2</b>	<b>27.7</b>
Impact of transactions taxed at reduced rates	(2.3)	(2.4)
Impact of tax rate changes <sup>(a)</sup>	(26.6)	(0.3)
Impact of tax exemptions and others <sup>(b)</sup>	5.9	(0.1)
<b>Average effective tax rate</b>	<b>8.2</b>	<b>24.9</b>

(a) Including, in 2017, the gross income related to the US tax reform corresponding to a tax rate change impact of 648.1 million euros as described in note 7.1.

(b) Including in particular in 2017, the estimates of -140 million euros for tax on accumulated undistributed retained earnings of foreign subsidiaries of US holding companies described in note 7.1.

The 2018 Group effective tax rate is significantly lower than the 2017 Group effective tax rate excluding the impact of non-recurring items and amounting to 29.4%, mainly due to the US tax reform.

In France, L'Air Liquide S.A. has elected to determine French income taxes on a consolidated basis. This scheme applies to all French subsidiaries complying with the legal requirements.

Foreign subsidiaries have elected to apply for similar rules wherever this is allowed under local regulations.

**Note 8 Discontinued operations**

Air Liquide is focused on its Gas & Services activities following the Group's acquisition of Airgas, as well as on the implementation of its company program NEOS for the 2016-2020 period. In this context, at the end of 2016 the Group decided to divest its "Other activities" sector, including the Diving and Welding World Business Lines. After having sold its full stake in Aqua Lung on December 30, 2016, Air Liquide announced on March 2, 2017 that it had entered into exclusive negotiations with Lincoln Electric Holdings, Inc. for the sale of its subsidiary Air Liquide Welding, specialized in the manufacturing of welding and cutting technologies. At the end of July 2017, Air Liquide completed this disposal.

**Aggregated consolidated income statement**

(in millions of euros)	2017
Revenue	199.3
<b>Profit before tax</b>	<b>(3.1)</b>
Income taxes	(0.4)
Gain on disposal / impairment related to fair value measurement of discontinued activities, after tax	(33.7)
<b>NET PROFIT FROM DISCONTINUED OPERATIONS</b>	<b>(37.2)</b>
■ Minority interests	-
■ Net Profit (Group share)	(37.2)

**Statement of net income and gains and losses recognized directly in equity**

The statement of net income and gains and losses recognized directly in equity has not been restated following the application of IFRS 5 since the impact of discontinued operations in that statement is immaterial.

**Cash flow**

In 2017, the proceeds net of tax from the sale of Air Liquide Welding of 62.6 million euros were recorded under "Proceeds from sale of property, plant and equipment and intangible assets". The other cash flows from discontinued operations are immaterial.

## Note 9 Net earnings per share

### 9.1. BASIC EARNINGS PER SHARE

	2017	2018
Net profit (Group share) attributable to ordinary shareholders of the parent <i>(in millions of euros)</i>	2,199.6	2,113.4
Weighted average number of ordinary shares outstanding	426,409,142	426,674,123
<b>Basic earnings per share (in euros)</b>	<b>5.16</b>	<b>4.95</b>

### 9.2. DILUTED EARNINGS PER SHARE

	2017	2018
<b>Net profit used to calculate diluted earnings per share (in millions of euros)</b>	<b>2,199.6</b>	<b>2,113.4</b>
Weighted average number of ordinary shares outstanding	426,409,142	426,674,123
Adjustment for dilutive impact of share subscription options	1,025,656	802,556
Adjustment for dilutive impact of performance shares	710,644	1,278,844
<b>Adjusted weighted average number of shares outstanding used to calculate diluted earnings per share</b>	<b>428,145,442</b>	<b>428,755,523</b>
<b>Diluted earnings per share (in euros)</b>	<b>5.14</b>	<b>4.93</b>

Instruments that could dilute net profit – Group share, and were not included in the calculation of diluted earnings per share because they are antidilutive over the year, are as follows:

- in 2018, the 2018 share subscription option plans;
- in 2017, the 2017 share subscription option plans.

The Group has not issued any other financial instruments that may result in further dilution of net earnings per share.

## Note 10 Dividend per share

The 2017 dividend on ordinary shares declared and paid on May 30, 2018 was 1,160.2 million euros (including fidelity premium) and amounted to 2.65 euros per share and a fidelity premium of 0.26 euro per share.

A dividend payment of 2.65 euros per ordinary share and a fidelity premium of 0.26 euro per share amounting to 1,164.8 million euros (estimated amount taking into account share buybacks and cancelations) will be proposed to the Annual General Meeting in respect of the financial year ended December 31, 2018.

## Note 11 Goodwill

### 11.1 MOVEMENTS DURING THE PERIOD

(in millions of euros)	As of January 1	Goodwill recognized during the period	Goodwill removed during the period	Foreign exchange differences	Other movements	As of December 31
2017	13,889.5	197.5	(21.6)	(1,230.3)	5.3	12,840.4
<b>2018</b>	<b>12,840.4</b>	<b>81.9</b>	<b>(2.9)</b>	<b>426.0</b>	<b>(0.4)</b>	<b>13,345.0</b>

### 11.2 SIGNIFICANT GOODWILL

(in millions of euros)	2017	2018		
	Net carrying amount	Gross carrying amount	Impairment losses	Net carrying amount
Gas & Services	12,505.4	12,996.3	(0.1)	12,996.2
Europe	3,038.1	3,056.4	(0.1)	3,056.3
Americas <sup>(a)</sup>	8,125.7	8,524.8	-	8,524.8
Asia-Pacific	1,242.9	1,316.1	-	1,316.1
Middle East and Africa	98.7	99.0	-	99.0
Engineering & Construction	219.7	231.4	-	231.4
Global Markets & Technologies	115.3	118.8	(1.4)	117.4
<b>TOTAL GOODWILL</b>	<b>12,840.4</b>	<b>13,346.5</b>	<b>(1.5)</b>	<b>13,345.0</b>

(a) Goodwill recognized within Gas & Services Americas mainly comes from the United States contributing up to 8,352.3 million euros as of December 31, 2018.

In the last two fiscal years, the Group has not recorded any goodwill impairment losses.

Impairment tests were carried out using the methods detailed in note 5.f of the Accounting Policies. The key model assumptions used, such as market multiples and the discount rate, took into account the stock market and world economic context.

The market multiples used were determined using the Air Liquide Group market value as of December 31, 2018. Multiples obtained do not materially differ from those of companies whose activity is similar to that of the Group.

The growth rates used for estimating the cash flows of cash-generating units or groups of cash-generating units were significantly lower than the Group's historical average growth rates. Growth rates are comprised between 1% and 3% in mature markets, and up to 5.5% in emerging markets.

The weighted average cost of capital used was 6.0% as of December 31, 2018 (4.9% as of December 31, 2017).

The weighted average cost of capital and market multiples are adjusted for the activity and the geographical location of the cash-generating units being tested.

As of December 31, 2018 and December 31, 2017, the recoverable amounts of each cash-generating unit or groups of cash-generating units significantly exceeded their net carrying amounts.

Considering the activity of the Air Liquide Group, no reasonably possible change in key assumptions would result in an impairment. The Gas & Services activity favors synergies between the different business lines by pooling assets for a given geographical area. The geographical development of the activity is generally based on local industrial investments and external growth operations throughout the Large Industries business line. The supply of gas to clients of the Large Industries business is contracted for a minimum duration of 15 years. These customer contracts provide a good visibility and guarantee of future income.

## Note 12 Other intangible assets

## 12.1 GROSS CARRYING AMOUNTS

2018 (in millions of euros)	As of January 1	Additions	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Internally generated intangible assets	585.5	28.3	(13.8)	5.4	-	25.5	630.9
Other intangible assets	2,265.3	62.1	(21.4)	53.0	6.9	21.2	2,387.1
<b>TOTAL GROSS INTANGIBLE ASSETS</b>	<b>2,850.8</b>	<b>90.4</b>	<b>(35.2)</b>	<b>58.4</b>	<b>6.9</b>	<b>46.7</b>	<b>3,018.0</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

2017 (in millions of euros)	As of January 1	Additions	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Internally generated intangible assets	565.7	35.1	(4.0)	(17.3)	-	6.0	585.5
Other intangible assets	2,380.1	45.5	(5.8)	(164.8)	-	10.3	2,265.3
<b>TOTAL GROSS INTANGIBLE ASSETS</b>	<b>2,945.8</b>	<b>80.6</b>	<b>(9.8)</b>	<b>(182.1)</b>	<b>-</b>	<b>16.3</b>	<b>2,850.8</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

## 12.2 AMORTIZATION AND IMPAIRMENT LOSSES

2018 (in millions of euros)	As of January 1	Charge for the period	Impairment losses	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Internally generated intangible assets	(358.2)	(45.9)	(5.0)	6.2	(1.4)	-	20.3	(384.0)
Other intangible assets	(881.5)	(127.2)	(1.7)	12.8	(9.7)	-	(28.0)	(1,035.3)
<b>TOTAL INTANGIBLE ASSET AMORTIZATION</b>	<b>(1,239.7)</b>	<b>(173.1)</b>	<b>(6.7)</b>	<b>19.0</b>	<b>(11.1)</b>	<b>-</b>	<b>(7.7)</b>	<b>(1,419.3)</b>
<b>TOTAL NET INTANGIBLE ASSETS <sup>(b)</sup></b>	<b>1,611.1</b>	<b>(82.7)</b>	<b>(6.7)</b>	<b>(16.2)</b>	<b>47.3</b>	<b>6.9</b>	<b>39.0</b>	<b>1,598.7</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

(b) Other intangible assets mainly include the Airgas trademark for 463.5 million euros as of December 31, 2018.

2017 (in millions of euros)	As of January 1	Charge for the period	Impairment losses <sup>(b)</sup>	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Internally generated intangible assets	(285.9)	(39.4)	(38.7)	4.0	3.4	-	(1.6)	(358.2)
Other intangible assets	(772.5)	(134.5)	(20.5)	10.9	27.0	-	8.1	(881.5)
<b>TOTAL INTANGIBLE ASSET AMORTIZATION</b>	<b>(1,058.4)</b>	<b>(173.9)</b>	<b>(59.2)</b>	<b>14.9</b>	<b>30.4</b>	<b>-</b>	<b>6.5</b>	<b>(1,239.7)</b>
<b>TOTAL NET INTANGIBLE ASSETS <sup>(c)</sup></b>	<b>1,887.4</b>	<b>(93.3)</b>	<b>(59.2)</b>	<b>5.1</b>	<b>(151.7)</b>	<b>-</b>	<b>22.8</b>	<b>1,611.1</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

(b) Following a strategic review of its activities and its portfolio of assets in connection with NEOS company program, the Group recorded impairment on assets as described in note 5.

(c) Other intangible assets mainly include the Airgas trademark for 468.2 million euros as of December 31, 2017.

As of December 31, 2018, the Group had no material commitment to acquire intangible assets and was not subject to any restrictions over the use of existing intangible assets.



## Note 13 Property, plant and equipment

## 13.1 GROSS CARRYING AMOUNTS

2018 (in millions of euros)	As of January 1	Additions	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Land	443.8	0.7	(14.9)	14.0	0.2	0.9	444.7
Buildings	1,896.6	51.9	(23.9)	36.8	0.6	128.4	2,090.4
Equipment, cylinders, installations	33,505.7	604.5	(429.3)	296.6	28.4	1,669.8	35,675.7
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT IN SERVICE</b>	<b>35,846.1</b>	<b>657.1</b>	<b>(468.1)</b>	<b>347.4</b>	<b>29.2</b>	<b>1,799.1</b>	<b>38,210.8</b>
Construction in progress	2,057.4	1,538.1	-	2.6	0.1	(1,745.3)	1,852.9
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT</b>	<b>37,903.5</b>	<b>2,195.2</b>	<b>(468.1)</b>	<b>350.0</b>	<b>29.3</b>	<b>53.8</b>	<b>40,063.7</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

2017 (in millions of euros)	As of January 1	Additions	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Land	482.9	3.4	(16.9)	(41.5)	4.2	11.7	443.8
Buildings	1,938.8	39.5	(18.1)	(137.4)	0.9	72.9	1,896.6
Equipment, cylinders, installations	33,856.6	541.2	(239.3)	(2,165.6)	(99.1)	1,611.9	33,505.7
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT IN SERVICE</b>	<b>36,278.3</b>	<b>584.1</b>	<b>(274.3)</b>	<b>(2,344.5)</b>	<b>(94.0)</b>	<b>1,696.5</b>	<b>35,846.1</b>
Construction in progress	2,785.1	1,532.5	-	(191.0)	1.6	(2,070.8)	2,057.4
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT</b>	<b>39,063.4</b>	<b>2,116.6</b>	<b>(274.3)</b>	<b>(2,535.5)</b>	<b>(92.4)</b>	<b>(374.3)</b>	<b>37,903.5</b>

(a) Other movements primarily include account reclassifications and changes in the scope of consolidation.

Purchases of property, plant and equipment and intangible assets presented in the consolidated statement of cash flows relate to the increase in property, plant and equipment and intangible assets adjusted for the change in the fixed asset suppliers' balance during the current year.

## 13.2 DEPRECIATION AND IMPAIRMENT LOSSES

2018 (in millions of euros)	As of January 1	Charge for the period	Impairment losses	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Buildings	(913.4)	(81.4)	-	21.3	(15.1)	-	(4.5)	(993.1)
Equipment, cylinders, installations	(18,464.2)	(1,520.5)	(1.8)	371.5	(187.1)	-	(20.3)	(19,822.4)
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT DEPRECIATION</b>	<b>(19,377.6)</b>	<b>(1,601.9)</b>	<b>(1.8)</b>	<b>392.8</b>	<b>(202.2)</b>	<b>-</b>	<b>(24.8)</b>	<b>(20,815.5)</b>
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT, NET</b>	<b>18,525.9</b>	<b>593.3</b>	<b>(1.8)</b>	<b>(75.3)</b>	<b>147.8</b>	<b>29.3</b>	<b>29.0</b>	<b>19,248.2</b>

(a) Other movements primarily include changes in the scope of consolidation.

2017 (in millions of euros)	As of January 1	Charge for the period	Impairment losses <sup>(b)</sup>	Disposals	Foreign exchange differences	Acquisitions related to business combinations	Other movements <sup>(a)</sup>	As of December 31
Buildings	(877.9)	(83.2)	-	7.3	47.8	-	(7.4)	(913.4)
Equipment, cylinders, installations	(18,069.8)	(1,532.1)	(82.2)	115.3	1,013.8	-	90.8	(18,464.2)
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT DEPRECIATION</b>	<b>(18,947.7)</b>	<b>(1,615.3)</b>	<b>(82.2)</b>	<b>122.6</b>	<b>1,061.6</b>	<b>-</b>	<b>83.4</b>	<b>(19,377.6)</b>
<b>TOTAL PROPERTY, PLANT AND EQUIPMENT, NET</b>	<b>20,115.7</b>	<b>501.3</b>	<b>(82.2)</b>	<b>(151.7)</b>	<b>(1,473.9)</b>	<b>(92.4)</b>	<b>(290.9)</b>	<b>18,525.9</b>

(a) Other movements primarily include changes in the scope of consolidation.

(b) Following a strategic review of its activities and portfolio of assets in connection with NEOS company program, the Group recorded an impairment of assets as described in note 5.

The charge for the period corresponds to the increase in depreciation, net of investment grants released to the income statement.

## 13.3 FINANCE LEASES

These agreements mainly relate to office or industrial buildings, vehicle trailers and other industrial equipment as well as information technology hardware.

The present value of minimum lease payments for leased assets is recorded in the balance sheet under "Property, plant and equipment". The breakdown is as follows:

(in millions of euros)	2017		2018	
	Minimum lease payments	Present value of minimum lease payments	Minimum lease payments	Present value of minimum lease payments
Less than 1 year	7	7	5	5
1 to 5 years	10	8	9	7
More than 5 years	1	1	-	-
<b>Total minimum lease payments</b>	<b>18</b>	<b>16</b>	<b>14</b>	<b>12</b>
Less impact of discounting (financial expenses)	(2)		(1)	
<b>Present value of minimum lease payments</b>	<b>16</b>		<b>13</b>	

## Note 14 Non-current financial assets

(in millions of euros)	2017	2018
Non-consolidated investments	146.1	139.9
Loans	51.3	53.3
Other long-term receivables	340.4	314.4
Employee benefits	3.8	17.3
<b>NON-CURRENT FINANCIAL ASSETS</b>	<b>541.6</b>	<b>524.9</b>

As of December 31, 2018, Other long-term receivables comprised the receivable related to the refund claim for the equalization charge paid for the period 2000 to 2004 in the amount of 69.6 million euros (compared to 68.6 million euros as of December 31, 2017). In connection with the litigation concerning the reimbursement of the receivable, the Administrative Court of Montreuil partially sided with Air Liquide on July 21, 2014. Following the court order, L'Air Liquide S.A. received 30.3 million euros in principal and 15.0 million euros in interest on arrears. The Group appealed the decision of the Administrative Court of Montreuil on September 19, 2014 for the recovery of the balance. The appeal decision had not been rendered as of the period-end date.

## Note 15 Investments in associates

## 15.1 FINANCIAL INFORMATION RELATED TO JOINT VENTURES AND ASSOCIATES

Group share of associates and joint ventures as of December 31, 2018 (in millions of euros)	Share of profit for the period	Share of equity <sup>(a)</sup>	Share of net income and gains and losses recognized directly in equity <sup>(b)</sup>
Joint ventures	9.1	103.1	9.5
Associates	(5.0)	39.0	13.8
<b>TOTAL</b>	<b>4.1</b>	<b>142.1</b>	<b>23.3</b>

(a) Including goodwill relating to associates and joint ventures.

(b) The share of net income and gains and losses recognized directly in equity primarily comprises the translation reserves.

Group share of associates and joint ventures as of December 31, 2017 (in millions of euros)	Share of profit for the period	Share of equity <sup>(a)</sup>	Share of net income and gains and losses recognized directly in equity <sup>(b)</sup>
Joint ventures	6.8	92.9	4.8
Associates	(1.6)	35.3	13.8
<b>TOTAL</b>	<b>5.2</b>	<b>128.2</b>	<b>18.6</b>

(a) Including goodwill relating to associates and joint ventures.

(b) The share of net income and gains and losses recognized directly in equity primarily comprises the translation reserves.

## 15.2 MOVEMENTS DURING THE YEAR

(in millions of euros)	As of January 1	Share of profit for the period	Dividend distribution	Foreign exchange differences	Other movements	As of December 31
2017	134.2	5.2	(4.7)	(12.6)	6.1	128.2
<b>2018</b>	<b>128.2</b>	<b>4.1</b>	<b>(5.2)</b>	<b>4.7</b>	<b>10.3</b>	<b>142.1</b>

None of the consolidated companies using the equity method of accounting is individually material.

## Note 16 Deferred taxes

### 16.1 DEFERRED TAX ASSETS

The change in deferred tax assets over the fiscal year is as follows:

(in millions of euros)	2017	2018
<b>AS OF JANUARY 1</b>	<b>181.9</b>	<b>258.4</b>
Income (charge) to the income statement	(3.2)	15.5
Income (charge) to equity for the period <sup>(a)</sup>	9.3	14.0
Changes related to business combinations	1.6	1.3
Foreign exchange differences	89.7	(5.8)
Others <sup>(b)</sup>	(20.9)	(0.6)
<b>AS OF DECEMBER 31</b>	<b>258.4</b>	<b>282.8</b>

(a) Relates to deferred taxes recognized in other items in the statement of net income and gains and losses recognized directly in equity: +19.6 million euros relate to changes in the fair value of derivatives and non-consolidated investments and -5.6 million euros relate to actuarial gains and losses. In 2017, the respective effects amounted to +7.2 million euros relating to changes in the fair value of derivatives and +2.1 million euros relating to actuarial gains and losses.

(b) Other movements primarily include account reclassifications between accounts and changes in the scope of consolidation.

As of December 31, 2018, unrecognized deferred tax assets amounted to 140.6 million euros (132.0 million euros as of December 31, 2017).

### 16.2. DEFERRED TAX LIABILITIES

The change in deferred tax liabilities over the fiscal year is as follows:

(in millions of euros)	2017	2018
<b>AS OF JANUARY 1</b>	<b>2,378.2</b>	<b>1,807.7</b>
Charge (income) to the income statement <sup>(a)</sup>	(335.6)	89.5
Charge (income) to equity for the period <sup>(b)</sup>	27.1	5.2
Changes related to business combinations	(77.3)	0.1
Foreign exchange differences	(209.1)	47.2
<b>OTHERS <sup>(c)</sup></b>	<b>24.4</b>	<b>6.2</b>
<b>AS OF DECEMBER 31</b>	<b>1,807.7</b>	<b>1,955.9</b>

(a) Mainly related to the 2017 US tax reform.

(b) Relates to deferred taxes recognized in other items in the statement of net income and gains and losses recognized directly in equity: -2.6 million euros relate to changes in the fair value of derivatives and non-consolidated investments and +7.8 million euros relate to actuarial gains and losses. In 2017 the respective effects amounted to -19.5 million euros relating to changes in the fair value of derivatives and +46.6 million euros relating to actuarial gains and losses.

(c) Other movements primarily include account reclassifications between accounts and changes in the scope of consolidation.

### 16.3 DEFERRED TAX BY NATURE

In 2018, the net deferred taxes are broken down as follows:

(in millions of euros)	2018
Amortization / depreciation	(2,046.4)
Provisions, pensions and other employee benefits	345.5
Other provisions	195.8
Tax loss carryforwards	88.6
Others	(256.6)
<b>TOTAL</b>	<b>(1,673.1)</b>

## Note 17 Inventories and work-in-progress

(in millions of euros)	2017	2018
Raw materials and supplies	300.3	339.5
Finished and semi-finished goods	953.9	1,014.1
Work-in-progress	79.5	106.5
<b>NET INVENTORIES</b>	<b>1,333.7</b>	<b>1,460.1</b>

(in millions of euros)	2017	2018
Write-down of inventories	(39.8)	(15.7)
Reversals of write-down	22.8	21.3
<b>NET WRITE-DOWN RECOGNIZED IN THE INCOME STATEMENT</b>	<b>(17.0)</b>	<b>5.6</b>

## Note 18 Trade receivables

(in millions of euros)	2017	2018
Trade and other operating receivables	3,082.0	2,678.7
Provisions for impairment	(182.0)	(178.3)
<b>TRADE RECEIVABLES</b>	<b>2,900.0</b>	<b>2,500.4</b>

The significant decrease in trade receivables is mainly due to the new factoring program implemented at Airgas, as described in note 25.6.

Trade and other operating receivables include gross amounts relating to Engineering & Construction contracts for 136.0 million euros (191.7 million euros as of December 31, 2017).

As of December 31, 2018, cumulative revenue recognized using the percentage of completion method and cumulative cash in over the past years from the beginning of the projects in progress amounted to 2,163.3 million euros and 2,135.4 million euros respectively.

As of December 31, 2017, cumulative revenue recognized using the percentage of completion method and cumulative cash in over the past years from the beginning of the projects in progress amounted to 1,857.6 million euros and 1,789.7 million euros respectively.

### 18.1 BREAKDOWN OF TRADE AND OTHER OPERATING RECEIVABLES

(in millions of euros)	Gross carrying amount	Not yet due	Overdue with no expected default identified	Overdue with expected default identified
2017	3,082.0	2,190.5	724.9	166.6
<b>2018</b>	<b>2,678.7</b>	<b>1,963.3</b>	<b>568.7</b>	<b>146.7</b>

Trade receivables overdue and for which no expected default has been identified are mainly due within three months.

Trade receivables overdue and for which an expected default has been identified have been impaired and represent the main part of the provision for impairment booked at Group level.

Non-recourse factoring of receivables is described in note 25.

### 18.2 PROVISION FOR IMPAIRMENT

(in millions of euros)	As of January 1	Charges	Reversals	Foreign exchange differences	Other movements	As of December 31
2017	(165.6)	(60.9)	39.2	7.8	(2.5)	(182.0)
<b>2018</b>	<b>(182.0)</b>	<b>(57.2)</b>	<b>51.8</b>	<b>1.7</b>	<b>7.4</b>	<b>(178.3)</b>

## Note 19 Working capital requirement

The decrease in working capital requirement by 612.9 million euros, presented in the consolidated cash flow statement, mainly comes from:

- the decrease in working capital requirement of Gas & Services by 549.8 million euros mainly due to new program of non-recourse trade receivables factoring implemented at Airgas described in note 25.6;
- offset by the decrease in working capital of Engineering & Construction activity by 65.9 million euros.

## Note 20 Other current assets

<i>(in millions of euros)</i>	2017	2018
Advances and down-payments made	199.1	240.9
Prepaid expenses	119.9	119.5
Other sundry current assets	544.5	531.6
<b>OTHER CURRENT ASSETS</b>	<b>863.5</b>	<b>892.0</b>

## Note 21 Cash and cash equivalents

<i>(in millions of euros)</i>	2017	2018
Short-term loans	34.2	45.0
Short-term marketable securities	196.8	395.4
Cash in bank	1,425.1	1,285.2
<b>CASH AND CASH EQUIVALENTS</b>	<b>1,656.1</b>	<b>1,725.6</b>

As of December 31, 2018, cash and cash equivalents include 88 million euros subject to restrictions (108 million euros as of December 31, 2017), mainly in three countries: in Luxembourg (regulatory restrictions relating to the Group's captive reinsurance company), in South Korea (local deposit) and in Egypt (because of effective currency restrictions).

Furthermore, 45 million euros of cash and cash equivalents are held in countries in which a prior authorization is necessary to transfer funds abroad. These liquidities are at the Group's disposal within a reasonable time period, if preliminary formalities are respected. This amount stood at 17 million euros as of December 31, 2017.

## Note 22 Shareholders' equity

### 22.1 SHARES

#### Number of shares

	2017	2018
<b>NUMBER OF SHARES AS OF JANUARY 1</b>	<b>388,875,761</b>	<b>428,397,550</b>
Free share attribution	39,814,353	-
Capital increase reserved for employees	-	1,049,529
Options exercised during the period	807,436	630,355
Cancellation of treasury shares	(1,100,000)	(654,000)
<b>NUMBER OF SHARES AS OF DECEMBER 31</b>	<b>428,397,550</b>	<b>429,423,434</b>

Shares have a par value of 5.50 euros each and are all issued and fully paid-up.

In 2018, a total of 631,500 shares were repurchased (net of disposals).

## 22.2 SHARE CAPITAL INCREASE RESERVED FOR EMPLOYEES

On May 16, 2018, confirmed on July 27, 2018, the Board of Directors decided to proceed to a capital increase reserved for employees of Group companies belonging to the France Group savings plan or the Air Liquide International Group savings plan.

Under the authority conferred to him by the Board of Directors at its meetings held on May 16, 2018, the share capital increase was acknowledged by the Chief Executive Officer on December 7, 2018.

The purchase price was 87.09 euros for all employees, with the exception of employees of Group's subsidiaries located in the US, for which the purchase price was 92.53 euros.

A total of 1,049,529 Air Liquide shares were purchased, for an amount raised of 92 million euros, including a share premium of 86.3 million euros.

The Group savings plans are recorded in profit or loss and measured in accordance with IFRS 2 "Share-based Payment" based on the following assumptions:

- a two-week subscription period;
- a five-year lock-in period from the end of the subscription period in accordance with the French legislation.

The expense recorded takes into account the five-year lock-in period. The discount was measured taking into account the employee's borrowing rate.

The expense recorded in 2018 pursuant to IFRS 2 "Share-based Payment" amounted to 8.7 million euros (after discount) with respect to the Group's savings plan. 2.1 million euros came from the contribution granted by certain Group subsidiaries.

This expense is recorded in "Other operating expenses".

## 22.3 CAPITAL DECREASE

Under the authority of the 15<sup>th</sup> resolution adopted by the Annual General Meeting held on May 16, 2018, the Board of Directors of May 16, 2018, carried out the capital decrease of 3,597,000 euros to bring the capital back from 2,356,439,277.50 euros to 2,352,842,277.50 euros by cancelling 654,000 shares.

## 22.4 COMPANY TREASURY SHARES

Treasury shares are Air Liquide shares held by the Group, including shares forming part of the liquidity contract in accordance with an Ethics Charter recognized by the French financial markets authority (Autorité des marchés financiers). As of December 31, 2018, the Group held 1,456,504 treasury shares (1,665,698 as of December 31, 2017) including 9,500 treasury shares under a liquidity contract (8,000 as of December 31, 2017). Changes in the number of treasury shares are explained on pages 187 and 188 (in the consolidated statement of changes in equity).

## 22.5 SHARE-BASED PAYMENTS

### Share subscription option plans

Pursuant to the decisions of the Board of Directors, following the approval by the Annual General Meeting and based on the recommendations of the Remuneration Committee, the Group had adopted share subscription plans for some of the senior executives of the Company and its subsidiaries worldwide, as well as corporate officers.

The purpose of these options is to provide an incentive to key executives, by rewarding the loyalty of high-performing executives and their actions in exceptional situations, as well as associating them with the long-term interests of shareholders.

Stock options are granted for a minimum price which cannot be lower than the average closing market price over the 20 trading days preceding the grant date. Options granted between March 21, 2005 and June 28, 2010 inclusive must be exercised within eight years and options granted since October 14, 2011 must be exercised within 10 years.

A four-year vesting period applies to stock options granted.

On September 25, 2018, the Board of Directors consented to grant 73,380 stock options (217 beneficiaries) exercisable between September 25, 2022 and September 24, 2028, at a purchase price of 107.00 euros.

As of December 31, 2018, the number of outstanding share options granted by the Board of Directors under the plans approved by Annual General Meetings amounted to 3,119,897 options after adjustment (average price of 81.76 euros), or 0.73% of share capital, of which 611,731 options (average price of 80.98 euros) were granted to corporate officers present as of December 31, 2018.

Out of the total number of options issued pursuant to the approval by the Annual General Meeting on May 12, 2016, 8,298,309 options were retained for possible grant by the Board of Directors as of December 31, 2018.

### Performance shares plans

An additional compensation system involving performance shares was set up in 2008 as a way to reward our best employees and associate their medium-term performance with the Company's objectives.

The 19<sup>th</sup> resolution adopted by the Extraordinary Annual General Meeting held on May 12, 2016 authorizes the Board of Directors to grant free shares to Group employees, up to a maximum of 0.5% of the Company's share capital over a 38-month period. As part of this maximum attribution, free shares representing up to 0.15% of the Group's share capital can be granted to corporate officers over the same period.



Under this authority, the Board of Directors adopted:

- two different general regulations on September 25, 2018 ("France" Plan and "World" Plan) governing the attribution of performance shares to beneficiaries determined by the Board of Directors. The differences between the "France" and "World" Plans mainly differ as to the number of years of service required – paragraph a) below, and to the correlative absence of any holding requirement for the "World" Plan – paragraph c) below.

The granted shares shall be either shares issued through a capital increase performed by the Company by no later than the definitive vesting date or shares bought back by the Company in the market prior to such date.

To date, performances shares granted are treasury shares bought back as part of the Company's shares buyback program (see pages 310 and 340 for the minutes of the shares buyback program).

The granted shares shall be of the same nature and category as those making up the Company's share capital at the date on which the plans are approved by the Board of Directors.

On September 25, 2018, the Board of Directors decided to grant 393,774 performance shares to employees (1,734 beneficiaries).

Subscription options and performance shares are subject to:

- a continued service requirement during the vesting period:  
the shares granted to a beneficiary shall only finally vest if he or she has been an employee or corporate officer of a Group company during a vesting period, calculated as from the grant date, of three years for "France" Plan beneficiaries and four years for "World" Plan beneficiaries. In the event of retirement, the beneficiary retains his rights, being no longer required to satisfy the continued service requirement;
- performance requirements for all performance shares allocated to all beneficiaries which are now identical to performance requirements applicable to stock-options. They are described in the attribution of performance shares to employees summary table on page 170;
- a holding requirement for performance shares:  
as from the final grant date, the beneficiaries of the "France" Plan are required to hold their shares for two additional years during which such shares may not be transferred (except in the event of disability or death).

### Options granted to the ten employees of the Company and its subsidiaries (excluding corporate officers) who were attributed the highest number of options

In 2018, 6,540 options were granted to the ten employees of the Company and its subsidiaries (excluding corporate officers), who were attributed the highest number of options.

### Options exercised in 2018 by the ten employees of the Company and its subsidiaries (excluding corporate officers) with the highest number of options exercised

Year of grant	Number of options exercised	Average price (in euros) <sup>(a)</sup>
2010	104,334	60.28
2011	41,297	63.18
2012	9,476	77.36
2013	10,441	81.68
2014	2,000	85.66
<b>TOTAL</b>	<b>167,548</b>	<b>63.60</b>

(a) Historical data.

### Options exercised in 2017 by the ten employees of the Company and its subsidiaries (excluding corporate officers) with the highest number of options exercised

Year of grant	Number of options exercised	Average price (in euros) <sup>(a)</sup>
2009	51,248	48.72
2010	45,786	61.68
2011	20,166	65.27
2012	19,702	80.38
2013	21,961	83.60
2014	4,424	94.45
2015	2,671	102.24
<b>TOTAL</b>	<b>165,958</b>	<b>64.76</b>

(a) Historical data.

## Number of share subscription options and weighted average strike price

	2017		2018	
	Options <sup>(a)</sup>	Weighted average strike price (in euros)	Options	Weighted average strike price (in euros)
<b>Total number of options outstanding as of January 1</b> <i>(adjusted number and price)</i>	<b>4,691,455</b>	<b>76.31</b>	<b>3,787,066</b>	<b>79.04</b>
Options granted during the period <i>(adjusted number and price)</i>	81,184	94.32	73,380	107.00
Options exercised during the period <i>(adjusted number and price)</i>	807,436	64.25	630,355	66.64
Options canceled during the period <i>(adjusted number and price)</i>	178,137	93.96	110,194	91.64
<b>Total number of options as of December 31</b> <i>(adjusted number and price)</i>	<b>3,787,066</b>	<b>79.04</b>	<b>3,119,897</b>	<b>81.76</b>
<b>Of which total number of options eligible for exercise</b>	<b>2,268,824</b>	<b>72.82</b>	<b>2,400,916</b>	<b>78.53</b>

(a) The total number of outstanding options at the beginning of the period was adjusted following the capital increase in cash in 2017.

## Information on the fair value of share subscription options and attribution of performance shares

### Share subscription options

	2017	2018
	Plan 1 <sup>(b)</sup>	Plan 1 <sup>(b)</sup>
	09/20/2017	09/25/2018
Duration of the option	10 years	10 years
Fair value of the option <i>(in euros)</i>	18.39 <sup>(a)</sup>	18.98 <sup>(a)</sup>

(a) Options attributed to employees for which the fair value depends for 65% on performance requirements related to the Group's results and 35% on shareholder's return.

(b) Fair value at the attribution date, not restated for the effect of the share capital increase with preferential subscription rights in the market and attributions of free shares.

### Attribution of performance shares

The achievement of performance conditions limited with Group result is not considered as an underlying assumption and was deemed to have been fully achieved at the valuation date.

	2017		2018	
	Plan 1 <sup>(c)</sup>		Plan 1 <sup>(c)</sup>	
	09/20/2017		09/25/2019	
Duration of performance shares	5 years	4 years	5 years	4 years
Fair value of performance shares <i>(in euros)</i>	93.16 <sup>(a)</sup>	89.38 <sup>(b)</sup>	98.75 <sup>(a)</sup>	94.81 <sup>(b)</sup>

(a) Performance share to employees for beneficiaries located in France for which the fair value depends for 65% on performance conditions linked to the Group's results and 35% on shareholder's return.

(b) Performance share to employees for beneficiaries located outside France for which the fair value depends for 65% on performance conditions linked to the Group's results and 35% on shareholder's return.

(c) Fair value at the attribution date, not restated for the effect of the share capital increase with preferential subscription rights in the market and attributions of free shares.

An expense of 39.7 million euros (excluding taxes) relating to share subscription options and the attribution of performance shares was recognized in the income statement in 2018 compared to 34.4 million euros in 2017. The corresponding entry is recorded in equity.

## Note 23 Provisions, pensions and other employee benefits

2018 (in millions of euros)	As of January 1	Increase	Utilized	Other reversals	Discounting	Foreign exchange differences	Acquisitions related to business combination	Other movements <sup>(a)</sup>	As of December 31
Pensions and other employee benefits	1,739.5	58.0	(137.5)		(37.6)	4.0		(4.0)	1,622.4
Restructuring plans	43.2	8.7	(25.3)			(0.1)		0.1	26.6
Guarantees and other provisions related to engineering contracts	60.2	44.8	(14.2)	(12.0)	0.1				78.9
Dismantling	222.1		(8.8)	(3.7)	7.2	(0.2)		3.7	220.3
Provisions and contingent liabilities as part of a business combination	279.8		(39.3)	(11.3)	1.8	11.8		1.2	244.0
Other provisions	581.2	102.4	(85.0)	(48.8)	0.3	1.9	5.5	(13.9)	543.6
<b>TOTAL PROVISIONS</b>	<b>2,926.0</b>	<b>213.9</b>	<b>(310.1)</b>	<b>(75.8)</b>	<b>(28.2)</b>	<b>17.4</b>	<b>5.5</b>	<b>(12.9)</b>	<b>2,735.8</b>

(a) Other movements correspond to account reclassifications, disposals and provisions for dismantling, with no impact on the consolidated cash flow statement.

2017 (in millions of euros)	As of January 1	Increase	Utilized	Other reversals	Discounting	Foreign exchange differences	Acquisitions related to business combination	Other movements <sup>(a)</sup>	As of December 31
Pensions and other employee benefits	1,771.8	59.4	(111.1)		41.2	(25.9)	4.4	(0.3)	1,739.5
Restructuring plans	18.6	29.8	(14.1)	(0.2)		(0.2)		9.3	43.2
Guarantees and other provisions related to engineering contracts	58.6	40.7	(21.0)	(16.2)		(1.0)		(0.9)	60.2
Dismantling	235.0		(4.9)	(4.4)	7.3	(9.3)	(14.1)	12.5	222.1
Provisions and contingent liabilities as part of a business combination	303.1		(39.0)	(4.0)	0.9	(37.8)	56.6		279.8
Other provisions	484.8	303.3	(123.9)	(45.8)		(20.5)	3.6	(20.3)	581.2
<b>TOTAL PROVISIONS</b>	<b>2,871.9</b>	<b>433.2</b>	<b>(314.0)</b>	<b>(70.6)</b>	<b>49.4</b>	<b>(94.7)</b>	<b>50.5</b>	<b>0.3</b>	<b>2,926.0</b>

(a) Other movements correspond to account reclassifications, disposals and provisions for dismantling, with no impact on the consolidated cash flow statement.

In the normal course of its operations, the Group is party to arbitration, judicial or administrative proceedings. The potential costs of such proceedings are provided for, when they are probable, only if the amount can be quantified or estimated within a reasonable range. In the latter case, the amount provided for represents the best estimate of the Group's management. Provisions are determined based on a case-by-case risk assessment and events occurring during ongoing proceedings may result in a risk reappraisal at any time. These litigations are by nature diverse and involve various Group subsidiaries. Contingency

provisions recorded with respect to all Group litigations amounted to 182.6 million euros as of December 31, 2018 (176.4 million euros as of December 31, 2017) and are presented in "Other provisions". They include provisions for industrial disputes and for tax risks respectively for 120.7 and 61.9 million euros.

The Group does not provide the detail of these provisions, considering that disclosing the amount provided for each individual litigation could be prejudicial to the Group. Nevertheless, no single litigation is likely to have a material effect on the Group's financial position or its profitability.

## Note 24 Employee benefit obligations

### 24.1 PENSION PLANS

The most significant pension plans relate to France, Germany and the United States.

In France, Air Liquide provides an additional retirement benefit based on the final salary which is paid in addition to other normal pension plans. On December 31, 1995, this plan was closed to employees under age 45 or with less than 20 years of service as of January 1, 1996; the latter being covered by a defined contribution plan. These plans are unfunded. The annual amounts paid with regards to additional benefits cannot exceed a threshold set originally at 12% of total payroll or 12% of pre-tax profits of companies involved. This 12% threshold will be proportionately reduced by comparing the number of plan beneficiaries for the year to the number of plan beneficiaries for the previous year. In 2017, this additional benefit was funded subsequently to the article 50 of the law of January 20, 2014 securing the future and fairness of pensions plans.

IAS 19 "Employee Benefits" provides a very restrictive definition of defined contribution plans; any plans not complying fully with the conditions required are defined benefit plans by default.

This restrictive definition of defined contribution plans requires Air Liquide to account for these additional benefits as a defined benefit plan in spite of the limited obligations for the Company and the nature of the obligations not being stable or continuous.

The qualification as a defined benefit plan results in the recognition of a provision with regards to the future obligations.

With the Company's obligations being limited, the valuation of what will actually be paid to retirees is uncertain. Since the effect of this threshold cannot be measured reliably, the provision recognized represents the actuarial value of the amounts to be paid out to retirees until the plan is closed, excluding any potential threshold effect. The additional retirement benefit paid by Air Liquide is aligned with the indexation of French statutory and supplementary pension plans up to a maximum annuity. Any additional annuity will not be subject to any indexation. The effects related to the revaluation cap and floor were accounted for in "Other financial expenses".

In Germany, there are two main Air Liquide pension plans.

The first plan provides the retirees of Lurgi (Engineering & Construction activity) with a lifetime annuity, based on the income and length of service vested in the plan at the time of retirement, the normal retirement age being 65. The plan also provides disability and widowhood pensions. This plan is now closed to new entrants, the latter benefiting from a defined contribution plan.

The second plan is an old plan covering employees of the Gas & Services activity. The plan provides a lifetime annuity, based on the average income earned over the employee's career and the length of service vested at the time of retirement, the normal retirement age being 65. The plan also provides disability, pre-retirement and widowhood pensions. It is now closed to new entrants, with new employees benefiting from another defined benefit plan. Providing a minimum length of service of ten years, the plan provides a lifetime annuity based on the average income earned over the employee's career and the length of service vested at the time of retirement, the normal retirement age being 65. The plan also provides disability, pre-retirement and widowhood pensions.

In accordance with common market practice in Germany, limited funding contributions are made to pension funds as both plans are mainly managed internally.

In the United States, Air Liquide grants retirees supplemental benefits in addition to the normal pension plans. The US plan provides a traditional final average pay benefit to those who continue to accrue benefits. A retiring employee may elect to receive their pension benefit as a lump sum or a lifetime annuity. This plan was closed to new participants in 2004 and was frozen in 2016. Therefore, employees who joined the Company before 2004 are no longer acquiring new rights on this defined benefit plan, but benefit from the defined contribution plan that has been opened since 2004 to new employees.

In 2017, a new plan was implemented (Supplemental Saving plan). This plan comes on top of the basic savings plan offering additional retirement benefits beyond the tax limit of the basic plan. It represents an annual cost of around 10 million dollars.

## 24.2 OBLIGATIONS

Group obligations related to pension plans and similar benefits as of December 31, 2018 are shown below:

2018 (in millions of euros)	Defined benefit plans	Retirement termination payments	Other long term benefits	Medical Plans	Total
<b>A. Change in net liabilities</b>					
Net liabilities at the beginning of the period	(1,505.2)	(166.0)	(24.2)	(40.2)	(1,735.6)
(Acquisition) divestiture / transfer	1.3	0.1	0.1	(0.1)	1.4
(Expense) income recognized	(42.1)	(10.1)	(1.5)	(4.1)	(57.8)
Employer contributions	127.3	6.7	2.0	5.6	141.6
Gains (losses) for the period	55.9	(7.3)		0.8	49.4
Exchange rate movements	(4.6)	1.1	(0.1)	(0.5)	(4.1)
<b>Net liabilities at the end of the period</b>	<b>(1,367.4)</b>	<b>(175.5)</b>	<b>(23.7)</b>	<b>(38.5)</b>	<b>(1,605.1)</b>
<b>B. Expense recorded in 2018</b>					
Service cost	25.7	8.5	1.7	3.4	39.3
Interest expense on the net defined benefit liability	16.8	1.7	0.2	0.7	19.4
Past service cost			(0.8)		(0.8) <sup>(a)</sup>
Actuarial (gains) losses			0.3		0.3
Curtailment / settlement	(0.4)	(0.1)	0.1		(0.4) <sup>(a)</sup>
<b>Expense (income) recognized</b>	<b>42.1</b>	<b>10.1</b>	<b>1.5</b>	<b>4.1</b>	<b>57.8</b>
<b>C. Change in present value of obligations in 2018</b>					
DBO at the beginning of the period	2,624.0	166.3	24.3	40.3	2,854.9
Acquisition (divestiture) / transfer	(1.3)	(0.1)	(0.1)	0.1	(1.4)
Service cost	25.7	8.5	1.7	3.4	39.3
Interest cost	42.1	1.8	0.2	0.7	44.8
Employee contributions	2.0				2.0
Plan amendments			(0.8)		(0.8) <sup>(a)</sup>
Curtailment / settlement	(2.5)	(0.1)	0.1		(2.5) <sup>(a)</sup>
Benefit payments	(151.6)	(6.8)	(2.0)	(5.6)	(166.0)
Actuarial (gains) losses	(84.7)	7.4	0.3	(0.8)	(77.8)
Exchange rate movements	36.8	(1.2)		0.6	36.2
<b>Obligations at the end of the period</b>	<b>2,490.5</b>	<b>175.8</b>	<b>23.7</b>	<b>38.7</b>	<b>2,728.7</b>
<b>D. Change in plan assets in 2018</b>					
Fair value of assets at the beginning of the period	1,129.1	0.3	0.1	0.1	1,129.6
Actual return on plan assets	(13.8)	0.1			(13.7)
Employer contributions	107.5	6.7	2.0	5.6	121.8
Employee contributions	2.0				2.0
Benefit payments	(131.8)	(6.7)	(2.0)	(5.6)	(146.1)
Settlement	(2.1)				(2.1)
Exchange rate movements	32.2	(0.1)	(0.1)	0.1	32.1
<b>Fair value of assets at the end of the period</b>	<b>1,123.1</b>	<b>0.3</b>	<b>-</b>	<b>0.2</b>	<b>1,123.6</b>
<b>E. Funded status at the end of 2018</b>					
Present value of obligations	(2,490.5)	(175.8)	(23.7)	(38.7)	(2,728.7)
Fair value of plan assets	1,123.1	0.3	-	0.2	1,123.6
<b>Net liabilities</b>	<b>(1,367.4)</b>	<b>(175.5)</b>	<b>(23.7)</b>	<b>(38.5)</b>	<b>(1,605.1)</b>
<b>F. Actuarial (gains) and losses recognized directly in equity</b>					
(Gains) and losses at the beginning of the period	1,174.8	36.7		6.2	1,217.7
(Gains) and losses on obligations	(84.7)	7.4		(0.8)	(78.1)
(Gains) and losses on plan assets	39.1	(0.1)			39.0
Change in surplus management reserve	(10.3)				(10.3)
Exchange rate movements	16.5	(0.9)		0.5	16.1
<b>(Gains) and losses at the end of the period <sup>(b)</sup></b>	<b>1,135.4</b>	<b>43.1</b>		<b>5.9</b>	<b>1,184.4</b>

(a) Past service costs and plan amendments mainly relate to pension plans and medical costs in Switzerland.

(b) Losses (gains), net of tax, recognized in equity, amounted to 866.2 million euros as of December 31, 2018.

Group obligations related to pension plans and similar benefits as of December 31, 2017 are shown below:

2017 (in millions of euros)	Defined benefit plans	Retirement termination payments	Other long term benefits	Medical Plans	Total
<b>A. Change in net liabilities</b>					
Net liabilities at the beginning of the period	(1,541.3)	(160.2)	(22.4)	(43.6)	(1,767.5)
(Acquisition) divestiture / transfer	(3.2)	1.0	(5.5)		(7.7)
(Expense) income recognized	(49.3)	(10.7)	1.8	(1.3)	(59.5)
Employer contributions	107.2	6.0	1.8	2.8	117.8
Gains (losses) for the period	(42.8)	(2.7)		1.1	(44.4)
Exchange rate movements	24.2	0.6	0.1	0.8	25.7
<b>Net liabilities at the end of the period</b>	<b>(1,505.2)</b>	<b>(166.0)</b>	<b>(24.2)</b>	<b>(40.2)</b>	<b>(1,735.6)</b>
<b>B. Expense recorded in 2017</b>					
Service cost	31.5	9.0	1.9	0.5	42.9
Interest expense on the net defined benefit liability	20.1	2.1	0.3	0.9	23.4
Past service cost	(0.2)	(0.3)	(3.5)		(4.0) <sup>(a)</sup>
Actuarial (gains) losses			(0.5)		(0.5)
Curtailment / settlement	(2.1)	(0.1)		(0.1)	(2.3) <sup>(a)</sup>
<b>Expense (income) recognized</b>	<b>49.3</b>	<b>10.7</b>	<b>(1.8)</b>	<b>1.3</b>	<b>59.5</b>
<b>C. Change in present value of obligations in 2017</b>					
DBO at the beginning of the period	2,744.0	160.6	22.5	43.7	2,970.8
Acquisition (divestiture) / transfer	3.5	(1.0)	5.5		8.0
Service cost	31.5	9.0	1.9	0.5	42.9
Interest cost	46.5	2.0	0.4	0.8	49.7
Employee contributions	2.3				2.3
Plan amendments	(0.1)	(0.2)	(3.5)	(0.1)	(3.9) <sup>(a)</sup>
Curtailment / settlement	(25.8)	(0.1)		(0.1)	(26.0) <sup>(a)</sup>
Benefit payments	(163.0)	(6.0)	(1.9)	(2.6)	(173.5)
Actuarial (gains) losses	120.0	2.7	(0.5)	(1.1)	121.1
Exchange rate movements	(134.9)	(0.7)	(0.1)	(0.8)	(136.5)
<b>Obligations at the end of the period</b>	<b>2,624.0</b>	<b>166.3</b>	<b>24.3</b>	<b>40.3</b>	<b>2,854.9</b>
<b>D. Change in plan assets in 2017</b>					
Fair value of assets at the beginning of the period	1,202.7	0.4	0.1	0.1	1,203.3
Acquisition (divestiture) / transfer	0.3				0.3
Actual return on plan assets	113.8				113.8
Employer contributions	89.1	5.9	1.9	2.8	99.7
Employee contributions	2.3				2.3
Benefit payments	(144.7)	(5.9)	(1.9)	(2.8)	(155.3)
Settlement	(23.7)				(23.7)
Exchange rate movements	(110.7)	(0.1)			(110.8)
<b>Fair value of assets at the end of the period</b>	<b>1,129.1</b>	<b>0.3</b>	<b>0.1</b>	<b>0.1</b>	<b>1,129.6</b>
<b>E. Funded status at the end of 2017</b>					
Present value of obligations	(2,624.0)	(166.3)	(24.3)	(40.3)	(2,854.9)
Fair value of plan assets	1,129.1	0.3	0.1	0.1	1,129.6
Surplus management reserve	(10.3)				(10.3)
<b>Net liabilities</b>	<b>(1,505.2)</b>	<b>(166.0)</b>	<b>(24.2)</b>	<b>(40.2)</b>	<b>(1,735.6)</b>
<b>F. Actuarial (gains) and losses recognized directly in equity</b>					
(Gains) and losses at the beginning of the period	1,246.6	34.6		6.7	1,287.9
Acquisition (divestiture) / transfer	(56.3)				(56.3)
(Gains) and losses on obligations	120.0	2.7		(1.1)	121.6
(Gains) and losses on plan assets	(87.5)				(87.5)
Change in surplus management reserve	10.3				10.3
Exchange rate movements	(58.3)	(0.6)		0.6	(58.3)
<b>(Gains) and losses at the end of the period <sup>(b)</sup></b>	<b>1,174.8</b>	<b>36.7</b>		<b>6.2</b>	<b>1,217.7</b>

(a) Past service costs and plan amendments mainly relate to pension plans and medical costs in the US and in Switzerland.

(b) Losses (gains), net of tax, recognized in equity, amounted to 890.1 million euros as of December 31, 2017.

The amounts mentioned above can be broken down as follows by geographical area as of December 31, 2018:

<b>2018</b> (in millions of euros)	<b>Obligations</b>	<b>Plan assets</b>	<b>Provisions in the balance sheet</b>	<b>Surplus management reserve</b>
Europe / Africa	(1,801)	359	(1,442)	-
Americas	(850)	703	(147)	-
Asia-Pacific	(78)	62	(16)	-
<b>TOTAL</b>	<b>(2,729)</b>	<b>1,124</b>	<b>(1,605)</b>	<b>-</b>

The amounts mentioned above can be broken down as follows by geographical area as of December 31, 2017:

<b>2017</b> (in millions of euros)	<b>Obligations</b>	<b>Plan assets</b>	<b>Provisions in the balance sheet</b>	<b>Surplus management reserve</b>
Europe / Africa	(1,875)	359	(1,526)	10
Americas	(902)	712	(190)	-
Asia-Pacific	(78)	58	(20)	-
<b>TOTAL</b>	<b>(2,855)</b>	<b>1,129</b>	<b>(1,736)</b>	<b>10</b>

## 24.3 MAIN ASSUMPTIONS

The main discount rates used are as follows:

	<b>2017</b>	<b>2018</b>
Euro zone	1.6%	1.6%
Canada	3.5%	3.8%
Japan	0.4%	0.4%
Switzerland	0.6%	0.9%
United States	3.6%	4.2%
United Kingdom	2.5%	2.7%

Differences between expected returns on plan assets and the main discount rates are as follows:

<b>2018</b>	<b>Expected return on assets <sup>(a)</sup></b>	<b>Discount rate 2017</b>	<b>Impact (in bp)</b>
Euro zone	3.0%	1.6%	(140)
Canada	4.4%	3.5%	(90)
Japan	3.0%	0.4%	(260)
Switzerland	3.5%	0.6%	(290)
United States	5.6%	3.6%	(200)
United Kingdom	5.0%	2.5%	(250)

(a) The expected return on long-term assets was determined by taking into account, in each country, the asset allocation in the portfolio.

<b>2017</b>	<b>Expected return on assets <sup>(a)</sup></b>	<b>Discount rate 2016</b>	<b>Impact (in bp)</b>
Euro zone	3.0%	1.6%	(140)
Canada	4.8%	3.8%	(100)
Japan	3.0%	0.4%	(265)
Switzerland	3.5%	0.7%	(285)
United States	6.0%	4.1%	(190)
United Kingdom	5.4%	2.6%	(285)

(a) The expected return on long-term assets was determined by taking into account, in each country, the asset allocation in the portfolio.



## 24.4 BREAKDOWN OF GAINS AND LOSSES FOR THE PERIOD

<i>(in millions of euros)</i>	2017	2018
Experience gains and losses on present value of the obligation	(6)	6
Gains and losses on present value of the defined obligation related to changes in assumptions	(115)	72
Experience gains and losses on fair value of assets	88	(39)

## Breakdown of experience gains and losses on financial assets

2018 <i>(in millions of euros)</i>	Interest income on financial assets	Actual return on assets	Gains and losses on assets
Europe / Africa	3.9	2.2	(1.7)
Americas	21.1	(16.5)	(37.6)
Asia-Pacific	0.4	0.6	0.3
<b>TOTAL</b>	<b>25.4</b>	<b>(13.7)</b>	<b>(39.0)</b>

2017 <i>(in millions of euros)</i>	Interest income on financial assets	Actual return on assets	Gains and losses on assets
Europe / Africa	4.1	29.6	25.5
Americas	21.8	79.3	57.5
Asia-Pacific	0.4	4.9	4.5
<b>TOTAL</b>	<b>26.3</b>	<b>113.8</b>	<b>87.5</b>

## 24.5 PENSION PLAN RISK ANALYSIS

## Sensitivity to movements in discount rates and other variables

The present value of obligations related to defined benefit plans is measured by discounting future cash flows. Discount rates are determined based on Government bonds rates or, when the financial markets are sufficiently liquid, on "high-quality" corporate bond rates, which can vary from one period to another.

Changes in discount rates can materially change the present value of the Group's obligations and the expense recorded in the year.

The amount of obligations is affected to a lesser extent by revised wages and inflation indexes, as well as legal changes regarding retirement age or official mortality tables.

## Impact of a -0.25% decrease in discount rates

	Impact on obligations as of December 31, 2018 <i>(in millions of euros)</i>	% of total obligations as of December 31, 2018
Europe / Africa	61	3.4%
Americas	26	3.1%
Asia-Pacific	1	1.6%
<b>TOTAL</b>	<b>88</b>	<b>3.2%</b>

	Impact on obligations as of December 31, 2017 <i>(in millions of euros)</i>	% of total obligations as of December 31, 2017
Europe / Africa	65	3.5%
Americas	30	3.3%
Asia-Pacific	1	1.7%
<b>TOTAL</b>	<b>96</b>	<b>3.4%</b>

## Impact of a +0.25% increase in discount rates

	Impact on obligations as of December 31, 2018 (in millions of euros)	% of total obligations as of December 31, 2018
Europe / Africa	(59)	-3.3%
Americas	(25)	-3.0%
Asia-Pacific	(1)	-1.6%
<b>TOTAL</b>	<b>(85)</b>	<b>-3.1%</b>

	Impact on obligations as of December 31, 2017 (in millions of euros)	% of total obligations as of December 31, 2017
Europe / Africa	(62)	-3.3%
Americas	(29)	-3.2%
Asia-Pacific	(1)	-1.6%
<b>TOTAL</b>	<b>(92)</b>	<b>-3.2%</b>

## Sensitivity of the value of plan assets to market conditions

For the Group's defined benefit plans subject to funding requirements, the fair value of plan assets is primarily dependent on interest rates, the performance of plan assets and amendments to local regulations. Any adverse movement in these variables would require additional Group contributions to the pension funds on a timely basis.

Plan assets consist of shares, bonds and other assets whose value is subject to market fluctuations. A downturn in the financial markets would increase the net liabilities of defined benefit plans. The plans' coverage ratios would decrease accordingly, requiring additional Group contributions on a timely basis.

	Shares		Bonds		Real estate		Cash		Others		Total	
	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%
<b>2018</b>												
Europe / Africa	82	22.8%	134	37.3%	92	25.6%	2	0.6%	49	13.6%	359	100.0%
Americas	145	20.6%	508	72.3%	14	2.0%	6	0.9%	30	4.3%	703	100.0%
Asia-Pacific	6	9.7%	49	79.0%	-	0.0%	-	0.0%	7	11.3%	62	100.0%
<b>TOTAL</b>	<b>233</b>		<b>691</b>		<b>106</b>		<b>8</b>		<b>86</b>		<b>1,124</b>	

	Shares		Bonds		Real estate		Cash		Others		Total	
	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%
<b>2017</b>												
Europe / Africa	109	30.3%	147	41.0%	72	20.1%	8	2.2%	23	6.4%	359	100.0%
Americas	214	30.1%	413	58.0%	27	3.8%	3	0.4%	55	7.7%	712	100.0%
Asia-Pacific	23	39.7%	30	51.7%	1	1.7%	1	1.7%	3	5.2%	58	100.0%
<b>TOTAL</b>	<b>346</b>		<b>590</b>		<b>100</b>		<b>12</b>		<b>81</b>		<b>1,129</b>	

## Note 25 Borrowings

This note provides information on the breakdown of the Group's borrowings by instrument. For further information on financial instruments and the exposure to foreign exchange and interest rate risks, please refer to note 26.

### Net indebtedness calculation

(in millions of euros)	December 31, 2017	December 31, 2018
Non-current borrowings	(12,522.4)	(11,709.6)
Current borrowings	(2,504.6)	(2,550.9)
<b>TOTAL GROSS INDEBTEDNESS</b>	<b>(15,027.0)</b>	<b>(14,260.5)</b>
Cash and cash equivalents	1,656.1	1,725.6
<b>TOTAL NET INDEBTEDNESS AT THE END OF THE PERIOD</b>	<b>(13,370.9)</b>	<b>(12,534.9)</b>

### Statement of changes in net indebtedness

(in millions of euros)	December 31, 2017	December 31, 2018
<b>Net indebtedness at the beginning of the period</b>	<b>(15,368.1)</b>	<b>(13,370.9)</b>
Net cash flows from operating activities	4,254.0	4,716.4
Net cash flows used in investing activities	(1,845.7)	(2,270.2)
Net cash flows from (used in) financing activities excluding changes in borrowings	(1,191.6)	(1,161.6)
<b>Total net cash flows</b>	<b>1,216.7</b>	<b>1,284.6</b>
Effect of exchange rate changes, opening net indebtedness of newly acquired companies and others	886.2	(236.2)
Adjustment of net finance costs <sup>(a)</sup>	(105.7)	(212.4)
<b>Change in net indebtedness</b>	<b>1,997.2</b>	<b>836.0</b>
<b>TOTAL NET INDEBTEDNESS AT THE END OF THE PERIOD</b>	<b>(13,370.9)</b>	<b>(12,534.9)</b>

(a) In 2017, the net finance costs included only the amount related to the acquisition of Airgas.

The Air Liquide Group net indebtedness breaks down as follows:

(in millions of euros)	2017			2018		
	Carrying amount			Carrying amount		
	Non-current	Current	Total	Non-current	Current	Total
Bonds and private placements	11,712.2	1,617.0	13,329.2	11,072.7	1,334.2	12,406.9
Commercial paper programs		185.8	185.8		693.8	693.8
Bank debt and other financial debt	714.6	695.2	1,409.8	521.5	492.3	1,013.8
Finance leases <sup>(a)</sup>	9.3	6.6	15.9	8.0	4.6	12.6
Put options granted to minority shareholders	86.3		86.3	107.4	26.0	133.4
<b>TOTAL BORROWINGS (A)</b>	<b>12,522.4</b>	<b>2,504.6</b>	<b>15,027.0</b>	<b>11,709.6</b>	<b>2,550.9</b>	<b>14,260.5</b>
Short-term loans		34.2	34.2		45.0	45.0
Short-term marketable securities		196.8	196.8		395.4	395.4
Cash in bank		1,425.1	1,425.1		1,285.2	1,285.2
<b>TOTAL CASH AND CASH EQUIVALENTS (B)</b>		<b>1,656.1</b>	<b>1,656.1</b>		<b>1,725.6</b>	<b>1,725.6</b>
<b>NET INDEBTEDNESS (A) - (B)</b>	<b>12,522.4</b>	<b>848.5</b>	<b>13,370.9</b>	<b>11,709.6</b>	<b>825.3</b>	<b>12,534.9</b>

(a) See note 13.3. Finance leases.

In accordance with the Group's policy to diversify funding sources, different types of instruments are used to meet the Group's funding requirements (capital markets and bank credit facilities). Long-term bonds and private placements are the primary sources of funding and represent 87% of gross debt as of December 31, 2018. At the end of 2018, outstanding notes under these sources amounted to 12.4 billion euros, of which 279 million euros (nominal amount of 2.2 billion Chinese renminbi) was issued in 2018 to finance the Group's funding requirements.

The carrying amount of commercial paper amounted to 0.7 billion euros as of December 31, 2018 versus 0.2 billion euros as of December 31, 2017.

Gross indebtedness decreases by 0.8 billion euros, repayments of matured bonds being higher than the bond issued in 2018.

The 2018 bond issue had the following characteristics:

- a bond issue on the Chinese mainland market ("Panda") for an aggregate nominal amount of 2.2 billion Chinese renminbi (approximately 279 million euros). This transaction bears coupons of 5.95% and 6.40% for a 3-year and a 5-year maturity respectively.

In consideration thereof:

- the bond issue of 325 million US dollars (284 million euros) by Air Liquide Finance was repaid on February 15, 2018;
- the bond issue of 500 million euros by Air Liquide Finance was repaid on June 13, 2018;
- the bond issue of 170 million euros by Air Liquide Finance was repaid on June 30, 2018;
- the second and last tranche of "Dim Sum" was repaid on September 19, 2018, for an amount of 850 million Chinese renminbi (108 million euros);
- the bond issue of 456.75 million euros by Air Liquide S.A. was repaid on October 12, 2018.

The carrying amount of borrowings in the balance sheet is as follows:

	2017	2018		
	Carrying amount	Amount issued <sup>(a)</sup>	Amortized cost adjustments <sup>(b)</sup>	Carrying amount <sup>(a)+(b)</sup>
<i>(in millions of euros)</i>				
Bonds in the EMTN program	6,958.1	6,734.0	39.4	6,773.4
Bonds not in the EMTN program	4,848.4	4,209.5	13.5	4,223.0
Private placements in the EMTN program	934.3	782.4	11.6	794.0
Private placements not in the EMTN program	588.4	611.4	5.1	616.5
<b>TOTAL BONDS AND PRIVATE PLACEMENTS</b>	<b>13,329.2</b>	<b>12,337.3</b>	<b>69.6</b>	<b>12,406.9</b>
Commercial paper programs	185.8	694.2	(0.4)	693.8
Bank debt and other financial debt	1,409.8	1,007.6	6.2	1,013.8
Finance leases <sup>(c)</sup>	15.9	12.6		12.6
Put options granted to minority shareholders	86.3	133.4		133.4
<b>LONG-TERM BORROWINGS</b>	<b>15,027.0</b>	<b>14,185.1</b>	<b>75.4</b>	<b>14,260.5</b>

(a) Nominal amount.

(b) Amortized cost including accrued interest.

(c) See note 13.3. Finance leases.

## 25.1 CARRYING AMOUNT AND FAIR VALUE OF FINANCIAL ASSETS AND LIABILITIES

Financial assets or liabilities with a carrying amount differing from their fair value are unhedged fixed-rate borrowings.

	2017		2018	
	Carrying amount	Fair value	Carrying amount	Fair value
<i>(in millions of euros)</i>				
<b>FINANCIAL LIABILITIES</b>				
Non-current borrowings	12,522.4	12,444.1	11,709.6	11,592.2

The Group's financial instruments are measured at fair value to the extent that available financial market data enables a reliable estimate of their market value, assuming the absence of any intentions or needs to liquidate.

## 25.2 MATURITY OF BORROWINGS

It is the Group policy to spread over time the maturity of long-term debt (bonds, private placements and bank credit facilities) in order to limit the annual refinancing needs.

2018 (in millions of euros)	Maturity											
	Nominal amount	Carrying amount	On demand	< 1 year	≥ 1 year and ≤ 5 years				> 5 years			
					2020	2021	2022	2023	2024	2025	2026	> 2026
Bonds and private placements	12,337.3	12,406.9		1,334.2	1,229.0	1,544.7	1,542.0	1,052.6	1,432.7	498.4	1,234.3	2,539.0
Commercial paper programs	694.2	693.8		693.8								
Bank debt and other financial debt	1,007.6	1,013.8		492.3	100.0	103.4	101.8	96.8	86.8	22.8	7.4	2.4
Finance leases <sup>(a)</sup>	12.6	12.6		4.6	3.6	2.3	1.3	0.4	0.1	0.1	0.2	
Put options granted to minority shareholders	133.4	133.4	133.4									
<b>TOTAL BORROWINGS</b>	<b>14,185.1</b>	<b>14,260.5</b>	<b>133.4</b>	<b>2,524.9</b>	<b>1,332.6</b>	<b>1,650.4</b>	<b>1,645.1</b>	<b>1,149.8</b>	<b>1,519.6</b>	<b>521.3</b>	<b>1,241.9</b>	<b>2,541.4</b>

(a) See note 13.3. Finance leases.

2017 (in millions of euros)	Maturity											
	Nominal amount	Carrying amount	On demand	< 1 year	≥ 1 year et ≤ 5 years				> 5 years			
					2019	2020	2021	2022	2023	2024	2025	> 2025
Bonds and private placements	13,377.9	13,329.2	-	1,617.0	1,160.1	1,225.0	1,335.2	1,519.1	928.0	1,405.8	493.6	3,645.4
Commercial paper programs	185.8	185.8		185.8								
Bank debt and other financial debt	1,406.0	1,409.8		695.2	163.0	128.8	96.0	84.7	85.2	73.0	60.8	23.1
Finance leases <sup>(a)</sup>	15.9	15.9		6.6	3.6	2.6	1.3	0.6	0.5	0.5	0.2	
Put options granted to minority shareholders	86.3	86.3	86.3									
<b>TOTAL BORROWINGS</b>	<b>15,071.9</b>	<b>15,027.0</b>	<b>86.3</b>	<b>2,504.6</b>	<b>1,326.7</b>	<b>1,356.4</b>	<b>1,432.5</b>	<b>1,604.4</b>	<b>1,013.7</b>	<b>1,479.3</b>	<b>554.6</b>	<b>3,668.5</b>

(a) See note 13.3. Finance leases.

### 25.3 NET INDEBTEDNESS BY CURRENCY

The Group provides a natural hedge and reduces its exposure to currency fluctuations by raising debt mainly in the currency of the cash flows that are generated to repay the debt. In most countries, and especially outside the euro, US dollar, Japanese yen and Chinese renminbi zones, financing is raised in either local or foreign currency (EUR or USD) when sales contracts are indexed in foreign currency. Debt in other currencies is mainly denominated in Brazilian real, Singapore dollar, Canadian dollar, British pound sterling and South African rand.

As part of intra-group multi-currency financing, the Central Treasury Department converts the debt raised in financial markets into various

currencies to finance subsidiaries in their functional currencies or their cash flow currencies. The breakdown of this hedging portfolio is shown in the table below.

Accordingly, a portion of the euro debt raised was converted (607.1 million euros) to other currencies to finance foreign subsidiaries. Out of the Group's US dollar initial debt amounting to 5,510 million euros, 629.8 million was converted to euros using currency swap contracts, and 194.9 million euros were in cash or cash equivalent, leading to an adjusted net debt in US dollars of 4,685.3 million euros. The weighting between the euro and the US dollar has shifted in favor of the euro, due to the financing in euros of a share of US dollar debt contracted for Airgas acquisition.

2018 (in millions of euros)	Gross debt – original issue	Cash and cash equivalents	Rate and currency swaps	Adjusted net indebtedness
EUR	7,327.8	(1,120.5)	(607.1)	5,600.2
USD	5,510.0	(194.9)	(629.8)	4,685.3
JPY	243.7	(7.7)	93.8	329.8
CNY	434.1	(134.7)	117.1	416.5
Other currencies	744.9	(267.8)	1,026.0	1,503.1
<b>TOTAL</b>	<b>14,260.5</b>	<b>(1,725.6)</b>		<b>12,534.9</b>

2017 (in millions of euros)	Gross debt – original issue	Cash and cash equivalents	Rate and currency swaps	Adjusted net indebtedness
EUR	7,837.6	(1,073.7)	(2,541.5)	4,222.4
USD	5,815.0	(145.7)	1,227.5	6,896.8
JPY	226.7	(18.5)	161.3	369.5
CNY	375.8	(186.0)	418.6	608.4
Other currencies	771.9	(232.2)	734.1	1,273.8
<b>TOTAL</b>	<b>15,027.0</b>	<b>(1,656.1)</b>		<b>13,370.9</b>

### 25.4 FIXED-RATE PORTION OF GROSS DEBT

(as % of total debt)		2017	2018
EUR debt	Portion of fixed-rate gross debt	80%	75%
USD debt	Portion of fixed-rate gross debt	97%	100%
CNY debt	Portion of fixed-rate gross debt	NC <sup>(a)</sup>	99%
JPY debt	Portion of fixed-rate gross debt	100%	100%
Total debt	Portion of fixed-rate gross debt	87%	90%

(a) Not communicated in 2017.

As of December 31, 2018, fixed-rate debt represented 90% of the total debt.

To secure the fixed-rate portion of gross debt in the future, protecting the Group against a potential increase in euro rates until the refinancing of a euro bond issue, maturing in June 2020, three firm hedges for 100 million euros each were set up. In the same way, to protect the Group against an increase in dollar rates at date of refinancing of a US dollar bond issue under US Public Rule 144A, maturing in September 2019, a firm hedge for 200 million US dollars was set up.

## 25.5 BREAKDOWN OF AVERAGE NET FINANCE COSTS

(in millions of euros)	2017			2018		
	Average outstanding debt	Net interests	Average net finance costs	Average outstanding debt	Net interests	Average net finance costs
EUR	4,303.5	85.8	2.0%	5,355.6	103.8	1.9%
USD	8,221.5	233.9	2.8%	5,704.7	157.1	2.8%
JPY	505.1	9.0	1.8%	449.7	6.9	1.5%
CNY	884.9	49.4	5.6%	607.7	40.8	6.7%
Other currencies	1,587.2	110.3	6.9%	1,617.9	105.6	6.5%
<b>TOTAL</b>	<b>15,502.2</b>	<b>488.4</b>	<b>3.2%</b>	<b>13,735.6</b>	<b>414.2</b>	<b>3.0%</b>
Income of debt restructuring					(54.4)	
Capitalized interests		(66.5)			(56.4)	
<b>TOTAL COST OF DEBT</b>		<b>421.9</b>			<b>303.4</b>	

The average net finance costs, excluding the non-recurring gain generated by the anticipated unwinding of hedging instruments relating to the United States debt restructuring for 54.4 million euros, decreased to 3.0% in 2018. This decrease is mainly the result of the maturity of several bond issues, whose interest rates were higher than the current funding ones. This is mitigated by the higher cost of fundings in new developing economies, particularly in China, South Africa and Russia.

## 25.6 OTHER INFORMATION

## Other financing information

Financial covenants are associated to two bank debt facilities exceeding 50 million euros:

- a long-term loan used by Air Liquide Arabia (Saudi Arabia) with an outstanding amount of 65.9 million US dollars (equivalent to 57.5 million euros) as of December 31, 2018. Financial covenants were all met as of December 31, 2018;
- a long-term loan used by Air Liquide Arabia (Saudi Arabia) with an outstanding amount of 533.8 million Saudi riyals (equivalent to 124.1 million euros) as of December 31, 2018. Financial covenants were all met as of December 31, 2018.

The amount of bank credit facilities subject to financial covenants represent a level of 3.7% of the Group's gross debt as of December 31, 2018.

Bonds issued by both L' Air Liquide S.A., Air Liquide Finance and Airgas and making up the carrying amount of bonds as of December 31, 2018, include a change of control clause, with the exception of the 2.2 billion Chinese renminbi (279 million euros) issued by Air Liquide Finance in March 2018, on the domestic Chinese market.

## Information relating to non-recourse assignments of trade receivables

Non-recourse factoring, carried out in Asia, in Americas and in Europe, represented 1,053.1 million euros compared to 458.7 million euros at the end of 2017.

The European program, set up in December 2015 and covering 500 million euros, was extended to 8 new countries. The assigned receivables, in the amount of 376 million euros, were derecognized as of December 31, 2018 (342 million euros as of December 31, 2017).

Furthermore, Airgas restructured in 2018 its securitization program in a deconsolidating factoring program of 700 million US dollars (611 million euros). 557 million US dollars (486 million euros) were derecognised as of December 31, 2018.

Other non-recourse factoring programs exist in various countries and activities, mainly in Asia and Healthcare.

Almost all the risks and rewards were transferred to the assignees.



## Note 26 Financial risk policy and management

### 26.1 FINANCIAL RISK MANAGEMENT

Risk management is a priority for the Group. Consequently, the Finance Department governance relies on Strategic Finance Committees and Operational Finance Committees.

The Finance Department centrally manages the main financial risks, in accordance with decisions taken by the Strategic Finance Committee to which it reports on a regular basis. The Finance Department also performs country and customer risks analyses associated with investment decisions and attends Investment Committee meetings.

The financial policy adopted by Air Liquide, the purpose of which is to minimize the risks incurred by the Group and its subsidiaries, enabled the Group to ensure sustainable funding sources in 2018. To minimize the refinancing risk related to debt maturity schedules, the Group diversifies financing sources and spreads maturities over several years. In 2018, the average debt maturity was 5.9 years. As of December 31, 2018, the long-term debt ratio (gross debt maturing in more than one year / total gross debt) represented 82% of the overall Group debt, compared to 83% as of December 31, 2017.

Interest rate and foreign currency hedging strategies validated by the Operational Finance Committee are set up depending on market opportunities with a concern for optimization, while complying with prudence and risk limitation principles.

The Group also pays particular attention to its bank and customer counterparty risks by regularly monitoring ratings and the level of risk associated with these counterparties. In 2018, Air Liquide added an internal ratings system when no leading credit ratings agency information is available.

#### a) Foreign exchange risk

##### Principles

Financial instruments are only used to hedge transaction-based foreign exchange risk. The risk is attached on the one hand to financial cash flows arising from patent royalties, brands, technical support,

dividends, intra-group loans and borrowings denominated in foreign currencies and on the other hand to foreign currency commercial cash flows from operating entities. Commercial cash flows denominated in foreign currencies do not represent significant amounts compared to consolidated revenue.

Foreign exchange risk related to patent royalties, brands, technical support, dividend flows and intra-group loans and borrowings in foreign currencies is hedged by the Central Treasury Department using currency forwards or options with an overall term of less than 18 months. Currency hedging of intra-group loans and borrowings uses currency forwards, except in the rare cases that qualify as net investments in a foreign entity.

Foreign currency commercial cash flows from operating entities are hedged either as part of the annual budgetary process for subsidiaries with recurring flows in foreign currency or at the signing date of a sale or purchase contract for non-recurring flows, as is the case for the Engineering & Construction business line. Around a hundred subsidiaries are exposed to foreign exchange risk. These subsidiaries mainly use currency forwards set up by Air Liquide Finance (internal counterparty for hedging transactions) except in countries where it is prohibited by local regulations. The majority of these contracts have short maturities (three to twelve months) and market transactions are regulated by master agreements of the French Banking Federation ("FBF") or by master agreements of the International Swaps and Derivative Association ("ISDA") for local hedging operations.

When preparing their budget at the year-end, subsidiaries report their foreign exchange risk exposure to the Central Treasury Department in order to hedge the commercial cash flows expected in the following year. In each case, the Central Treasury Department monitors the adequacy of the hedges with the identified risks and performs a full revaluation of all hedges, every six months.

The foreign exchange translation risk (consolidation in euros of the assets and liabilities in currencies) was not subject to hedging. In effect, investments are essentially funded in the currency in which the cash flows are generated, thus creating a natural currency hedging.

#### Sensitivity of income statement and balance sheet items to foreign currency fluctuations

The table below sets out the effect of the translation of balance sheet items and the income statement of subsidiaries with a functional currency of USD, CNY, JPY, or CAD assuming a 1% increase against the euro (foreign exchange translation risk) on the following items:

(in millions of euros)	Revenue	% Total group	Operating income recurring	% Total group	Net profit	% Total group	Equity	% Total group
USD	72.0	0.34%	11.9	0.35%	8.3	0.39%	103.0	0.58%
CNY	18.3	0.09%	3.7	0.11%	2.6	0.12%	18.1	0.10%
JPY	10.5	0.05%	2.0	0.06%	1.2	0.06%	8.2	0.05%
CAD	6.2	0.03%	1.2	0.03%	0.8	0.04%	1.2	0.01%

The foreign currency risk sensitivity analysis shows that a 1% increase in the four major currencies as of December 31, 2018 would result in changes to revenue, operating income recurring, net profit and equity, as indicated above.

A 1% decrease in the above currencies as of December 31, 2018, would have the equivalent but opposite effects as those presented above, assuming that all other variables remained constant.

### Sensitivity of derivatives and their underlying hedged items to foreign currency fluctuations

The table below shows the effect of a 1% fluctuation in hedging currency exchange rates on the recognition of the foreign exchange derivatives portfolio in the Group's net profit and equity as of December 31, 2018. The sensitivity of net profit and equity primarily reflects the effect of foreign exchange swaps relating to the intragroup financing activity of the subsidiary Air Liquide Finance, and currency forward hedging instruments contracted at head office level.

(in millions of euros)	Foreign exchange risk			
	+ 1%		- 1%	
	P&L impact	Equity impact	P&L impact	Equity impact
Foreign exchange derivatives and their hedged underlying items	0.0	4.2	0.0	(4.2)

### b) Interest rate risk

#### Principles

Air Liquide centrally manages interest rate risk on the main currencies: euro, US dollar, Chinese renminbi and Japanese yen which represented 88% of the Group's total net indebtedness as of December 31, 2018. Regarding other currencies, the Finance Department provides subsidiaries with advice as to the different types of bank loans and/or hedging transactions to enter into according to the characteristics of local financial markets.

The Group policy is to maintain the major portion of total debt at fixed rates and to protect the residual balance using optional hedging instruments. This approach enables the Group to limit the effect of interest rate fluctuations on financial expenses.

Consequently, at the 2018 year-end, 90% of the total debt was fixed-rate debt. The fixed-rate/floating-rate breakdown is reviewed on a regular basis by the Finance Committees, depending on interest rate fluctuations and the level of Group debt.

### Sensitivity to interest rate fluctuations on floating-rate debt

The Group net indebtedness exposed to interest rate fluctuations amounted to around 333 million equivalent euros as of December 31, 2018, for an average outstanding amount of 0.5 billion equivalent euros (total debt adjusted for interest rate hedging instruments and short-term securities) decreasing sharply compared to December 31, 2017 (1.1 billion equivalent euros).

An increase or decrease in interest rates by 100 basis points ( $\pm 1\%$ ) on all yield curves would have an effect of approximately  $\pm 1$  million euros on the Group's annual financial expenses before tax, assuming outstanding debt remains constant.

### Sensitivity to interest rate fluctuations on derivatives and their underlying hedged items

The table below shows the effect of a 0.5% fluctuation of interest rates in all foreign currencies on the interest rate derivatives portfolio in the Group's net profit and equity, as of December 31, 2018.

(in millions of euros)	Interest rate risk			
	+ 0.5%		- 0.5%	
	P&L impact	Equity impact	P&L impact	Equity impact
Interest rate derivatives and their hedged underlying items	0.0	43.7	(0.3)	(45.5)

To protect the Group against a potential increase in euro rates until the refinancing of a euro bond issue, maturing in June 2020, three firm hedges for 100 million euros each were set up. In the same way, to protect the Group against an increase in dollar rates at date of refinancing of a US dollar bond issue under US Public Rule 144A, maturing in September 2019, a firm hedge for 200 million US dollars was set up. Moreover, optional hedges for a total of 150 million US dollars were set up with maturity December 2019 to protect the Group against the increase of short-term variable rates.

All hedging instruments used for interest rate or foreign exchange risk management purposes relate to identified risks and were set up to comply with the Group's financial policy. The effect on equity primarily stems from the fixed-rate hedging instruments contracted by the subsidiary Air Liquide Finance.

### c) Counterparty risk

Counterparty risks for Air Liquide potentially include customers and bank counterparties.

The Group's subsidiaries serve a very significant number of customers (over two million worldwide) located in extremely various markets: chemicals, steel, refining, food, pharmaceuticals, metals, automotive, manufacturing, healthcare, research laboratories, photovoltaic, etc. In 2018, the Group's main customer represents around 2% of revenue, the Group's 10 main customers represent around 11% of sales, and the Group's 50 main customers represent around 25% of sales. The geographical risk is limited by the Group's sustainable coverage in 80 countries on all continents. This diversity reduces customer and market risk.

To better assess its exposure, the Group has implemented procedures to regularly monitor the financial situation of its major customers as well as a monthly reporting for the Group's 170 main transnational customers in order to monitor the related consolidated risk.

Moreover, customer risk assessment and in particular the quality of the customer's site is an important component of the investment decision process.

Bank counterparty risk relates to the outstanding amounts of deposits, market values of derivatives and to the credit lines contracted with each bank. Pursuant to its financial policy, in the vast majority of cases, the Group requires a long-term Standard & Poor's "A" credit rating or a Moody's "A2" rating from its counterparties to accept commitments on financial instruments. The Group's credit lines are also spread among several banks from various geographical areas to avoid the

risk of concentration while complying with the same credit rating requirements. The Operational Finance Committee regularly reviews and approves the list of bank counterparties related to investments and the list of financial instruments. With regards to short-term investments, outstandings are subject to strict limits per counterparty and are monitored daily.

IFRS 13 Fair Value Measurement specifies that the valuation of currency, interest rate and commodity hedging instruments must take into account the counterparty credit risk attached to these transactions. Considering the aforementioned counterparty selection criteria, the effect on the periodic valuations, by applying the historical default probabilities method is immaterial.

### d) Liquidity risk

It is Group financial policy to spread over time the maturity of long-term debt in order to avoid concentration of annual refinancing needs. Liquidity risk is also reduced by the stability of cash flows generated from operations as well as by having confirmed credit lines in place. The financial covenants attached to the current financing arrangements described in note 25.6 do not affect the Group's access to liquidity.

The carrying amount of short-term financing in the form of commercial paper amounted to 694 million euros as of December 31, 2018, an increase of 508 million euros compared to the end of 2017. The average amount of commercial paper amounted to 699 million euros in 2018, compared to 542 million euros in 2017. The Group policy requires that commercial paper in issue be backed by confirmed long-term credit lines. In 2018, this requirement was met, with an amount of confirmed credit lines of 3,605 million euros largely exceeding outstanding commercial paper.

The table below presents the maturities of the bilateral and syndicated credit lines:

(in millions of euros)	2019	2020	2021	2022	2023	2024	Total
Bilateral lines and syndicated credit lines	380.0	300.0	700.0	125.0	2,100.0	-	3,605.0

On December 12, 2018, a credit facility of 400 million euros maturing in 2018, was renewed for 200 million euros until 2020, with extension clause.

On December 14, 2018, the syndicated credit facility maturing in 2020 was renewed and extended to 2 billion euros. This facility will mature in 2023, and Air Liquide can exercise two extension options, of one year each.

When the Group makes short-term financial investments other than bank deposits, it systematically favors monetary instruments with a short-term maturity in order to limit the risk of non-liquidity or high volatility.

The following tables represent the future cash flows related to the main balance sheet items and to the derivative financial instruments recognized at the end of the last two periods. Interest flows are calculated in accordance with IFRS 7 and represent the interest payable for each relevant period. Interest flows related to floating interest rate or foreign currency instruments were calculated using the closing interest and exchange rates as of December 31, 2017 and 2018. The flows related to debt repayment obligations differ from the amounts recognized in the Group's balance sheet due to the accounting treatment applied to borrowings and the exclusion of hedging instruments.

2018 (in millions of euros)	Book value as of December 31, 2018	Cash Flow < 1 year		Cash flow ≥ 1 year and ≤ 5 years		Cash Flow > 5 year	
		Interest	Capital refund	Interest	Capital refund	Interest	Capital refund
Derivative instruments							
Assets							
Fair value of derivatives (assets)	120.1	12.4	237.5	29.5	1,254.9	7.7	250.9
Liabilities							
Fair value of derivatives (liabilities)	(45.5)	(53.9)	(237.5)	(138.1)	(1,254.9)	(59.7)	(250.9)
SUB-TOTAL DERIVATIVE INSTRUMENTS		(41.5)		(108.6)		(52.0)	
Assets							
Loans and other non-current receivables	367.8				367.8		
Trade receivables	2,500.4		2,468.2		32.2		
Cash and cash equivalents	1,725.6	0.3	1,725.3				
SUB-TOTAL ASSETS		0.3		4,193.5		400.0	
Liabilities							
Non-current borrowings	(11,709.6)	(247.5)		(741.7)	(5,805.4)	(797.7)	(5,795.7)
Other non-current liabilities	(250.0)				(250.0)		
Trade payables	(2,714.5)		(2,697.2)		(17.3)		
Current borrowings	(2,550.9)	(138.7)	(2,412.2)				
SUB-TOTAL LIABILITIES		(386.2)		(5,109.4)		(741.7)	
2017 (in millions of euros)	Book value as of December 31, 2017	Cash Flow < 1 year		Cash flow ≥ 1 year and ≤ 5 years		Cash Flow > 5 year	
		Interest	Capital refund	Interest	Capital refund	Interest	Capital refund
Derivative instruments							
Assets							
Fair value of derivatives (assets)	168.9	72.5	568.1	188.8	3,236.2	49.3	1,581.7
Liabilities							
Fair value of derivatives (liabilities)	(45.2)	(191.9)	(567.5)	(515.0)	(3,234.4)	(147.1)	(1,581.7)
SUB-TOTAL DERIVATIVE INSTRUMENTS		(119.4)		0.6		(326.2)	
Assets							
Loans and other non-current receivables	391.7				391.7		
Trade receivables	2,900.0		2,863.2		36.8		
Cash and cash equivalents	1,656.1	3.2	1,652.9				
SUB-TOTAL ASSETS		3.2		4,516.1		428.5	
Liabilities							
Non-current borrowings	(12,522.4)	(211.1)		(908.9)	(5,777.3)	(1,009.2)	(6,810.9)
Other non-current liabilities	(238.5)				(238.5)		
Trade payables	(2,446.4)		(2,433.3)		(13.1)		
Current borrowings	(2,504.6)	(107.3)	(2,397.3)				
SUB-TOTAL LIABILITIES		(318.4)		(4,830.6)		(908.9)	

Cash and cash equivalents slightly increased at the end of 2018. The carrying amount of non-current borrowings has decreased following the reclassification of maturities of the next twelve months in current borrowing, partially offset by the panda bond issue. The carrying amount of current borrowings has increased, following the reclassification of the maturities of the next twelve months, greater than the maturities for 2017, and following the increase in outstanding commercial paper.

**e) Hierarchy of financial instruments fair value**

<i>(in millions of euros)</i>	2017	2018
<b>Level 1</b>	<b>27.0</b>	<b>26.3</b>
Non-consolidated shares (listed shares)	27.0	26.3
<b>Level 2</b>	<b>123.7</b>	<b>74.6</b>
Derivative instruments	123.7	74.6
<b>Level 3</b>	<b>86.3</b>	<b>133.4</b>
Put options granted to minority shareholders	86.3	133.4

**f) Commodity risk (energy contracts)**

Most of Air Liquide's energy supplies are obtained through forward purchase contracts at a fixed or indexed price.

IFRS 9 provides for the inclusion within its scope of forward purchases and sales of non-financial assets as soon as these transactions are deemed similar to derivative instruments.

However, IFRS 9 considers that forward contracts for non-financial assets should not be considered as derivatives when they have been entered into to meet the Company's "normal" business requirements, resulting in the delivery upon maturity of the underlying item for use in the Company's industrial process. As Air Liquide does not purchase electricity or natural gas for speculation or arbitrage on commodity price trends purposes, no forward contracts relating to energy meet the definition of a derivative instrument. The contracts enter into as part of the Company's normal business to be used in the industrial process and do not meet the definition of a derivative instrument.

Furthermore, in a global context of highly volatile electricity and natural gas market prices, Air Liquide continues to index long-term customer contracts to hedge these risks. For natural gas and electricity prices, the opening of some markets led the Group, under these circumstances, to replace the price indices used during the regulated period by indices relevant to each local market.

Nonetheless, a few isolated contracts remain for which price indexation alone cannot guarantee a total and effective hedge against the risk of energy prices fluctuations. These risks are therefore hedged by Air Liquide, particularly by Air Liquide Finance, using adequate commodity derivatives, which are mainly swaps with maturities of generally less than two years.

The fair value recognition of these derivative instruments had no material impact on Group equity or profits as of December 31, 2018.

**26.2 INFORMATION ON DERIVATIVE INSTRUMENTS**

The Group policy consists in using financial derivatives only when hedging actual financial flows. As a result, the majority of derivative financial instruments used by the Group benefit from hedge accounting. Derivative instruments that do not benefit from hedge accounting are not used for speculative purposes.

Impact of the fair value recognition of derivative instruments on the balance sheet:

2018 (in millions of euros)	IFRS classification	Assets					Equity and liabilities						
		Deferred tax assets	Trade receivables	Fair value of derivatives		Total	Net income recognized in equity	Profit for the period	Borrowings	Trade payables	Fair value of derivatives		Total
				Non current	Current						Non current	Current	
Foreign exchange risk													
Currency forwards hedging future cash flows	CFH <sup>(a)</sup>	0.1		1.9	16.4	18.4	(0.2)				2.9	15.7	18.4
Currency forwards hedging transactions recorded in the accounts and Cross Currency Swaps	FVH <sup>(b)</sup>	(0.5)	2.4	73.0	23.8	98.7		1.2	75.9	2.5	8.3	10.8	98.7
Other derivatives <sup>(c)</sup>		0.1			0.1	0.2	(0.3)	0.1				0.4	0.2
Interest rate risk													
Interest rate swaps	FVH <sup>(b)</sup>	(0.1)		0.3		0.2		0.2					0.2
Swaps, options and Cross Currency Swaps	CFH <sup>(a)</sup> and NIH <sup>(d)</sup>	0.9		0.7	3.2	4.8	(1.6)				6.8	(0.4)	4.8
Commodity risk (Energy)													
Forwards hedging future cash flows	CFH <sup>(a)</sup>	0.1			0.7	0.8	0.2	(0.4)			0.4	0.6	0.8
TOTAL		0.6	2.4	75.9	44.2	123.1	(1.9)	1.1	75.9	2.5	18.4	27.1	123.1

(a) CFH: Cash Flow Hedge.

(b) FVH: Fair Value Hedge.

(c) Derivative instruments not benefiting from hedge accounting.

(d) NIH: Net Investment Hedge.

2017 (in millions of euros)	IFRS classification	Assets					Equity and liabilities							
		Deferred tax assets	Trade receivables	Fair value of derivatives		Total	Net income recognized in equity	Profit for the period	Borrowings	Trade payables	Fair value of derivatives		Total	
				Non current	Current						Non current	Current		
Foreign exchange risk														
Currency forwards hedging future cash flows	CFH <sup>(a)</sup>	(0.2)			16.8	16.6	2.2	(1.8)					16.2	16.6
Currency forwards hedging transactions recorded in the accounts and Cross Currency Swaps	FVH <sup>(b)</sup>	0.2	1.1	64.5	20.0	85.8		(0.9)	54.5	3.9	2.7	25.6	85.8	
Other derivatives <sup>(c)</sup>								0.1				(0.1)		
Currency embedded derivatives and Cross Currency Swaps	NIH <sup>(d)</sup>	(0.3)			1.3	1.0	1.0							1.0
Interest rate risk														
Interest rate swaps	FVH <sup>(b)</sup>	(0.2)				(0.2)		0.4			(0.6)			(0.2)
Swaps, options and Cross Currency Swaps	CFH <sup>(a)</sup> and NIH <sup>(d)</sup>	(23.1)		66.0	0.3	43.2	43.8				0.2	(0.8)	43.2	
Commodity risk (Energy)														
Forwards hedging future cash flows	CFH <sup>(a)</sup>	0.6				0.6	(1.0)	(0.4)				2.0		0.6
TOTAL		(23.0)	1.1	130.5	38.4	147.0	46.0	(2.6)	54.5	3.9	2.3	42.9	147.0	

(a) CFH: Cash Flow Hedge.

(b) FVH: Fair Value Hedge.

(c) Derivative instruments not benefiting from hedge accounting.

(d) NIH: Net Investment Hedge.

## Note 27 Other liabilities (non-current/current)

### 27.1 OTHER NON-CURRENT LIABILITIES

<i>(in millions of euros)</i>	2017	2018
Investment grants	69.3	60.5
Advances and deposits received from customers	42.1	38.6
Other non-current liabilities	127.1	150.9
<b>TOTAL OTHER NON-CURRENT LIABILITIES</b>	<b>238.5</b>	<b>250.0</b>

### 27.2 OTHER CURRENT LIABILITIES

<i>(in millions of euros)</i>	2017	2018
Advances received	316.6	305.2
Advances and deposits received from customers	99.1	84.9
Other payables	979.5	1,011.8
Accruals and deferred income	228.7	237.9
<b>TOTAL OTHER CURRENT LIABILITIES</b>	<b>1,623.9</b>	<b>1,639.8</b>

Amounts payable to customers under Engineering & Construction contracts and amounting to 108.1 million euros are included in other current liabilities as of December 31, 2018 (123.8 million euros in 2017).

## Note 28 Trade payables

<i>(in millions of euros)</i>	2017	2018
Operating suppliers	2,155.0	2,392.2
Property, plant and equipment and intangible assets suppliers	291.4	322.3
<b>TOTAL TRADE PAYABLES</b>	<b>2,446.4</b>	<b>2,714.5</b>

## Note 29 Related party disclosures

### 29.1 TRANSACTIONS WITH COMPANIES INCLUDED IN THE SCOPE OF CONSOLIDATION

The consolidated financial statements include the financial statements of L'Air Liquide S.A. and all the subsidiaries listed on pages 244 to 246. L'Air Liquide S.A. is the ultimate parent company.

Due to the activities and legal organization of the Group, only executives, associates and joint ventures are considered to be related parties to the Group. Transactions performed between these individuals or these companies and Group subsidiaries are not material.

Information related to associates and joint ventures is disclosed in note 15.



## 29.2 REMUNERATION ALLOCATED TO MEMBERS OF THE BOARD OF DIRECTORS AND MANAGEMENT BODIES

The remuneration of Group executives includes the remuneration allocated to the Board of Directors and the Company's management bodies as compensation for their duties within the entire Group as employees and corporate officers for the respective fiscal years. The Company's management bodies include all the members of Executive Management and the Executive Committee. The amounts expensed in this respect are as follows:

<i>(in thousands of euros)</i>	2017	2018
Short-term benefits	14,156	13,994
Post-employment benefits	2,857	2,012
Share-based payments	7,303	8,499
<b>TOTAL</b>	<b>24,316</b>	<b>24,505</b>

### Short-term benefits

Short-term benefits include fixed remuneration, variable remuneration, benefits in kind and Directors' fees. The entire variable remuneration portion due for any given year is paid the following year after the financial statements have been approved.

The remuneration policy for members of the executive team takes into account market practices. It includes a substantial variable portion depending on the achievement of earnings and individual performance objectives.

### Post-employment benefits

Post-employment benefits include the contributions paid to external pension funds. Retirement commitments amounted to 30,703 thousand euros in 2018 and 25,699 thousand euros in 2017.

### Share-based payments

Stock options and performance shares granted to Executive Management and to the Executive Committee have the following expiry dates and strike prices:

Year	Expiry date	Strike price <sup>(a)</sup> (in euros)	Number 2017	Strike price (in euros)	Number 2018
2011 (October 14)	10/13/2021	63.18	266,962	63.18	226,499
2012 (September 27)	09/26/2022	77.36	236,221	77.36	236,221
2013 (September 26)	09/25/2023	81.68	291,986	81.68	289,474
2014 (September 22)	09/21/2024	85.66	253,267	85.66	253,267
2015 (September 28)			50,127		17,281
2015 (September 28)	09/27/2025	92.73	165,326	92.73	136,387
2016 (July 29)			42,126		42,126
2016 (November 29)	11/28/2026	84.34	73,307	84.34	73,307
2016 (November 29)			84,688		84,688
2017 (September 20)	09/19/2027	94.32	25,471	94.32	25,471
2017 (September 20)			98,510		98,510
2018 (September 25)	09/24/2028			107.00	23,690
2018 (September 25)					87,330

(a) Adjusted for share capital increases by attributions of free shares (2017, 2014, 2012, 2010) and for the share capital increase in cash of October 11, 2016.

The fair value of stock options and performance shares granted in 2018 is disclosed in note 22 (page 221).

These amounts are expensed over the lock-in period of the option and performance shares. The amounts that will be recognized in future periods in respect of the granted stock options and performance shares totaled 17,215 thousand euros as of December 31, 2018 (19,194 thousand euros as of December 31, 2017).

The 2018 plan stock options and performance shares granted to corporate officers and Executive Committee members cannot be exercised unless certain performance conditions are achieved.

No stock options or performance shares were granted to other non-executive Directors under these plans.

## Note 30 Commitments

Commitments are given in the normal course of the Group's business.

<i>(in millions of euros)</i>	2017	2018
Firm purchase orders for fixed assets	727.3	799.4
Lease commitments which cannot be terminated	1,178.0	1,279.4
Other commitments related to operating activities	4,311.0	4,794.6
<b>Commitments relating to operating activities</b>	<b>6,216.3</b>	<b>6,873.4</b>
<b>Commitments relating to financing operations and consolidation scope</b>	<b>228.8</b>	<b>245.7</b>
<b>TOTAL</b>	<b>6,445.1</b>	<b>7,119.1</b>

Air Liquide owns a 13.7% stake in Exeltium S.A.S. amounting to 23.8 million euros.

On March 24, 2010, Exeltium and EDF entered into an industrial partnership agreement under which Exeltium can acquire rights to a portion of EDF's electronuclear production. In consideration, Exeltium and its shareholder clients signed long-term electricity supply contracts. The contract signed by Air Liquide has a 20-year term and can be suspended by Air Liquide after 10 years. This contract provides long-term visibility over the price of the electricity to be supplied. This project was approved by the European Commission.

The Group's energy purchase commitments amounted to 1,125.8 million euros as of December 31, 2018 (994.9 million euros as of December 31, 2017). This amount includes the energy purchase commitments relating to the Exeltium contract.

Almost all of these commitments are covered by mutual commitments received from clients in connection with long-term gas supply contracts. These commitments are not disclosed in the table above.

Commitments to purchases of molecules as part of take-or-pay contracts amounted to 4,453.6 million euros as of December 31, 2018 (4,057.4 as of December 31, 2017), and are reported in other commitments related to operating activities. These amounts include Helium purchase commitments.

Confirmed credit lines are shown in note 26.

Commitments related to associates amounted to 80.8 million euros as of December 31, 2018.

### Operating leases

Assets used for industrial activities are leased under an operating lease when the acquisition of such assets does not present any economic benefits. The primary assets included are utility vehicles, transport equipment and property.

Future minimum lease payments under non-cancelable operating leases payable as of December 31, 2018 are as follows::

<i>(in millions of euros)</i>	2017	2018
Due within 1 year	271	290
Due in 1 to 5 years	574	619
Due after 5 years	333	370
<b>TOTAL</b>	<b>1,178</b>	<b>1,279</b>

## Note 31 Contingent liabilities

To the best of the Group's knowledge, there is no exceptional event or litigation which has affected in the recent past or which is likely to materially affect its financial situation or profitability.

In September 2010, the Brazilian competition authority ("CADE") fined the major industrial gas companies operating in Brazil, including Air Liquide Brazil, for unfair trade practices prior to 2004. Air Liquide Brazil was fined 197.6 million Brazilian reais before interest on arrears amounting to 197.6 million Brazilian reais as of December 31, 2018 (equivalent to 44.5 million euros for the fine and 36.5 million euros for interest on arrears).

Air Liquide Brazil has strongly contested this decision and has consequently filed an application to annul the fine before the Brasilia Federal Court. In May 2014, the CADE ruling was annulled in first instance by this Court. In September 2014, the CADE filed an appeal against this decision, which was rejected by the Court in November 2015. Recently, the CADE and the Procurator's Office had both filed a new appeal against this decision in the second instance before the Superior Court and the Supreme Court of Justice. At this stage, the Group considers it probable that Air Liquide Brazil will prevail and consequently no provision has been recorded.

## Note 32 Greenhouse gas emission quotas

The ETS (Emission Trading Scheme) European Directive which established a quota system for greenhouse gas emissions in the European Union has entered its third phase (2013-2020), which will feature an expanded scope for industrial plants subject to the ETS and a gradual reduction in the free allocation of quotas.

With phase III, the Group is required to obtain CO<sub>2</sub> quotas for the portion of emissions from hydrogen production sites not covered by free allocations, as well as for all emissions from cogeneration sites.

As the Group manages CO<sub>2</sub> quotas solely to cover its industrial needs, they are classified as a commodity and managed as such. The quotas are therefore valued at acquisition cost and presented in inventories.

The Group recognizes a provision when the year-end quotas covering greenhouse gas emissions are insufficient, based on the best estimate of the outflow of resources required to settle the obligation.

As of December 31, 2018, the amounts recognized in assets and liabilities are immaterial.

## Note 33 Post-balance sheet events

There are no significant post-balance sheet event.

## Foreign exchange rates and main consolidated companies

### FOREIGN EXCHANGE RATES

#### Main foreign exchange rates used

##### Average rates

Euros for 1 currency	2017	2018
USD	0.89	0.85
CNY	0.13	0.13
CAD	0.68	0.65
Yen (1,000)	7.91	7.67

##### Closing rates

Euros for 1 currency	2017	2018
USD	0.83	0.87
CNY	0.13	0.13
CAD	0.66	0.64
Yen (1,000)	7.41	7.95

## MAIN CONSOLIDATED COMPANIES

Companies marked with JO are consolidated by joint operation and those marked with E by the equity method. Other companies are fully consolidated.

The total Group interest is given after the name of each company.

Main consolidated companies	Country	Integration	% interest	Main consolidated companies	Country	Integration	% interest
<b>GAS &amp; SERVICES</b>				Société des Gaz Industriels de la Guadeloupe S.A.	FRA		95.88%
<b>EUROPE</b>				Société d'Exploitation de Produits pour les Industries Chimiques S.A.	FRA		99.98%
Air Liquide Austria GmbH	AUT		100.00%	Société Guyanaise de L' Air Liquide S.A.	FRA		97.04%
L' Air Liquide Belge S.A.	BEL		100.00%	Société Martiniquaise de L' Air Liquide S.A.	FRA		95.87%
Air Liquide Industries Belgium S.A.	BEL		100.00%	VitalAire S.A.	FRA		100.00%
Air Liquide Large Industry S.A.	BEL		100.00%	Air Liquide Ltd.	GBR		100.00%
Air Liquide Medical S.A.	BEL		100.00%	Air Liquide (Homecare) Ltd.	GBR		100.00%
Air Liquide Bulgaria EOOD	BGR		100.00%	Air Liquide UK Ltd.	GBR		100.00%
Carbagas S.A.	CHE		100.00%	Energas Ltd.	GBR		100.00%
Air Liquide CZ, s.r.o.	CZE		100.00%	SPL Services Limited	GBR		98.02%
Air Liquide Deutschland GmbH	DEU		100.00%	Air Liquide Hellas S.A.G.I.	GRC		99.78%
Air Liquide Electronics GmbH	DEU		100.00%	Air Liquide Italia S.p.A.	ITA		99.77%
Air Liquide Industriegase GmbH & Co. KG	DEU		100.00%	Air Liquide Italia Service S.r.l	ITA		99.77%
Energieversorgungscener Dresden-Wilschdorf GmbH & Co. KG <sup>(a)</sup>	DEU		40.00%	Air Liquide Sanità Service S.p.A.	ITA		99.77%
Schülke & Mayr GmbH	DEU		100.00%	Air Liquide Italia Produzione S.r.l	ITA		99.77%
VitalAire GmbH	DEU		100.00%	Medicasa Italia S.p.A	ITA		99.77%
Zweite Energieversorgungscener Dresden-Wilschdorf GmbH & Co. KG	DEU		50.00%	VitalAire Italia S.p.A.	ITA		99.77%
Air Liquide Danmark A/S	DNK		100.00%	Air Liquide Healthcare Ireland Limited	IRL		100.00%
AL Air Liquide España S.A.	ESP		99.90%	Air Liquide Munay Tech Gases	KAZ		75.00%
Air Liquide Ibérica de Gases S.L.U.	ESP		100.00%	L' Air Liquide Luxembourg S.A.	LUX		100.00%
Air Liquide Medicinal S.L.U.	ESP		99.90%	Air Liquide Acetylene B.V.	NLD		100.00%
Grupo Gasmedi S.L.U.	ESP		100.00%	Air Liquide B.V.	NLD		100.00%
Air Liquide Finland Oy.	FIN		100.00%	Air Liquide Industrie B.V.	NLD		100.00%
Air Liquide Eastern Europe S.A.	FRA		100.00%	Air Liquide Nederland B.V.	NLD		100.00%
Air Liquide France Industrie S.A	FRA		100.00%	Scott Specialty Gases Netherlands B.V.	NLD		100.00%
Air Liquide Medical Systems S.A.	FRA		100.00%	Air Liquide Norway A.S.	NOR		100.00%
Air Liquide Réunion S.A.	FRA		95.08%	Air Liquide Katowice Sp.z.o.o.	POL		79.25%
Air Liquide Russie S.A.	FRA		100.00%	Air Liquide Polska Sp.z.o.o.	POL		100.00%
Air Liquide Santé (International) S.A.	FRA		100.00%	Air Liquide Medicinal S.A.	PRT		99.85%
Air Liquide Santé France S.A.	FRA		100.00%	Sociedade Portuguesa do Ar Liquido Lda	PRT		99.93%
Air Liquide Guyane Spatial S.A.	FRA		98.79%	Air Liquide Romania S.r.l	ROM		100.00%
Air Liquide Ukraine S.A.	FRA		100.00%	Air Liquide OOO	RUS		100.00%
Cryo-Express S.A.	FRA		98.82%	Air Liquide Severstal CJSC	RUS		75.00%
Lavéra Energies S.N.C.	FRA	JO	50.00%	Air Liquide Slovakia s.r.o.	SVK		100.00%
LVL Médical Groupe S.A.	FRA		100.00%	Air Liquide Gas A.B.	SWE		100.00%
Pharma Dom S.A.	FRA		100.00%	NordicInfu Care A.B	SWE		100.00%
				Air Liquide Gaz San. Ve Tic. A.S.	TUR		100.00%

(a) Consolidation method differs from percentage of shares due to a contractual agreement.

Main consolidated companies	Country	Integration	% interest
<b>AMERICAS</b>			
Air Liquide Argentina S.A.	ARG		100.00%
Air Liquide Brasil Ltda	BRA		100.00%
Air Liquide Canada, Inc.	CAN		100.00%
Vitalaire Canada, Inc.	CAN		100.00%
Respiratory Homecare Solutions Canada Inc.	CAN		72.50%
Air Liquide Chile S.A.	CHL		100.00%
Air Liquide Colombia S.A.S	COL		100.00%
Oxymaster S.A.	COL		70.00%
Air Liquide Dominicana S.A.S	DOM		100.00%
Air Liquide Mexico, S. de RL de CV	MEX		100.00%
La Oxigena Paraguay S.A.	PRY		87.96%
Air Liquide Trinidad and Tobago Ltd.	TTO		100.00%
Air Liquide Uruguay S.A.	URY		96.68%
Airgas USA, LLC	USA		100.00%
Airgas Specialty Products	USA		100.00%
Airgas Carbonic, Inc.	USA		100.00%
Red-D-Arc, Inc.	USA		100.00%
Airgas Safety, Inc.	USA		100.00%
Air Liquide Electronics U.S. LP	USA		100.00%
Air Liquide Large Industries U.S. LP	USA		100.00%
Air Liquide Advanced Materials, Inc.	USA		100.00%
<b>MIDDLE EAST AND AFRICA</b>			
Air Liquide Afrique S.A.	FRA		100.00%
Air Liquide Angola LDA	AGO		73.99%
Air Liquide Middle East & North Africa FZCO	ARE		100.00%
Air Liquide Gulf FZE	ARE		100.00%
Air Liquide Bénin S.A.	BEN	E	99.99%
Air Liquide Burkina Faso S.A.	BFA		64.87%
Air Liquide Botswana Proprietary Ltd.	BWA		99.93%
Air Liquide Côte d'Ivoire S.A.	CIV		72.08%
Air Liquide Cameroun S.A.	CMR		100.00%
Air Liquide Congo S.A.	COG		100.00%
Société d'Installations et de Diffusion de Matériel Technique S.P.A.	DZA	E	100.00%
Air Liquide Alexandria for Medical & Industrial Gases S.A.E.	EGY		99.99%
Air Liquide El Soukhna for Industrial Gases S.A.E.	EGY		99.93%

Main consolidated companies	Country	Integration	% interest
Air Liquide Misr S.A.E.	EGY		100.00%
Air Liquide Middle East S.A.	FRA		100.00%
Air Liquide Gabon S.A.	GAB		99.04%
Air Liquide Ghana Ltd.	GHA		100.00%
Air Liquide India Holding Pvt. Ltd.	IND		100.00%
Shuaiba Oxygen Company K.S.C.C. <sup>(a)</sup>	KWT		49.81%
Air Liquide Maroc S.A.	MAR		74.80%
Air Liquide Madagascar S.A.	MDG		73.74%
Air Liquide Mali S.A.	MLI		99.97%
Air Liquide Namibia Proprietary Ltd.	NAM		100.00%
Air Liquide Nigeria Plc	NGA		61.11%
Air Liquide Sohar Industrial Gases LLC	OMN		50.10%
Gasal Q.S.C.	QAT	E	40.00%
Vitalaire Arabia LLC.	SAU		60.00%
Air Liquide Al-Khafrah Industrial Gases LLC	SAU		75.00%
Air Liquide Arabia LLC	SAU		65.00%
Air Liquide Sénégal S.A.	SEN		83.60%
Air Liquide Togo S.A.	TGO	E	70.57%
Air Liquide Tunisie S.A.	TUN		59.17%
Air Liquide Large Industries (Pty) Ltd.	ZAF		100.00%
Air Liquide Proprietary Ltd.	ZAF		99.93%
<b>ASIA PACIFIC</b>			
Air Liquide Australia Ltd.	AUS		100.00%
Air Liquide Healthcare P/L	AUS		100.00%
Air Liquide W.A. Pty Ltd.	AUS		100.00%
Brunei Oxygen SDN	BHD		50.00%
Air Liquide Cangzhou Co., Ltd.	CHN		100.00%
Air Liquide China Holding Co., Ltd.	CHN		100.00%
Air Liquide Shanghai Co., Ltd.	CHN		100.00%
Air Liquide Shanghai International Trading Co. Ltd.	CHN		100.00%
Air Liquide Tianjin Co., Ltd.	CHN		100.00%
Air Liquide Yongli Tianjin Co., Ltd.	CHN		55.00%
Air Liquide Zhangjiagang Industrial Gases Co., Ltd.	CHN		100.00%
Shanghai Chemical Industry Park Industrial Gases Co., Ltd.	CHN	JO	50.00%
Air Liquide Fuzhou Co., Ltd.	CHN		100.00%

Main consolidated companies	Country	Integration	% interest
Société d'Oxygène et d'Acétylène d'Extrême-Orient S.A.	FRA		100.00%
Celki International Ltd.	HKG		100.00%
P.T. Air Liquide Indonesia	IDN		100.00%
Air Liquide Japan Ltd.	JPN		100.00%
Toshiba Nano Analysis K.K.	JPN		51.00%
Sohgo Industry Co., Ltd.	JPN		90.23%
Vital Air Japan K.K.	JPN		100.00%
Air Liquide Korea Co., Ltd.	KOR		100.00%
VitalAire Korea Inc.	KOR		100.00%
Air Liquide Malaysia Sdn Bhd	MYS		100.00%
Air Liquide New Zealand Ltd.	NZL		100.00%
Air Liquide Phils Inc.	PHL		100.00%
Air Liquide Singapore Pte Ltd.	SGP		100.00%
Air Liquide Thailand Ltd.	THA		100.00%
Air Liquide Electronics Systems Asia Ltd.	TWN		100.00%
Air Liquide Far Eastern Ltd.	TWN		65.00%
Air Liquide Vietnam Co., Ltd.	VNM		100.00%
<b>ENGINEERING &amp; CONSTRUCTION</b>			
Air Liquide Global E&C Solutions Canada LP	CAN		100.00%
Air Liquide Hangzhou Co., Ltd.	CHN		100.00%
Air Liquide Global E&C Solutions Germany GmbH	DEU		100.00%
Air Liquide Global E&C Solutions France S.A.	FRA		100.00%
Air Liquide Global E&C Solutions Japan K.K.	JPN		100.00%
JJ-Lurgi Engineering Sdn. Bhd.	MYS	E	50.00%
Air Liquide Global E&C Solutions Singapore Pte. Ltd.	SGP		100.00%
Air Liquide Global E&C Solutions US, Inc.	USA		100.00%

Main consolidated companies	Country	Integration	% interest
<b>GLOBAL MARKETS &amp; TECHNOLOGIES</b>			
Air Liquide Advanced Technologies US LLC	USA		100.00%
Air Liquide Services S.A.	FRA		100.00%
Air Liquide Advanced Technologies S.A.	FRA		100.00%
Cryolor S.A.	FRA		100.00%
GIE Cryospace	FRA		55.00%
Air Liquide Electronics Systems S.A.	FRA		100.00%
FordonsGas Sverige AB	FRA		100.00%
Hélium Services S.A.	FRA		100.00%
Oilfield Hire and Services	GBR		100.00%
<b>HOLDING COMPANIES AND R&amp;D ACTIVITIES</b>			
Air Liquide Finance S.A.	FRA		100.00%
Air Liquide International S.A.	FRA		100.00%
Air Liquide Participations S.A.	FRA		100.00%
L'Air Liquide S.A.	FRA		100.00%
Orsay-Re S.A.	LUX		100.00%
Air Liquide International Corp.	USA		100.00%
American Air Liquide, Inc.	USA		100.00%
American Air Liquide Holdings, Inc.	USA		100.00%

The extended list of consolidated companies is available on :  
<https://www.airliquide.com/group/consolidation-scope-2018>

## Statutory Auditors' offices and fees

### STATUTORY AUDITORS' OFFICES

#### ERNST & YOUNG et Autres

##### Principal Statutory Auditor

ERNST & YOUNG et Autres is represented by  
Jeanne Boillet and Emmanuelle Mossé  
Tour First – TS 14444 – 1, place des Saisons  
92037 Paris-La Défense Cedex (Courbevoie)

##### Deputy Statutory Auditor

Auditex  
Tour First – TS 14444 – 1, place des Saisons  
92037 Paris-La Défense Cedex (Courbevoie)

#### PricewaterhouseCoopers Audit

##### Principal Statutory Auditor

PricewaterhouseCoopers Audit is represented by  
Olivier Lotz and Séverine Scheer  
63, rue de Villiers  
92200 Neuilly-sur-Seine

##### Deputy Statutory Auditor

Jean-Christophe Georghiou  
with PricewaterhouseCoopers Audit  
63, rue de Villiers  
92200 Neuilly-sur-Seine



## STATUTORY AUDITORS' FEES

(in thousands of euros)	2018							
	ERNST & YOUNG et Autres		PricewaterhouseCoopers Audit		Others		Total	
Audit, certification, review of individual and consolidated financial statements	7,807	90.4%	5,172	86.1%	447	75.9%	13,427	88.2%
■ Issuer	992		852		-		1,844	
■ Fully consolidated subsidiaries	6,815		4,320		447		11,583	
of which Airgas	1,383		-		-		1,383	
Services required by law	85	1.0%	151	2.5%	55	9.3%	291	1.9%
<b>Total of certification missions and services required by law</b>	<b>7,892</b>	<b>91.4%</b>	<b>5,323</b>	<b>88.6%</b>	<b>502</b>	<b>85.2%</b>	<b>13,717</b>	<b>90.1%</b>
Services relating to Corporate Social Responsibility (CSR)	60	0.7%	120	2.0%	-	0.0%	180	1.2%
Due-diligence services (sell-side and buy-side)	252	2.9%	-	0.0%	-	0.0%	252	1.7%
Other services	431	5.0%	565	9.4%	87	14.8%	1,083	7.0%
<b>Total of non-audit services</b>	<b>743</b>	<b>8.6%</b>	<b>685</b>	<b>11.4%</b>	<b>87</b>	<b>14.8%</b>	<b>1,516</b>	<b>9.9%</b>
<b>TOTAL</b>	<b>8,635</b>	<b>100%</b>	<b>6,009</b>	<b>100%</b>	<b>589</b>	<b>100%</b>	<b>15,233</b>	<b>100%</b>

(in thousands of euros)	2017							
	ERNST & YOUNG et Autres		PricewaterhouseCoopers Audit		Others		Total	
Audit, certification, review of individual and consolidated financial statements	7,420	88.6%	4,963	87.6%	429	70.4%	12,812	87.5%
■ Issuer	612		623		-		1,235	
■ Fully consolidated subsidiaries	6,808		4,340		429		11,577	
of which Airgas	1,584		143		-		1,727	
Services required by law	283	3.4%	154	2.7%	89	14.6%	526	3.6%
<b>Total of certification missions and services required by law</b>	<b>7,703</b>	<b>92.0%</b>	<b>5,117</b>	<b>90.3%</b>	<b>518</b>	<b>85.0%</b>	<b>13,338</b>	<b>91.1%</b>
Services relating to Corporate Social Responsibility (CSR)	211	2.5%	7	0.1%	1	0.2%	219	1.5%
Due-diligence services (sell-side and buy-side)	-	0.0%	-	0.0%	26	4.3%	26	0.2%
Other services	456	5.5%	541	9.6%	64	10.5%	1,061	7.2%
<b>Total of non-audit services</b>	<b>667</b>	<b>8.0%</b>	<b>548</b>	<b>9.7%</b>	<b>91</b>	<b>15.0%</b>	<b>1,306</b>	<b>8.9%</b>
<b>TOTAL</b>	<b>8,370</b>	<b>100%</b>	<b>5,665</b>	<b>100%</b>	<b>609</b>	<b>100%</b>	<b>14,644</b>	<b>100%</b>

## Statutory Auditors' Report on the consolidated financial statements

*This is a free translation into English of the Statutory Auditors' Report on the consolidated financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This Statutory Auditors' Report includes information required by European regulation and French law, such as information about the appointment of the Statutory Auditors or verification of the information concerning the Group presented in the Management Report.*

*This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.*

To the Annual General Meeting of L'Air Liquide,

### OPINION

In compliance with the engagement entrusted to us by your Annual General Meeting, we have audited the accompanying consolidated financial statements of L'Air Liquide for the year ended December 31, 2018.

In our opinion, the consolidated financial statements give a true and fair view of the assets and liabilities and of the financial position of the Group as at December 31, 2018 and of the results of its operations for the year then ended in accordance with International Financial Reporting Standards as adopted by the European Union.

The audit opinion expressed above is consistent with our report to the Audit and Accounts Committee.

### BASIS FOR OPINION

#### Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described in the *Statutory Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report.

#### Independence

We conducted our audit engagement in compliance with independence rules applicable to us, for the period from January 1, 2018 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in article 5(1) of Regulation (EU) no. 537/2014 or in the French Code of ethics (*Code de déontologie*) for Statutory Auditors.

### JUSTIFICATION OF ASSESSMENTS - KEY AUDIT MATTERS

In accordance with the requirements of articles L. 823-9 and R. 823-7 of the French Commercial Code (*Code de commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the consolidated financial statements.

#### Large Industries activity: qualification of the contracts and related revenue recognition method

##### Risk identified

The gas supply of the Large Industries activity is based on long term contracts with a limited number of customers and requires significant industrial investments.

As described in note "accounting policies 3.a. Revenue recognition – Gas & Services" to the consolidated financial statements, these investments are usually made to share production capacity with the Industrial Merchant business line or to serve customers connected to pipelines in an industrial region. In such cases, the Group considers that those assets are not specific to customers as defined in IFRIC 4 "Determine whether an arrangement contains a lease".

When assets used for the long term supply agreements are dedicated to a customer, the Group considers, as described in note "accounting policies 5.g. Leases" to the consolidated financial statements, that all the risk and rewards resulting from the utilization of those assets are not transferred to the customers. Accordingly, gas supply agreements linked to those assets are not considered as finance leases. These industrial investments continue to be owned by the Group from an accounting standpoint and are recorded as property, plant and equipment, the full amounts received for the contracts being recognized as revenue.

Due to the complexity of those contracts and the impact on the consolidated financial statements of the judgments made when the contract is signed, or in case of subsequent significant modifications, we have considered the qualification of Large Industries long-term contracts and related revenue recognition criteria as a key audit matter.

### Our response

Our procedures consisted in:

- assessing the criteria to qualify these contracts, considering in particular the specific nature of the underlying assets and certain risks and rewards, resulting from the use of the assets, retained by the Group;
- considering internal control procedures implemented by the Group to confirm the compliance of the contracts with standard terms and conditions on which the Group IFRIC 4 analysis is based;
- for the significant new contracts in the current year, assessing the compliance of the contracts to standard terms and conditions and the impact of potential deviations on the accounting treatment;
- verifying the appropriateness of the disclosure included in note "accounting policies 3.a. Revenue recognition – Gas & Services" to the consolidated financial statements, in particular the confirmation that IFRS 16 "Leases", mandatory from January 1, 2019, will not impact the current accounting treatment of the contracts.

### Large Industries activity: useful lives of production units and measurement of their recoverable amount

#### Risk identified

As at December 31, 2018, the net book value of property, plant and equipment amounts to 19,248 million euros (45,9% of the Group total assets). The Large Industries activity requires significant industrial investment to execute customer agreements. Large Industries production units are depreciated on a straight line basis over their estimated useful life, usually between 15 and 20 years. The estimated useful lives are reassessed on a regular basis and the resulting change in estimates, if any, are recorded on a prospective basis.

In addition, the Group can be exposed to certain risks specific to industrial investments. Expected returns on investment and their recoverable value can, for example, be adversely impacted by overruns and construction delays, start-up conditions, technology changes, geographical location or counterparty risk.

As disclosed in note "accounting policies 5.f. Impairment of assets" to the consolidated financial statements, the Group determines on a regular basis whether asset impairment indicators exist. If a triggering event is identified, an impairment test is performed to confirm whether the net book value of the asset exceeds its recoverable value. These principles lead the Group to individually test production assets, in particular in case of significant start-up delays, project termination or early termination of related customer contracts. The measurement of the recoverable value of the equipment relies on significant estimates relating to the Group's capacity to re-use certain equipment for other internal or external customers or to sell the assets to the related customers or to third parties, or to obtain indemnification, notably from customers.

Due to the significant value of each production asset and the cumulative value of these assets, the key assumptions used to assess their useful life, their re-use or the compensation to be received, we have considered the depreciation principles and measurement of the recoverable value of Large Industries assets as a key audit matter.

### Our response

Our procedures consisted in:

- assessing the procedures performed by the Group to assess and update the depreciation period of the equipment and the consistency of their useful lives with contractual terms and available technical studies;
- assessing the Group process to identify impairment indicators;
- corroborating, in particular through management inquiries, the reasonableness of the key underlying data and assumptions used for these estimates;
- examining correspondence with Group customers and advisors.

## Impairment test of goodwill

### Risk identified

In connection with its external growth strategy, the Group monitors the related goodwill at the level of group of cash generating units. For the Gas & Services activity, goodwill is mostly allocated on a geographical basis. For the World Business Units Engineering & Construction and Global Markets & Technologies, goodwill is monitored at the business unit level. As at December 31, 2018, goodwill amounts to a net book value of 13,345 million euros (31,8% of the Group total assets).

The Group performs annually, an impairment test, mostly by reference to market values and, if required, with discounted cash-flows as described in note "accounting policies 5.f. Impairment of assets" to the consolidated financial statements.

The determination of fair value and recoverable value, and the sensitivity to the fluctuation of market value and key data and assumptions used, require significant management judgement and estimates. We have considered the measurement of the recoverable value of the groups of cash generating units as a key audit matter.

### Our response

Our procedures consisted in assessing:

- principles used to determine the groups of cash generating units;
- principles and methods used to determine the market value and their measurement based on multiples of market capitalization;
- in particular for cash generating units (or groups of cash generating units) subject to a value in use valuation, management key assumptions and estimates, notably the underlying operating data and long-term growth rates of the cash-flow. We have also assessed with the support of our valuation experts the discount rates applied and performed sensitivity tests;
- the appropriateness of the information included in note 11. Goodwill to the consolidated financial statements.

## SPECIFIC VERIFICATIONS

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations of the Group information given in the Management Report of the Board of Directors.

We have no matters to report as to their fair presentation and their consistency with the consolidated financial statements.

We attest that the consolidated non-financial information statement required by article L.225-102-1 of the French Commercial Code is presented in the Group's Management Report, being specified that, in accordance with article L.823-10 of this Code, the information given in this statement have not been verified by us with respect to the fair presentation and consistency with the consolidated financial statements and has to be subject to a report by an independent third party.

## REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

### Appointment of the Statutory Auditors

We were appointed as Statutory Auditors of L'Air Liquide by the Annual General Meeting held on May 12, 2016 for PricewaterhouseCoopers Audit and on May 5, 2010 for ERNST & YOUNG et Autres.

As at December 31, 2018, PricewaterhouseCoopers Audit was in its third year of uninterrupted engagement and ERNST & YOUNG et Autres in its ninth year of uninterrupted engagement. Previously, ERNST & YOUNG Audit, member of the EY network, was Statutory Auditor of L'Air Liquide from 1983 to 2009.

## RESPONSIBILITIES OF MANAGEMENT AND THOSE CHARGED WITH GOVERNANCE FOR THE CONSOLIDATED FINANCIAL STATEMENTS

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards as adopted by the European Union and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit and Accounts Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The consolidated financial statements were approved by the Board of Directors.

## STATUTORY AUDITORS' RESPONSIBILITIES FOR THE AUDIT OF THE CONSOLIDATED FINANCIAL STATEMENTS

### Objectives and audit approach

Our role is to issue a report on the consolidated financial statements. Our objective is to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As specified in article L.823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the statutory auditor exercises professional judgment throughout the audit and furthermore:

- identifies and assesses the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control;
- evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the consolidated financial statements;
- assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the statutory auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the consolidated financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein;
- evaluates the overall presentation of the consolidated financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation;
- obtains sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. The statutory auditor is responsible for the direction, supervision and performance of the audit of the consolidated financial statements and for the opinion expressed on these consolidated financial statements.

### Report to the Audit and Accounts Committee

We submit to the Audit and Accounts Committee a report which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control regarding the accounting and financial reporting procedures that we have identified.

Our report to the Audit and Accounts Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the consolidated financial statements of the current period and which are therefore the key audit matters that we are required to describe in this report.

We also provide the Audit and Accounts Committee with the declaration provided for in article 6 of Regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by articles L.822-10 to L.822-14 of the French Commercial Code (*Code de commerce*) and in the French Code of Ethics (*Code de déontologie*) for statutory auditors. Where appropriate, we discuss with the Audit and Accounts Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors

*French original signed by*

PricewaterhouseCoopers Audit

ERNST & YOUNG et Autres

Olivier Lotz

Séverine Scheer

Jeanne Boillet

Emmanuelle Mossé

## STATUTORY ACCOUNTS OF THE PARENT COMPANY

### Income statement

For the year ended December 31

<i>(in millions of euros)</i>	Notes	2017	2018
Revenue	(2)	139.3	110.3
Royalties and other operating income	(3)	522.0	577.8
<b>Total operating income (I)</b>		<b>661.3</b>	<b>688.1</b>
Purchases		(59.1)	(44.4)
Duties and taxes other than corporate income tax		(20.1)	(20.7)
Personnel expenses		(221.6)	(235.7)
Depreciation, amortization and provision expenses	(5)	(29.1)	(34.7)
Other operating expenses	(4)	(272.6)	(292.4)
<b>Total operating expenses (II)</b>		<b>(602.5)</b>	<b>(627.9)</b>
<b>Net operating profit (loss) (I + II)</b>		<b>58.8</b>	<b>60.2</b>
Financial income from equity affiliates	(6)	988.5	330.9
Interests, similar income and expenses	(6)	(10.8)	(12.6)
Other financial income and expenses	(6)	(45.5)	(12.1)
<b>Financial income and expenses (III)</b>		<b>932.2</b>	<b>306.2</b>
<b>Net profit / (loss) from ordinary activities before tax (I + II + III)</b>		<b>991.0</b>	<b>366.4</b>
<b>Exceptional income and expenses</b>	<b>(7)</b>	<b>98.3</b>	<b>208.5</b>
Statutory employee profit-sharing		(2.6)	(2.6)
Corporate income tax – Reimbursement of the 3% additional contribution	(1)	133.9	-
Corporate income tax	(8)	(70.8)	(27.5)
<b>NET PROFIT FOR THE YEAR</b>		<b>1,149.8</b>	<b>544.8</b>

## Balance sheet

For the year ended December 31

(in millions of euros)	Notes	December 31, 2017	December 31, 2018		
		Net	Gross carrying amounts	Amortization, depreciation and provisions	Net
<b>Assets</b>					
Intangible assets	(9) & (11)	43.3	283.3	(243.6)	39.7
Tangible assets	(9) & (11)	62.9	155.6	(78.4)	77.2
Financial assets	(10) & (11)	14,633.2	13,686.4	(99.5)	13,586.9
<b>TOTAL NON-CURRENT ASSETS</b>		<b>14,739.4</b>	<b>14,125.3</b>	<b>(421.5)</b>	<b>13,703.8</b>
Inventories and work-in-progress	(11)	1.1	2.1	(1.1)	1.0
Operating receivables	(11) & (14)	394.9	447.2	(5.9)	441.3
Current account loans with subsidiaries	(11) & (14)	257.6	671.0	-	671.0
Short-term financial investments	(12)	107.2	133.3	-	133.3
Cash and financial instruments		8.6	13.0	-	13.0
Prepaid expenses		4.7	5.7	-	5.7
<b>TOTAL CURRENT ASSETS</b>		<b>774.1</b>	<b>1,272.3</b>	<b>(7.0)</b>	<b>1,265.3</b>
Loan issue premiums	(15)	11.2	-	-	-
Bond redemption premiums	(15)	4.5	0.2	-	0.2
Unrealized foreign exchange losses		2.8	2.7	-	2.7
<b>TOTAL ASSETS</b>		<b>15,532.0</b>	<b>15,400.5</b>	<b>(428.5)</b>	<b>14,972.0</b>
<b>Equity and liabilities</b>					
Share capital		2,356.2			2,361.8
Additional paid-in capital		2,821.3			2,884.5
Revaluation reserve		23.9			23.9
Legal reserve		213.7			235.5
Other reserves		388.5			388.5
Retained earnings		6,240.3			6,207.7
Net profit for the year		1,149.8			544.8
Tax-driven provisions		2.5			2.4
<b>TOTAL SHAREHOLDERS' EQUITY</b>	<b>(13)</b>	<b>13,196.2</b>			<b>12,649.1</b>
<b>PROVISIONS</b>	<b>(11)</b>	<b>44.9</b>			<b>55.2</b>
Other bonds	(14)	762.0			302.3
Bank borrowings	(14)	0.3			0.2
Other borrowings	(14)	252.4			252.7
Operating payables	(14)	494.7			544.1
Current account borrowings with subsidiaries	(14)	779.5			1,167.1
Deferred income		0.7			0.4
		<b>2,289.6</b>			<b>2,266.8</b>
<b>Unrealized foreign exchange gains</b>		<b>1.3</b>			<b>0.9</b>
<b>TOTAL EQUITY AND LIABILITIES</b>		<b>15,532.0</b>			<b>14,972.0</b>



## Notes to the statutory accounts

### ACCOUNTING POLICIES

#### 1. General principles

The year-end financial statements of L'Air Liquide S.A. have been prepared in accordance with general accounting principles applicable in France and in particular those of the French Chart of Accounts (Plan Comptable Général) and the French Commercial Code.

#### 2. Non-current assets

##### A. Intangible assets

Internally generated intangible assets primarily include the development costs of information management systems. They are capitalized only if they generate probable future economic benefits. Internal and external costs corresponding to detailed application design, programming, the performance of tests and the drafting of technical documentation intended for internal or external use are capitalized.

Significant upgrade and improvement costs are added to the initial cost of assets if they specifically meet the capitalization criteria.

Other intangible assets include separately acquired intangible assets such as software, licenses and intellectual property rights and are measured at acquisition cost.

Intangible assets are amortized according to the straight-line method over their estimated useful lives.

##### B. Tangible assets

Land, buildings and equipment are recognized at historical cost. Interim interest expense is not included in the cost.

Where components of a tangible asset have different useful lives, they are accounted separately and depreciated over their own useful lives.

Depreciation is computed according to the straight-line method over their estimated useful lives as follows:

- buildings: 10 to 30 years;
- other equipment: 5 to 20 years.

Land is not depreciated.

##### C. Impairment of intangible and tangible assets

The Company assesses at each closing date whether there is any indication of impairment loss of intangible and tangible assets. If such indications exist, an impairment test is performed to assess

whether the carrying amount of the asset exceeds its present value, which is defined as the greater of its fair value less costs to sell and its value in use.

In assessing value in use, the estimated future cash flows are discounted to their present value as this would be done for an investment decision.

When the present amount of an asset is lower than its net carrying amount, an impairment loss is recognized in the income statement. When the present value exceeds the carrying amount, the previously recognized impairment is reversed to the income statement.

##### D. Equity investments

Equity investments are recognized at their initial amount on the entry date, with the exception of those subject to a revaluation as provided by Law 76-1232 of December 29, 1976. Acquisition costs that are not representative of market value are expensed.

When the carrying amount, determined using the criteria normally adopted for the measurement of equity investments (market multiples method based on the Air Liquide Group market valuation, estimated cash flow approach, and net asset value remeasured at fair value), is lower than the book value, an impairment loss is recognized for the difference.

##### E. Treasury shares

When the Company purchases its own shares, they are recognized at cost as treasury shares in other long-term investment securities. The gains or losses on disposals of treasury shares contribute to the net profit for the year.

However, shares allocated for the purpose of implementing plans for free grants of shares are reclassified to a "Short-term financial investments – Company treasury shares" caption at the balance sheet value on the date of allotment.

A provision is recorded over the rights vesting period to cover the future charge of employees and members of Executive Management of the Company relating to the remittance of current shares when the performance criteria can be determined with reliability. Conversely, the amount corresponding to the maximum performance level is presented in off-balance sheet commitments.

When the purchase cost of shares is higher than their valuation based on the average share price during the last month of the fiscal year, treasury shares earmarked for cancellation or allocated for the purpose of implementing plans for free grants of shares are not impaired.

### 3. Inventories and work-in-progress

Raw materials, supplies and goods are primarily measured at weighted average cost.

An impairment loss is recognized for inventories and work-in-progress when the estimated realizable amount is lower than cost.

### 4. Trade receivables and other operating assets

Trade receivables and other operating assets are measured at historical cost.

An impairment loss for doubtful receivables is recognized when it becomes probable that the amount due will not be collected and the loss can be reasonably estimated.

### 5. Foreign currency transactions

Foreign currency transactions are translated at the exchange rate prevailing on the transaction date.

At year-end, the difference arising from the translation of receivables and payables denominated in a foreign currency, are recognized in suspense accounts in assets and liabilities ("Unrealized foreign currency gains or losses").

Where applicable, unrealized foreign exchange losses associated with non-hedged transactions are subject to a contingency provision.

### 6. Provisions

Provisions are recognized when:

- the Company has a present obligation as a result of a past event or an ongoing one;
- it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation;
- a reliable estimate can be made of the amount of the obligation.

### 7. Financial instruments

Since January 1, 2017, L'Air Liquide S.A. has applied the ANC regulation no. 2015-05 of July 2, 2015 related to financial forward and hedging instruments.

In accordance with its risk management policy, L'Air Liquide S.A. enters into forward currency purchases or sales in order to hedge the exposure to foreign exchange risk associated with transactions carried out in foreign currencies.

By symmetry, the foreign exchange gains or losses on forward currency purchases or sales is presented at the same time and in the same income statement caption as the hedged item.

Likewise, the unrealized gain from the hedging is presented within the unrealized foreign currency gains or losses statement caption, to offset the exchange differentials related to the revaluation of underlying receivables and debts. When the forward currency purchases or sales,

hedge future transactions not yet recorded on the balance sheet, the fair value of these instruments represents an off balance sheet commitment.

Where applicable, when the financial instruments used do not constitute hedging transactions ("isolated open position"), the losses resulting from their year-end market value are provided for in the income statement. In accordance with the principle of prudence, unrealized gains are not recognized in the income statement.

### 8. Post-employment benefits

The Company applies ANC recommendation 2013-02 related to the recognition and measurement of retirement benefits and similar obligations.

The Company provides its employees with various pension plans, termination benefits, jubilees (awards based on years of service) and other post-employment benefits for both active employees and retirees. These benefits are covered in two ways:

- by so-called defined contribution plans;
- by so-called defined benefit plans.

The Company grants both defined benefit and defined contribution plans.

Defined contribution plans are plans under which the employer's sole obligation is to pay regular contributions. The employer does not grant any guarantee on the future level of benefits paid to the employee or retiree ("means-based obligation"). The annual pension expense is equal to the contribution paid during the fiscal year which relieves the employer from any further obligation.

Defined benefit plans are those by which the employer guarantees the future level of benefits defined in the agreement, most often depending on the employee's salary and seniority ("result-based obligation"). Defined benefit plans can be:

- either financed by contributions to a fund specialized in managing the contributions paid;
- or managed internally.

In the case of defined benefit plans, retirement and similar obligations are measured by independent actuaries, according to the projected unit credit method. The actuarial calculations mainly take into account the following assumptions: salary increases, employee turnover, retirement date, mortality, inflation and appropriate discount rates.

Actuarial gains and losses exceeding the greater of 10% of the obligations or 10% of the fair value of plan assets at the beginning of the reporting period are amortized over the expected average working lives of the plan participants.

In accordance with the option offered by ANC recommendation 2013-02, the Company maintained its previous practices: obligations related to retirement termination payments and jubilees are provided whereas other retirement obligations related to defined benefit plans are not provided but are disclosed in the notes.

## 9. Revenue recognition

Revenue from the sale of goods is recognized when the risks and rewards of ownership have been transferred to the buyer.

Revenue associated with delivery of services is recognized depending on the stage of completion of the transaction at the balance sheet date, when this can be reliably measured.

## 10. Tax consolidation

L'Air Liquide S.A. has set up a tax consolidation group with the French subsidiaries in which it holds a direct or indirect interest exceeding 95%, as defined by article 223-A of the French General Tax Code.

Each company calculates its tax provision as if it was taxed separately. L'Air Liquide S.A., as head of the tax consolidation group, recognizes as an expense the tax corresponding to its own profits and recognizes in a balance sheet current tax account the impact of restatements and eliminations when determining taxable profit as a whole and the tax deferrals of subsidiaries with losses. It is booked in exceptional income

and expenses according to the Opinion 2005-G of the emergency committee of the C.N.C.

## 11. Research and Development expenditures

Development costs shall be recognized as assets if and only if the Company can demonstrate all of the following:

- the project is clearly identified and the related costs are individualized and reliably monitored;
- the technical and industrial feasibility of the project is demonstrated;
- there is a clear intention to complete the project and use or sell the products arising from it;
- it is probable that the project will generate future economic benefits for the Company.

When these conditions are not satisfied, the work carried out does not systematically result in the completion of an intangible asset that will be available for use or sale, development costs generated are recognized as an expense when incurred.

## ADDITIONAL NOTES ON THE BALANCE SHEET AND INCOME STATEMENT

### 1. Significant events

In 2018, there were no significant events during the fiscal year.

In 2017,

The Amended Finance Act enacted in August 2012 introduced an additional 3% contribution on cash dividends. L'Air Liquide S.A. was subject to this tax for the dividends paid between 2013 and 2017.

L'Air Liquide S.A. had filed claims for the reimbursement of the amounts paid for the 2013 to 2017 fiscal years (133.9 million euros, before interests on arrears).

Following the favorable decision of the European Court of Justice on May 17, 2017 and the French Constitutional Council on October 6, 2017 leading to the cancellation of the additional contribution, a receivable was recognized. This receivable was collected in December 2017, along with interests on arrears of 15.2 million euros.

This payment is booked on line "Corporate income tax – Reimbursement of the 3% additional contribution" for the principal and on line "Exceptional income and expenses" for the interests on arrears.

### 2. Revenue breakdown by geographical area

<i>(in millions of euros)</i>	2017	2018
France	94.0	76.6
Abroad	45.3	33.7
<b>REVENUE</b>	<b>139.3</b>	<b>110.3</b>

By the nature of its activities, the revenue of L'Air Liquide S.A. mainly corresponds to services and pension expenses recharged to its subsidiaries (see note 17.A).

### 3. Royalties and other operating income

Other operating income mainly includes change in inventories of goods and services, production of assets capitalized, operating subsidies, operating expense reclassifications, as well as operating provision and impairment reversals.

### 4. Other operating expenses

Other operating expenses primarily consist of research and development costs and other external expenses such as subcontracting and maintenance costs, fees, travel expenses, telecommunication costs and rental expenses.

## 5. Depreciation, amortization and provision expenses

Depreciation, amortization and provision expenses break down as follows:

<i>(in millions of euros)</i>	2017	2018
Depreciation and amortization expenses	(16.1)	(15.6)
Provision expenses	(13.0)	(19.1)
<b>DEPRECIATION, AMORTIZATION AND PROVISION EXPENSES</b>	<b>(29.1)</b>	<b>(34.7)</b>

## 6. Financial income and expenses

Financial income from equity affiliates amounts to 330.9 million euros in 2018 (988.5 million euros in 2017). In 2017, Air Liquide International made a dividend payment amounting to 600.8 million euros (none in 2018).

Interests, similar income and expenses break down as follows:

<i>(in millions of euros)</i>	2017	2018
Revenues from other marketable securities and long-term loans	15.5	11.3
Other interest and similar income	(26.3)	(23.9)
<b>INTERESTS, SIMILAR INCOME AND EXPENSES</b>	<b>(10.8)</b>	<b>(12.6)</b>

Other financial income and expenses break down as follows:

<i>(in millions of euros)</i>	2017	2018
Other financial expenses, impairment and provisions net of reversals	(44.3)	(12.2)
Foreign exchange gains / losses (net)	(1.2)	0.1
<b>OTHER FINANCIAL INCOME AND EXPENSES</b>	<b>(45.5)</b>	<b>(12.1)</b>

## 7. Exceptional income and expenses

As part of the tax consolidation of L'Air Liquide S.A. and its consolidated French subsidiaries, an exceptional income of 193.2 million euros was booked in 2018 (83.1 million euros in 2017). This income had no impact on the Group's consolidated tax position or the profit or loss of the relevant subsidiaries.

Exceptional income and expenses also include the impact of eliminations related to the tax consolidation regime in the amount of 13.6 million euros in 2018 and 2.5 million euros in 2017.

In 2017, exceptional income and expenses also include interests linked to the reimbursement of the additional contribution in the amount of 15.2 million euros (see note 1).

## 8. Corporate income tax

The total tax expense amounts to 27.5 million euros, compared to 70.8 million euros in 2017.

After allocation of add-backs, deductions and tax credits relating to profits, it breaks down as follows:

<i>(in millions of euros)</i>	2017	2018
Net profit from ordinary activities before tax	(22.5)	(25.7)
Additional contributions on earnings <sup>(a)</sup>	(1.7)	(1.8)
Exceptional contributions <sup>(b)</sup>	(15.7)	-
Additional contribution on cash dividend <sup>(c)</sup>	(30.9)	-
<b>TOTAL</b>	<b>(70.8)</b>	<b>(27.5)</b>

(a) 3.3% social security contribution on earnings.

(b) In 2017, introduction of an exceptional contribution of 15% on profits, plus an additional exceptional contribution of 15%.

(c) Corresponds to a 3% contribution on the amount of the dividend paid in cash. In December 2017, this tax was reimbursed (see note 1).

## 9. Intangible and tangible assets

Changes in gross value break down as follows:

(in millions of euros)	Gross value as of January 1, 2018	Additions	Disposals	Gross value as of December 31, 2018
Concessions, patents, licenses	103.7	3.9	-	107.6
Other intangible assets	172.0	5.5	(1.8)	175.7
<b>INTANGIBLE ASSETS</b>	<b>275.7</b>	<b>9.4</b>	<b>(1.8)</b>	<b>283.3</b>
Land and buildings	45.9	48.8	(2.2)	92.5
Plant, machinery and equipment	36.8	1.2	(1.8)	36.2
Other tangible assets	17.6	3.6	(1.0)	20.2
Tangible assets under construction and payments on account – tangible assets	41.7	5.2	(40.2)	6.7
<b>TANGIBLE ASSETS</b>	<b>142.0</b>	<b>58.8</b>	<b>(45.2)</b>	<b>155.6</b>
<b>TOTAL</b>	<b>417.7</b>	<b>68.2</b>	<b>(47.0)</b>	<b>438.9</b>

Changes in tangible assets primarily correspond to the commissioning of the new Research and Development Center, located on the "Plateau de Saclay" in Paris area.

Changes in amortization, depreciation and impairment losses break down as follows:

(in millions of euros)	Amortization, depreciation, and impairment losses as of January 1, 2018	Amortization and depreciation	Decreases, disposals, scrappings	Amortization, depreciation and impairment losses as of December 31, 2018
Intangible assets	(232.4)	(11.6)	0.4	(243.6)
Tangible assets	(79.1)	(4.0)	4.7	(78.4)
<b>TOTAL</b>	<b>(311.5)</b>	<b>(15.6)</b>	<b>5.1</b>	<b>(322.0)</b>

## 10. Financial assets

Changes in gross value break down as follows:

(in millions of euros)	Gross value as of January 1, 2018	Increases	Decreases	Gross value as of December 31, 2018
Equity investments	12,453.3	0.4	(0.1)	12,453.6
Other long-term investment securities <sup>(a)</sup>	51.3	134.7	(176.5)	9.5 <sup>(c)</sup>
Long-term loans	2,153.3	1.4	(1,001.6) <sup>(b)</sup>	1,153.1
Other long-term financial assets	69.3	0.9	-	70.2 <sup>(d)</sup>
<b>FINANCIAL ASSETS</b>	<b>14,727.2</b>	<b>137.4</b>	<b>(1,178.2)</b>	<b>13,686.4</b>

(a) The change in other long-term investment securities mainly corresponds to:

- the acquisition and sale of Company treasury shares under the liquidity contract for 113.2 million euros and -113.1 million euros respectively;
- the acquisition of 214,000 Company treasury shares (for the purpose of cancellation) for 21.5 million euros;
- the cancellation of 654,000 Company treasury shares in the amount of -63.4 million euros.

(b) The decrease in long-term loans mainly corresponds to the reimbursement of the loan to Air Liquide Finance for 1,000.6 million euros on December 21, 2018.  
At the 2018 year-end:

(c) The "Other long-term investment securities" caption includes 9,500 shares held under the liquidity contract in an amount of 1.0 million euros;

(d) The "Other long-term investments" caption mainly includes the receivable linked to the refund claim on the equalization charge paid for the years 2000 to 2004 for 41.4 million euros and the interest on arrears for 28.2 million euros. In connection with the litigation concerning the reimbursement of the receivable, the Administrative Court of Montreuil partially sided with L'Air Liquide S.A. on July 21, 2014. Following this decision, L'Air Liquide S.A. received 30.3 million euros in principal and 15.0 million euros in interest on arrears. On September 19, 2014, the Company appealed the decision of the Administrative Court of Montreuil regarding the recovery of the balance. The appeal decision had not been rendered as of the period-end date.

## 11. Impairment, allowances and provisions

### A. Impairment and allowances

Impairment and allowances are recognized when the asset's carrying amount is lower than its entry value.

They break down as follows:

(in millions of euros)	2017	Charges	Reversals	2018
Intangible and tangible assets	(4.4)	-	0.1	(4.3)
Equity investments	(85.7)	(7.7)	2.2	(91.2)
Other long-term investment securities	(8.3)	-	-	(8.3)
Inventories and work-in-progress	(1.3)	-	0.2	(1.1)
Operating receivables	(17.8)	-	11.9	(5.9)
<b>IMPAIRMENT AND ALLOWANCES</b>	<b>(117.5)</b>	<b>(7.7)</b>	<b>14.4</b>	<b>(110.8)</b>
Whose charges and reversals:				
operating items		-	12.2	
financial items		(7.7)	2.2	
exceptional items		-	-	

Charges mainly relate to impairment of equity investments.

Reversals mainly relate to depreciation of subsidiaries receivables.

### B. Provisions

Provisions mainly include:

- foreign exchange provisions;
- third party or employee contingency and litigation provisions;
- jubilee awards and vested rights with regard to retirement termination payments (23.5 million euros in 2018 and 22.4 million euros in 2017).

(in millions of euros)	2017	Charges / increases	Reversals	2018
Provisions for contingencies	11.4	3.3	(3.9)	10.8
Provisions for losses	33.5	16.4	(5.5)	44.4
<b>PROVISIONS</b>	<b>44.9</b>	<b>19.7</b>	<b>(9.4)</b>	<b>55.2</b>
Whose charges and reversals:				
operating items		19.1	(6.1)	
financial items		-	(2.8)	
exceptional items		0.6	(0.5)	

Charges mainly relate to provisions for jubilee awards and vested rights with regard to retirement termination payments for 2.0 million euros, foreign exchange provision for 2.7 million euros and provisions to cover the future charge of the remittance of current shares for 14.2 million euros.

Reversals primarily stem from the cancellation of foreign exchange provisions for -2.8 million euros, the utilization of provisions for jubilee awards and vested rights with regard to retirement benefits for -0.9 million euros, and the remittance of current shares for -4.4 million euros.

## 12. Short-term financial investments

The item breaks down as follows:

(in millions of euros)	Gross value as of December 31, 2017	Gross value as of December 31, 2018
Company treasury shares	92.0	118.3
Other short-term financial investments	15.2	15.0
<b>SHORT-TERM FINANCIAL INVESTMENTS</b>	<b>107.2</b>	<b>133.3</b>

At the 2018 year-end, "Company treasury shares" consisted of 1,234,488 shares (1,005,182 shares in 2017) allocated to the implementation of performance shares plans to employees.

## 13. Shareholders' equity

As of December 31, 2018, the share capital comprised 429,423,434 shares with a par value of 5.50 euros.

The portion of share capital arising from the special revaluation reserve totals 71.4 million euros.

(in millions of euros)	As of December 31, 2017 (before appropriation of earnings)	Appropriation of 2017 net profit	Capital increases	Capital decrease	Other changes	As of December 31, 2018 (before appropriation of earnings)
Share capital <sup>(b)</sup>	2,356.2	-	9.2	(3.6)	-	2,361.8
Additional paid-in capital <sup>(b)</sup>	2,821.3	-	123.0	(59.8)	-	2,884.5
Revaluation reserve	23.9	-	-	-	-	23.9
Reserves:						
■ Legal reserve	213.7	21.8	-	-	-	235.5
■ Tax-driven reserves	307.8	-	-	-	-	307.8
■ Translation reserve	7.7	-	-	-	-	7.7
■ Other reserves	73.0	-	-	-	-	73.0
Retained earnings <sup>(c)</sup>	6,240.3	(37.7)	-	-	5.1	6,207.7
Net profit for the year	1,149.8	(1,149.8)	-	-	544.8	544.8
Accelerated depreciation <sup>(d)</sup>	2.5	-	-	-	(0.1)	2.4
<b>SHAREHOLDERS' EQUITY</b>	<b>13,196.2</b>	<b>(1,165.7) <sup>(a)</sup></b>	<b>132.2</b>	<b>(63.4)</b>	<b>549.8</b>	<b>12,649.1</b>

(a) Following the decision of the Combined Annual Shareholders' Meeting of May 16, 2018.

(b) The change in the Share capital and Additional paid-in capital results from the following transactions:

- capital decrease in the amount of -3.6 million euros by cancelling 654,000 treasury shares, as decided by the Board of Directors on May 16, 2018. The Additional paid-in capital was reduced by the amount of premiums related to these shares, i.e. -59.8 million euros;
- capital increases of 3.4 million euros resulting from the exercise of 630,355 subscription options. The Additional paid-in capital was increased by the premiums related to these share capital increases, i.e. 38.5 million euros;
- capital increase of 5.8 million euros resulting from the subscription of 1,049,529 shares by employees of the Group ascertained on December 7, 2018 by the Chairman and Chief Executive Officer under powers granted by the Board of Directors on May 16, 2018 and confirmed on July 27, 2018. The Additional paid-in capital was increased by the premiums related to these share capital increase, i.e. 86.3 million euros and reduced by the capital increase costs i.e. -1.8 million euros.

(c) The change in Retained earnings also includes the difference between the estimated loyalty dividend and the loyalty dividend actually paid and the cancellation of the dividend pertaining to treasury shares.

(d) The change in the Accelerated depreciation results from the reversal of accelerated depreciation in accordance with asset depreciation and amortization policies.



## 14. Debt maturity analysis

(in millions of euros)	December 31, 2018		
	Gross	<= 1 year	> 1 year
Long-term loans	1,153.1	3.1	1,150.0
Other long-term investments	70.2	0.6	69.6
Operating receivables	447.2	422.2	25.0
Current account loans with subsidiaries <sup>(a)</sup>	671.0	671.0	-
<b>ASSETS</b>	<b>2,341.5</b>	<b>1,096.9</b>	<b>1,244.6</b>

(a) Current amount loans agreements are concluded for an indefinite period.

(in millions of euros)	December 31, 2018			
	Gross	<= 1 year	> 1 to <= 5 years	> 5 years
Other bonds <sup>(a)</sup>	302.3	2.3	300.0	-
Bank borrowings	0.2	0.2	-	-
Other borrowings	252.7	2.1	0.6	250.0
Operating payables	544.1	519.1	25.0	-
Current account borrowings with subsidiaries <sup>(b)</sup>	1,167.1	1,167.1	-	-
<b>DEBTS</b>	<b>2,266.4</b>	<b>1,690.8</b>	<b>325.6</b>	<b>250.0</b>

(a) All new bond issues carried out by L'Air Liquide S.A., and constituting the outstanding bonds as of December 31, 2018, include a change of control clause. On October 12, 2018, the Company repaid the 457 million euros bond issue maturing.

(b) Current amount borrowings agreements are concluded for an indefinite period.

## 15. Loan issue and bond redemption premiums

The change in the item breaks down as follows:

(in millions of euros)	Net value as of January 1, 2018	Increases	Charges	Net value as of December 31, 2018
Loan issue premiums	11.2	-	(11.2)	-
Bond redemption premiums	4.5	-	(4.3)	0.2
<b>TOTAL</b>	<b>15.7</b>	<b>-</b>	<b>(15.5)</b>	<b>0.2</b>

The decrease in bond redemption premiums is mainly due to a transfer to the "cash instruments" item.

The decrease in bond redemption premiums mainly correspond to the end of amortization related to the 2010 bond exchange over the term of the new bond, i.e. until October 2018.

## 16. Financial instruments

Unsettled derivatives as of December 31, 2018 break down as follows:

(in millions of euros)	December 31, 2018	
	Carrying value	Fair value
Currency forwards		
■ Buy	53.9	0.5
■ Sell	157.9	(0.8)
<b>FOREIGN EXCHANGE RISK</b>		<b>(0.3)</b>

The fair value difference represents the difference between the derivative valuation and the value of the contract determined at the closing year-end exchange rate.

All of these instruments are allocated to hedging. There is therefore no isolated open position whose change in fair value would have a direct impact on the income statement.

## 17. Retirement and similar plans

### A. Group retirement benefit guarantee agreement

In France, Air Liquide grants additional benefits to retirees (3,845 retirees as of December 31, 2018) and to employees over 45, or with more than 20 years of service as of January 1, 1996 (6 employees as of December 31, 2018). These benefits provide a supplemental retirement income based on final pay, which is paid in addition to other normal retirement benefits. This plan is closed to employees under the age 45, or with less than 20 years of service as of January 1, 1996. These plans are unfunded. The annual amount paid with regards to additional benefits cannot exceed originally 12% of total payroll or, in some case, 12% of pre-tax profits of companies involved. This 12% threshold will be proportionately reduced by comparing the number of plan beneficiaries for the year to the number of plan beneficiaries for the previous year. In 2017, this additional benefit was funded subsequently to the article 50 of the law of January 20, 2014 securing the future and fairness of pensions plans.

The contributions amounted to 12.2 million euros in 2018 (12.1 million euros in 2017) after re-invoicing subsidiaries. Excluding the impact of timelines, and until the plan ends, the actuarial value of obligations vis-à-vis retirees and those eligible as of December 31, 2018 amounts to 611.2 million euros (579.2 million euros for retirees and 32.0 million euros for active employees).

Based on the assumptions used for the valuation of the retirement obligations, an estimated 442.2 million euros will be recharged to the subsidiaries of L'Air Liquide S.A. as and when benefits are paid to the retirees.

### B. Externally funded plan

L'Air Liquide S.A. grants to employees not covered by the preceding plan (949 employees as of December 31, 2018) and with at least one half-year of service benefit from an externally funded defined contribution plan. Contributions to this plan are jointly paid by the employer and employee. For 2018, employer contributions (net of re-invoicing to subsidiaries) amounted to 5.8 million euros (6.5 million euros in 2017).

### C. Retirement termination payments and jubilees

The corresponding obligations are provided for in the amount of 22.6 million euros (net of tax) and 0.9 million euros, respectively.

### D. Calculation of actuarial assumptions and methods

The calculations with respect to the Group's retirement benefit guarantee agreement, retirement termination payments and jubilees are performed by independent actuaries using the projected unit credit method.

Actuarial gains and losses exceeding the greater of 10% of the obligations related to retirement termination payments and unrecognized past service costs are amortized over the expected average working lives of the plan participants. As of December 31, 2018, the amounts stand at 18.7 million euros (12.2 million euros in 2017).

The actuarial assumptions (turnover, mortality, retirement age, salary increase) vary according to demographic and economic conditions.

The discount rates used to determine the present value of obligations are based on Government bonds or High-quality Corporate bonds, with the same duration as the obligations at the valuation date (1.60% as of December 31, 2018).

### E. Change in retirement obligations and similar benefits

Company obligations with respect to pension plans and similar benefits break down as follows:

<i>(in millions of euros)</i>	Defined benefit plan	Retirement indemnities	Jubilees	Total
<b>OBLIGATIONS AS OF JANUARY 1, 2018</b>	<b>666.9</b>	<b>45.1</b>	<b>0.9</b>	<b>712.9</b>
Service cost	0.6	2.2	0.1	2.9
Interest cost	6.1	0.4	-	6.5
Benefit payments	(42.4)	(1.5)	-	(43.9)
Actuarial (gains) / losses <sup>(a)</sup>	(20.0)	7.0	(0.1)	(13.1)
<b>OBLIGATIONS AS OF DECEMBER 31, 2018 <sup>(b)</sup></b>	<b>611.2</b>	<b>53.2</b>	<b>0.9</b>	<b>665.3</b>

(a) The amounts recognized in "Actuarial (gains) / losses" mainly arise from the updating of the beneficiaries' database.

(b) Commitments as of December 31, 2018 are covered by assets amounting to 11.6 million euros.

## 18. Accrued income and accrued expenses

(in millions of euros)	December 31, 2018
<b>Accrued income</b>	
Other long-term financial assets	70.6
Operating receivables	93.0
<b>ACCRUED INCOME</b>	<b>163.6</b>
<b>Accrued expenses</b>	
Other bonds	2.3
Other borrowings	1.9
Operating payables	204.2
<b>ACCRUED EXPENSES</b>	<b>208.4</b>

## 19. Deferred taxes

Deferred taxes arise from timing differences between the tax regime and the accounting treatment of income and expenses. According to the nature of the differences, these deferred taxes will increase or decrease the future tax expense and are not recorded pursuant to the provisions of the chart of accounts.

Deferred taxes as of December 31, 2018 are estimated as follows:

(in millions of euros)	December 31, 2017	December 31, 2018
Deferred tax assets (decrease in future tax expense)	3.8	3.5
Deferred tax liabilities (increase in future tax expense)	1.8	-

The deferred taxes were calculated taking into account the 3.3% social security contribution on earnings i.e. a general rate of 34.43% for 2017 and 32.02% for 2018.

## OTHER INFORMATIONS

### 20. Items concerning related undertakings

The Company conducted related party transactions with its wholly owned subsidiaries or subsidiaries that were directly or indirectly controlled.

(in millions of euros)	December 31, 2018	
	Gross	Including related undertakings
<b>Balance sheet</b>		
Long-term loans	1,153.1	1,151.0
Other long-term financial assets	70.2	-
Operating receivables	447.2	368.8
Current account loans with subsidiaries	671.0	671.0
Other borrowings	252.7	251.9
Operating payables	544.1	69.1
Current account borrowings with subsidiaries	1,167.1	1,167.1
<b>Income statement</b>		
Financial income from equity affiliates	330.9	330.9
Interests, similar income and expenses	(12.6)	5.5
Other financial income and expenses	(12.1)	(5.2)

## 21. Off-balance sheet commitments

Off-balance sheet commitments break down as follows:

(in millions of euros)	December 31, 2017	December 31, 2018
<b>Commitments given</b>		
Endorsements, securities and guarantees given <sup>(a)</sup>	1,257.2	994.4
To Air Liquide Finance and Air Liquide US LLC on transactions performed <sup>(b)</sup>	12,016.9	12,282.7
Firm purchase orders for fixed assets	7.0	0.8
<b>COMMITMENTS GIVEN</b>	<b>13,281.1</b>	<b>13,277.9</b>

(a) Endorsements, securities and guarantees given mainly consist of the guarantees given in favor of holders of the Senior Notes issued by Airgas. These guarantees amount to 825 million US dollars (compared to 1,150 as of December 31, 2017). This also includes the joint and several liability guarantee of the subsidiary Air Liquide France Industrie in connection with the energy purchases and a guarantee covering the obligations of the Air Liquide Global E&C Solutions France subsidiary under the Middle Eastern projects.

(b) L'Air Liquide S.A. holds 100% of the French subsidiary Air Liquide Finance, which manages the Group's cash position and interest rate risk, as well as financing. In addition, Air Liquide Finance holds 100% of Air Liquide US LLC, in order to borrow on the US market. Insofar as the sole activity of Air Liquide Finance and Air Liquide US LLC is the Group's financing, L'Air Liquide S.A. is required to guarantee any issuances performed by these companies.

## 22. Remuneration paid to members of Executive Management and the Board of Directors

The remuneration (short-term benefits: fixed and variable portions, benefits in kind, retirement termination payments, Directors' fees) paid by the Company to members of Executive Management and the Board of Directors respectively, amounts to:

(in millions of euros)	2018
Remuneration of the Board of Directors	0.8
Remuneration of Executive Management	3.4
<b>TOTAL</b>	<b>4.2</b>

During 2018, the Company paid to third parties the total amount of 226,004 euros for Benoît Potier: with respect to supplementary defined contribution pension plans: 9,500 euros, with respect to the collective life insurance contract: 211,831 euros and with respect to the collective death and disability benefits plan: 4,673 euros.

## 23. Average number of employees

The average number of employees is:

	2017	2018
Engineers and executives	809	816
Supervisory staff	224	211
Employees	5	5
Laborers	19	14
<b>TOTAL</b>	<b>1,057</b>	<b>1,046</b>

## 24. Subsidiaries and affiliates information

(in thousands of euros)	Share capital as of December 31, 2018	Other equity as of December 31, 2018	% share holding	Carrying amount of shares held after the revaluations of 1976, 1978 and 1979		Including revaluation difference	Loans and advances granted by the Company and not repaid	Guarantees and endorsements given by the Company	2017 net revenue <sup>(a)</sup>	Net profit (or loss) for 2017 <sup>(a)</sup>	Dividends collected by the Company during 2018
				Gross	Net						
A. Detailed information on affiliates whose carrying amounts exceed 1% of the capital of the Company required to publish its financial statements											
a) Companies operating in France											
Air Liquide International <sup>(b)</sup> – 75, quai d'Orsay – 75007 Paris	3,151,080	3,447,787	100.00%	9,333,923	9,333,923	21,186	466,624		371	67,915	
Air Liquide France Industrie – 6, rue Cognacq-Jay – 75007 Paris	72,268	509,912	100.00%	285,126	285,126				1,039,495	107,215	110,000
Air Liquide Finance – 6, rue Cognacq-Jay – 75007 Paris	72,000	8,087	100.00%	72,901	72,901		1,156,692	11,947,304		91,058	91,080
Air Liquide Santé (International) – 75, quai d'Orsay – 75007 Paris	38,477	346,716	100.00%	331,728	331,728	6,301	29			80,217	
Chemoxal <sup>(b)</sup> – 75, quai d'Orsay – 75007 Paris	30,036	4,073	100.00%	30,326	30,326					37,910	37,146
Air Liquide Investissements d'Avenir et de Démonstration – 6, rue Cognacq-Jay – 75007 Paris	75,050	(9,752)	100.00%	75,050	64,751		272		20	(12,015)	
Air Liquide Advanced Business – 6, rue Cognacq-Jay – 75007 Paris	106,450	(37,819)	100.00%	106,450	78,051		21,028		9,708	(11,773)	
b) Companies operating outside of France											
Air Liquide Industriegase GmbH & Co. KG – Hans-Günther-Sohl-Strasse 5 – 40235 Düsseldorf – Germany	10	2,947,632	100.00%	2,106,474	2,106,474				55,229	100,298	75,000
B. General information on other subsidiaries and affiliates											
a) French companies (together)				106,354	54,540	16,068	15,051	2,204			11,946
b) Foreign companies (together)				3,973	3,216						5,705

(a) Most recent year-end accounts approved by the competent decision-making bodies.

(b) Holding company.

## Statutory Auditors' Report on the financial statements

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This Statutory Auditors' Report includes information required by European regulation and French law, such as information about the appointment of the Statutory Auditors or verification of the Management Report and other documents provided to shareholders.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Annual General Meeting of L'Air Liquide,

### OPINION

In compliance with the engagement entrusted to us by your Annual General Meeting, we have audited the accompanying financial statements of L'Air Liquide for the year ended December 31, 2018.

In our opinion, the financial statements give a true and fair view of the assets and liabilities and of the financial position of the Company as at December 31, 2018 and of the results of its operations for the year then ended in accordance with French accounting principles.

The audit opinion expressed above is consistent with our report to the Audit and Accounts Committee.

### BASIS FOR OPINION

#### Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described in the *Statutory Auditors' Responsibilities for the Audit of the Financial Statements* section of our report.

#### Independence

We conducted our audit engagement in compliance with independence rules applicable to us, for the period from January 1, 2018 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in article 5(1) of Regulation (EU) no. 537/2014 or in the French Code of ethics (*Code de déontologie*) for Statutory Auditors.

### JUSTIFICATION OF ASSESSMENTS - KEY AUDIT MATTERS

In accordance with the requirements of articles L. 823-9 and R. 823-7 of the French Commercial Code (*Code de commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the financial statements.

#### Equity investments measurement

##### Identified risk

As at December 31, 2018, the net book value of the equity investments amounts to 12,362 million euros and represents 82,6% of the total balance sheet. Equity investments are recognized at their initial consideration, excluding acquisition costs and after considering legal reevaluation if any.

As disclosed in note "2.D. Accounting policies – Equity investments", when the carrying amount (determined applying the market multiples method based on the Group market capitalization or the estimated cash flows method or the method of net asset value re-measured at fair value) is lower than the net book value of the equity investment, an impairment loss is recognized for the difference.

The selection of the method used to determine the carrying amount requires significant Management judgement.

Due to the significant equity investments balance and the impact of the method retained to determine the carrying amount, we have considered that the measurement of the equity investments as a key audit matter.

##### Our audit response

Our procedures consisted in:

- assessing, based on information provided by Management, valuation methods applied by the Company;
- assessing assumptions used to determine the re-measured net asset;
- assessing the methodology and the results of the tests performed based on the Group market capitalization;
- verifying the information included in notes "2.D. Accounting policies – Equity investments", "10. Financial assets" and "11. Impairment, allowances and provisions" to the statutory financial statements.

## SPECIFIC VERIFICATIONS

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations.

### Information given in the management report and in other documents with respect to the financial position and the financial statements provided to the Shareholders

We have no matters to report as to the fair presentation and the consistency with the financial statements of the information given in the Management Report of the Board of Directors and in the other documents with respect to the financial position and the financial statements provided to the Shareholders.

We attest the fair presentation and the consistency with the financial statements of the information relating to the payment terms required by article D. 441-4 of the French Commercial Code (*Code de commerce*).

### Report on corporate governance

We attest that the Board of Directors' report on corporate governance sets out the information required by articles L. 225-37-3 and L. 225-37-4 of the French Commercial Code (*Code de commerce*).

Concerning the information given in accordance with the requirements of article L. 225-37-3 of the French Commercial Code (*Code de commerce*) relating to remunerations and benefits received by the directors and any other commitments made in their favour, we have verified its consistency with the financial statements, or with the underlying information used to prepare these financial statements and, where applicable, with the information obtained by your Company from controlling and controlled companies. Based on these procedures, we attest the accuracy and fair presentation of this information.

With respect to the information relating to items that your Company considered likely to have an impact in the event of a public purchase offer or exchange, provided pursuant to article L. 225-37-5 of the French Commercial Code (*Code de commerce*), we have agreed these to the source documents communicated to us. Based on our work, we have no observations to make on this information.

### Other information

In accordance with French law, we have verified that the required information concerning the identity of the shareholders and holders of the voting rights has been properly disclosed in the Management Report.

## REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

### Appointment of the Statutory Auditors

We were appointed as Statutory Auditors of L'Air Liquide by the Annual General Meeting held on May 12, 2016 for PricewaterhouseCoopers Audit and on May 5, 2010 for ERNST & YOUNG et Autres.

As at December 31, 2018, PricewaterhouseCoopers Audit was in its third year of uninterrupted engagement and ERNST & YOUNG et Autres in its ninth year of uninterrupted engagement. Previously, ERNST & YOUNG Audit, member of the EY network, was Statutory Auditor of L'Air Liquide from 1983 to 2009.

## RESPONSIBILITIES OF MANAGEMENT AND THOSE CHARGED WITH GOVERNANCE FOR THE FINANCIAL STATEMENTS

Management is responsible for the preparation and fair presentation of the financial statements in accordance with French accounting principles and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit and Accounts Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The financial statements were approved by the Board of Directors.



## STATUTORY AUDITORS' RESPONSIBILITIES FOR THE AUDIT OF THE FINANCIAL STATEMENTS

### Objectives and audit approach

Our role is to issue a report on the financial statements. Our objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As specified in article L.823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the statutory auditor exercises professional judgment throughout the audit and furthermore:

- identifies and assesses the risks of material misstatement of the financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control;
- evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the financial statements;
- assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the statutory auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein;
- evaluates the overall presentation of the financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation.

### Report to the Audit and Accounts Committee

We submit to the Audit and Accounts Committee a report which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control relating to the accounting and financial reporting procedures that we have identified.

Our report to the Audit and Accounts Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the financial statements of the current period and which are therefore the key audit matters that we are required to describe in this report.

We also provide the Audit and Accounts Committee with the declaration provided for in article 6 of Regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by articles L.822-10 to L.822-14 of the French Commercial Code (*Code de commerce*) and in the French Code of Ethics (*Code de déontologie*) for statutory auditors. Where appropriate, we discuss with the Audit and Accounts Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors

*French original signed by*

PricewaterhouseCoopers Audit	ERNST & YOUNG et Autres		
Olivier Lotz	Séverine Scheer	Jeanne Boillet	Emmanuelle Mossé

## Five year summary of Company results

(Articles R. 225-83 and R. 225-102 of the French Commercial Code)

	2014	2015	2016	2017	2018
<b>I – Share capital at the end of the year</b>					
a) Share capital <i>(in euros)</i> <sup>(a)(b)(c)</sup>	1,896,800,857	1,892,896,506	2,138,816,686	2,356,186,525	2,361,828,887
b) Number of outstanding ordinary shares	344,872,883	344,163,001	388,875,761	428,397,550	429,423,434
c) Number of shares with loyalty dividend entitlement <sup>(d)</sup>	102,644,011	102,889,311	102,292,196	117,152,854	128,524,663
d) Convertible bonds					
<b>II – Operations and results of the year</b> <i>(in millions of euros)</i>					
a) Revenue	166.6	176.3	154.5	139.3	110.3
b) Net profit before tax, employee profit-sharing, depreciation, amortization and provisions	5,160.5	2,455.5	577.9	1,276.8	624.0
c) Corporate income tax	53.1	59.0	53.8	70.8	27.5
d) Employee profit-sharing for the year	2.7	2.2	2.6	2.6	2.6
e) Net profit after tax, employee profit-sharing, depreciation, amortization and provisions	5,060.8	2,317.2	482.4	1,149.8	544.8
f) Distributed profit	905.1	921.6	1,037.7	1,165.7	1,171.4
<b>III – Per share data</b> <i>(in euros)</i>					
a) Net profit after tax, employee profit-sharing, but before depreciation, amortization and provisions					
- over the number of ordinary shares outstanding	14.80	6.96	1.34	2.88	1.38
- over the adjusted number of shares <sup>(e)</sup>	13.14	6.17	1.31	2.89	1.39
b) Net profit after tax, employee profit-sharing, depreciation, amortization and provisions					
- over the number of ordinary shares outstanding	14.67	6.73	1.24	2.68	1.27
- over the adjusted number of shares <sup>(e)</sup>	13.02	5.97	1.21	2.70	1.28
c) Dividend allocated to each share					
- over the number of ordinary shares outstanding	2.55	2.60	2.60	2.65	2.65
- over the adjusted number of shares <sup>(f)</sup>	2.25	2.30	2.36	2.65	2.65
d) Loyalty dividend					
- over the number of ordinary shares outstanding	0.25	0.26	0.26	0.26	0.26
- over the adjusted number of shares <sup>(f)</sup>	0.23	0.23	0.24	0.26	0.26
<b>IV – Employees working in France</b>					
a) Average number of employees during the year	1,097	1,108	1,107	1,057	1,046
b) Total payroll for the year <i>(in millions of euros)</i>	145.1	147.0	149.9	151.9	160.4
c) Amounts paid with respect to employee benefits during the year (social security, staff benefits, etc.) <i>(in millions of euros)</i>	67.6	70.0	68.9	69.8	75.2

- (a) Using the authorization granted by the 15th resolution of the Combined Annual Shareholders' Meeting of May 7, 2014, the 12th resolution of the Combined Annual Shareholders' Meeting of May 5, 2017 and the 15th resolution of the Combined Annual Shareholders' Meeting of May 16, 2018, the Board of Directors made the following decisions:
- in its meeting of May 7, 2014, capital decrease by cancellation of 1,000,000 treasury shares;
  - in its meeting of May 6, 2015, capital decrease by cancellation of 1,500,000 treasury shares;
  - in its meeting of May 3, 2017, capital decrease by cancellation of 1,100,000 treasury shares;
  - in its meeting of May 16, 2018, capital decrease by cancellation of 654,000 treasury shares.
- (b) Using the authorization granted by the 16th resolution of the Combined Annual Shareholders' Meeting of May 7, 2014, the Board of Directors decided in its meeting of May 7, 2014, the granting of one free share for ten existing shares (ranking for dividends as of January 1, 2014), and the granting of a 10% bonus for shares held in registered form from December 31, 2011 to June 1, 2014 (ranking for dividends as of January 1, 2014).

Using the authorization granted by the 17th resolution of the Combined Annual Shareholders' Meeting of May 12, 2016, the Board of Directors decided in its meeting of July 27, 2017, the granting of one free share for ten existing shares (ranking for dividends as of January 1, 2017), and the granting of a 10% bonus for shares held in registered form from December 31, 2014 to September 29, 2017 (ranking for dividends as of January 1, 2017).

- (c) Using the authorizations granted by the resolutions of Combined Annual Shareholders' Meetings of May 5, 2010 and May 7, 2013,
- the Board of Directors noted in its meeting of February 14, 2018 the issuance of 45,955 shares (ranking for dividends as of January 1, 2018) arising from:
    - the exercise of 10,923 options subscribed at the price of 60.28 euros;
    - the exercise of 6,777 options subscribed at the price of 63.18 euros;
    - the exercise of 8,265 options subscribed at the price of 70.44 euros;
    - the exercise of 11,153 options subscribed at the price of 77.36 euros;
    - the exercise of 8,837 options subscribed at the price of 81.68 euros;
  - the Board of Directors noted in its meeting of July 27, 2018 the issuance of 481,736 shares (ranking for dividends as of January 1, 2018) arising from:
    - the exercise of 334,817 options subscribed at the price of 60.28 euros;
    - the exercise of 52,647 options subscribed at the price of 63.18 euros;
    - the exercise of 443 options subscribed at the price of 63.91 euros;
    - the exercise of 70,322 options subscribed at the price of 77.36 euros;
    - the exercise of 23,507 options subscribed at the price of 81.68 euros;
  - the Board of Directors noted in its meeting of February 13, 2019 the issuance of 102,664 shares (ranking for dividends as of January 1, 2018) arising from:
    - the exercise of 31,246 options subscribed at the price of 63.18 euros;
    - the exercise of 21,778 options subscribed at the price of 77.36 euros;
    - the exercise of 14,406 options subscribed at the price of 81.68 euros;
    - the exercise of 34,860 options subscribed at the price of 85.66 euros;
    - the exercise of 374 options subscribed at the price of 92.73 euros.

Using the authorization granted by the 16th resolution of the Combined Annual Shareholders' Meeting of May 6, 2015, pursuant to the delegation granted by the Board of Directors in its meetings of July 29, 2015 and October 23, 2015, and confirmed on February 15, 2016, the Chairman and CEO noted on May 10, 2016 the employee-reserved issuance of 999,143 new shares:

- 931,900 new shares subscribed in cash at a price of 77.18 euros per share, (ranking for dividends as of January 1, 2016), of which 2,728 shares were subscribed as part of the contribution paid by the Company (1 bonus share for 4 shares subscribed with a maximum of 3 bonus shares per employee);
- 67,243 new shares subscribed in cash at a price of 82.00 euros per share, (ranking for dividends as of January 1, 2016).

Using the authorization granted by the 12th resolution of the Combined Annual Shareholders' Meeting of May 6, 2015, the Chairman and CEO, pursuant to the delegation granted by the Board of Directors in its meetings of July 29, 2016, noted on October 11, 2016, the issuance of 43,202,209 new shares, with retention of the preferential subscription rights on the basis of one new share for eight existing shares, subscribed in cash, at a price of 76.00 euros per share.

Using the authorization granted by the 15th resolution of the Combined Annual Shareholders' Meeting of May 3, 2017, pursuant to the delegation granted by the Board of Directors in its meetings of May 16, 2018 and confirmed on July 27, 2018, the Chairman and CEO noted on December 7, 2018 the employee-reserved issuance of 1,049,529 new shares:

- 934,697 new shares subscribed in cash at a price of 87.09 euros per share, (ranking for dividends as of January 1, 2018), of which 2,413 shares were subscribed as part of the contribution paid by the Company (1 bonus share for 4 shares subscribed with a maximum of 3 bonus shares per employee);
- 114,832 new shares subscribed in cash at a price of 92.53 euros per share, (ranking for dividends as of January 1, 2018).

- (d) Beginning December 31, 1995, shareholders holding their shares in registered form for at least two years at the period-end, and who will retain these shares in this form until the dividend payment date, will receive a dividend with a 10% bonus compared to the dividend paid to other shares. The difference between the loyalty dividend calculated on the number of shares outstanding as of the period-end and the loyalty dividend actually paid shall be allocated to retaining earnings.
- (e) Adjusted to take into account, in the weighted average, the capital increases performed via cash subscriptions and treasury shares.
- (f) Adjusted to account for share capital movements.



# 4

## ENVIRONMENTAL AND SOCIETAL REPORTING

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## INTRODUCTION

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Air Liquide's ambition is to lead its industry, deliver long-term performance and contribute to sustainability.

As part of its sustainable development strategy, the Group aims:

- to prevent global warming and to improve air quality;
- to strengthen dialog with all its stakeholders.

Climate issues and the energy transition are major subjects. Air Liquide strives to actively participate in the transition to a carbon-free economy by committing to improving air quality and limiting CO<sub>2</sub> emissions into the atmosphere.

Listening to and in-depth dialog with various stakeholders help Air Liquide better understand usage trends and reinforce its measures, in particular those in favor of the environment and local development.

Chapter 1 of the Reference Document presents the Group's integrated strategy, along with its financial, environmental, and societal performance.

Chapter 4 presents the Group's environmental and societal achievements, coupled with the related reporting. These achievements are monitored using key indicators which indicate their change. Just like the Financial Report, this Environmental and Societal Report is reviewed each year by an independent verifier. In 2018, 13 industrial sites and subsidiaries were audited.

For further information, the Group's website has a section dedicated to Sustainable Development: <https://www.airliquide.com/group/ambition-commitments-objectives>.

## ENVIRONMENTAL ACHIEVEMENTS

In addition to the environmental performance presented in chapter 1 on page 70, this section highlights the Group's other environmental achievements, particularly in the areas of energy, water, biodiversity and air quality preservation.

### 1. Energy



#### Key points

#### The Group's electricity procurement

# 70%

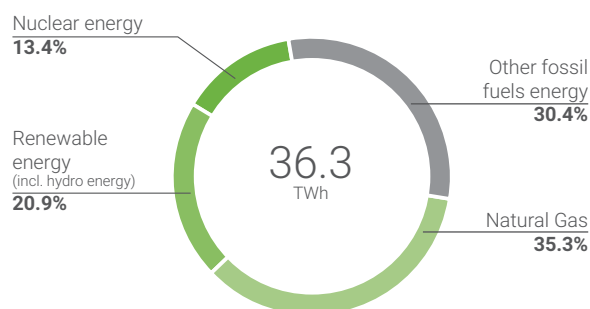
The percentage of electricity consumed by the Group which is low-carbon or renewable.

The role of energy procurement is essential for Air Liquide, in particular for its impact on the Group's indirect emissions (Scope 2).

The Group's energy procurement policy favors the purchase of electricity from suppliers who have made the choice to produce low-carbon solutions. Each time an electricity supply contract is up for renewal and for each new contract, Air Liquide always takes into account the suppliers' primary energy mix to assess and select its electricity suppliers. Moreover, to step up the pace of the transition towards supplying electricity with lower carbon content, in 2018 Air Liquide continued with the initiative launched in 2017 and has successfully signed a major renewable wind energy procurement agreement in Texas (United States). Opportunities in other regions are currently being assessed to increase the share of renewable energy procurement, in line with the Climate objectives announced.

By taking into account the different natures of primary energy used to produce electricity in the countries where Air Liquide is present, it is then possible to calculate a global breakdown by nature of the electricity used. This calculation includes the electricity produced from natural gas by the Group's cogeneration units. In 2018, 20.9% of electricity consumed was from a renewable source and 35.3% from natural gas composed mainly of methane. This molecule contains one carbon atom and four hydrogen atoms, the combustion of which generates around two-times less CO<sub>2</sub> emissions than coal per kWh of electricity produced.

#### ELECTRIC ENERGY ORIGIN USED IN 2018





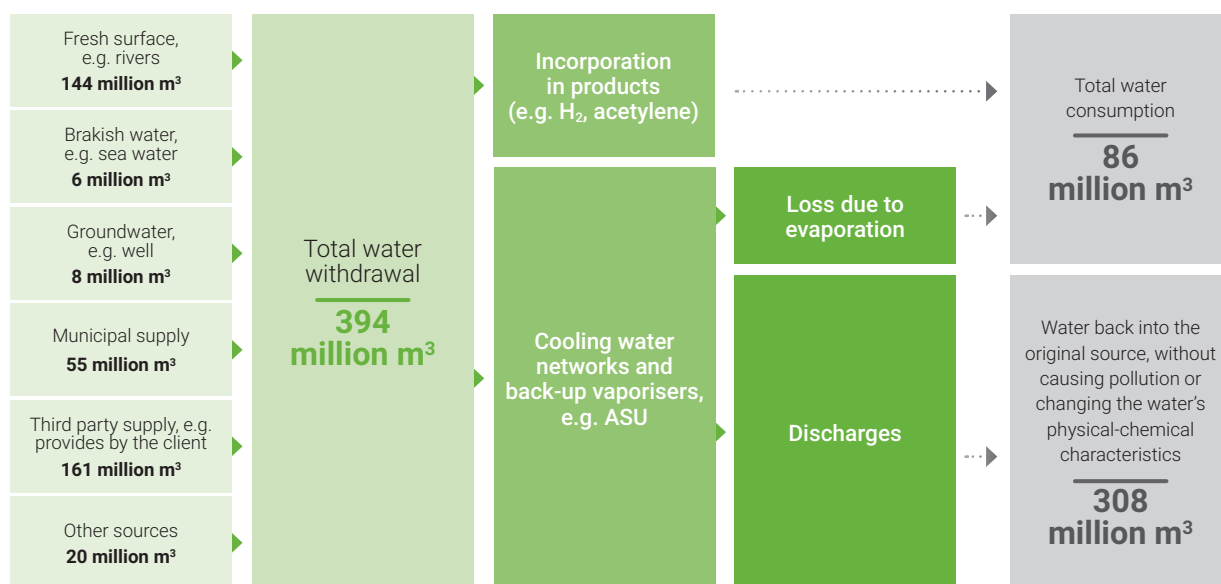
## 2. Water

In 2018, Air Liquide set up a task force dedicated to the valuable resource, water. Reporting methods were reviewed to take data into account in a more precise manner. This enables the Group to observe and control water management at its production sites more efficiently to reduce its consumption, particularly in areas of water stress.

### Water consumption

In 2018, Air Liquide consumed 86 million m<sup>3</sup> of water. This consumption is from the loss of water through evaporation during the cooling process as well as its incorporation in products, such as hydrogen and acetylene.

#### WATER USAGE WITHIN THE GROUP'S PROCESSES



In 2018, Air Liquide withdrew 394 million of m<sup>3</sup> of water from various sources. 41% came from customers, 37% came from freshwater sources such as rivers or lakes, 14% from municipal supply and the remaining 8% from various other sources.

With regard to Air Separation Units, there are several types of cooling systems. Around 54%<sup>(a)</sup> of these units have semi-open water recirculating systems which require back-up water. Around 38% of these units have open systems. In such cases, water comes from natural resources or third-party industrial systems. It is discharged back into

the original source, without causing pollution or changing the water's physical-chemical characteristics. Lastly, around 8% of these units have closed systems that consume no water.

6% of Air Liquide's sites are located in countries that, according to the World Resources Institute, will be under extremely high water stress in 2030. Today, this represents 6% of the annual water consumption of Air Liquide's industrial sites.

	2014	2015	2016 <sup>(a)</sup>	2017	2018
Annual water consumption (estimation in millions of m <sup>3</sup> )	70	79	77	81	86 * <sup>(b)</sup> <sup>(c)</sup>

(a) Excluding Airgas.

(b) Represents less than 0.5 one-thousandth of the industrial water consumption of the countries under review.

(c) The deviation to 2017 is due to a more detailed measurement of water consumption on the production sites.

\* Indicator verified by the independent verifier.

### Water treatment solutions at customers' sites

Only 64% of the world's population has access to drinking water and 80% of wastewater is discharged into the environment without any treatment<sup>(b)</sup>. Moreover, the world's population is expected to increase from 7.5 to 9 billion inhabitants by 2050, but the quantity of available fresh water will remain the same. Finally, the scarcity of water and

environmental challenges are leading industrial players to seek reliable and economic technologies to treat and recycle water. Air Liquide has been a benchmark in water treatment for 35 years, and provides its customers with adapted solutions for the production of drinking water, the treatment of wastewater, cooling water and pH testing.

(a) The difference in percentage observed in 2017 (82% in semi-open circuit and 8% in open circuit) is mainly due to the better management of all the water use by the Group, in particular in open and closed systems for which the Group does not consume water.

(b) Water Quality and Wastewater on [unwater.org](http://unwater.org) (2017, Unesco).

### 3. Biodiversity

The impact of Air Liquide's activities on biodiversity is limited because the Group's production units are generally located on sites in industrial zones.

However, Air Liquide supports biodiversity preservation via its Foundation, which funds micro-initiatives around the world on environment-related local development, and scientific research projects in the field of environmental protection, focusing on projects that contribute to the preservation of our planet's atmosphere, and in particular air quality.

In recent years, the Air Liquide Foundation has sponsored the following projects:

- the work of the Institut de Recherche pour le Développement (IRD) and WWF France respectively on mangroves in the Indo-Pacific

region and the Indonesian and Gabonese forests. These works quantify and qualify the carbon cycle of mangroves and forests with the aim of protecting these ecosystems which are home to a wide range of biodiversity;

- the Observatoire Français d'Apidologie's (OFA) project to increase bee populations in Europe. The decline in bee populations is a major threat to biodiversity and agricultural production. The OFA is developing a natural and non-chemical solution that can be used sustainably to fight against Varroa mites, a parasite which attacks certain types of bees.

At the end of 2018, the Board of Directors also approved research projects on methane concentration and flux in the marine environment and the presence of plastic particles in the atmosphere.

### 4. Air quality

#### Air pollutants

##### Particulate Matter (PM)

This pollutant affects more people than any other. It is composed of a mix of sulfates, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water. Its impact on health is extremely harmful as it reduces life expectancy by 6-18 months<sup>(a)</sup>. PM10 concentrations should be < 20 µg/m<sup>3</sup>.

##### Nitrogen oxide (NOx)

This pollutant can cause inflammation of the airways (asthma, lung conditions). Also a source of particulate matter & ozone (O<sub>3</sub>). NOx concentrations should be < 40 µg/m<sup>3</sup>.

##### Sulfur oxide (SOx)

This pollutant can have a harmful effect on the respiratory system. It is also responsible for acid rain. Concentrations should be < 20 µg/m<sup>3</sup>.

(a) Data from the World Health Organization.

#### The desulfurization of oil-based fuels through hydrogen

Sulfur oxides released in the atmosphere cause serious respiratory difficulties. They are also responsible for smog and acid rain that leads to deforestation and the acidification of water.

Hydrogen is mainly used in refineries in order to desulfurize fuels and, as a result, contributes to cleaner transportation. The use of these fuels almost no longer generates sulfur oxide emissions, one of the main atmospheric pollutants.

In 2018, the hydrogen supplied by Air Liquide to its customers' refineries resulted in the avoidance of 1.6 million tons of sulfur oxide emissions being discharged into the atmosphere, which is more than ten times as much as the total sulfur oxide emissions of a country like France.

## SOCIETAL ACHIEVEMENTS

### 1. The long-term engagement of employees

#### 1.1. HUMAN RESOURCES

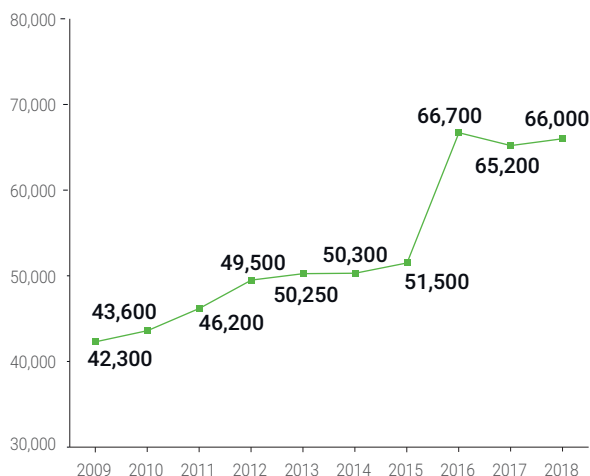
Air Liquide brings together 66,000 men and women of more than 150 nationalities, in 80 countries, who form multi-cultural teams with a host of skills.

The Group strives to promote this diversity, encourage innovation and the engagement of employees, to meet customers' expectations and guarantee Air Liquide's long-term performance.

In an environment which is undergoing profound transformation, Air Liquide has developed a Human Resources strategy to identify, attract, maintain and develop competent employees from all walks of life. This strategy is based on the following three priorities:

- encouraging employee engagement;
- developing an agile and collaborative structure;
- anticipating the "future of work".

#### GROUP HEADCOUNT



#### 1.2. EMPLOYEES' ENGAGEMENT

##### 1.2.1. Employees' voices

There is a direct link between employees' engagement and customer satisfaction which is at the heart of the NEOS company program. Employees' engagement is one of Human Resources' priorities. Air Liquide has launched "MyVoice", a program similar to the "Voice of Customer" project introduced as part of the customer-centric NEOS company program. This program has been designed to encourage feedback from employees and to rapidly implement measures resulting from this feedback. The platform was in its pilot phase at the end of 2018 and will be rolled out to all employees in the various Group subsidiaries during 2019.

##### 1.2.2. Mobility for skills development

Air Liquide is continually looking to recruit diverse profiles to build multi-disciplinary and complementary teams.

The Group's diversity is characterized by the fact that there is no "standard career path". Quite the contrary, each employee adapts his or her career path according to their individual objectives and the career opportunities offered by the Group. Internal mobility and technical expertise are two major factors in career development.

The Technical Community Leaders (TCL) program enables talent in the technical sectors to access careers that offer recognition, satisfaction and influence. More than 3,000 experts have been recognized, playing a key role in sharing expertise, knowledge and technical excellence.

This community of the Group's technology experts contributes to the transfer of the technical know-how that Air Liquide will need in the future.

This development program aimed at our technical talent, TCL, also received particular attention in 2018 with the appointment of two Senior Fellows (the program's highest level of recognition), the first International Experts from the Airgas teams and greater gender equality with the appointment of the first female Fellow. This program is a key driver of innovation and contributes greatly to ensuring the Group's long-term reliability and safety.

##### 1.2.3. Employee performance and remuneration

The performance review meeting is a key stage in employee development as it facilitates a discussion between an employee and their manager on performance and development, the assessment and setting objectives for the year ahead. In 2018, 80% of Group employees had a performance review meeting with their immediate supervisor.

The comprehensive remuneration of Group employees is based on three criteria:

- the position held;
- the degree of responsibility;
- performance.

Plus the factoring in of the situation of the local market, the Group's fair pay at hiring policy and current legislation. It is generally made up of a basic salary plus additional remuneration elements.

The variable portion of remuneration is devised locally for certain categories of employees to reward performance. In general, it depends on parameters such as the Group's earnings, the entity's earnings and individual performance, which is measured in quantitative and qualitative terms. By rewarding collective and individual performance, Air Liquide encourages everyone to collaborate and contribute to overall earnings.

Most of the managers and professionals have a variable remuneration, which includes Sustainable Development objectives.

Remuneration may also include benefits such as disability-incapacity-death insurance, health insurance, profit sharing<sup>(a)</sup> or solutions to help balance work and family life which vary by country.

In 2018, 53% of Group employees received an individual variable portion as part of their remuneration (down 4% compared to 2017).

15% of managers' variable remuneration is linked to Sustainable Development criteria, such as safety, customer satisfaction, energy efficiency and equality.

Finally, the top 370 Group executives have a significant portion of their variable remuneration mandatorily linked to these criteria, for example, safety and Corporate Sustainability Program targets for their entity.

### 1.2.4. Well-being at work

The official definition of well-being in the workplace provided by the World Health Organization (WHO) considers this to be "a dynamic state of mind characterized by reasonable harmony between a person's abilities, needs and expectations, and environmental demands and opportunities". Moreover, one of these SDGs, defined by the UN, is specifically focused on health and well-being.

Safety, ethics and the respect of Human Rights are prerequisites for achieving a high-quality work environment. Well-being in the workplace has a direct impact on the engagement of employees and their performance.

In order to strengthen occupational well-being within Air Liquide, various initiatives were implemented within the Group to promote the work-life balance of its employees (support for new parents, access to service platforms and expertise, raising awareness of health-related issues).

Telecommuting is widespread among several of the Group's entities. This approach is a response to employees' wishes in terms of work-life balance.

### 1.2.5. Legal working hours

Each Group entity defines, in agreement with representative bodies and in line with local regulations, legal working hours which encourage engagement and performance.

In France, the general framework of legal working hours is defined in agreements signed with the unions. A few businesses operate with shift work. These concern fewer than 10 plants in the country, mainly in the Large Industries business line. A project is currently being deployed to reduce shift work.

On the other hand, the industrial businesses, as well as those in Healthcare, include on-call systems that are regularly discussed and are subject to agreements with the unions.

### 1.2.6. Renewing social dialog

The Group ensures that social dialog is encouraged and, in this context, an increasing number of Group employees (86% in 2018) have access to a representation, dialog or consultation structure.

In Europe, the European Works Council has 29 employee representatives from 13 countries. It was renewed in 2017 for a term of four years. The role and nature of exchanges within this body was strengthened by an agreement signed in 2014. Chaired by a member of the Executive Committee, the European Works Council met twice in 2018, for two ordinary meetings. Four other meetings of the Council's presiding officers also took place, including one meeting of the extended members and one informal meeting. The main themes dealt with during information and consultation meetings are safety, news on the Group's activities, especially in Europe, the annual financial statements, the Sustainable Development policy, strategy and its implementation in the different countries of Air Liquide's operations.

In France, the Group sought to improve social dialog, using a debate and project development approach. A social seminar was held to promote working together (employee representatives / trade unions and management / HR) towards a new ambition. This exercise helped define a roadmap and transformation projects:

- implementing changes to Group activities differently;
- modernizing social dialog and communications;
- strengthening local management in terms of social dialog;
- reviewing and working on employability against a backdrop where jobs are changing profoundly.

At the same time, Group companies in France have negotiated new structures for their representative bodies. The guiding principle and recommendation for the negotiation of agreements to establish Economic and Social Committees **was to strike a balance** between:

- **large-scale economic and strategic social dialog** with a wide range of continuously changing markets, which requires a strong ability for adaptation / transformation;
- **regular social dialog** which addresses the daily lives of employees in terms of working conditions, monitoring the implementation of HR policy, following up on agreements reached and projects undertaken, managing social and cultural activities.

During the first elections which took place, the main challenges included:

- **preparing the social dialog of the future**, to ensure that it is adapted to the Company's social and economic realities;
- **placing employees at the heart** of social dialog, making the actions of employee representatives more visible and understandable;
- **attracting new candidates** in order to build a representative body which correctly reflected the Company's employees.

In terms of employee savings plans, new agreements were signed within Group companies. These agreements allow employees to be more involved in the Company's performance. In France, 99.1% of employees benefited from these provisions.

(a) This method of remuneration, used in certain countries, is at the Company's initiative or in response to local legislation or market requirements.

### 1.3. AN AGILE AND COLLABORATIVE STRUCTURE

The second focus of the Human Resources strategy consists of creating an agile and collaborative structure capable of addressing the challenges of a constantly-changing world. This requires facilitating cross-divisional exchanges within our teams to ensure a sustainable performance.

#### 1.3.1. Inclusion and diversity

Diversity is a priority of Air Liquide's Human Resources strategy and policy and the Group considers it a source of dynamism, creativity and performance.

It is a fundamental element of the organization, in terms of both businesses and employees, and drives the Group's long-term performance.

Our objectives at the Group level include enhancing diversity among managerial staff to better value the various cultures on which Air Liquide is based and to improve gender equality. In this respect, quantified targets have been set for the Group and its entities for gender and nationalities.

At the entity level, our aim is for our teams to be made up of employees which represent the environment in which they work.

Through this diversity policy, Air Liquide is strongly committed to fighting any form of discrimination.

A solid roadmap has been defined to achieve our objectives. A team within Human Resources is responsible for managing diversity projects. The Group's roadmap is based on three criteria:

- introducing diversity objectives at all our entities and ensuring the implementation of related actions plans, in particular for key populations (management positions, high-potential employees and technical experts);
- improving all of the Group's Human Resources processes to reduce any bias and avoid all forms of discrimination;
- promoting an inclusive culture to leverage the diversity of our teams.

#### 1.3.2. Gender

The Group has set ambitious gender equality objectives aimed at reaching a rate of 35% of women among its employees in "Managers and Professionals" by 2025. These objectives are in line with the results obtained over the past ten years which have allowed the share of female "Managers and Professionals" within the Group to increase from 19% to 29%.

Women now represent 41% of employees considered as high-potential. This level must be maintained.

Five women are now members of the Group's Board of Directors.

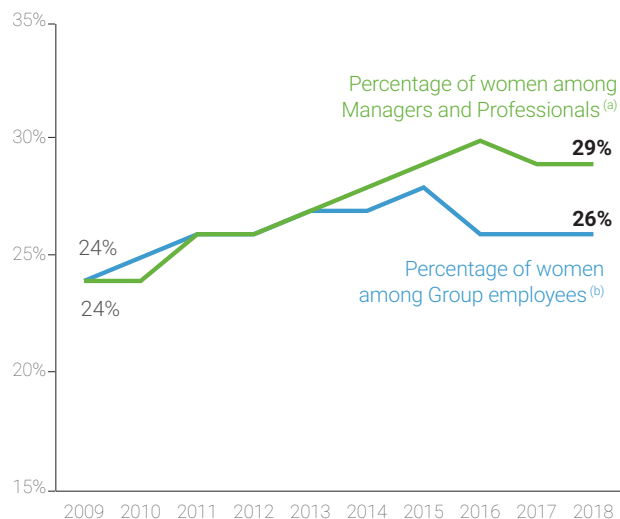
The Executive Committee has two women among its ten members (excluding Executive Officers). Among these, one was appointed to the Executive Committee upon her arrival within the Group in 2008, then appointed Executive Vice President in 2017; and the other was appointed to the Executive Committee in 2017.

More generally, and taking the highest level of responsibilities across the Group into account, women currently hold 15% of the Top 100 positions, and 19% among positions defined as Executive. This second percentage has increased from 4% to 19% over the past ten years.

The Group aims to achieve a rate of 25% of women in Executive positions by 2025.

Among the 10% of positions with the greatest level of responsibility within the Company \*, 21% are held by women. These women have an average and median age of 50, i.e., 3.7 years and 5 years less respectively than the average age (53.7 years) and median age (55 years) of men in these positions. This difference is due to the policy to promote women at the highest level of responsibilities earlier on in their careers, and thus abolish career development discrepancies that may be seen in the absence of voluntary measures in this field.

#### PERCENTAGE OF WOMEN AMONG MANAGERS AND PROFESSIONALS



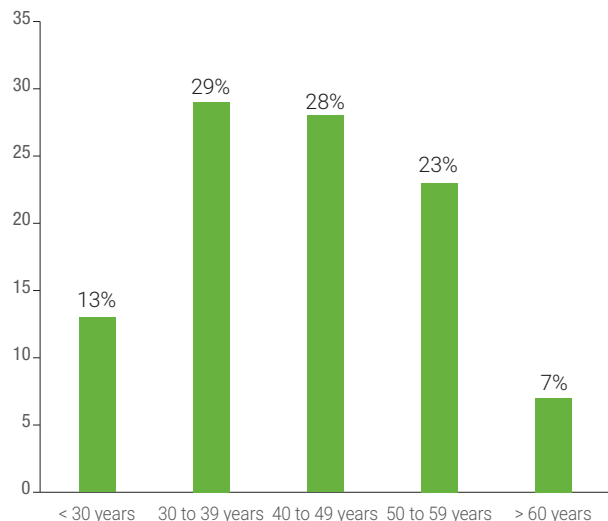
(a) Including Airgas since 2017.

(b) Including Airgas since 2016.

\* i.e., 123 positions, including all members of the Executive Committee (excluding Executive Officers) as well as expatriate employees whose work contracts are suspended but whose career and remuneration continue to be managed by the Company during the suspension of their French contract.

### 1.3.3. Age

DISTRIBUTION OF EMPLOYEES BY AGE BRACKET IN 2018



■ Distribution of employees by age bracket

The Group has invested in better professional qualifications and training programs for young people to facilitate their integration into the business world.

Internship and apprenticeship contracts are encouraged by the Group. In France, 529 young people have benefited from work-study contracts and around 425 from an internship, combining theoretical learning at their university or school and a practical internship at Air Liquide.

Seniors will represent an increasing share of Air Liquide employees in the coming years. Their contribution to mentoring programs (notably the "Technical Career Leaders" program) and training programs aimed at younger generations will be further promoted.

Various initiatives have been introduced within the Group to ensure the support and engagement of employees nearing retirement age. For example in France:

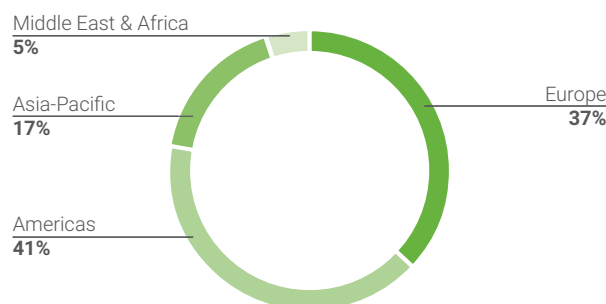
- a skill-based sponsorship pilot scheme was successfully launched in 2018;
- "Youth-employment contracts" were continued. These include an initiative which allows employees to prepare for their retirement, and in particular take early retirement.

### 1.3.4. Nationality

Air Liquide's senior managers are of 30 different nationalities. The Group's Board of Directors is composed of six different nationalities. In terms of total employees, more than 150 different nationalities are employed by the Group.

The Group has international exchange programs to attract and train young talent: the ALLEX program for managers and the EVE program for technicians (more than 400 people since their creation).

BREAKDOWN OF EMPLOYEES BY GEOGRAPHIC AREA



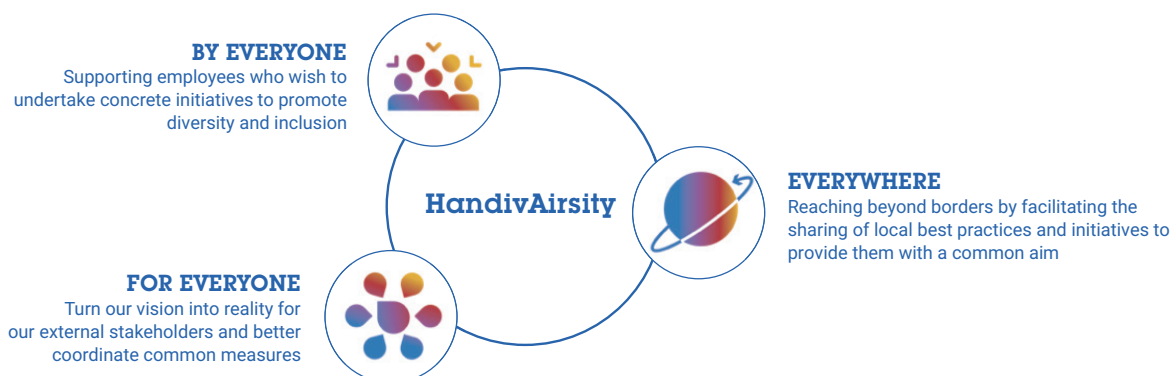
### 1.3.5. Disability

The Group has recently reviewed its Disability policy, which is now called HandivAirsity, in order to expand its inclusive culture to Europe and further promote the integration of employees with disabilities within the Company.

HandivAirsity involves a whole ecosystem of players on a European scale such as employees, shareholders, customers, and suppliers and provides the means to commit to working together to promote the inclusion of disability.

Through the policy's main guiding principle: "Our differences are our strength", the Group aims to value the uniqueness of each person for the benefit of all. HandivAirsity is driving this desired change: "by everyone, everywhere, for everyone". The HandivAirsity Charter encourages employees to maintain the momentum by taking part in concrete measures.

Since its creation, more than 1,000 employees from 22 different countries have signed the HandivAirsity Charter. More than one hundred events were organized during the 2018 Disabilities Week.





In France, thanks to the involvement of employees and workplace agreements in favor of recruiting employees with disabilities, a set of subsidiaries has seen an increase in the rate of employees with a disability from 1.75% in 2007 to 4.43% in 2018. More than 1 million euros is also subcontracted to firms in the adapted and protected sector.

### 1.3.6. Network-based structure

Air Liquide has a decentralized organizational structure which relies on its hubs and clusters (groups of countries or entities). This global scale network structure is more agile, favors initiative-taking and strengthens proximity with customers.

A collaborative workplace called "Kite" has been launched throughout the Group. Kite is changing every year to offer new services to its users. The Group therefore provides employees with the opportunity to create and access Google+ communities through the Kite collaborative workplace. These communities rally employees on several subjects: expertise, tools, events, procedures, shared interests, etc. They transform working methods, by favoring flexibility, efficiency, diversity and collective intelligence.

## 1.4. ANTICIPATING THE "FUTURE OF WORK"

The "Future of Work" cornerstone focuses on identifying the business lines and skills of the future. To do so, the Human Resources teams must understand and anticipate trends that are likely to transform our business.

### 1.4.1. Business lines and skills

The aim is to implement an efficient action plan to help employees evolve at the same pace as their business line. To support each employee in this new technological environment, Air Liquide University has developed:

- a "digital passport", which consists of several self-assessment questionnaires on digital culture in general, but also on the knowledge of Kite (the Group's collaborative workplace);
- for the first time, a Digital campus has been created where new training relating to all things digital (Data strategy, Digital marketing, Cybersecurity, and others) has been made available to all Group employees.

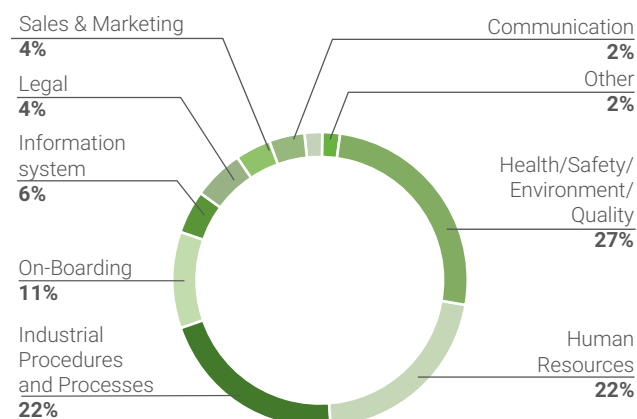
### 1.4.2. Career-long training and development

Air Liquide takes particular care to develop the competencies and expertise of its employees. Several ways of learning are proposed. Career development can take place throughout our careers and we must all take a proactive approach.

In 2018, the percentage of Group's employees who had at least one training session during the year was up, at 63%<sup>(a)</sup>.

The online training offering is upgraded every year and covers many topics such as safety, ethics, Human Resources processes, management and, more recently, digital technology.

#### BREAKDOWN OF TRAINING TOPICS <sup>(a)</sup>



(a) For the first time in 2018, Airgas training data is included in reporting figures.

Through its programs and structure, the University supports the Group's strategic initiatives and promotes the Air Liquide culture. Today, the University is present at the Group level and globally promotes new ways of learning, in both traditional and non-traditional ways. The Company's various businesses and functions thus have access to tools to design their own programs.

Modern teaching methods, for adults, are coupled with formal and informal skills, online training, lessons, support, mentoring, co-development, etc. The programs are as practical and relevant as possible, and use role play, mock exercises, workshops, case studies, guided discussions and various feedback mechanisms.

Among the University's programs, those on management and leadership cover all modern management situations, thus promoting the use of a shared language at the Group level. These programs help managers understand the increasingly volatile and complex world that surrounds them and provide the Group with the relevant expertise to maintain its leadership position over the long term.

In 2018, the launch of the digital campus, in cooperation with the digital transformation teams, helped raise awareness among various populations regarding new digital expertise: platform economies, data strategies, user-related research, cybersecurity, etc.

(a) For the first time in 2018, Airgas training data is included in reporting figures.



## 2. Shareholders: a long-term relationship



### Key points

More than **64%**  
of shareholders own their shares  
for more than **10 years**

Shareholders have been contributing and supporting the Group's growth since its creation. During the 2016 acquisition of Airgas, they again confirmed their commitment to the Group's growth by participating massively in the capital increase in cash with preferential subscription rights. Today, it is thanks to their loyal support that Air Liquide can

continue to change and grow. Air Liquide's long-term profitable growth strategy and its commitment to its shareholders are therefore closely linked.

By promoting individual share ownership, through various measures in place and by offering shareholders the expertise of its dedicated service, Air Liquide fosters a close relationship based on dialog with its shareholders on a daily basis which focuses on the following key principles:

- promoting long-term share investment;
- encouraging shareholder loyalty through registered shares;
- promoting dialog and meetings;
- recognizing and promoting the shareholder's key role.

### BREAKDOWN OF SHARE CAPITAL (AT DECEMBER 31, 2018)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Individual shareholders	38%	36%	37%	37%	36%	37%	36%	33%	32%	32%
French institutional investors	26%	23%	21%	19%	19%	17%	18%	20% (a)	19%	18%
Non-French institutional investors	36%	40%	42%	44%	45%	46%	46%	47% (a)	49%	50%
Treasury shares	> 0%	< 1%	> 0%	> 0%	> 0%	> 0%	> 0%	> 0%	> 0%	> 0%
Registered capital	32%	34%	35%	36%	35%	36%	36%	33%	34%	35%
Capital eligible for the loyalty bonus	25%	25%	28%	29%	30%	30%	30%	26%	25%	26%

(a) In 2016, the proportion of institutional investors in the Group's capital increased due to their over-subscription to the capital increase.

Air Liquide regularly receives rewards for the quality of its financial communication and its transparency. In 2018, the Group received six shareholder-related awards, including the Agefi's 1<sup>st</sup> prize for "Composition of the Board" and "Shareholding democracy, transparency of information and quality of communication", Bronze prize for the best shareholder relations in the CAC 40 awarded by French magazine *Le Revenu*, the "Investor Awards for education" awarded by Boursorama and Opinion Way and the "Labrador Transparency Grand Prix" for its website. Air Liquide is also ranked among the Top 5 in the *Échos* Executives eCAC40 Barometer (4<sup>th</sup>) and has received an award for "strategic continuity".

The Chairman and Chief Executive Officer is personally involved in Shareholders' Meetings, shareholders' conferences and Shareholders' Communication Committees.

### 2.1. A STEADY LONG-TERM PERFORMANCE AND AN ATTRACTIVE REMUNERATION POLICY

Since its IPO in 1913, Air Liquide has always shown a profit and shared the fruits of its growth by rewarding its shareholders' confidence through a remuneration and loyalty policy that is based on regular dividend distribution, free share attribution and a loyalty bonus.

During the last 10 years, more than 50% of earnings have been distributed to shareholders.

### 2.2. MADE-TO-MEASURE SERVICES

Shareholder Services, with more than thirty employees, is a unique service at Air Liquide.

Air Liquide provides its institutional and individual shareholders, who are bearer or registered shareholders, with information and support. In addition to its steady performance and remuneration policy, and to increase the investment value of shares and reward long-term shareholders, Air Liquide showcases registered shares.

In 2017, as part of the NEOS company program, Shareholder Services launched its "Shareholder experience" approach to continue to improve the quality of its services for shareholders. Similar to initiatives launched as part of the NEOS company program on the customer-centric strategy, the aim of this global approach of comprehensive active response to its shareholders and their expectations is to streamline administrative procedures by offering made-to-measure services, ensuring a better and wider circulation of strategy and financial information, for example with the live broadcasting of the Group shareholders' events. The latest digital tools are also at the heart of this initiative as they are an excellent source of leverage and customization.

### 2.2.1. Registered shareholder services

This form of shareholding provides access to a loyalty bonus for registered shares held for more than two full calendar years: +10% on the amount of the dividends received and on the number of free shares granted during attribution transactions. To benefit from the loyalty bonus, shareholders must continue to hold their shares in registered form on the day of the dividend payment or of the free share attribution.

Air Liquide is the only CAC 40 non-bank company which manages internally all aspects of its shares on behalf of its 100,000 direct registered shareholders: account administration-holding, record keeping, centralization of the Shareholders' Meeting. They pay no handling fees, and broker fees are 0.18% excluding tax of the gross amount of the transaction, and reduced to 0.10% (excluding tax) for stock market orders placed online and paid by bank card or account debit.

## Different shareholding options

### Direct registered shares

Direct registered shares are registered in the Air Liquide account and held in a securities account opened at Air Liquide. Air Liquide's Shareholder Services is shareholders' contact point.

### Intermediary registered shares

Intermediary registered shares are registered in the Air Liquide account and held in a securities account or a personal equity plan at the shareholder's financial institution.

### Bearer shares

Bearer shares are held in a securities account or a personal equity plan at a financial intermediary.

### 2.2.2. Innovation for the benefit of shareholders

Information documents and media for shareholders such as the Annual Report, the Shareholders' Guide, Shareholders' Newsletter "Interactions" and the Invitation to Shareholders' Meeting are drawn up with a particular focus on educating readers. Air Liquide also publishes, in the month after the event, a report of its Shareholders' Meeting that is sent to all shareholders who exercised their right to vote and presents all the discussions.

Direct registered shareholders have access to a personal secure space on the Internet, so that they can consult their share portfolio and useful documents for managing their account as well as modify their personal information. They can also place buy and sell orders on the stock market online and view, in real time, the operations conducted on their securities account.

Air Liquide was the first company to set up a Shareholders' Communication Committee (SCC). The SCC is composed of 12 shareholders and is regularly consulted on subjects relating to shareholder communication in addition to the three plenary meetings

with the Chairman and Chief Executive Officer. A Committee member is part of the Air Liquide Foundation's Project Selection Committee.

The Chairman and Chief Executive Officer is personally involved in Shareholders' Meetings, shareholders' conferences and Shareholders' Communication Committees.

### 2.2.3. The Shareholders' Meeting, the expression of shareholder democracy

Each year, all Air Liquide shareholders who hold at least one share are invited to the Shareholders' Meeting. They receive all the documentation relating to their vote either by mail or by email more than one month before the Shareholders' Meeting. In accordance with the principle of shareholder equality to which Air Liquide is very committed, each share entitles its owner to one vote. Air Liquide endeavors to make all this material available in English to its non-French shareholders in similar time frames. Air Liquide centralizes its Shareholders' Meeting by collecting the votes of its shareholders directly and offers voting by Internet.

## Shareholder Services and Sustainable Development

Shareholders have had the option for many years of receiving their voting documents in digital form and voting by Internet. This measure saves some 4 tons of paper each year. Moreover, for all its mail shots, Shareholder Services uses a biosourced film, produced using a raw material that complies with the NF T51-800 standard.

### 2.3. RECOGNIZING AND PROMOTING THE SHAREHOLDER'S KEY ROLE

The accelerated decline in the number of individual shareholders in France is a major social challenge. Air Liquide is committed to defending individual shareholders' rights and promoting equity investments. The Group has supported, in particular, stock market initiatives such as those of the ANSA (Association Nationale des Sociétés par Actions), the Observatoire des Actionnaires d'Avenir and the F2iC (the French

Federation of Individual Investors and Investment Clubs) which contributed to the creation of the PEA Jeunes, young person's personal equity plan under the PACTE Act.

Finally, a study on "Millennials and Xennials and corporate investment" was carried out in partnership with the Actionaria Fair, as a follow-up to an initial study carried out in 2017. This study examined the motivation and saving habits of 25-40 year olds in greater depth, with a view to recruiting a new generation of shareholders.

## 3. The Group's commitment to its customers

### Proximity and expertise

Air Liquide meets the needs of two million customers in 80 countries. These customers come from sectors ranging from steel, the food industry, electronics, pharmaceuticals and craftsmen. The Group aims to support its customers by acquiring a deep understanding of their business to provide them with innovative services and solutions.

The Group's organization enables each entity, in each geographic region, to meet the specific expectations of local customers, thus building a close relationship with individual customers. Customers demand flexibility, responsiveness, service, availability and a real partnership over the long term. In addition, some international customers require fully coordinated global management services. An organization dedicated to strategic key accounts helps support these customers and meet their specific needs. This program relies on a team of Key Account Managers whose task is to develop a thorough knowledge of these customers in order to better serve their needs and be strategically aligned with their growth priorities.

### From listening to action

For more than 115 years, the Group has always listened to its customers. However, the traditional methods of collecting our customers' opinions does not allow us to properly understand their satisfaction or the best way to class their priorities in order of importance and follow up on what they tell us. In 2017, a major overhaul was implemented using a digital platform called "Voice of Customer" (VoC) to collect and analyze customer comments. This solution provides all entities with

the possibility to survey, once a year, an unlimited number of customers, analyze their comments in real time, identify unsatisfied customers immediately to close the loop, i.e., recontact them extremely quickly and do what is necessary to deal with the reasons for their dissatisfaction. Thanks to the Group's wide sharing of customers' comments at all levels, appropriate action plans are identified and implemented to improve the customer experience.

This VoC platform was launched in March 2017 and has already been rolled out in more than 45 countries. Feedback from tens of thousands of customers has been collected and analyzed, highlighting the key priorities for each subsidiary. In addition, in 2018 the Group decided to launch transactional surveys to measure satisfaction at key stages of the customer experience (order, delivery, invoicing). Thanks to this new approach, customer comments are collected and analyzed at the time. All this information allows local teams to identify problems and act on them rapidly, by implementing new processes and behavior.

Customer satisfaction and loyalty is measured using an indicator known as the NPS (Net Promoter Score). With NPS, Air Liquide's unsatisfied customers are instantly identified and the reasons for their non-satisfaction resolved.

With VoC, the Group is focusing on digital solutions to offer its customers the best experience in their sector. This program is the perfect example of the customer-centric transformation strategy which is part of the NEOS company program. VoC is an innovative means of connecting with customers and helps the Group better meet their expectations and improve its global performances.

## 4. Listening to our patients

1.6 million customers and patients worldwide currently place their trust in Air Liquide. They all live in changing environments. Energy and environmental transition, changes in healthcare, as well as digital transformation are giving rise to new usages and new challenges. Moreover, the industrial offering is gradually shifting towards a focus on the end user, transforming the traditional value chain.

Society is currently faced with numerous healthcare challenges, in a sector which is undergoing major change:

- an aging population: in the near future, almost a quarter of the population will be over 60 years old;
- the increase in chronic diseases, pandemics and nosocomial infections;
- changes at hospitals and their role in light of these challenges;
- the role of digital solutions in the continuum of care; and
- the role of patients which is becoming increasingly key in the healthcare sector.

With a long-term vision and as a benchmark healthcare player, Air Liquide provides solutions along the continuum of care in the following areas:

- home healthcare;
- hospital care;
- hygiene and healthcare specialty ingredients.

### 4.1. HOME HEALTHCARE

Air Liquide's Home Healthcare business cares for more than 1.6 million patients worldwide in their homes suffering from chronic diseases. These treatments require medical respiratory equipment or nutritional assistance and treatment through perfusion to be made available at the patient's home. The human dimension is extremely important in this field as it involves raising awareness of the challenges of treatment and correct monitoring and of having patients and their families accept a treatment which can be long-term and sometimes constraining.

Air Liquide's employees provide home support to patients suffering from chronic pathologies such as respiratory insufficiency, sleep apnea, diabetes or Parkinson's disease. These multi-disciplinary teams of pharmacists, nurses, nutritionists and technicians are dedicated to providing services as cost-effectively as possible. Innovative training and support programs therefore aim to improve the patients' quality of life by helping to reinforce treatment follow-up and increasing their autonomy.

The Home Healthcare business is one of the responses to the shift to outpatient care and sits at the heart of the healthcare system between the patient, hospital, doctors, nurses, health insurance organizations, pharmacists and others. Air Liquide supplies the services, products and/or medical equipment necessary to start treatment at the patient's home, following the medical prescription, and trains the patients and their families in the proper use of devices. Air Liquide, therefore, makes

a major contribution to the continuum of care by ensuring follow-up care at home for patients with chronic conditions. This business demands high quality service on a daily basis and is focused on the long term, with all the caregivers dedicated to improving the patient's quality of life at home.

### 4.2. HOSPITAL BUSINESSES

Air Liquide is one of the world leaders in medical gas production and distribution for hospitals and related services. The medical gases that Air Liquide provides, such as medical oxygen, are mainly used in emergency wards, operating theaters and intensive care units.

Air Liquide aims to help professionals to care for their patients while facing the constantly changing challenges in the healthcare environment, by supplying medical gases, related services and innovative solutions.

Air Liquide has developed a global solution bringing together gas, medical equipment, and services to provide care for pulmonary arterial hypertension. It also provides a medical gas for pain relief, used in some countries during childbirth and for procedures mainly carried out at dental surgeries. Air Liquide also offers services such as "Total Gas Management" (TGM) which remains permanently at the hospital in order to optimize the supply of medical gases and to monitor the different supply parameters so that the hospital can maintain efficiency. Air Liquide supports the transformation of hospital care and the development of outpatient care with a significant presence in the urban medical sector and care centers.

### 4.3. HYGIENE AND HEALTHCARE SPECIALTY INGREDIENTS

According to the World Health Organization (WHO), 5 to 10% of people hospitalized in advanced economies contract a nosocomial infection, and this proportion can exceed 25% in some developing economies<sup>(a)</sup>. This is a major public health issue, often caused by pathogenic multi-drug resistant bacteria. Prevention and hygiene help to reduce these risks. With its subsidiary Schülke, a specialist in hygiene and hospital disinfection, Air Liquide is developing an offering particularly dedicated to hospital hygiene, which will contribute to the fight against nosocomial infections and ensure the safety of patients and medical staff. The Group supplies disinfectants for hospitals, medical instruments and hand-cleansing for medical staff. It also supplies skin cleansers for pre-operative preparation for patients and antiseptics for wound-healing.

Air Liquide currently supplies more than 15,000 hospitals and clinics worldwide with these products and services.

As an Air Liquide Healthcare company, for over 70 years Seppic has created and supplied innovative specialty ingredients for the healthcare and beauty markets, in particular excipients and active ingredients for the cosmetics, pharmaceutical, and nutraceutical markets.

(a) WHO – Background to Clean Care is Safer Care. <http://www.who.int/gpsc/background/en/>

## 5. Sustainable procurement

Air Liquide strives to build long-lasting and balanced relationships with its suppliers, in an environment of mutual trust. The Group attaches great importance to the ability of its suppliers to offer long-term partnerships and to ensure a high level of safety, reliability, competitiveness and innovation, while guaranteeing that ethics and sustainable development are also taken into account. These principles are set out in the following documents:

- the Procurement Code of Conduct, translated into several languages, which applies to all Group employees engaged in Procurement activities;
- the Sustainable Procurement policy, updated in 2018, lays out the guidelines to be applied by the procurement departments to integrate ethical, social and environmental aspects in their procurement processes, and defines the prevention approach for the related supplier risks. A CSR commitment clause (covering compliance with the Supplier's Code of Conduct, safety, and the environment) is included in the contract templates used by the Procurement teams and signed by suppliers;

the Supplier's Code of Conduct is published in 13 languages and can be accessed from Air Liquide's homepage <https://www.airliquide.com/group/sustainable-procurement>. Its purpose is to promote and ensure all our suppliers respect practices relating to Human Rights, ethics, the protection of the environment and safety.

As part of its supplier monitoring approach, the Group classes its critical suppliers according to seven main criteria including, in particular, the supplier's business, the amount of average expenditure with the supplier, and the supplier's dependency ratio to Air Liquide.

Among its critical suppliers, 1,200 present a critical CSR risk for the Group. The aim is to assess their CSR performance through to 2020. Corrective action plans are regularly implemented for those with an unsatisfactory score. In 2018, more than 230 suppliers were assessed (indicator monitored under the Vigilance Plan – see chapter 1 – pages 50 and 51);

Several measures have been implemented to raise awareness and train buyers in the context of the Group's Sustainable Procurement policy, thus strengthening its application within the organization:

- a Sustainable Procurement e-learning module has been developed. It is aimed at everyone in the Group that is involved in Procurement and allows:
  - the presentation of consistency between the Sustainable Procurement approach and the Group's strategy,
  - the challenges of the Sustainable Procurement approach to be explained and positioned as a source of value creation for the Company,
  - for the presentation of various tools to facilitate the roll-out of this approach,

to date, the e-learning module has been taken by 700 Air Liquide employees and almost 80% of those who have completed it consider that they have become more efficient in their role as buyers (indicator monitored under the Vigilance Plan – see chapter 1 – pages 50 and 51),

- specific training sessions covering the methodology for the Sustainable Development evaluation of suppliers and the implementation of corrective action plans were organized for the Group's buyers and critical suppliers, in line with preceding years;
- since 2015, a Sustainable Procurement network of correspondents from the Group's main procurement organizations has been set up and is used as a local intermediary for the implementation of the Sustainable Procurement approach;
- since 2016, a Sustainable Procurement category has been introduced in our "Air Liquide Procurement Awards" to promote the best initiatives in this field and increase their visibility within the Group. Thirteen projects were submitted in this category in 2018.

## 6. The Air Liquide Foundation

Created in 2008, the Air Liquide Foundation represents the Group's commitment to being a responsible enterprise. The Air Liquide Foundation provides financial, material and Human Resources means to the projects which it supports in the countries where the Group is present.

Its action is in line with the Group's Sustainable Development strategy which aims to improve air quality, prevent global warming and strengthen its commitment to stakeholders. Its missions include:

- environment: supporting scientific research projects in the environmental protection field that contribute to preserving our planet's atmosphere, and in particular air quality;

- health/breathing: supporting scientific research projects aimed at improving respiratory function and gas metabolism in the human body in the healthcare and exploration fields (space, deep-sea diving, sport);
- scientific education: supporting scientific education in the above mentioned areas (in particular in museums);
- local development: supporting local development micro-initiatives which contribute to improving living conditions in communities in the following fields: access to water, energy and care, education and training, the environment, disability, micro-entrepreneurs, social.

A dedicated website enables projects to be directly submitted online, in French or English. The website address is: [www.fondationairliquide.com](http://www.fondationairliquide.com).

### How the project selection at the Air Liquide Foundation works

#### Project Selection Committee (PSC)



#### EXAMPLES OF PROJECTS IN 2018

##### Doctors of the world Japan



##### Japan

Medical and social assistance to homeless people



**Social**

##### Smile Operation



##### Paraguay

Care of children with labio-palatal cleft



**Healthcare access**

##### Fundación Gil Gayarre



##### Spain

Computer training for children and adults with mental disabilities



**Handicap**

#### Board of Directors (BoD)



#### EXAMPLES OF PROJECTS IN 2018

##### National Institute of Agronomic Research



##### France

Preventive treatment of bronchitis



**Healthcare research on breath**



## 6.1. LOCAL CORPORATE PHILANTHROPY INITIATIVES

In addition to the initiatives of the Air Liquide Foundation, subsidiaries are also directly involved with the communities throughout the world, supporting local corporate philanthropy initiatives. As well as financial support, these actions are successfully conducted with the enthusiastic involvement of employees.

In Turkey, Air Liquide employees support the Foundation's Local Development mission through the donation of equipment to a school for children with mental disabilities, tandem bike rides with the visually impaired and the collection of books for the "One book, one child; one child, fresh hope" project. In France, the i-Lab's *Inclusive Business* team dedicated its annual seminar to solidarity. They shared their day with refugees who are supported by the charity Français Langue d'Accueil. The day included speaking French and sharing experiences.

In the United States, Air Liquide entities and their employees are greatly involved in education and training. The Global Markets & Technologies business supports the education programs of the Delaware Foundation for Science and Mathematics Education. In Houston, the "Business Resource Groups", employees from the Americas hub helped sort more than 20,000 children's books for a literacy foundation. This support follows on from the 2017 donation by Air Liquide and its employees of 20,000 US dollars to finance local libraries under the "My Home Library" scheme.

### ZOOM ON...

#### THE COMMITMENT OF AIR LIQUIDE IBERIA EMPLOYEES

Air Liquide Iberia has launched a volunteer program following a survey of employees in the industrial businesses. This survey showed that 30% of teams were keen to take part in educational, professional training and environmental protection activities. Portugal and Spain have experienced terrible forest fires in recent years. The program's first initiative were therefore related to these events, with the organization of onsite mobilization days dedicated to the control of invasive species, plantation forest conservation, and the sustainable planting of native tree species.

## 6.2. SUPPORT FROM THE FOUNDATION, IN PARTNERSHIP WITH OUR EMPLOYEES

In the framework of its local micro-initiatives support program, the Foundation favors actions aimed at developing local communities over the long term in countries in which the Air Liquide Group operates.

Air Liquide employees are actively involved in the work of the Foundation. Environmental and Healthcare/Breathing scientific projects are assessed and monitored by experts from Air Liquide's research centers.

Local development micro-initiatives are sponsored by employees who work near these projects. The Foundation thus provides employees with the opportunity to take part in community work and to express their social and human commitment. The role of a sponsor is broken down into three steps:

- making contact and project feasibility study;
- follow-up and support;
- final assessment.

Moreover, Group employees are encouraged to recommend projects in organizations close to their hearts.

Currently, hundreds of employees are involved in the Foundation's actions. Their contribution was showcased during the second Air Liquide Foundation Awards held to celebrate the Foundation's 10<sup>th</sup> anniversary.



### Key points

#### SHAREHOLDERS REPRESENTED IN THE SELECTION OF PROJECTS

Air Liquide shareholders also contribute to the Foundation's missions. A shareholder is also a member of the Project Selection Committee. The representation of shareholders in this way is a special feature of the Air Liquide Foundation. Their presence is important: the shareholder provides an external perspective, while being familiar with the Group. The other seven members of the Project Selection Committee are Group employees. The Project Selection Committee examines the projects put forward by the Foundation's team three times a year.



## 7. Developing the local economy

Air Liquide's teams across the globe are wholeheartedly committed to playing their part in local economic life. This participation includes hiring employees in the area and developing close relations with training organizations and universities that can prepare people for the Group's core businesses.

Air Liquide supplies more than two million industrial customers, major companies, SMEs and craftsmen thanks to the large diversity of its industrial gas applications. The Group provides solutions which are adapted to the competitive or innovative needs of each customer and supports them in their development.

In healthcare, Air Liquide is present in the development of infrastructures by supplying medical gases and dedicated equipment to hospitals and by training their staff in their use. Air Liquide cares for more than 1.5 million patients suffering from chronic diseases.

In addition, the Group's businesses, as well as the means implemented in order to prevent and manage industrial risks, are regularly presented to the populations near Air Liquide's sites. In France, the industrial sites participate in two local committees, CLIC and CLIE. These committees provide information and regulatory consultations at the communes' initiative, with the aim of providing transparent information on their activities to representatives of the local populations.

Moreover, subsidiaries are also directly involved with the communities throughout the world, supporting local corporate philanthropy initiatives. As well as financial support, these actions are successfully conducted with the enthusiastic involvement of employees.

### Local procurement

More than 80% of Air Liquide's procurement expenditures are made locally, limiting the environmental footprint relating to transportation and developing the local economy<sup>(a)</sup>. As an example in this area, Air Liquide is a partner and member of the Board of Directors of "Pacte PME", an association which puts innovative small and medium-sized enterprises (SMEs) in contact with major French groups. In 2018, on the 55 public and private corporate accounts, the association gave Air Liquide the score of A for its exemplary approach to the development of collaborative working relationships with SMEs.

The total amount of Group procurement in 2018 was 10.9 billion euros, including energy and transportation procurement.

In 2018, subcontracting for Air Liquide came to a total of 1.7 billion euros. Subcontracted activities are mainly those which are too far-removed from the Group's businesses or that require specific resources or that are linked to a concentrated workload at particular times.

(a) 2015 analysis based on 2013 data.

## 8. Relationships with the public sphere

Air Liquide has formalized a Public Affairs policy governing the Group's interactions with the national, regional and international public spheres to develop growth opportunities, reduce risks relating to regulatory changes, and involve Air Liquide in public debate.

This policy specifies that Air Liquide work with the public authorities of each country in which it does business in a constructive and transparent manner, following ethical rules and applying political neutrality. All the Group's actions respect the official lobbying regulations in force in the countries in which it is present. Air Liquide is therefore listed in the "Transparency Register" of European institutions and in France in the "Interest Representatives" register which was created in 2017 and is managed by the High Authority of Transparency in Public Life (Haute Autorité pour la Transparence de la Vie Publique – HATVP).

Managers specializing in Public Affairs have been appointed in the principal countries, comprising a network of around 20 people worldwide, coordinated by the European and International Affairs Division. The tasks of these managers are to follow public initiatives that may have an impact on the Group and to interact with the public authorities to defend or promote Air Liquide's interests.

This network allows the Group to work on the definition of joint positions on cross-divisional challenges such as the circular economy, energy transition and innovation, and to share information on changes to social challenges in different parts of the world.

Air Liquide's Public Affairs policy also aims to establish and develop constructive and sustainable relationships with:

- public authorities;
- professional bodies which represent the sectors in which the Group operates;

- other players such as non-governmental organizations and Think Tanks.

These interactions can take place either directly or through national or international associations of professional bodies such as the European Roundtable of Industrialists (ERT).

The Group also calls on outside consultants to support its actions. Public affairs cover all the Group's activities. The priorities in this area form part of a long-term process:

- the competitiveness of companies at the worldwide level;
- air quality as a key public health challenge;
- energy transition and the environment with the boom in alternative energies (hydrogen energy, biogases, photovoltaic, wind turbines, etc.), their applications in particular in terms of mobility and energy efficiency;
- the carbon market with changes in European regulations and the development of regional markets in North America and Asia Pacific;
- the opportunities and risks relating to the digitalization of the economy;
- the defense of Air Liquide's shareholding model;
- at the European level, space exploration;
- the defense of intellectual property and the launch of the European unitary patent and of the Unified Patent Court;
- environmental and societal reporting challenges.

In relation to fiscal matters, Air Liquide is particularly attentive to paying taxes in the countries where the Group is present and to the desire for good relations with the different local tax authorities.

### Hydrogen Council

Launched during the Davos World Economic Forum at the beginning of 2017, the Hydrogen Council is the first global initiative of its kind which intends to show that hydrogen is a key solution in energy transition for transport. The Group is currently composed of more than 50 multinationals, including Air Liquide. The initiative is growing rapidly, with 11 new members joining the Hydrogen Council in March and 14 new members in September 2018.

If deployed on a large scale, hydrogen could represent almost one fifth of total energy consumed by 2050. This would help reduce annual CO<sub>2</sub> emissions by around 6 gigatons compared with current levels and account for 20% of the decrease required to limit global warming to 2°C.

Through its ambition to limit global warming, the Hydrogen Council is committed to providing 100% carbon-free hydrogen for mobility by 2030. This objective was presented by Benoît Potier and Dr. Woong-Chul Yang during the Global Climate Action Summit in San Francisco in September 2018.

Moreover, hydrogen has the potential to generate 2,500 billion US dollars in revenue and create more than 30 million jobs by 2050.

## ANNUAL REPORTING

## 1. Safety indicators

## SAFETY INDICATORS FOR THE GROUP AS A WHOLE

	2009	2010	2011	2012	2013	2014	2015	2016	2017 <sup>(f)</sup>	2018
Number of Group employee lost-time accidents of at least one day <sup>(a)</sup>	131	153	144	149	151	144	152	137	198	161
Accident frequency of Group employees <sup>(b)</sup>	1.7	1.9	1.7	1.7	1.6	1.6	1.6	1.4	1.6	1.3*
Accident severity rate <sup>(c)</sup>			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.17
Number of accidents of subcontractors and temporary workers <sup>(d) (e)</sup>	148	155	118	142	110	92	94	91	90	93
Frequency of accidents of subcontractors and temporary workers					2.2	2.3	2.2	2.0	2.1	2.2

(a) Fatal work accidents since 2011: three in 2018, none in 2017, one in 2016, none in 2015, none in 2014, three in 2013, one in 2012, one in 2011. Among these fatal accidents, the one in 2016 and one in 2013 were road accidents.

(b) Number of accidents involving lost time of at least one day, per million hours worked by Group employees. Accidents defined following the recommendation of the International Labour Office. Working hours are defined according to local employment laws.

(c) Average number of days of lost time per thousand hours worked. Accidents defined following the recommendation of the International Labour Office.

(d) Personnel working under an Air Liquide contract at a Group site, at a customer site, or as a delivery vehicle driver.

(e) Fatal work accidents since 2011: five in 2018, none in 2017, one road accident in 2016, one road accident in 2015, one road accident in 2014, one road accident in 2013, three fatal work accidents in 2012 including a road accident, four fatal work accidents in 2011 including three road accidents.

(f) With Airgas, data from previous years relate to Air Liquide alone.

\* Indicator verified by the independent verifier.

## QUALITY INDICATORS

	2018
Estimate of Group revenue covered by an ISO9001 quality certification <sup>(a)</sup>	51%
Estimate of Group revenue covered by an ISO14001 quality certification	23%
Estimate of Group revenue covered by an OHSAS18001 occupational Health and Safety certification	12%

(a) Excluding Airgas.

## 2. Environmental indicators

### 2.1. LIST OF PRODUCTION UNITS AND THEIR ENVIRONMENTAL FOOTPRINT

The environmental elements that are most representative of the Group's activities and part of Air Liquide's Sustainable Development reporting are described below. They cover a total of 565 Air Liquide production units worldwide.

Type of production unit	Number of production units	Applications and environmental footprint
Large Air Separation Units (ASUs)	332	<p>Large Air Separation Units produce oxygen, nitrogen and argon, with some sites also producing rare gases such as krypton and xenon.</p> <p>These plants "without chimneys" do not use any combustion processes. They are particularly environmentally-friendly as they emit no CO<sub>2</sub>, sulfur oxide (SO<sub>x</sub>) or nitrogen oxide (NO<sub>x</sub>).</p> <p>They use almost exclusively electricity: worldwide they use about 3,600 MW at any given moment. The electricity purchased from our energy suppliers and consumed by the Air Separation Units is the source of indirect emissions. The cooling systems of these units require back-up water.</p>
Hydrogen and carbon monoxide units (HyCO)	46	<p>Large hydrogen and carbon monoxide units also produce steam for some customers. They primarily use natural gas as raw material and some water, required for the reaction that produces hydrogen. Carbon monoxide is an essential raw material in the chemical industry for producing plastics. The desulfurization of hydrocarbons in order to produce fuels with reduced sulfur content is one of the main applications of hydrogen. These units emit CO<sub>2</sub> and nitrogen oxides (NO<sub>x</sub>), but practically no sulfur oxide (SO<sub>x</sub>). They also consume electricity and their cooling systems require back-up water.</p>
Cogeneration units	19	<p>Cogeneration units produce steam and electricity simultaneously. They consume natural gas and water, mostly converted into steam and supplied to customers. The steam can be condensed at these customers' facilities and then reused in the cogeneration unit. In most cases, the electricity produced is supplied to the local electricity distribution network, which in some countries can be used to power the Group's other units. Combustion of natural gas produces CO<sub>2</sub> and leads to low nitrogen oxide (NO<sub>x</sub>) emissions, but practically no sulfur oxide (SO<sub>x</sub>) emissions.</p>
Acetylene units	60	<p>These units produce acetylene, a gas primarily used in metal welding and cutting. 50 of these units produce this gas through the decomposition of a solid (calcium carbide) using water. Two units fill cylinders with this gas, which is supplied by another industrial company. This process produces lime, at least 90% of which tends to be recycled in industrial and agricultural applications.</p>
Nitrous oxide units	7	<p>Nitrous oxide is used primarily as an anesthetic gas in the healthcare sector and as a sweetening agent in the food industry. It is produced from ammonium nitrate in solid form or as a water-based solution.</p>
Carbon dioxide liquefaction and purification units	72	<p>These units liquefy and purify carbon dioxide, which has many industrial applications, especially in the food industry where it is used to deep-freeze foods or to produce carbonated beverages.</p> <p>Carbon dioxide is most often a by-product of chemical units operated by other manufacturers. In certain cases, it is found naturally in underground deposits.</p> <p>While in others, it comes from the Group's hydrogen and carbon monoxide units. It is purified and liquefied in Air Liquide units consuming electricity and cooling water. Carbon dioxide is thus reused for other industrial applications instead of being emitted directly into the atmosphere.</p>
Units for the Hygiene and Specialty Ingredients business	8	<p>These production units for the Hygiene and Specialty Ingredients business are located in France, Germany and China and belong to the subsidiaries Schülke (Hygiene business) and Seppic (Specialty Ingredients business). Air Liquide experts work closely with hospitals to help them reduce the risk of nosocomial infection and contamination, thanks to the products the Group has developed. These units consume natural gas, electricity and water. Combustion of natural gas produces small amounts of CO<sub>2</sub>.</p>
Engineering & Construction units	6	<p>Units for the Engineering &amp; Construction business taken into account in this reporting are located at five sites in France, China and the United Arab Emirates. They are mainly used for the construction of air separation columns and cryogenic tanks.</p>
Biogas units	15	<p>These units process waste to produce biogas, a renewable energy source. Biogas is produced during the methanization of biomass: household waste, industrial and agricultural waste and sewage sludge. Air Liquide is aware of the potential of this process in terms of the energy transition and is thus working on global solutions dedicated to the valorization of biogas and which meet the needs of farmers, waste treatment managers and the agro-industry.</p>

## 2.2. ENVIRONMENTAL FOOTPRINT OF TRANSPORTATION

### TRANSPORTATION: INDUSTRIAL MERCHANT BUSINESS

	2014	2015	2016	2017	2018
Kilometers traveled by all vehicles delivering gas in liquid or cylinder form <i>(in millions of km)</i>	428	426	540	588	601 *
Estimate of CO <sub>2</sub> emissions generated by these vehicles in the Industrial Merchant business <i>(in thousands of tons)</i>	471	468	600	653	666 *
Evolution of the distance traveled per ton of liquid industrial gas delivered (oxygen, nitrogen, argon, carbon dioxide) <sup>(a)</sup> <i>(truck delivery)</i>	94.8	92.2	90.3	93.3	94.6 *
Estimate of truck transport kilometers avoided through on-site customer units <i>(in millions of km)</i>	(72)	(74)	(63)	(57)	(58)
Estimate of avoided CO <sub>2</sub> emissions by these on-site units <i>(in thousands of tons)</i>	(72)	(74)	(63)	(58)	(59)
Percentage of deliveries of air gases and hydrogen via pipeline or on-site	86%	87%	85%	85%	85%

(a) In kilometers per ton delivered for the Industrial Merchant business. 2008 base of 100.

\* Indicator verified by the independent verifier.

### TRANSPORTATION: HEALTHCARE BUSINESS

	2014	2015	2016	2017	2018
<b>Transportation: Home Healthcare business</b>					
Kilometers traveled <i>(in millions of km)</i>	149	161	173	184	181
Associated CO <sub>2</sub> emissions <i>(in thousands of tons)</i>	35	39	38	35	35
<b>Transportation: Medical Gases business</b>					
Kilometers traveled <i>(in millions of km)</i>	26	28	27	33	33
Associated CO <sub>2</sub> emissions <i>(in thousands of tons)</i>	23	25	24	29	30
<b>TOTAL KILOMETERS TRAVELED HEALTHCARE BUSINESS</b> <i>(in millions of km)</i>	<b>175</b>	<b>189</b>	<b>200</b>	<b>217</b>	<b>214</b>
<b>TOTAL ASSOCIATED CO<sub>2</sub> EMISSIONS</b> <i>(in thousands of tons)</i>	<b>58</b>	<b>64</b>	<b>62</b>	<b>64</b>	<b>65</b>

## 2.3. SUMMARY OF THE GROUP'S GREENHOUSE GAS EMISSIONS

### 2.3.1. The various Scopes

Companies' greenhouse gas emissions are usually broken down into three "scopes", depending on their origin.

- Scope 1 includes direct emissions generated by all possible emission sources owned or controlled by Air Liquide.

This scope includes:

- the Group's production units;
- the transport of products to customers or patients.

94% of the direct emissions are related to the nature of the thermal energy used as a raw material by the Group's large hydrogen and carbon monoxide production units, and cogeneration units (for steam and electricity production). The vast majority of these units use natural gas.

- Scope 2 corresponds to all indirect emissions related to the production of electricity or steam purchased outside the Group in the various countries where it operates. These emissions therefore have a close link with the carbon content of the electricity of countries where Air Liquide operates.

Direct and indirect emissions (Scope 1 and 2) represent 99% of the Group's total reported emissions in 2018.

- Scope 3 corresponds to other indirect emissions generated, for example, by Group employees' business travel or emissions linked to home-office commuting.

### 2.3.2. Group Scope 1 and Scope 2 emissions

	2014	2015	2016	2017	2018
Scope 1: total direct greenhouse gas emissions (GHG) (in thousands of tons of CO <sub>2</sub> eq.) <sup>(a)</sup>	11,569	13,552	14,062	14,476	15,390 *
Scope 2: total indirect GHG emissions (in thousands of tons of CO <sub>2</sub> ) <sup>(b)</sup>	11,405	11,716	11,174	11,679	12,422 *
<b>TOTAL DIRECT AND INDIRECT GHG EMISSIONS</b> (in thousands of tons of CO <sub>2</sub> eq.)	<b>22,974</b>	<b>25,268</b>	<b>25,236</b>	<b>26,155</b>	<b>27,812 *</b>

(a) Includes CO<sub>2</sub> emissions and nitrous oxide emissions.

(b) Total of indirect GHG emissions generated by the production of electricity purchased outside the Group. The indirect emissions only concern CO<sub>2</sub> emissions. The calculation takes into account the various primary energy sources that each country uses to produce electricity (source: International Energy Agency).

\* Indicator verified by the independent verifier.

The Group's direct emissions increased from 14.5 million tons of CO<sub>2</sub> equivalent in 2017 to 15.4 million tons in 2018, i.e., an increase of 6.3%. This growth is mainly due to the start up of new units, as well as overall increase in sold hydrogen volumes.

The Group's indirect emissions decreased from 11.7 million tons of CO<sub>2</sub> equivalent in 2017 to 12.4 million tons in 2018, i.e., an increase of 6.4%. This increase is related to the start-up of several large units including worlds largest ASU in South Africa. This growth is counteracted by improvement of overall efficiency of the ASU production units.

### 2.3.3. Scope 3 emissions related to business travel

Business travel by plane, road or train is the source of reported Scope 3 CO<sub>2</sub> emissions.

Emissions from business travel represented around 210,000 tons of CO<sub>2</sub> in 2018 for all subsidiaries, representing less than 1% of the Group's total emissions.

## 2.4. ENERGY AND EFFICIENCY INDICATORS FOR THE GROUP AS A WHOLE

	2014	2015	2016	2017	2018
Annual electricity consumption (in GWh) <sup>(a)</sup>	30,341	31,650	32,834	34,062	36,265 *
Annual thermal energy consumption (in LHV terajoules) <sup>(b)</sup>	226,036	266,153	281,043	290,285	306,111 * <sup>(c)</sup>
Evolution of energy consumption per m <sup>3</sup> of air gas produced <sup>(d) (e)</sup>	99.3	98.7	100.3	98.1	97.7 *
Evolution of energy consumption per m <sup>3</sup> of hydrogen produced <sup>(d) (f)</sup>	97.5	99.3	99.5	98.6	99.4 *

(a) Includes a share of steam and compressed air purchased by the Group.

(b) LHV: Lower Heat Value, which includes the fact that energy from water vaporizing in fuel is not recovered.

(c) Approximately 85,000 GWh LHV.

(d) Calculated using a base of 100 in 2007.

(e) Gases produced (oxygen, nitrogen, argon) calculated in m<sup>3</sup> of equivalent gaseous oxygen.

(f) Hydrogen and carbon monoxide.

\* Indicator verified by the independent verifier.

The hydrogen unit energy efficiency indicator was down in 2018 mainly due to the increase in large production units that have not yet reached maximum efficiency.

## 2.5. DISCHARGES INTO AIR AND WATER

### DISCHARGES INTO AIR AND WATER (IN TONS)

	2014	2015	2016	2017	2018
Discharges into air: NOx (nitrogen oxide)	3,200	3,270	3,563	3,542	3,974
Discharges into air: SOx (sulfur oxide)	< 200	< 250	< 250	< 250	<100
Volatile organic compounds (VOCs) discharged into the atmosphere ( <i>estimate</i> )	110	99	76	146	246 <sup>(a)</sup>
Discharge to water: oxidizable matter	< 1,000	< 1,000	< 1,000	< 1,000	<1,500
Discharge to water: suspended solids	< 1,500	< 1,500	< 1,500	< 1,500	<1,000

(a) This increase of VOC in 2018 is a result of the start-up of new units and the significant production increase of the site in Pau, France.

## 2.6. WASTE AND BY-PRODUCTS

### WASTE AND BY-PRODUCTS

	2014	2015	2016	2017	2018
<b>Non-hazardous waste and by-products</b>					
Annual quantity of lime produced (extracted dry equivalent) by the acetylene production units ( <i>in tons</i> )	32,000	29,000	26,000	25,000	25,380
% recycled	> 90%	> 80%	> 80%	> 90%	>90%
Metal waste ( <i>in tons</i> ) <sup>(a)</sup>	9,000	7,600	5,700	61,513	61,680
% recycled	> 99%	> 99%	> 99%	> 99%	> 99%
<b>Total non-hazardous waste and by-products</b> ( <i>estimate in tons</i> )	<b>41,000</b>	<b>36,600</b>	<b>31,700</b>	<b>86,513</b>	<b>87,060</b>
<b>Hazardous waste</b>					
Paints and solvents ( <i>in tons</i> )	100	104	106	79	72
% recycled	63%	59%	63%	31%	45% <sup>(b)</sup>
Oils ( <i>in tons</i> )	600	650	696	821	815
% recycled	83%	92%	91%	93%	93% <sup>(c)</sup>
<b>Total hazardous waste and by-products</b> ( <i>estimate in tons</i> )	<b>700</b>	<b>754</b>	<b>802</b>	<b>899</b>	<b>887</b>
<b>TOTAL WASTE AND BY-PRODUCTS</b>	<b>41,700</b>	<b>37,354</b>	<b>32,502</b>	<b>87,412</b>	<b>87,947</b>

(a) Non-hazardous metal waste.

(b) In addition, 39% is incinerated.

(c) In addition, 7% is incinerated.

## 2.7. REGULATIONS

### 2.7.1. Market authorization regulations

The distribution of substances, products and articles is part of the product stewardship approach developed by the chemicals industry.

In terms of market authorizations, Air Liquide is mainly affected by four regulations: chemical substances (REACH), Biocidal products (BPR), Plant protection products (PPP) and Fluorinated gases (F-gas).

### INDUSTRIAL MANAGEMENT SYSTEM AND CERTIFICATIONS (GLOBAL SCOPE)

	2014	2015	2016	2017	2018
Estimate of revenue of Group entities covered by an ISO9001 quality certification	70%	72%	66%	73%	51%
Estimate of revenue of Group entities covered by an ISO14001 environmental certification	27%	27%	26%	30%	23%
Estimate of revenue of Group entities covered by the OHSAS18001 occupational Health and Safety certification	16%	15%	14%	16%	12%



### European REACH regulation – 2007

REACH (Registration, Evaluation, Authorisation and restriction of CHemicals) is a European Union regulation that governs the registration, restriction and authorization of chemical substances produced in or imported to the European Union. Air Liquide also ensures that the raw materials in use and authorized for use on the market are in compliance with the REACH regulation.

### REACH restrictions

Air Liquide is mainly impacted by restrictions relating to the use of solvents used to distribute acetylene. The restriction dossier for the solvent DMF was finalized in October 2018. Its substitution will require that cylinder filling processes are reviewed. Potential substitute NMP will also be subject to restricted use as of May 2020.

### REACH authorizations

Transitional authorizations before the permanent interruption of use in Europe apply to substances on the list of substances subject to authorization. These SVHCs (substances of very high concern) are mainly contained in articles distributed for the commissioning of gases.

### Registration with REACH

Any chemical substance imported or manufactured in Europe of over one ton a year must be registered with the European chemicals agency, ECHA. Each manufacturer or importer must have its own registration.

The European REACH regulation came into effect in 2007 and authorization procedures for products manufactured or imported at a rate of more than one ton per year were spread from this period until May 31, 2018. After this date, requirements in terms of substances will continue to apply in the event of production in a higher tonnage band or when registration files are reviewed by the authorities. The same requirement will apply to all new products as of the first ton produced.

Air Liquide's main products such as oxygen, nitrogen, hydrogen, CO<sub>2</sub>, helium and rare gases are not subject to REACH registration.

Air Liquide is the lead registrant for several molecules, in particular Specialty Gases in the Electronics business (NF<sub>3</sub>, CF<sub>4</sub>, C<sub>4</sub>F<sub>8</sub>, SiF<sub>4</sub>, etc.). Until now, several other products (carbon monoxide, acetylene, methanol, lime, nitrous oxide, ultra-pure fuels) have been, or will be, registered in compliance with the schedule established by this Regulation.

In addition, Seppic, which produces healthcare and beauty specialty ingredients, falls under the REACH regulation for some of its products. Seppic anticipated the introduction of the European REACH regulation and has complied with the various deadlines imposed by this regulation since it came into effect. As well as the European cases submitted under the REACH regulation, Seppic also complies with similar non-European regulations.

In 2018, Group sales subject to REACH registration represented less than 3% of Group revenue.

### Regulations governing Biocidal products (BPR – 2012) and Plant protection products (PPP – 2009)

These long-standing regulations (BPR 2012 and PPP 2009) are often stated in national decrees governing crop protection products. The purpose of using gases such as CO<sub>2</sub> is often as an insecticide, substituting chemical products which are banned in Europe.

These two regulations require approval of the substance at the European level, before national authorization can be requested.

Since 2016, Air Liquide has been investing in a renewal file, under PPP, of the approval of CO<sub>2</sub> and ethylene, which are up for renewal in 2020 and 2022 respectively.

Under BPR, the review of the Ozone approval file is still underway and requests for the appropriate authorization for use both in our industrial facilities and for the market authorization of its precursor, oxygen, will then be made. Applications relating to the drinkability of water, the disinfection of containers and the treatment of industrial water are affected by this review.

### F-Gas regulation (2014)

Following the marked reduction in the import quotas for these gases which have high global warming potential, Air Liquide will, from now on, limit its business to the electronics sector alone as this application is exempt.

### 2.7.2. Globally Harmonized System of Classification and Labelling of Chemicals

The Globally Harmonized System of Classification and Labelling of Chemicals, better known as GHS, was created by the United Nations. This system sets out the classification of chemical products according to the type of danger that they represent and provides standardized hazard information, including labeling and safety data sheets.

This labeling must provide key information concerning health, safety and environmental protection to everyone who handles a hazardous product or who could be exposed to one.

In the countries in which GHS is applicable, Air Liquide subsidiaries have already implemented the principles of GHS in terms of product compliance with local and regional regulations.

### 2.7.3. Seveso 3 Directive

This European directive focuses on preventing major industrial risks. It applies to any facility where hazardous substances exceed certain quantities. These facilities are divided into two categories according to the quantity of such substances: Seveso 3 "upper tier" and "lower tier". In Europe, 101 "lower tier" and 27 "upper tier" Air Liquide sites are affected, mainly because of their stocks of oxygen.

Seveso regulations apply only in Europe, but if the Seveso "upper tier" criteria were to be applied worldwide, 42 other Group sites would be covered.

#### 2.7.4. CO<sub>2</sub> emission quotas

Air Liquide is present in a number of regions that have implemented, or are in the process of implementing, a quota system for greenhouse gas emissions. Air Liquide's Corporate teams and dedicated teams based in these regions monitor and follow these regulatory developments, in order to ensure that their operations are fully compliant with the objectives and obligations related to these quota systems. Thanks to the energy efficiency of its production systems, Air Liquide is able to naturally minimize the energy footprint, and therefore the carbon footprint of its products and services.

In the European Union, the European directive ETS (Emission Trading Scheme) established a quota system for greenhouse gas emissions in 2005, in compliance with the Kyoto Protocol and EU targets on climate change. Following an initial phase from 2005 to 2007, and a second phase from 2008 to 2012, a third phase, covering the period from 2013 to 2020, has expanded the scope of industrial facilities subject to the ETS. For Air Liquide, seven cogeneration sites in Germany, France and the Netherlands, along with all of the Group's large hydrogen production sites in Europe were affected by this directive in 2018. With regard to hydrogen production units, CO<sub>2</sub> emission quotas are mostly allocated for free, according to a benchmark set for the top performing European facilities. Air Liquide obtains CO<sub>2</sub> quotas from the market or its customers in order to cover the emissions from hydrogen production sites not covered by the free allocations and for all emissions from the cogeneration sites.

China announced ambitious targets for reducing the carbon intensity of its economy by 2030. In 2013 and 2014, the Chinese government launched pilot ETS programs in seven regions (the provinces of Guangdong and Hubei, and the cities of Beijing, Tianjin, Shanghai, Chongqing and Shenzhen). These programs relate to four Group production sites located in these regions (Air Separation Units and hydrogen units). At the end of 2017, the Chinese government implemented a national emissions trading scheme. China's national

ETS only covers the electricity production sector for the moment. Other regions such as Kazakhstan, Korea and California, have also introduced a national emissions trading scheme. In 2018, a CO<sub>2</sub> taxation system was introduced in Singapore.

#### 2.8. ENVIRONMENTAL INCIDENTS AND RISKS RELATED TO CLIMATE CHANGE

An Air Liquide procedure, available for all Group employees and fully integrated into Air Liquide's Industrial Management System (IMS), defines environmental incidents based on three levels of severity. All incidents reported at Group level are subject to a systematic, in-depth analysis, depending on the nature of the incident, so that preventative measures can be stepped up. Environmental risks related to industrial processes and risks related to climate change are taken into account by the Group and are presented in the "Risk factors" section of the Reference Document.

Most of the time, environmental incidents in the Industrial and Medical Gas business have a very low impact on the environment compared to the traditional chemicals industry. For example, in air gas production, any possible leak of these gases does not represent any danger for the atmosphere. Likewise, the water used in Air Liquide's processes is primarily used in cooling and steam production. The risk of possible pollution of the water used is therefore very low. In 2018, there were a total of 15 environmental incidents in the Group, mainly involving air gas and oil leaks.

Climate risks are reviewed at both Group and site level. Weather-related and climatic disasters, water stress and the increased frequency of cyclones constitute a risk that could disrupt the smooth running of operations. Preventive measures targeting extreme weather-related phenomena exist at the main sites located in high-risk areas.

The amount of financial provision and guarantees earmarked for environmental risks is 11.2 million euros.

### 3. Specific indicators for the Home Healthcare business linked to the issue of socially responsible bonds

In 2012, Air Liquide issued its first SRI-labeled bond<sup>(a)</sup> under its Euro Medium Term Notes (EMTN) program, for a total amount of 500 million euros. This bond was mostly placed with investors having SRI management mandates and permitted the Group to diversify its financing sources. After numerous public authorities and supranational issuers, Air Liquide became the first company in the world to issue bonds meeting the criteria of SRI investors. Obtaining a rating from the extra-financial rating agency Vigeo for the Home Healthcare business

led to this issue being given an SRI label. This evaluation is based on the social, environmental and governance criteria of the Home Healthcare business that concerns more than 1.5 million patients worldwide.

In the framework of this SRI bond issue, Air Liquide made a commitment to publishing during the life of these bonds, i.e. nine years, indicators specific to the Home Healthcare business relating to the environment, safety and employee diversity.

(a) Socially Responsible Investment: application of sustainable development principles to investment. Approach consisting in systematically considering the three dimensions – environment, social / societal, and governance – in addition to the usual financial criteria.

Number of patients treated	2014	2015	2016	2017	2018
Total number of patients treated by the Air Liquide Home Healthcare Division	1,200,000	1,300,000	1,400,000	1,550,000	1,630,000
<b>Group employees</b>					
Home Healthcare employees <sup>(a)</sup>	8,183	9,112	9,492	10,015	10,143
<b>Safety</b>					
Number of lost-time accidents of at least one day among employees	62 <sup>(b)</sup>	79 <sup>(b)</sup>	63 <sup>(b)</sup>	66 <sup>(b)</sup>	63
Number of accidents of subcontractors and temporary workers <sup>(c)</sup>	9 <sup>(b)</sup>	16 <sup>(b)</sup>	21 <sup>(d)</sup>	8 <sup>(b)</sup>	16 <sup>(b)</sup>
<b>Equality</b>					
% of women among managers and professionals	58%	58%	57%	58%	56%
% of women among managers and professionals hired during the year	56%	58%	62%	59%	60%
<b>Training</b>					
Average number of days of training per employee, per year	2	1.6	2.1	1.9	2.1 <sup>(e)</sup>
<b>Kilometers driven and CO<sub>2</sub> emissions related to transportation</b>					
Kilometers driven per patient monitored per year	124	123	131	118	111
CO <sub>2</sub> emissions related to transportation per patient (kgCO <sub>2</sub> /patient) per year	29	30	29	23	21

(a) Employees under contract, excluding temporary employees.

(b) No fatal work accidents.

(c) Personnel working under an Air Liquide contract at a Group site, at a customer site, or as a delivery vehicle driver.

(d) One fatal accident (road accident).

(e) 16 hours a year when counted in hours (base: 1 day = 7.5 hrs).

## 4. Human Resources indicators

### GROUP EMPLOYEES <sup>(a)</sup>

Employees <sup>(a)</sup>	2014	2015	2016	2017	2018
Group employees	50,300	51,500	66,700	65,200	66,000 *
Women	13,600	14,200	17,000 <sup>(e)</sup>	16,900	17,300
as a %	27%	28%	25%	26%	26%
Men	36,700	37,300	49,700	48,300	48,700
as a %	73%	72%	75%	74%	74%
Joining the Group <sup>(b)</sup>	14.8%	16.5%	17.1%	16.7%	16.5%
Leaving the Group <sup>(c)</sup>	14.7%	14.0%	15.1%	18.0%	15.2%
% of employees having resigned during the year <sup>(d)</sup>	5.8%	5.3%	5.4%	7.5%	8.0%

(a) Employees under contract, excluding temporary employees.

(b) Hiring or integration due to acquisitions. The percentage is based on the number of employees as of December 31 of the preceding year.

(c) Retirement, resignations, layoffs (around 20% of the departures), departures due to disposals, etc. The percentage is calculated based on the number of employees as of December 31 of the preceding year.

(d) Calculated on the number of employees as of December 31 of the preceding year.

(e) Estimate.

\* Indicator verified by the independent verifier.

## HUMAN RESOURCES INDICATORS FOR THE GROUP

	2014	2015	2016	2017	2018
<b>Parity and diversity</b>					
<b>Equality</b>					
% of women among managers and professionals	28%	29%	30%	29%	29% *
% of women among managers and professionals hired during the year	31%	34%	39%	37%	36% *
% of women among employees considered as high potential	41%	38%	40%	40%	41%
<b>Number of nationalities</b>					
Among expatriates	44	50	44	53	49
Among senior executives	31	33	30	33	30
Among employees considered as high potential	44	48	49	52	53
Number of nationalities among senior executives / Number of countries where the Group is present	39%	41%	38%	41%	38%
<b>Training</b>					
% of total payroll allocated to training	About 2%	About 2%	About 2%	About 2%	About 1.5%
Average number of days of training per employee, per year (order of magnitude)	3.5 days	3.5 days	3.1 days	3.0 days	2.7 days <sup>*(a)</sup>
% of employees having received training at least once during the year (order of magnitude)	78%	77%	72%	73%	63% *
<b>Performance review</b>					
% of employees who have had an annual performance review meeting with their direct supervisor during the year	79%	80%	76%	81%	80% *
% of employees who have had a career development meeting with the HR Department during the year	16%	15%	17%	12%	13%
<b>Remuneration</b>					
% of employees with an individual variable component as part of their remuneration	58%	60%	63%	57%	53%
<b>Absenteeism</b>					
Absence rate of Air Liquide employees (estimate)	2.4%	2.7%	2.7%	2.5%	2.3%
<b>Ethics</b>					
% of employees belonging to an entity with a local Code of Conduct	94%	97%	96%	97%	97%
<b>Employee loyalty</b>					
Average seniority in the Group	10 years	10 years	10 years	10 years	10 years
Retention rate of managers and professionals over a year <sup>(b)</sup>	93%	95%	95%	93%	93%
<b>Social performance</b>					
% of employees with disabilities <sup>(c)</sup>	1.3%	1.4%	1.4%	1.1%	1.1%
% of employees having access to a representation/dialog/consultation structure	76%	79%	82%	85%	86%
% of employees belonging to an entity at which an internal commitment survey was conducted within the last three years	> 55%	68%	65%	45%	36%
<b>Employee shareholders</b>					
% of capital held by Group employees <sup>(d)</sup>	1.5%	1.5%	1.5%	1.5%	1.7%
% of Group employees that are shareholders of L'Air Liquide S.A.	More than 50%	Almost 50%	More than 50%	36%	43%

(a) 23 hours a year when counted in hours (base: 1 day = 7.5 hrs).

(b) This rate takes only resignations into account.

(c) For the countries where regulations allow this data to be made available.

(d) Within the meaning of article L. 225-102 of the French Commercial Code.

\* Indicator verified by the independent verifier.

## 5. Reporting methodology

### 5.1. PROTOCOL AND DEFINITIONS

In the absence of a relevant and recognized protocol for industrial gas operations, Air Liquide has created its own protocol to define its reporting methods for Human Resources, safety and environmental indicators. This protocol includes all the definitions, measurement procedures and collection methods for this information. In line with the Group's commitment to continuous improvement, Air Liquide is progressively completing the work of adjusting to its Sustainable Development indicators protocol to reflect changes in the Group.

This protocol is based on the general principles defined by the Group with regard to scope, responsibilities, controls and limits, and establishes definitions, the departmental responsibilities, tools and data-tracing methods for each indicator. This document is regularly updated. Moreover, this protocol takes into account all the Group's formalized procedures in the framework of the Industrial Management System (IMS) and the global protocol for Group Policies, Codes and Procedures called the BLUEBOOK. This reporting framework makes it possible to cover the information listed in articles L. 225-102-1 and R. 225-105 of the French Commercial Code, except for the fight against food waste, food insecurity, respect for the animal well-being and commitments to responsible food, fair and sustainable. Due to its industrial activity, these subjects are not considered as a priority by Air Liquide.

### 5.2. SCOPE AND CONSOLIDATION METHODS

Human Resources and environmental indicators are consolidated worldwide for all companies integrated within the financial consolidation scope. Entities accounted for by the equity method are excluded from the reporting scope. Safety indicators are consolidated worldwide for all companies in which Air Liquide has operational control or is responsible for safety management. Apart from these general rules, there are some specific ones:

- information on the impact of transportation (kilometers traveled, CO<sub>2</sub> emitted) is calculated on the basis of data collected in the main countries where the Group is established around the world;
- information on kilometers and avoided CO<sub>2</sub> emissions through on-site Air Separation Units and efficiency measures pertains to fully-consolidated subsidiaries;
- environmental and energy indicators for the main types of production units operated by the Group cover about 99% of the Group's Gas & Services revenue, and 98% of the Group's total revenue;
- for environmental and energy indicators, production units are included in the reporting system from the effective date of their industrial commissioning;
- electricity consumption, and the indirect CO<sub>2</sub> emissions related to it, are only taken into account when Air Liquide pays for this electricity. Energy consumption of on-site units, as well as water consumption specific to the sale of treated water (which is not part

of the Group's core business) are excluded from the consolidation scope of the data. When the Group has cogeneration units in a country where ASUs are available, the indirect emissions from the electricity of these units are not taken into account;

- the segmentation between advanced economies and developing economies used for direct and indirect greenhouse gas emissions is the same as that used by the Finance Department.

### 5.3. DATA COLLECTION AND RESPONSIBILITIES

The Human Resources, safety and environmental indicators are produced by several data-collection systems in the Group, each under the responsibility of a specific department:

- Human Resources indicators, included in the Group's general accounting consolidation tool, fall under the responsibility of the Human Resources Department;
- the energy consumption and CO<sub>2</sub> emissions indicators for the main Air Separation Units, and cogeneration, hydrogen and carbon monoxide units are tracked by the Large Industries business line using a dedicated Intranet tool;
- as a complement, environmental and safety reporting is carried out by the Safety and Industrial System Department using a dedicated Intranet tool, and includes:
  - for all entities, the data of the Group's accident reporting,
  - for the units of the Large Industries business line, other environmental indicators (atmospheric emissions, water consumption, discharge to water, etc.),
  - for the smaller units (acetylene, nitrous oxide, carbon dioxide units and Hygiene and Specialty Ingredients businesses), the Engineering & Construction business units, the Research & Development sites and the Technical Centers, all indicators (energy, atmospheric emissions, water consumption, discharge to water, etc.);
- indicators on Industrial Merchant transportation are the responsibility of this business line;
- indicators on transportation for Medical Gases and Home Healthcare are the responsibility of the Healthcare business line;
- the estimate of the percentage of the Group's revenue with respect to the implementation of the Industrial Management System (IMS), as well as ISO9001, ISO14001 and OHSAS18001 are indicators which fall under the responsibility of the Safety and Industrial System Department;
- among the subjects covered by the French "Grenelle 2" law, soil pollution and the consideration of noise pollution are not relevant for the Industrial Gas business, given the size of the Group's sites and the noise levels generated. They are therefore not mentioned in this report.

#### 5.4. CONTROLS

Each department in charge of collecting data is responsible for the indicators provided. Control occurs at the time of consolidation (review of changes, inter-entity comparisons).

Safety and energy indicators are tracked monthly. In addition, audits of environmental data are carried out by the Safety and Industrial System Department on a sample of sites representative of the various types of units monitored. Where the data reported are inconsistent or missing, an estimated value may be used by default.

#### 5.5. METHODOLOGICAL LIMITS

The methodologies used for certain Human Resources, safety and environmental indicators can have certain limits due to:

- ▶ the absence of nationally or internationally recognized definitions, in particular for indicators on managers and professionals and social performance indicators;
- ▶ the representativeness of the measurements taken and required estimates. This is particularly the case for indicators regarding avoided CO<sub>2</sub> emissions, water consumption, kilometers avoided per on-site unit, and training.

## 6. Independent verifier's report

*This is a free translation into English of the Statutory Auditor's report issued in French and is provided solely for the convenience of English speaking readers. This report should be read in conjunction with, and construed in accordance with, French law and professional standards applicable in France.*

### **REPORT BY ONE OF THE STATUTORY AUDITORS, APPOINTED AS AN INDEPENDENT THIRD PARTY, ON THE NON-FINANCIAL INFORMATION STATEMENT INCLUDED IN THE MANAGEMENT REPORT.**

For the year ended 31 December 2018

To the Shareholders,

In our capacity as Statutory Auditor of L'Air Liquide appointed as an independent third party and certified by COFRAC under number 3-1060 rév.2 (whose scope is available at [www.cofrac.fr](http://www.cofrac.fr)), we hereby report to you on the non-financial information statement for the year ended December 31, 2018 (hereinafter the "Statement"), included in the Management Report pursuant to the legal and regulatory provisions of articles L. 225 102-1, R. 225-105 and R. 225-105-1 of the French Commercial Code (*Code de commerce*).

#### **The entity's responsibility**

Pursuant to legal and regulatory requirements, the Board of Directors is responsible for preparing the Statement, which must include a presentation of the business model, a description of the principal non financial risks, a presentation of the policies implemented in light of those risks and the outcome of said policies, including key performance indicators.

The Statement has been prepared in accordance with the entity's procedures (hereinafter the "Guidelines"), the main elements of which are presented in the Statement.

#### **Independence and quality control**

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

#### **Responsibility of the Statutory Auditor, appointed as an independent third party**

On the basis of our work, our responsibility is to provide a reasoned opinion expressing a limited assurance conclusion on:

- the consistency of the Statement with the provisions of article R. 225-105 of the French Commercial Code;
- the fairness of the information provided in accordance with article R. 225-105 I, 3 and II of the French Commercial Code, i.e., the outcome of the policies, including key performance indicators, and the measures implemented in light of the principal risks (hereinafter the "Information").

However, it is not our responsibility to comment on:

- The entity's compliance with other applicable legal and regulatory provisions, in particular the French duty of care law and anti-corruption and tax evasion legislation;
- The consistency of products and services with the applicable regulations.

#### **Nature and scope of our work**

The work described below was performed in accordance with the provisions of articles A. 225-1 et seq. of the French Commercial Code determining the conditions in which the independent third party performs its engagement and with the professional standards applicable in France to such engagements, as well as with ISAE 3000 – Assurance engagements other than audits or reviews of historical financial information;

Our procedures allowed us to assess the consistency of the Statement with regulatory provisions and the fairness of the Information:

- we obtained an understanding of all the consolidated entities' activities, the description of the labour and environmental risks associated with their activities and, where applicable, the impact of those risks on compliance with human rights and anti corruption and tax evasion legislation, as well as the resulting policies and their outcomes;
- we assessed the appropriateness of the Guidelines with respect to their relevance, completeness, reliability, objectivity and understandability, with due consideration of industry best practices, where appropriate;



- we verified that the Statement includes each category of labour and environmental information set out in article L. 225-102 1 III as well as information regarding compliance with human rights and anti corruption and tax evasion legislation;
- we verified that the Statement includes an explanation for the absence of the information required under article L. 225-102-1 III, 2;
- we verified that the Statement presents the business model and the principal risks associated with all the consolidated entities' activities, including where relevant and proportionate, the risks associated with their business relationships and products or services, as well as their policies, measures and the outcomes thereof, including key performance indicators;
- we verified, where relevant with respect to the principal risks or the policies presented, that the Statement provides the information required under article R. 225-105 II;
- we assessed the process used to identify and confirm the principal risks;
- we asked what internal control and risk management procedures the entity has put in place;
- we assessed the consistency of the outcomes and the key performance indicators used with respect to the principal risks and the policies presented;
- we verified that the Statement covers the scope of consolidation, i.e., all the companies included in the scope of consolidation in accordance with article L. 233-16 within the limitations set out in the Statement;
- we assessed the data collection process implemented by the entity to ensure the completeness and fairness of the Information;
- for the key performance indicators and other quantitative results that we considered to be the most important, we implemented:
  - analytical procedures to verify the proper consolidation of the data collected and the consistency of any changes in those data,
  - tests of details, using sampling techniques, in order to verify the proper application of the definitions and procedures and reconcile the data with the supporting documents, were undertaken. This work was carried out on a selection of contributing entities – Airgas, Gasmedi, Seppic, Air Liquide Germany Industry, and Air Liquide Italia entities for social indicators and for the Fos-sur-Mer ASU, Sarroch ASU, Sarlux ASU, Jurong Island ASU 8 & ASU 9, Pernis Cogen, El Segundo HyCo, Rodeo HyCo, and ALFI Bagneux sites for the environmental indicators – and covers 30% of the workforce and between 14% and 26% of the environmental information related to the consolidated data relating to the key performance indicators and outcomes selected for these tests;
- we referred to documentary sources and conducted interviews to corroborate the qualitative information (measures and outcomes) that we considered to be the most important;
- we assessed the overall consistency of the Statement based on our knowledge of the all the consolidated entities

We believe that the work carried out, based on our professional judgement, is sufficient to provide a basis for our limited assurance conclusion; a higher level of assurance would have required us to carry out more extensive procedures.

### Means and resources

Our work was carried out by a team of eight people between September 2018 and March 2019 and took a total of 20 weeks.

We were assisted in our work by our specialists in sustainable development and corporate social responsibility. We conducted some ten interviews with the people responsible for preparing the Statement, representatives namely of the Sustainable Development, Risks, Purchasing, Ethics, Human Resources, Safety & Industrial Systems, and Large Industries teams.

### Conclusion

Based on our work, nothing has come to our attention that causes us to believe that the non-financial information statement is not in accordance with the applicable regulatory provisions and that the Information, taken as a whole, is not presented fairly and in accordance with the Guidelines.

Neuilly-sur-Seine, March 1, 2019

One of the Statutory Auditors

PricewaterhouseCoopers Audit

Olivier Lotz  
Partner

Sylvain Lambert  
Sustainable Development Partner

**Appendix: List of the information we considered most important****Environmental - Key Performance Indicators and Other Quantitative Results:**

- Direct and indirect emissions of greenhouse gases;
- Avoided greenhouse gas emissions;
- Evolution of energy consumption per m<sup>3</sup> of gas produced;
- Evolution of energy consumption per m<sup>3</sup> of hydrogen produced;
- Releases to air: NOx (nitrogen oxides);
- Releases to air: SOx (sulfur oxides);
- Releases into the water of oxidizable materials;
- Releases into the water of suspended matter;
- Share of water consumption at Air Liquide sites located in probable areas of very high water stress versus the Group's annual water consumption;
- Volume of renewable energy purchased by Air Liquide;
- Share of low-carbon or renewable electricity consumed by the Group;
- Distance traveled per tonne of industrial gas delivered.

**Social - Key performance indicators and other quantitative results:**

- Accident frequency rate (with at least one day off) for Group employees;
- Accident severity rate;
- Percentage of women among engineers and managers;
- Percentage of women among the top 10% positions of society;
- Percentage of women among employees considered as high potential;
- Percentage of recent graduates among hiring engineers and executives;
- Percentage of employees belonging to an entity with a local Code of Conduct;
- Percentage of employees with disabilities;
- Percentage of Group employees who have received at least one training during the year.

**Qualitative information (actions and results):**

- Inclusion of energy mix in supplier selection criteria;
- Inauguration in 2018 of a new "Smart Innovative Operations Center" (SIO) Center for the South-East Asia-Pacific region;
- Establishment of a working group on water to better manage water on production sites;
- Development of solutions to improve the quality of the air, in particular by the use of cryogenic molecules for the refrigerated transport of products;
- EcoVadis Award in the category "Responsible Purchasing: Stakeholder Engagement";
- Desulfurization by hydrogen of petroleum fuels;
- Safety "leadership" training and regular training at the workplace;
- Signature of the Responsible Care® Charter of the International Council of Chemical Associations (ICCA) with the aim of improving the overall performance of the chemical industry in terms of health, safety and environmental protection;
- Road safety program;
- Launch of a digital campus in collaboration with digital transformation teams in 2018;
- Involvement of employees in the Air Liquide Foundation through support for local sponsorship initiatives;
- Update of the Group's Responsible Purchasing policy in 2018;
- Operation the "Ethical" system.

## 7. Appendix

### Link between Air Liquide's Sustainable Development indicators and the indicators of the Global Reporting Initiative (GRI)

Page	Air Liquide indicators	GRI indicators
<b>Human Resources</b>		
299	Group employees	102-8
281	Breakdown of employees by geographic region	102-8
299	Turnover of employees (leaving the Group)	401-1
281	Distribution of employees by age bracket	405-1
300	Retention rate of managers and professionals	401-1
299	Percentage of women in the Group	405-1
300	Percentage of women among managers and professionals	405-1
300	Average number of days of training per employee, per year	404-1
300	Percentage of employees who have had an annual performance review meeting with their direct supervisor	404-3
300	Diversity indicator (number of nationalities)	405-1
<b>Safety</b>		
292	Number of lost-time accidents of Group employees	403-9
292	Frequency of lost-time accidents of Group employees	403-9
292	Number of lost-time accidents of subcontractors and temporary workers	403-9
<b>Energy and environment</b>		
295	Total annual electricity consumption	302-1
295	Total annual thermal energy consumption	302-1
295	Evolution of energy consumption per m <sup>3</sup> of air gas produced (ASU)	302-3
295	Evolution of energy consumption per m <sup>3</sup> of hydrogen produced (HyCO)	302-3
294	Evolution of the distance traveled per ton of gas delivered	302-5
276	Total annual water consumption	303-5
276	Total annual water withdrawal	303-3
276	Total annual water discharge	303-4
295	Total direct greenhouse gas emissions	305-1
295	Total indirect greenhouse gas emissions	305-2
295	Total direct and indirect greenhouse gas emissions	305-1/2
296	Discharge into the atmosphere (NOx)	305-7
296	Discharge into the atmosphere (SOx)	305-7
76	Avoided CO <sub>2</sub> emissions in Air Liquide operations and at customers' facilities	305-5
296	Estimate of discharge into the atmosphere (VOCs)	305-7
296	Discharge to water (oxidizable matter, suspended solids)	306-1
296	Total mass of waste by type and waste treatment	306-2
<b>Transportation</b>		
294	Estimate of CO <sub>2</sub> emissions generated by truck delivery	305-1
294	Estimate of avoided CO <sub>2</sub> emissions through on-site units	305-5
<b>Social</b>		
300	% of employees belonging to an entity with a local Code of Conduct	205-1



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# ANNUAL GENERAL MEETING 2019

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## BOARD OF DIRECTORS' REPORT ON THE RESOLUTIONS PRESENTED TO THE COMBINED SHAREHOLDERS' MEETING – MAY 7, 2019

### Results for the fiscal year

The financial statements of L'Air Liquide S.A. that have been prepared by applying the methods provided for by law and the standards of the French General Chart of Accounts are attached to this report – pages 253 and 254.

Revenue for the fiscal year ended December 31, 2018 amounted to 110.3 million euros, compared to 139.3 million euros in 2017, down by -20.8%.

The income from French and foreign equity securities amounted to 330.9 million euros, compared to 988.5 million euros in 2017.

Net profit for the fiscal year ended December 31, 2018 amounted to 544.8 million euros, compared to 1,149.8 million euros in 2017.

In 2017 and 2018, L'Air Liquide S.A. net profit is impacted by exceptional items.

Consolidated revenue in 2018 amounted to 21,011.1 million euros, compared to 20,349.3 euros in 2017, up +3.3%. After adjusting for the cumulative impact of foreign exchange fluctuations, revenues was up +6.9%. The latter essentially stemmed from the depreciation of the US Dollar, Argentinian peso and the Brazilian real against the euro.

Consolidated net profit, after deduction of minority interests, amounted to 2,113.4 million euros, compared to 2,199.6 million euros in 2017, down by -3.9%.

These results are detailed in the Management Report and the financial statements.

### Information on share capital

#### AMOUNT OF SHARE CAPITAL HELD BY EMPLOYEES

Please refer to the chapter "Additional Information" of this Reference Document – page 339.

#### CROSSING OF SHARE CAPITAL AND VOTING RIGHTS THRESHOLDS IN 2017

Please refer to the chapter "Additional Information" of this Reference Document – page 339.

### Investments and acquisition of controlling interests

In accordance with the provisions of article L. 233-6 of the French Commercial Code, there is no new transaction performed by L'Air Liquide S.A. in 2018.

### Resolutions within the authority of the Ordinary Shareholders' Meeting

We ask you, after having reviewed:

- the Reports of the Board of Directors;
- the Company's financial statements, income statement, balance sheet and notes thereto;
- the Group's consolidated financial statements;
- the Reports of the Statutory Auditors;

to approve the Company's financial statements and the consolidated financial statements for the year ended December 31, 2018 as presented, as well as the transactions set out in these financial statements or mentioned in these reports.

Your Company's net profit allows the Board to propose the payment of a dividend of 2.65 euros for each share entitled to a dividend, it being specified that in the event of a change in the number of shares entitled to a dividend compared to the 429,423,434 shares making up the share capital as of December 31, 2018, the overall dividend amount would be adjusted accordingly and the amount appropriated to the retained earnings account would be determined on the basis of the dividend effectively paid.

The proposed dividend amounts to 2.65 euros per share. The level of this dividend must be taken into account including the free share attribution of one share for 10 existing shares on October 9, 2019, subject to the necessary approvals by this Shareholders' Meeting.

The ex-dividend date will be set for May 20, 2019. The dividend payment date will be set for May 22, 2019.

In accordance with the provisions of article 243 bis of the French Tax Code, it is specified that this dividend is eligible in its entirety for the 40% allowance referred to in section 2° of paragraph 3 of article 158 of the French Tax Code.

In addition, shareholders who have held their shares in registered form for at least two years as of December 31, 2018 and who retain such shares in registered form up to the dividend payment date, shall be

entitled, for such shares (i.e. a total number of 128,524,663 shares at December 31, 2018), to a loyalty dividend of 10% compared with the dividend paid to the other shares, i.e. an additional dividend of 0.26 euro per share. In accordance with the provisions of article 243 bis of the French Tax Code, it is specified that this dividend is also eligible in its entirety for the 40% allowance referred to in section 2° of paragraph 3 of article 158 of the French Tax Code.

The difference between the loyalty dividend calculated on the number of shares known to exist at December 31, 2018 and the loyalty dividend actually paid will be allocated to the retained earnings account.

We also ask you to take due note of distributable earnings for the fiscal year. Such amount includes profits for fiscal year 2018 of 544,804,174 euros plus available retained earnings at December 31, 2018 of 6,207,721,088 euros, i.e. a total of 6,752,525,262 euros.

We propose to appropriate the distributable earnings for fiscal year 2018, i.e. 6,752,525,262 euros, as follows:

Legal reserve	564,237 euros
Retained earnings	5,880,572,513 euros
Dividend (including the loyalty dividend)	1,171,388,512 euros

## DISTRIBUTION

In accordance with French law, we wish to remind you that the distributions made in respect of the last three fiscal years were as follows:

	Total amount distributed <sup>(a)</sup> (in euros)	Number of shares concerned <sup>(b)</sup>	Dividend distributed eligible in its entirety for the 40% allowance referred to in article 158-3-2° of the French Tax Code (in euros)
<b>Fiscal year 2015</b>			
Ordinary dividend	894,823,802	344,163,001	2.60
Loyalty dividend	26,751,221	102,889,311	0.26
<b>Fiscal year 2016</b>			
Ordinary dividend	1,011,076,979	388,875,761	2.60
Loyalty dividend	26,595,971	102,292,196	0.26
<b>Fiscal year 2017</b>			
Ordinary dividend	1,135,253,508	428,397,550	2.65
Loyalty dividend	30,459,742	117,152,854	0.26

(a) Theoretical values calculated based on the number of shares as of December 31 for each fiscal year.

(b) Number of shares expressed historically as of December 31 for each fiscal year.

The amounts effectively paid after adjustment were as follows:

- fiscal year 2015 – ordinary dividend: 895,276,249 euros for 344,337,019 shares; loyalty dividend: 25,311,759 euros for 97,352,920 shares;
- fiscal year 2016 – ordinary dividend: 1,005,542,972 euros for 386,747,297 shares; loyalty dividend: 26,025,861 euros for 100,099,466 shares;
- fiscal year 2017 – ordinary dividend: 1,130,983,210 euros for 426,786,117 shares; loyalty dividend: 29,591,663 euros for 113,814,089 shares.

The adjustment arises from the change in the number of treasury shares, from the final determination of the loyalty dividend taking into account shares sold between January 1 and the ex-dividend date, from the exercise of options over this same period and the capital increase reserved for employees.



## BUYBACK BY THE COMPANY OF ITS OWN SHARES

### A. Information on the completion of the Company's share buyback program (pursuant to article L. 225-211 of the French Commercial Code)

The Combined Shareholders' Meeting of May 16, 2018 authorized the Board, for a period of 18 months, in accordance with articles L. 225-209 et seq. of the French Commercial Code and the directly applicable provisions of EC Regulation No. 596/2014 of April 16, 2014, to allow the Company to repurchase its own shares in order to:

- cancel them;
- tender them following the exercise of rights attached to marketable securities conferring entitlement to Company shares by redemption, conversion, exchange, presentation of a warrant or any other means;
- implement (i) any share purchase option plans or (ii) plans for free share attributions, or (iii) any employee share ownership transactions reserved for members of a Company Savings Plan, performed through the transfer of shares acquired previously by the Company, or providing for a free share grant in respect of a contribution in shares by the Company and/or to replace the discount, or (iv) allocation of shares to employees and/or Executive Officers of the Company and affiliated companies, in accordance with the laws and regulations in force;
- maintain an active market in the Company's shares pursuant to a market liquidity contract in accordance with an Ethics Charter recognized by the French financial market authority (Autorité des marchés financiers).

The maximum purchase price was set at 165 euros per share, and the maximum number of shares that can be bought back was set at 10% of the total number of shares making up the share capital as of December 31, 2017, namely 42,839,755 shares for a maximum total amount of 7,068,559,575 euros, subject to the legal limits.

These shares could be purchased at any time, excluding the periods for takeover bids on the Company's share capital, on one or more occasions and by all available means, either on or off a stock exchange, over-the-counter, including the purchase of blocks of shares, or through the use of derivative financial instruments, and, if applicable, by all third parties acting on behalf of the Company, under the conditions stipulated in the provisions of the final paragraph of article L. 225-206 of the French Commercial Code.

Pursuant to this authorization and the previous delegation authorized by the Combined Shareholders' Meeting of May 3, 2017,

- a liquidity contract was set up which led to the following movements during the 2018 fiscal year:
  - 1,073,980 shares were purchased for a total price of 113,264,915 euros, or an average purchase price of 105.46 euros;
  - 1,072,480 shares were sold for a total price of 113,110,379 euros, or an average purchase price of 105.47 euros.
- On February 19, 2018, under the share buyback program, 630,000 shares were bought back for a total amount of 63,164,120 euros, i.e. an average cost of 100.2605 euros per share, representing 0.15% of the share capital as of December 31, 2017.

No other shares were bought before the end of fiscal year 2018.

The total cost of the buybacks was thus limited to 176,429,035 euros.

The total amount of the transaction fees (exclusive of taxes) was 0.2 million euros.

- In addition, during the fiscal year, the Company proceeded to the tender of treasury shares to beneficiaries of performance share plans as follows:
  - 90,931 shares vested under the 2015 performance share plan ("France" Plan);
  - 94,634 shares vested under the 2014 performance share plan ("World" Plan);
  - 1,111 shares tendered under the 2015 performance share plan ("PPR" Plan); and
  - 18 shares granted following one death under the 2017 performance share plan ("France" Plan).

As of December 31, 2018, the Company directly owned 1,234,488 shares at an average purchase price of 95.80 euros, i.e. a balance sheet value of 118,265,288 euros. These shares, each with a par value of 5.50 euros, represented 0.29% of the Company's share capital.

1,234,488 of these shares are assigned for implementation of any performance share plans.

Under the liquidity contract, as of December 31, 2018 a total of 9,500 shares were on the balance sheet for a net value of 1,006,876 euros.

### B. Draft resolution

As the authorization granted by the Ordinary Shareholders' Meeting of May 16, 2018 was partially used, the Board proposes to replace it with a new authorization to allow the Company to repurchase its own shares in order to:

- cancel them, subject to the adoption of the 10<sup>th</sup> resolution;
- tender them following the exercise of rights attached to marketable securities conferring entitlement to Company shares by redemption, conversion, exchange, presentation of a warrant or any other means;
- implement (i) any share purchase option plans or (ii) plans for free share attributions, or (iii) any employee share ownership transactions reserved for members of a company savings plan, performed under the terms and conditions set forth in articles L. 3331-1 et seq. of the French Labor Code through the transfer of shares bought back previously by the Company under this resolution, or providing for free share attributions in respect of a contribution in shares by the Company and/or to replace the discount; or (iv) share grants to employees and/or Executive Officers of the Company and affiliated companies, in accordance with the laws and regulations in force;
- maintain an active market in the Company's shares pursuant to a market liquidity contract in accordance with an Ethics Charter recognized by the French financial market authority (Autorité des marchés financiers).

The maximum purchase price will be set at 165 euros (excluding acquisition costs) per share with a par value of 5.50 euros per share, and the maximum number of shares that can be bought back will be



set at 10% of the total number of shares making up the share capital as of December 31, 2018, or 42,942,343 shares with a par value of 5.50 euros, for a maximum total amount of 7,085,486,595 euros, subject to the legal limits.

As the objective of retaining shares and subsequently tendering them within the scope of external growth transactions is no longer considered an accepted market practice under the new European regulations, it has not been maintained in the draft resolution.

As in previous years, the resolution stipulates that the authorization does not apply during takeover bid periods. These shares may thus be purchased at any time, excluding the periods for takeover bids on the Company's share capital, on one or more occasions and by all available means, either on or off a stock exchange, over-the-counter, including the purchase of blocks of shares, or through the use of derivative financial instruments, and, if applicable, by all third parties acting on behalf of the Company, under the conditions stipulated in the provisions of the last paragraph of article L. 225-206 of the French Commercial Code.

Shares bought back may be commuted, assigned or transferred in any manner on or off a stock exchange or over-the-counter, including the sale of blocks of shares, in accordance with the applicable regulations.

Dividends on treasury shares held by the Company shall be allocated to retained earnings.

This authorization shall be granted for a period of 18 months starting from the date of this Shareholders' Meeting. It shall be valid as of the date of the Board of Directors meeting called to decide on the implementation of the share buyback program and, at the latest, as of November 15, 2019. It supersedes the authorization granted by the Ordinary Shareholders' Meeting of May 16, 2018 in its 4<sup>th</sup> resolution with respect to its non-utilized portion.

## RENEWAL OF THE TERMS OF OFFICE OF BOARD OF DIRECTOR MEMBERS

The 5<sup>th</sup> and 6<sup>th</sup> resolutions concern the renewal, as members of the Company's Board of Directors, for a period of four years, of the respective terms of office of Siân Herbert-Jones and Geneviève Berger that expire at the end of this Shareholders' Meeting.

Siân Herbert-Jones has been an independent Director on the Board of Directors since May 2011 and Chairman of the Audit and Accounts Committee since May 2015. She provides the Board of Directors with her financial expertise, strong audit skills and her knowledge of the Services sector. A British citizen, Siân Herbert-Jones also brings her multi-cultural expertise to the Board, as well as her experience acquired within major international companies.

Geneviève Berger has been an independent Director on the Board of Directors since May 2015 and a member of the Environment and Society Committee since May 2017. She provides the Board of Directors with her expertise in the fields of healthcare and research. Geneviève Berger also brings to the Board expertise acquired within major international companies.

## REGULATED AGREEMENTS AND COMMITMENTS

During the 2018 fiscal year, no new regulated agreement, other than those already approved by the May 16, 2018 Shareholders' Meeting, was submitted for the approval of the Board of Directors.

As provided by law, the Board of Directors carried out an annual review of agreements entered into and approved during previous fiscal years which continued to be applied during the year ended December 31, 2018.

In the 7<sup>th</sup> resolution, you are asked to take note that the Statutory Auditors' Special Report on regulated agreements and commitments does not mention any new agreement.

The Statutory Auditors' Special Report on regulated agreements and commitments is included in the 2018 Reference Document and is available on the Company's website.

## APPROVAL OF THE REMUNERATION OF THE COMPANY'S EXECUTIVE OFFICERS FOR THE 2018 FISCAL YEAR

Pursuant to article L. 225-100 of the French Commercial Code, shareholders are asked in the 8<sup>th</sup> resolution to approve the fixed, variable and exceptional components of the total remuneration and other benefits paid or awarded to Benoît Potier in respect of the 2018 fiscal year. It is specified that no exceptional remuneration has been paid or awarded in 2018.

The components of remuneration are described in the Report on corporate governance included in the 2018 Reference Document and are summarized in the 2019 Invitation to Shareholders' Meeting. They were paid or awarded in line with the remuneration policy approved by the Shareholders' Meeting on May 16, 2018.

## APPROVAL OF THE REMUNERATION POLICY APPLICABLE TO THE EXECUTIVE OFFICERS FOR THE 2019 FISCAL YEAR

Pursuant to article L. 225-37-2 of the French Commercial Code, shareholders are asked in the 9<sup>th</sup> resolution to approve for the 2019 fiscal year, the principles and criteria for determining, distributing and allocating the fixed, variable and exceptional components of the total remuneration and other benefits allocated to Executive Officers and applicable to Benoît Potier in respect of his term of office as Chairman and Chief Executive Officer, as described in the Report on Corporate Governance of the 2018 Reference Document and summarized in the 2019 Invitation to Shareholders' Meeting.

## Resolutions within the authority of the Extraordinary Shareholders' Meeting

### AUTHORIZATION TO REDUCE THE SHARE CAPITAL BY CANCELLATION OF TREASURY SHARES

You are asked, in the 10<sup>th</sup> resolution, to authorize the Board of Directors to cancel, at its sole discretion, on one or more occasions, and within the limit of 10% of the Company's share capital per 24-month period, any or all of the shares bought back by the Company within the scope of the authorization adopted by this Ordinary Shareholders' Meeting in its 4<sup>th</sup> resolution and those shares bought back within the scope of the authorizations adopted by the Ordinary Shareholders' Meetings of May 3, 2017 and May 16, 2018, and to reduce the share capital by this amount.

The difference between the carrying amount of the canceled shares and their par value will be allocated to reserve or additional paid-in capital accounts.

This authorization shall be granted for a period of 24 months starting from the date hereof and supersedes the authorization granted by the Extraordinary Shareholders' Meeting of May 16, 2018 in its 15<sup>th</sup> resolution with respect to the non-utilized portion of such authorization.

### INCREASE IN SHARE CAPITAL VIA THE ISSUANCE OF ORDINARY SHARES OR MARKETABLE SECURITIES CONFERRING ENTITLEMENT TO THE COMPANY'S SHARE CAPITAL, WITH RETENTION OF SHAREHOLDERS' PREFERENTIAL SUBSCRIPTION RIGHTS

The Extraordinary Shareholders' Meeting of May 3, 2017 had delegated to the Board of Directors the authority to decide to increase share capital for a maximum nominal amount of 530 million euros corresponding to around 25% of share capital as of December 31, 2016, by issuing, on one or more occasions, shares or marketable securities conferring entitlement, immediately or in the future, to the Company's shares, with retention of shareholders' preferential subscription rights. This authorization, granted for 26 months, is due to expire.

The Group has not made use of the previous delegation.

To finance the Group's growth investments, shareholders are asked in the 11<sup>th</sup> resolution to renew the delegation granted to the Board of Directors to increase the share capital for a maximum nominal amount of 470 million euros corresponding to around 20% of the share capital as of December 31, 2018 by issuing, on one or more occasions, ordinary shares or compound dilutive marketable securities. The shareholders shall have, in proportion to the amount of shares they own, a preferential subscription right to the shares or to the marketable securities issued.

This delegation of authority is valid for a period of 26 months.

The total amount of capital increases carried out pursuant to the 12<sup>th</sup> resolution below and any resolutions allowing employees and Executive Officers to benefit from shares (18<sup>th</sup> and 19<sup>th</sup> resolutions of

the May 12, 2016 Extraordinary Shareholders' Meeting and 13<sup>th</sup> and 14<sup>th</sup> resolutions submitted to this Shareholders' Meeting for approval), and resolutions which allow the implementation of employee share ownership transactions (15<sup>th</sup> and 16<sup>th</sup> resolutions submitted to this Shareholders' Meeting for approval) is also deducted from this ceiling of 470 million euros.

As in 2017, in order to provide shareholders with the right to express an opinion on the issues subject to this delegation of authority during periods of takeover bids, it is proposed that this delegation of authority is suspended during periods of takeover bids.

In the event of oversubscription, the 12<sup>th</sup> resolution authorizes the amount of the issue to be increased, within the legal limits of 15% of the ceiling of 470 million euros.

### ATTRIBUTION OF SHARE SUBSCRIPTION OPTIONS OR SHARE PURCHASE OPTIONS AND PERFORMANCE SHARES

The Company's allotment policy for options and performance shares, pursuant to the recommendations of the AFEP/MEDEF Code, is described in detail in this Reference Document – page 164 and specifically for Executive Officers pages 159 and 160.

Each year, the Group offers stock option and performance share plans which are aimed, in addition to the grant of incentives and profit-sharing, at involving the employees more in the Company's performance.

In order to maintain this allotment policy, shareholders are invited to renew the existing authorizations.

As previously, performance conditions are calculated over three years and are applicable to all options and performance shares attributed to any beneficiary. They are set at the beginning of the year, during the February meeting of the Board of Directors, in order to have a reference period of three full years.

Therefore, as from the 2019 stock-option and performance annual share plans, the EPS (Earning Per Share) performance condition will be replaced by the ROCE (Return on Capital Employed, which is thus no longer part of the short term variable remuneration criteria). The TSR (Total Shareholder Return) criterion remains a performance condition of the stock-option and performance share plans.

Moreover, the Board proposes that a deduction of one third to each of the sub-limits for allocations to Executive Officers is submitted to the Shareholders' Meeting to bring them in line with historic practices in terms of allocations to Executive Officers. As previously, the Board of Directors sets annual limits which are considerably lower than these sub-limits. Furthermore, these allocations to Executive Officers come with strict holding requirements for existing securities.

Moreover, since 2018, the allotment of LTI (long-term incentive) to Executive Officers is subject to the pro rata principle. In practice, in the event an Executive Officer leaves the Group for a reason other than resignation or removal from office for serious cause, the total rate of

allocation (after applying the performance conditions) is reduced on a prorated basis to the number of months during which the Executive Officer was effectively present at the Group during the assessment period for the performance criteria.

Finally, according to the principle adopted since 2016, the allocation of stock options and performance shares to an Executive Officer and the changes therein over time are assessed in terms of the IFRS valuation.

The purpose of the 13<sup>th</sup> resolution is to renew, for a period of 38 months, the authorization given to the Board of Directors in 2016 to grant Company share subscription options or share purchase options, in favor of employees and Executive Officers. Pursuant to the draft resolution, the total number of options that may be granted is maintained at 2% of the share capital over a period of 38 months and the maximum number of options that may be granted to Executive Officers is set at 0.2% of the share capital (compared with 0.3% previously) over the same period.

The purpose of the 14<sup>th</sup> resolution is to renew, for a period of 38 months, the authorization given to the Board of Directors in 2016 to grant performance shares of the Company in favor of employees and Executive Officers. Pursuant to the draft resolution, the total number of shares that may be allocated is maintained at 0.5% of the share capital over a period of 38 months and the maximum number of shares that may be granted to Executive Officers is set at 0.1% of the share capital (compared with 0.15% previously) over the same period.

### **CAPITAL INCREASE RESERVED FOR EMPLOYEES WITH CANCELLATION OF SHAREHOLDER PREFERENTIAL SUBSCRIPTION RIGHTS**

In accordance with legal provisions, these draft resolutions are submitted again to the vote at the Shareholders' Meeting. The two resolutions proposed to the Shareholders' Meeting are identical to those approved on May 3, 2017.

The previous employee share ownership transaction was carried out in November 2018 in accordance with the authorization granted by the May 3, 2017 Shareholders' Meeting. The share subscription price was set at 87.09 euros (92.53 euros for the United States) per share. 19,078 employees (and retired employees) across 72 countries representing 29.39% of eligible employees subscribed to this operation.

Shareholders, having read the Board of Directors' Report and the Statutory Auditors' Special Report, are therefore asked to authorize the Board of Directors to decide one or more share capital increases, at the time or times and in the proportions that it deems appropriate, via the issuance of ordinary shares of the Company, as well as other marketable securities granting access to the Company's share capital, reserved for:

- under the 15<sup>th</sup> resolution, the members, from the Company and the French or foreign companies which are affiliated to it within the meaning of article L. 225-180 of the French Commercial Code and article L. 3344-1 of the French Labor Code, of a Company or Group Savings Plan (directly or through a Company mutual fund or all other structures or entities permitted by applicable legal or regulatory provisions). The delegation shall be valid for a period of 26 months starting from the date of this Shareholders' Meeting;
- under the 16<sup>th</sup> resolution, a category of beneficiaries, defined as any bank or subsidiary of such an institution mandated by the Company, which would subscribe to shares, or other share capital issued by

the Company pursuant to the 15<sup>th</sup> resolution, with the sole intent of enabling employees and Executive Officers of foreign companies, affiliated to the Company within the meaning of article L. 225-180 of the French Commercial Code and article L. 3344-1 of the French Labor Code, to benefit from a plan with an economic profile comparable to an employee share ownership scheme that would be set up in connection with a share capital increase undertaken in accordance with the 15<sup>th</sup> resolution of this Shareholders' Meeting, taking into account the regulatory and fiscal and/or social framework applicable in the country of residence of the employees and Executive Officers of the aforementioned foreign companies. The delegation shall be valid for a period of 18 months starting from the date of this Shareholders' Meeting.

The Board of Directors shall be competent to determine, within those categories, the identity of the beneficiaries of these share capital increases.

The total amount of share capital increases likely to be performed in accordance with these two resolutions may not exceed a maximum nominal amount of 22 million euros, corresponding to the issue of a maximum of 4 million shares. Furthermore, the maximum nominal amount of share capital increases likely to be performed on the basis of these two resolutions shall be deducted from the overall limit stipulated in paragraph 2 of the 11<sup>th</sup> resolution subject the approval of this Shareholders' Meeting. In the event that they are used, the proposed resolutions will automatically result in the cancellation of the shareholders' preferential subscription rights in favor of the above-mentioned beneficiaries.

The subscription price of the shares that would be issued pursuant to these two resolutions may not exceed the average, determined in accordance with article L. 3332-19 of the French Labor Code, of the opening trading prices for the Company's share during the 20 stock market trading days preceding the date of the decision setting the opening date for the subscription to a share capital increase made on the basis of the 15<sup>th</sup> resolution, or be more than 20% lower than such average, bearing in mind that the shareholders will officially authorize the Board of Directors, if deemed appropriate, to reduce or cancel the aforementioned discount, within the legal, regulatory and tax limits under the applicable foreign law. In accordance with article L. 3332-21 of the French Labor Code, the Board of Directors may provide for the attribution, on a bonus basis, to the beneficiaries referred to in the 15<sup>th</sup> resolution, of shares to be issued or already issued or other marketable securities granting access to the Company's share capital to be issued or already issued, in respect of (i) the contribution that could be paid in accordance with the regulations governing Company or Group Saving Plans, and/or (ii) where appropriate, the discount.

Should the beneficiaries referred to in the 15<sup>th</sup> resolution not subscribe to the entire share capital increase within the allotted deadlines, the share capital increase would only be performed for the amount of the shares subscribed, and the non-subscribed shares may be offered again to the beneficiaries concerned within the scope of a subsequent share capital increase.

Finally, the shareholders shall grant full powers to the Board of Directors, with the option of sub-delegation under the conditions determined by law, to set, within the limits described above, the various terms and conditions governing the implementation of the two proposed resolutions.

## — RESOLUTIONS PRESENTED FOR THE APPROVAL — OF THE COMBINED SHAREHOLDERS' MEETING — MAY 7, 2019

### Ordinary Shareholders' Meeting

#### Resolutions 1 and 2 Approval of the financial statements for the year

##### Purpose

Shareholders are asked in the 1<sup>st</sup> and 2<sup>nd</sup> resolutions to approve both the Company and consolidated financial statements of Air Liquide for the year ended December 31, 2018, as presented in chapter 3 of the 2018 Reference Document.

##### FIRST RESOLUTION

##### (Approval of the Company financial statements for the year ended December 31, 2018)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, having reviewed:

- the Reports of the Board of Directors and the Statutory Auditors;
- the Company's financial statements, income statement, balance sheet and notes thereto;

approve the Company's financial statements for the year ended December 31, 2018 as presented, and approve the transactions reflected in these financial statements or mentioned in these reports.

The shareholders determined the amount of net earnings for the fiscal year at 544,804,174 euros.

##### SECOND RESOLUTION

##### (Approval of the consolidated financial statements for the year ended December 31, 2018)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, having reviewed:

- the Reports of the Board of Directors and the Statutory Auditors;
- the Group's consolidated financial statements;

approve the consolidated financial statements for the year ended December 31, 2018 as presented.

## Resolution 3 Appropriation of earnings and setting of the dividend

### Purpose

In the **3<sup>rd</sup> resolution**, shareholders are asked to **approve the distribution of a dividend of 2.65 euros per share**, stable compared to previous year.

This level of dividend also takes into account this year the attribution of one free share for 10 existing shares on October 9, 2019, pursuant to the authorization granted by the Extraordinary Shareholders' Meeting on May 16, 2018 in its 16<sup>th</sup> resolution.

**A loyalty dividend of 10%, i.e. 0.26 euro per share**, shall be granted to shares which have been held in registered form since December 31, 2016 and which remain held in this form continuously until May 22, 2019, the dividend payment date. As of December 31, 2018, 29.93% of the shares making up the share capital are likely to benefit from this loyalty dividend.

With an **estimated pay-out ratio of 55% of the Group's published net profit**, the proposed dividend is an integral part of Air Liquide's policy to reward and grow shareholder portfolios over the long term.

The ex-dividend date will be set for May 20, 2019. The dividend payment date will be set for May 22, 2019.

### THIRD RESOLUTION

#### (Appropriation of 2018 earnings and setting of the dividend)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, having noted that, considering the fiscal year 2018 earnings of 544,804,174 euros and the retained earnings of 6,207,721,088 euros as of December 31, 2018, distributable earnings for the year amount to a total of 6,752,525,262 euros, approve the proposals of the Board of Directors regarding the appropriation of earnings. The shareholders hereby decide to appropriate distributable earnings as follows:

Legal reserve	564,237 euros
Retained earnings	5,580,572,513 euros
Dividend (including the loyalty dividend)	1,171,388,512 euros

Hence, a dividend of 2.65 euros shall be paid to each of the shares conferring entitlement to a dividend, it being specified that in the event of a change in the number of shares conferring entitlement to a dividend compared to the 429,423,434 shares making up the share capital as of December 31, 2018, the overall dividend amount would be adjusted accordingly and the amount appropriated to the retained earnings account would be determined on the basis of the dividend effectively paid.

The dividend payment date will be set for May 22, 2019:

- for direct registered shares: directly by the Company, based on the means of payment indicated by the holders;
- for intermediary registered shares, as well as for bearer shares which are registered in shareholder accounts: by the authorized intermediaries to whom the management of these shares has been entrusted.

The dividend distributions made with respect to the last three fiscal years are as follows:

	Total amount distributed <sup>(a)</sup> (in euros)	Number of shares concerned <sup>(b)</sup>	Dividend distributed eligible in its entirety for the 40% allowance referred to in article 158-3-2° of the French Tax Code (in euros)
<b>Fiscal year 2015</b>			
Ordinary dividend	894,823,802	344,163,001	2.60
Loyalty dividend	26,751,221	102,889,311	0.26
<b>Fiscal year 2016</b>			
Ordinary dividend	1,011,076,979	388,875,761	2.60
Loyalty dividend	26,595,971	102,292,196	0.26
<b>Fiscal year 2017</b>			
Ordinary dividend	1,135,253,508	428,397,550	2.65
Loyalty dividend	30,459,742	117,152,854	0.26

(a) Theoretical values calculated based on the number of shares as of December 31 for each fiscal year.

(b) Number of shares expressed historically as of December 31 for each fiscal year.

The amounts effectively paid after adjustment were as follows:

- fiscal year 2015 – ordinary dividend: 895,276,249 euros for 344,337,019 shares; loyalty dividend: 25,311,759 euros for 97,352,920 shares;

- fiscal year 2016 – ordinary dividend: 1,005,542,972 euros for 386,747,297 shares; loyalty dividend: 26,025,861 euros for 100,099,466 shares;

- fiscal year 2017 – ordinary dividend: 1,130,983,210 euros for 426,786,117 shares; loyalty dividend: 29,591,663 euros for 113,814,089 shares.

The adjustment arises from the change in the number of treasury shares, from the final determination of the loyalty dividend taking into account shares sold between January 1 and the ex-dividend date, from the exercise of options over this same period and the capital increase reserved for employees.



Pursuant to the provisions of the articles of association, a loyalty dividend of 10%, i.e. 0.26 euro per share with a par value of 5.50 euros, shall be granted to shares which have been held in registered form since December 31, 2016, and which remain held in this form continuously until May 22, 2019, the dividend payment date.

In accordance with the provisions of article 243 bis of the French Tax Code, it is specified that the ordinary and loyalty dividends are also in their entirety eligible for the 40% allowance referred to in section 2° of paragraph 3 of article 158 of the aforementioned Code, which is applicable, under certain conditions, when the progressive rate is applied.

The total amount of the loyalty dividend for the 128,524,663 shares which have been held in registered form since December 31, 2016, and which remained held in this form continuously until December 31, 2018, amounts to 33,416,412 euros.

The total loyalty dividend corresponding to these 128,524,663 shares that cease to be held in registered form between January 1, 2019 and May 22, 2019, the dividend payment date, shall be deducted from the aforementioned amount.

## Resolution 4 Buyback by the Company of its own shares

### Purpose

The 4<sup>th</sup> resolution renews the authorization granted to the Board, for a term of 18 months, to allow the Company to buy back its own shares (including under a liquidity contract).

In 2018, the buyback program resulted in the purchase of 630,000 shares, representing 0.15% of the capital at December 31, 2017 and the cancellation of 654,000 shares.

Additionally, under the liquidity contract: 1.1 million shares were purchased and 1.1 million were sold. As of December 31, 2018, 9,500 shares were held under the liquidity contract.

As of December 31, 2018, the Company directly owned 1,234,488 shares assigned to the objective of implementation of any performance shares plan. **These shares represent 0.29% of the Company's share capital.** They do not have any voting rights and their related dividends are allocated to retained earnings.

The authorization referred to in the 4<sup>th</sup> resolution provides that the maximum purchase price is set at 165 euros (unchanged amount) per share and the maximum number of shares that can be bought back is limited to 10% of the total number of shares comprising the share capital as of December 31, 2018, i.e. 42,942,343 shares, for a maximum total amount of 7,085,486,595 euros.

The shares purchased may be canceled in order to offset, in the long term, the dilutive impact resulting from capital increases relating to employee share ownership transactions.

The objectives of the share buyback program are detailed below in the 4<sup>th</sup> resolution and the program description is available on the Company's website, [www.airliquide.com](http://www.airliquide.com), prior to the Shareholders' Meeting in the 2018 Reference Document.

As in previous years, the resolution stipulates that the authorization does not apply during takeover bid periods.

### FOURTH RESOLUTION

#### (Authorization granted to the Board of Directors for a period of 18 months to allow the Company to trade in its own shares)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors, in accordance with articles L. 225-209 et seq. of the French Commercial Code and the directly applicable provisions of European Commission Regulation No. 596/2014 of April 16, 2014, authorize the Board of Directors to allow the Company to repurchase its own shares in order to:

- cancel them, subject to the adoption of the tenth resolution;
- tender them following the exercise of rights attached to marketable securities conferring entitlement to Company shares by redemption, conversion, exchange, presentation of a warrant or any other means;
- implement (i) any share purchase option plans or (ii) plans for free share attributions, or (iii) any employee share ownership transactions reserved for members of a Company Savings Plan, performed under the terms and conditions set forth in articles L. 3331-1 et seq. of the French Labor Code through the transfer

of shares bought back previously by the Company under this resolution, or providing for free share attributions in respect of a contribution in shares by the Company and/or to replace the discount; or (iv) share grants to employees and/or Executive Officers of the Company or affiliated companies;

- maintain an active market in the Company's shares pursuant to a market liquidity contract in accordance with an Ethics Charter recognized by the French financial market authority (Autorité des marchés financiers).

The shareholders set the maximum purchase price at 165 euros (excluding acquisition costs) per share with a par value of 5.50 euros and the maximum number of shares that can be bought back at 10% of the total number of shares comprising the share capital at December 31, 2018, i.e. 42,942,343 shares with a par value of 5.50 euros, for a maximum total amount of 7,085,486,595 euros, subject to the legal limits.

These shares may be purchased at any time, excluding the periods for takeover bids on the Company's share capital, on one or more occasions and by all available means, either on or off a stock exchange, in private transaction, including the purchase of blocks of shares, or through

the use of derivative financial instruments, and, if applicable, by all third parties acting on behalf of the Company, under the conditions stipulated in the provisions of the final paragraph of article L. 225-206 of the French Commercial Code.

Shares bought back may be commuted, assigned or transferred in any manner on or off a stock exchange or through private transaction, including the sale of blocks of shares, in accordance with the applicable regulations.

Dividends on treasury shares held by the Company shall be allocated to retained earnings.

This authorization is granted for a period of 18 months starting from the date of this Shareholders' Meeting. It shall be valid as of the date of the Board of Directors meeting called to decide on the implementation of

the share buyback program and, at the latest, as of November 15, 2019. With effect from this date, it supersedes the authorization granted by the fourth resolution of the Ordinary Shareholders' Meeting of May 16, 2018 with respect to the non-utilized portion of such authorization.

The shareholders give full powers to the Board of Directors, with the possibility of delegating such powers, to implement this authorization, place orders for trades, enter into all agreements, perform all formalities and make all declarations with regard to all authorities and, generally, do all that is necessary for the execution of any of the Board's decisions made in connection with this authorization.

The Board of Directors shall inform the shareholders of any transactions performed in light of this authorization in accordance with applicable regulations.

## Resolutions 5 and 6 Renewal of the terms of office of Board of Director members

### Purpose

The 5<sup>th</sup> and 6<sup>th</sup> resolutions concern the renewal, of the terms of office of two Company Directors for a period of four years, for the respective terms of office of Siân Herbert-Jones and Geneviève Berger that expire at the end of this Shareholders' Meeting.

Siân Herbert-Jones has been an independent Director on the Board of Directors since May 2011 and Chairman of the Audit and Accounts Committee since May 2015. She provides the Board of Directors with her financial expertise, strong audit skills and her knowledge of the Services sector. A British citizen, Siân Herbert-Jones also brings her multi-cultural expertise to the Board, as well as her experience acquired within major international companies.

Geneviève Berger has been an independent Director on the Board of Directors since May 2015 and a member of the Environment and Society Committee since May 2017. She provides the Board of Directors with her expertise in the fields of healthcare and research. Geneviève Berger also brings to the Board expertise acquired within major international companies.

### FIFTH RESOLUTION

#### (Renewal of the term of office of Siân Herbert-Jones as Director)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors, decide to renew the term of office of Ms Siân Herbert-Jones as a Director for a term of four years, which will expire at the end of the 2023 Shareholders' Meeting, held to approve the financial statements for the fiscal year ending December 31, 2022.

### SIXTH RESOLUTION

#### (Renewal of the term of office of Geneviève Berger as Director)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors, decide to renew the term of office of Ms Geneviève Berger as a Director for a term of four years, which will expire at the end of the 2023 Shareholders' Meeting, held to approve the financial statements for the fiscal year ending December 31, 2022.



## Resolution 7 Regulated agreements and commitments

### Purpose

During the 2018 fiscal year, no new regulated agreement, other than those already approved by the May 16, 2018 Shareholders' Meeting, was submitted for the approval of the Board of Directors.

As provided by law, the Board of Directors carried out an annual review of agreements entered into and approved during previous fiscal years which continued to be applied during the year ended December 31, 2018.

In the **7<sup>th</sup> resolution**, you are asked to take note that the Statutory Auditors' Special Report on regulated agreements and commitments does not mention any new agreement.

The Statutory Auditors' Special Report on regulated agreements and commitments is included in chapter 5 of the 2018 Reference Document.

### SEVENTH RESOLUTION

**(Statutory Auditors' Special Report on agreements covered by articles L. 225-38 et seq. of the French Commercial Code)**

Auditors' Special Report on the agreements and transactions covered by articles L. 225-38 et seq. of the French Commercial Code required by the legal and regulatory provisions in force, and which makes no mention of any new agreement, has been submitted to them.

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, duly note that the Statutory

## Resolution 8 Approval of the remuneration of Executive Officers for the 2018 fiscal year

### Purpose

Pursuant to article L. 225-100 of the French Commercial Code, shareholders are asked in the **8<sup>th</sup> resolution** to approve the fixed, variable and exceptional components of the total remuneration and other benefits paid or awarded to Benoît Potier in respect of the 2018 fiscal year. It is specified that no exceptional remuneration has been paid or awarded in 2018.

The components of remuneration are described in the Report on Corporate Governance included in the 2018 Reference Document and are summarized in the 2019 Invitation to Shareholders' Meeting. They were paid or awarded in line with the remuneration policy approved by the Shareholders' Meeting on May 16, 2018.

### EIGHTH RESOLUTION

**(Approval of the elements of remuneration paid or awarded to Benoît Potier for the year ended December 31, 2018)**

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, approve, pursuant to article L. 225-100 of the French Commercial Code, the fixed, variable and exceptional components of the total remuneration and other benefits

paid or awarded to Mr Benoît Potier in respect of the 2018 fiscal year, as presented in the Company's 2018 Reference Document, chapter 2 "Corporate Governance", paragraph "Elements of the total remuneration and benefits of any kind paid or awarded to Mr Benoît Potier in respect of the 2018 fiscal year and on which the Shareholders' Meeting of May 7, 2019 is invited to vote".

## Resolution 9 Approval of the remuneration policy applicable to the Executive Officers for the 2019 fiscal year

### Purpose

Pursuant to article L. 225-37-2 of the French Commercial Code, shareholders are asked in the **9<sup>th</sup> resolution** to approve for the 2019 fiscal year, the principles and criteria for determining, distributing and allocating the fixed, variable and exceptional components of the total remuneration and other benefits allocated to Executive Officers and applicable to Benoît Potier in respect of his term of office as Chairman and Chief Executive Officer, as described in the Report on Corporate Governance included in the 2018 Reference Document and summarized in the 2019 Invitation to Shareholders' Meeting.

### NINTH RESOLUTION

#### (Approval of the remuneration policy applicable to the Executive Officers)

The shareholders, deliberating according to the quorum and majority required for Ordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors mentioned in article L. 225-37-2 of the French Commercial Code, approve the principles and criteria

for determining, distributing and allocating the fixed, variable and exceptional components of the total remuneration and other benefits allocated to Executive Officers as presented in the Company's 2018 Reference Document, chapter 2 "Corporate Governance", in the section covering the principles and criteria for the determination, distribution and allocation of the fixed, variable and exceptional elements of the total remuneration and the benefits of all kinds that may be granted to Executive Officers.

## Extraordinary Shareholders' Meeting

## Resolution 10 Authorization to reduce the share capital by cancellation of treasury shares

### Purpose

As is the case each year, we ask you, in the **10<sup>th</sup> resolution**, to authorize the Board of Directors to cancel any or all of the shares purchased in the share buyback program and reduce share capital under certain conditions, particularly in order to fully offset, where necessary, any potential dilution resulting from capital increases relating to employee share ownership transactions.

The difference between the carrying amount of the canceled shares and their nominal amount will be allocated to reserve or additional paid-in capital accounts. This authorization granted to the Board of Directors will be for a period of 24 months.

### TENTH RESOLUTION

#### (Authorization granted to the Board of Directors for a period of 24 months to reduce the share capital by cancellation of treasury shares)

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors and the Statutory Auditors' Special Report, authorize the Board of Directors to cancel, via its decisions alone, on one or more occasions, and within the limit of 10% of the Company's share capital per 24-month period, any or all of the shares bought back by the Company within the scope of the authorization adopted by this Ordinary Shareholders' Meeting in its fourth resolution and of those shares bought back within the scope of the authorizations adopted by the Ordinary Shareholders' Meetings of May 3, 2017 and May 16, 2018 and to reduce the share capital by this amount.

The difference between the carrying amount of the canceled shares and their nominal amount will be allocated to any reserve or additional paid-in capital accounts.

This authorization is granted for a period of 24 months starting from the date of this Shareholders' Meeting. It supersedes the authorization granted by the Extraordinary Shareholders' Meeting of May 16, 2018 in its fifteenth resolution with respect to the non-utilized portion of such authorization.

Full powers are granted to the Board of Directors, with the possibility of sub-delegation under the conditions set by law, to implement this authorization, deduct the difference between the carrying amount of the shares canceled and their nominal amount from all reserve and additional paid-in capital accounts and to carry out the necessary formalities to implement the reduction in capital which shall be decided in accordance with this resolution and amend the articles of association accordingly.

**Resolutions 11 and 12** Increase in share capital via the issuance of ordinary shares or marketable securities conferring entitlement to the Company's share capital, with retention of preferential subscription rights

### Purpose

To finance the Group's growth investments, shareholders are asked in the **11<sup>th</sup> resolution** to renew the delegation granted to the Board of Directors to increase the share capital for a maximum nominal amount of 470 million euros corresponding to around 20% of the share capital as of December 31, 2018 by issuing, on one or more occasions, ordinary shares or compound dilutive marketable securities. The shareholders shall have, in proportion to the amount of shares they own, a preferential subscription right to the shares or to the marketable securities issued.

The Group has not made use of the previous delegation approved by the May 3, 2017 Extraordinary Shareholders' Meeting.

This delegation of authority is valid for a period of 26 months.

The total amount of capital increases carried out pursuant to the **12<sup>th</sup> resolution** below and any resolutions allowing employees and Executive Officers to benefit from shares (18<sup>th</sup> and 19<sup>th</sup> resolutions of the May 12, 2016 Extraordinary Shareholders' Meeting and 13<sup>th</sup> and 14<sup>th</sup> resolutions submitted to this Shareholders' Meeting for approval), and resolutions which allow the implementation of employee share ownership transactions (15<sup>th</sup> and 16<sup>th</sup> resolutions submitted to this Shareholders' Meeting for approval) is also deducted from this ceiling of 470 million euros.

As in 2017, in order to provide shareholders with the right to express an opinion on the issues subject to this delegation of authority during periods of takeover bids, it is proposed that this delegation of authority is suspended during periods of takeover bids.

In the event of oversubscription, the **12<sup>th</sup> resolution** authorizes the amount of the issue to be increased, within the legal limits of 15% of the ceiling of 470 million euros.

### ELEVENTH RESOLUTION

**(Delegation of authority granted to the Board of Directors for a period of 26 months in order to increase the share capital via the issuance of ordinary shares or marketable securities conferring entitlement, immediately and/or in the future, to the Company's share capital, with retention of preferential subscription rights for a maximum nominal amount of 470 million euros)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Board of Directors' Report and the Statutory Auditors' Special Report and in accordance with articles L. 225-129 to L. 225-129-6 and L. 228-91 to L. 228-93 of the French Commercial Code:

- delegate to the Board of Directors, with the option of subdelegation, in accordance with the legal provisions, the authority to decide, in the amount and on the dates it will determine, with retention of preferential share subscription rights, one or more capital increases via the issue, in France and other countries, in euros, foreign currencies or units of account determined according to several currencies, (i) of ordinary Company shares, (ii) of marketable securities governed by articles L. 228-91 et seq. of the French Commercial Code which are the Company's equity securities, granting access to other Company share capital and/or entitlement

to Company debt securities and/or (iii) of marketable securities representing a debt claim governed or not by articles L. 228-91 et seq. of the French Commercial Code, conferring entitlement to or likely to confer entitlement to share capital to be issued by the Company, these marketable securities could also potentially grant access to the Company's existing share capital and/or debt securities, the subscription of which may be completed in cash or by offsetting against liquid and payable debts.

The delegation thereby granted to the Board of Directors is valid for a period of 26 months starting from the date of this Shareholders' Meeting, it being specified however that the Board of Directors will not be authorized to make use of it during periods of takeover bids on the Company's share capital;

- decide that the total amount of share capital increases likely to be performed thereby immediately and/or in the future may not exceed the nominal amount of 470 million euros, from which shall be deducted (i) the issuance amount of shares or marketable securities in the event of oversubscription, pursuant to the twelfth resolution (or any resolution which would replace it at a later date), (ii) the issuance amount of shares arising from the options or performance shares granted under the eighteenth and nineteenth resolutions of the Extraordinary Shareholders' Meeting of May 12, 2016 and the thirteenth and fourteenth resolutions of this Shareholders'

Meeting subject to their approval (or any resolutions which would replace them at a later date), and (iii) the total amount of share capital increases performed in accordance with the fifteenth and sixteenth resolutions of this Shareholders' Meeting subject to their approval (or any resolutions which would replace them at a later date), this limit being increased by the number of shares necessary for adjustments likely to be made in accordance with applicable legislative and regulatory provisions and, as the case may be, in accordance with the contractual provisions providing for other cases of adjustment, to preserve the rights of holders of marketable securities conferring entitlement to the Company's shares; the maximum nominal amount (or its counter-value in euros on the issue decision date in the event of an issue in foreign currencies or units of account determined by reference to several currencies) of the marketable debt securities conferring entitlement to the Company's share capital issued by virtue of this delegation may not exceed a limit of 3 billion euros from which shall be deducted, as the case may be, the issuance amount, in the event of oversubscription, pursuant to the twelfth resolution below (or any resolution which would replace it at a later date);

- decide that the shareholders have, proportional to the amount of their shares, a preferential subscription right to the shares or marketable securities conferring entitlement, immediately and/or in the future, to the Company's shares issued pursuant to this resolution;
- decide that if the subscriptions made by the shareholders pro rata to their existing shareholding and, as the case may be, over and above their existing shareholding if allowed by the Board of Directors, have not resulted in the purchase of all of the shares or marketable securities defined above, the Board of Directors may use, in the order it shall deem appropriate, each or some of the options set forth in article L. 225-134 of the French Commercial Code;
- acknowledge and decide, as necessary, that all issuance decisions under this delegation of authority shall entail, to the benefit of the holders of issued marketable securities giving access, or likely to give access to equity securities to be issued by the Company, the waiver by Company shareholders of their preferential subscription rights to shares to be issued to which these marketable securities will give entitlement immediately and/or in the future;
- grant full powers to the Board of Directors, with the option of sub-delegation under the conditions set forth by law, to implement this delegation and specifically:
  - determine the price, the terms and conditions and dates of issues, and the form and characteristics of the marketable securities to be created,
  - set the amounts to be issued, suspend, where necessary, the exercise of Company share allotment rights attached to marketable securities to be issued within a period not exceeding three months, determine the terms and conditions ensuring, as the case may be, the preservation of rights of holders of marketable securities conferring future entitlement to Company

shares, in accordance with the legal, regulatory and, as the case may be, contractual provisions, proceed, where necessary, with any deductions from any issue premiums and specifically deductions of costs arising from issues,

- list, where necessary, the marketable securities to be issued for trading in a regulated market, make all necessary arrangements and enter into any agreements in order to successfully conclude the issues contemplated, duly record the share capital increases arising from any issue carried out via this delegation and amend the articles of association accordingly;
- take due note that this delegation supersedes the delegation granted by the Extraordinary Shareholders' Meeting of May 3, 2017 in its thirteenth resolution.

## TWELFTH RESOLUTION

**(Authorization granted to the Board of Directors for a period of 26 months to increase the issuance amount of equity securities or marketable securities in the event of oversubscription)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Board of Directors' Report and the Statutory Auditors' Special Report, and pursuant to the provisions of article L. 225-135-1 of the French Commercial Code, in the event of an issue of shares or marketable securities with retention of preferential subscription rights as provided by the eleventh resolution:

- authorize the Board of Directors, with the option of subdelegation, to increase, under the conditions set by the law, the number of shares or marketable securities to be issued with shareholders preferential subscription rights, at the same price as set for the initial issue, within the deadlines and limits set by the applicable regulations, it being specified however that the Board of Directors will not be authorized to make use of it during periods of takeover bids on the Company's share capital;
- decide that the nominal amount of the increase in the issue determined in accordance with this resolution shall be deducted from the initial limit and, in the event of an issue of debt securities, from the second limit stated in the eleventh resolution;
- decide that the authorization thereby granted to the Board of Directors is valid for a period of 26 months starting from the date of this Shareholders' Meeting.

## Resolutions 13 and 14 Grant of share subscription options or share purchase options and performance shares

### Purpose

Each year the Group offers stock option and performance share plans which are aimed, in addition to the grant of incentives and profit-sharing, at involving the employees more in the Company's performance.

In order to maintain this allotment policy, shareholders are invited to renew the existing authorizations.

As previously, performance conditions are calculated over three years and are applicable to all options and performance shares attributed to any beneficiary. They are set at the beginning of the year, during the February meeting of the Board of Directors, in order to have a reference period of three full years.

Therefore, as from the 2019 stock option and performance annual share plans, the EPS (Earning Per Share) performance condition will be replaced by the ROCE (Return on Capital Employed, which is thus no longer part of the short term variable remuneration criteria). The TSR (Total Shareholder Return) criterion remains a performance condition of the stock option and performance share plans.

Moreover, the Board proposes that a **deduction of one third** to each of the **sub-limits for allocations to Executive Officers** is submitted to the Shareholders' Meeting to bring them in line with historic practices in terms of allocations to corporate officers. As previously, the Board of Directors sets **annual allocation limits** which are considerably lower than these sub-limits. Furthermore, these allocations to Executive Officers come with strict holding requirements for existing securities.

Moreover, since 2018, the allotment of LTI (long-term incentive) to Executive Officers is subject to the **pro rata** principle. In practice, in the event an Executive Officer leaves the Group for a reason other than resignation or removal from office for serious cause, the total rate of allocation (after applying the performance conditions) is reduced on a pro rata basis to the number of months during which the Executive Officer was effectively present at the Group during the assessment period for the performance criteria.

Finally, according to the principle adopted since 2016, the allocation of stock options and performance shares to an Executive Officer and the changes therein over time are assessed in terms of the **IFRS valuation**.

The purpose of the **13<sup>th</sup> resolution** is to renew, for a period of 38 months, the authorization given to the Board of Directors in 2016 to grant Company share subscription options or share purchase options, in favor of employees and Executive Officers. Pursuant to the draft resolution, the total number of options that may be granted is maintained at 2% of the share capital over a period of 38 months and the maximum number of options that may be granted to Executive Officers is set at 0.2% of the share capital (compared with 0.3% previously) over the same period.

The purpose of the **14<sup>th</sup> resolution** is to renew, for a period of 38 months, the authorization given to the Board of Directors in 2016 to grant performance shares of the Company in favor of employees and Executive Officers. Pursuant to the draft resolution, the total number of shares that may be allocated is maintained at 0.5% of the share capital over a period of 38 months and the maximum number of shares that may be granted to Executive Officers is set at 0.1% of the share capital (compared with 0.15% previously) over the same period.

### THIRTEENTH RESOLUTION

**(Authorization granted to the Board of Directors for a period of 38 months to grant to employees and Executive Officers of the Group, or some of such employees and Executive Officers, share subscription options or share purchase options resulting in the waiver by shareholders of their preferential subscription rights to shares to be issued upon exercise of the subscription options)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors and the Statutory Auditors' Special Report:

- authorize the Board of Directors within the scope of articles L. 225-177 et seq. of the French Commercial Code to grant on one or more occasions, to employees and Executive Officers of the Company or its French and foreign subsidiaries within the meaning of article L. 225-180 of the French Commercial Code or some of such employees and Executive Officers, options

conferring entitlement to subscribe to new shares of the Company to be issued pursuant to an capital increase or options conferring entitlement to the purchase of existing Air Liquide shares bought back by the Company;

- decide that the total number of the options thus granted over a period of 38 months may not confer entitlement to a total number of shares exceeding 2% of the Company's share capital on the date the options are granted by the Board of Directors, bearing in mind that the number of options granted to the Company's Executive Officers, pursuant to this authorization, may not confer entitlement to a total number of shares exceeding 0.2% of the Company's share capital on the date the options are granted by the Board of Directors; the total numbers of shares thus determined do not take into account any adjustments that could be made in accordance with the applicable legal and regulatory provisions in order to preserve the rights of beneficiaries of the share subscription or share purchase options;
- decide that the maximum nominal amount of share capital increases performed on the basis of this authorization shall be



deducted from the overall limit stipulated in paragraph 2 of the eleventh resolution of this Extraordinary Shareholders' Meeting (or any resolution which would replace it at a later date);

- set the period of validity during which the options may be exercised at a maximum period of 10 years as from the date of their allocation by the Board of Directors, and grant full powers to the Board of Directors to set a shorter period;
- decide that this authorization is granted for a period of 38 months as from the date hereof. It shall entail an express waiver by the shareholders of their preferential subscription right to the shares that shall be issued as and when the options are exercised in favor of the share subscription option beneficiaries;
- decide that the Board of Directors, within the limits provided for by law and this resolution, shall set the conditions in which the options will be granted as well as the list of beneficiaries and the number of the options offered and shall determine the subscription or purchase price of the shares, which may not be lower than the average of the opening trading prices for the 20 trading days prior to the date when the option is granted, rounded down to the nearest euro, nor for share purchase options, the average purchase price of the Company's treasury shares, rounded down to the nearest euro. This price may not be modified unless the Company were to carry out one of the financial or securities transactions provided for by law. In such a case, the Board of Directors would make an adjustment, under the conditions provided for in the regulations, to the number and the price of the shares covered by the options granted, in order to take into account the impact of the transaction; it may furthermore, in such a case, if it were to consider it necessary, temporarily suspend the right to exercise the options during the period of such transaction;
- grant full powers to the Board of Directors, with the option of sub-delegation under the conditions set by law, to, where necessary, deduct the share capital increase costs from the amount of additional paid-in capital relating to such increases, complete or have completed all actions and formalities in order to record the share capital increase(s) resulting from the exercise of share subscription options and amend the articles of association accordingly.

This authorization supersedes the authorization granted by virtue of the eighteenth resolution of the Extraordinary Shareholders' Meeting of May 12, 2016, for its non-utilized part.

#### FOURTEENTH RESOLUTION

**(Authorization granted to the Board of Directors for a period of 38 months to grant existing or new shares to employees and Executive Officers of the Group, or some of such employees or Executive Officers, resulting in the waiver by shareholders of their preferential subscription rights to the shares to be issued)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors and the Statutory Auditors' Special Report:

- authorize the Board of Directors, within the scope of articles L. 225-197-1 *et seq.* of the French Commercial Code, to proceed, on one or more occasions, to free share attribution of existing

or new shares to beneficiaries whom it will determine from among the employees and Executive Officers of the Company and entities affiliated with the Company within the meaning of article L. 225-197-2 of the aforementioned Code, under the conditions set out below;

- decide that the existing or new shares that are granted pursuant to this authorization may not represent more than 0.5% of the share capital on the date of the decision by the Board of Directors to grant them, bearing in mind that the shares granted to Executive Officers of the Company pursuant to this authorization may not represent more than 0.1% of the share capital on the date of the decision by the Board of Directors to grant them; the total numbers of shares thus determined do not take into account any adjustments that could be made in the event of a transaction involving the Company's share capital;
- decide that the maximum par value amount of share capital increases performed on the basis of this authorization shall be deducted from the overall limit stipulated in paragraph 2 of the eleventh resolution of this Extraordinary Shareholders' Meeting (or any resolution which would replace it at a later date);
- decide that the grant of such shares to their beneficiaries shall become definitive either:
  - at the end of a minimum vesting period of two years, it being specified that the beneficiaries shall then be required to hold such shares for a minimum period of two years as from their final grant date, or
  - for all or some of the shares granted, at the end of a minimum vesting period of four years, in which case no minimum holding period shall apply,

it being specified that the Board of Directors shall have the option to choose between these two possibilities and to use them alternatively or concurrently, and that it may, in either case, extend the vesting period, and, in the first case, extend the holding period and, in the second case, provide for a holding period;

- decide that the grant of such shares to their beneficiaries shall become definitive prior to the end of the above-mentioned vesting periods and that such shares shall be freely transferable in the event of disability of the beneficiary, under the conditions provided for by law;
- take due note that, in the event of the free attribution of new shares, this authorization shall entail, as and when such shares are definitively granted, an increase in capital by capitalization of additional paid-in capital, reserves or profits in favor of the beneficiaries of the shares and the correlative waiver by the shareholders of their preferential subscription rights to such shares in favor of the beneficiaries;
- grant full powers to the Board of Directors, with the possibility of sub-delegation under the conditions set by law, in order to implement this authorization. The Board of Directors shall have full powers in order to, in particular:
  - determine the identity of the beneficiaries, or the category or categories of beneficiaries, of the share attribution and the number of shares attributed to each of them,
  - set the conditions and, where applicable, the criteria for the attribution of shares,

- provide for the possibility to provisionally suspend the rights to the attribution under the conditions provided for by law and the applicable regulations,
- enter the free shares attributed in a registered account in the name of their holder, mentioning, where applicable, the holding period and the length of such period, and to waive the holding period for the shares in any circumstances in which this resolution or the applicable regulations make it possible to waive such holding period,
- provide for the possibility, if it deems necessary, to make adjustments to the number of free shares attributed in order to preserve the rights of the beneficiaries, depending on any transactions involving the Company's share capital carried out during the vesting period, as referred to in paragraph 2 of article L. 225-181 of the French Commercial Code, and under such conditions as it may determine,
- in the event of the issue of new shares, to deduct, where applicable, from additional paid-in capital, reserves or profits as it chooses, the amounts required to pay for such shares, record the completion of the capital increases carried out pursuant to this authorization, make the corresponding amendments to the articles of association and, in general, carry out all acts and complete all formalities that may be required.

This authorization is granted for a period of 38 months as from the date hereof and supersedes the authorization granted by virtue of the nineteenth resolution of the Extraordinary Shareholders' Meeting of May 12, 2016, for its non-utilized part.

## Resolutions 15 and 16 Capital increase reserved for employees

### Purpose

As provided by law, the resolution authorizing increases in share capital in favor of members of a Company Savings Plan approved during the Extraordinary Shareholders' Meeting of May 3, 2017, is resubmitted to you. The total nominal amount of share capital increases likely to be performed under this resolution is 22 million euros, corresponding to the issue of a maximum of 4 million shares, or 0.93% of the share capital as at December 31, 2018. This amount shall be deducted from the maximum nominal amount of 470 million euros, i.e. around 20% of the share capital, as stipulated in the 11<sup>th</sup> resolution of this Shareholders' Meeting relating to the overall limit for share capital increases likely to be performed with delegation to the Board of Directors.

The **15<sup>th</sup> resolution** outlines the conditions of share capital increases reserved for members of a Company or Group Savings Plan; it is accompanied in the **16<sup>th</sup> resolution** by a similar provision for Group employees and Executive Officers based abroad who cannot benefit from the shareholding mechanism which will be established pursuant to the **15<sup>th</sup> resolution**.

These two delegations will be valid for a period of 26 months for the **15<sup>th</sup> resolution** and for a period of 18 months for the **16<sup>th</sup> resolution**. They shall result in the waiver by shareholders of their preferential subscription rights in favor of the beneficiaries.

The previous employee share ownership transaction was carried out in November 2018 in accordance with the authorization granted by the May 3, 2017 Shareholders' Meeting. The share subscription price was set at 87.09 euros (92.53 euros for the United States) per share. 19,078 employees (and retired employees) across 72 countries representing 29.39% of eligible employees subscribed to this transaction.

The Group wishes to continue increasing the involvement of employees in its development. These employee share ownership offers contribute significantly to increasing employee motivation and a sense of belonging to the Group.

At the end of 2018, the share capital held by employees and former employees of the Group is estimated at 2.4%, of which 1.7% corresponds to shares subscribed by employees during reserved capital increases for employees or held through dedicated mutual funds.

### FIFTEENTH RESOLUTION

**(Delegation of authority granted to the Board of Directors for a period of 26 months to perform share capital increases, with cancellation of preferential subscription rights, reserved for members of a Company or Group Savings Plan)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors and the Statutory Auditors' Special Report, deliberating pursuant to articles L. 225-129-6 and L. 225-138-1 of the French Commercial Code and articles L. 3331-1 et seq. of the French Labor Code:

- delegate to the Board of Directors the authority to decide to increase Company's share capital, on one or more occasions, at the time or times and in the proportions that it deems appropriate, via the

issuance of ordinary shares of the Company as well as equity securities granting access to the Company's share capital, reserved for employees who contribute to a Company or Group Savings Plan;

- decide that the total amount of share capital increases likely to be performed under this resolution may not exceed a maximum nominal amount of 22 million euros, corresponding to the issue of a maximum of 4 million shares, it being specified that this amount does not include additional shares to be issued, in accordance with applicable legal and regulatory provisions, and, when relevant, contractual stipulations providing for other adjustments, to preserve the rights of holders of equity securities conferring access to share capital and that the total amount of capital increases to be performed under this resolution and the sixteenth resolution may not exceed the aforementioned nominal amount of 22 million euros;



- decide that the maximum nominal amount of share capital increases to be performed on the basis of this delegation shall be deducted from the overall limit stipulated in paragraph 2 of the eleventh resolution of this Extraordinary Shareholders' Meeting (or any resolution which would replace it at a later date);
- decide that the beneficiaries of these capital increases will be, directly or through an intermediary of a Company mutual fund (FCPE) or all other structures or entities permitted by applicable legal or regulatory provisions, the members, within the Company and the French or foreign companies affiliated to it within the meaning of article L. 225-180 of the French Commercial Code and article L. 3344-1 of the French Labor Code, of a Company or Group Savings Plan;
- decide to cancel the preferential subscription rights of shareholders to the new shares or other equity securities, and equity securities to which the latter would confer entitlement, which shall be issued in favor of the aforementioned members of a Company or Group Savings Plan in accordance with this resolution;
- decide that the subscription price may not exceed the average, determined in accordance with article L. 3332-19 of the French Labor Code, of the opening trading prices for the Company's share during the 20 trading days preceding the date of the decision setting the opening date for the subscription period, or be more than 20% lower than such average, bearing in mind that the shareholders officially authorize the Board of Directors, if deemed appropriate, to reduce or cancel the aforementioned discount, in view of the legal, regulatory and tax constraints under the applicable foreign law, where applicable;
- decide, in accordance with article L. 3332-21 of the French Labor Code, that the Board of Directors may provide for the free share attribution, to the aforementioned beneficiaries, of shares to be issued or already issued or other equity securities or securities granting access to the Company's capital to be issued or already issued, in respect of (i) the contribution that could be paid in accordance with the regulations governing Company or Group Saving Plans, and/or (ii) where appropriate, the discount;
- also decide that, should the beneficiaries not subscribe to the entire capital increase within the allotted deadlines, the capital increase would only be performed for the amount of the shares subscribed, and that the non-subscribed shares may be offered again to the beneficiaries concerned within the scope of a subsequent capital increase;
- grant full powers to the Board of Directors with the option of sub-delegation under the conditions set by law, to determine, within the limits described above, the various terms and conditions of the transaction and particularly:
  - define the criteria which the companies must meet in order for their employees to be entitled to benefit from the capital increases,
  - determine a list of these companies,
  - set the terms and conditions of the share issue, the characteristics of the shares, and, where appropriate, the other equity securities, determine the subscription price calculated based on the method defined above, set the terms and conditions and deadline for fully paying up the subscribed shares, deduct from the "Additional paid-in capital" account

all costs relating to these capital increases and, if deemed appropriate, all sums necessary to bring the legal reserve up to one tenth of the new share capital after each share issue; and generally complete, directly or through an authorized representative, all the transactions and formalities relating to the share capital increases performed under this resolution and, where appropriate, take any measures with a view to listing the shares issued pursuant to this resolution for trading on the Euronext Paris regulated exchange,

- set the opening and closing dates for the subscription period, record the completion of the corresponding capital increase and amend the articles of association accordingly;
- decide that this delegation of authority granted to the Board of Directors is valid for a period of 26 months starting from the date of this Shareholders' Meeting.

### SIXTEENTH RESOLUTION

#### **(Delegation of authority granted to the Board of Directors for a period of 18 months to perform share capital increases, with cancellation of preferential subscription rights, reserved for a category of beneficiaries)**

The shareholders, deliberating according to the quorum and majority required for Extraordinary Shareholders' Meetings, after having reviewed the Report of the Board of Directors and the Statutory Auditors' Special Report, pursuant to articles L. 225-129 to L. 225-129-2 and article L. 225-138 of the French Commercial Code:

- delegate to the Board of Directors the authority to decide to increase share capital, on one or more occasions, at the time or times and in the proportions it shall deem fit, via the issuance of ordinary shares of the Company as well as any other equity securities conferring entitlement to the Company's share capital, reserved for the category of beneficiaries defined hereafter;
- decide that the total amount of share capital increases likely to be performed under this resolution may not exceed a maximum nominal amount of 22 million euros, corresponding to the issue of a maximum of 4 million shares, it being specified that this amount does not include additional shares to be issued, in accordance with applicable legal and regulatory provisions, and when relevant, contractual stipulations providing for other adjustments, to preserve the rights of holders of equity securities conferring access to share capital and that the total amount of share capital increases to be performed under this resolution and the fifteenth resolution may not exceed the aforementioned nominal amount of 22 million euros;
- decide that the maximum nominal amount of share capital increases to be performed on the basis of this delegation shall be deducted from the overall limit stipulated in paragraph 2 of the eleventh resolution of this Extraordinary Shareholders' Meeting (or any resolution which would replace it at a later date);
- decide to cancel the preferential subscription rights of shareholders to the shares or other equity securities and to the equity securities to which the latter would confer entitlement, which shall be issued pursuant to this resolution and to reserve the right to subscribe them to the category of beneficiaries meeting the following characteristics: any bank or subsidiary of such a bank mandated by the Company and which would subscribe to shares, or other equity securities issued by the Company pursuant to this

resolution, with the sole intent to enable employees and Executive Officers of foreign companies, affiliated to the Company within the meaning of article L. 225-180 of the French Commercial Code and article L. 3344-1 of the French Labor Code, to benefit from a shareholding or investment plan with an economic profile comparable to an employee share ownership scheme that would be set up in connection with a share capital increase performed in accordance with the fifteenth resolution submitted to the vote of this Shareholders' Meeting, taking into account the regulatory and fiscal and/or social framework applicable in the country of residence of the employees and Executive Officers of the aforementioned foreign companies;

- decide that the unit price for the issue of the shares to be issued pursuant to this resolution shall be determined by the Board of Directors based on the Company's share price; this issue price shall be equal to the average of the opening trading prices for the Company's share during the 20 trading days preceding the date of the Board of Directors' decision setting the opening date for the period of subscription to a share capital increase performed on the basis of the fifteenth resolution, with the possibility of reducing this average by a maximum discount of 20%; the amount of this discount shall be determined by the Board of Directors within the aforementioned limit;
- decide that the Board of Directors shall have full powers, under the terms and conditions set forth by law and within the limits defined above, with the option of sub-delegation, so as to implement this delegation and particularly in order to:
  - set the date and price for the issue of shares or other equity securities to be issued in accordance with this resolution as well as the other terms and conditions governing the issue,
  - determine the beneficiary (or list of beneficiaries) for the cancellation of the preferential subscription right within the above-defined category, as well as the number of shares to be subscribed by such beneficiary (or each beneficiary),
  - where appropriate, determine the characteristics of the other equity securities granting access to the Company's share capital under the applicable legal and regulatory conditions,
  - record the completion of the share capital increase, complete, directly or through an authorized representative, all the transactions and formalities involving the share capital increases and, on its sole decision and if it deems appropriate, deduct the share capital increase costs from the amount of additional paid-in capital relating to such increases, amend the articles of association accordingly and perform all the necessary formalities and, where appropriate, take any measures with a view to listing the shares issued pursuant to this resolution for trading on the Euronext Paris regulated exchange;
- decide that this delegation of authority granted to the Board of Directors is valid for a period of 18 months starting from the date of this Shareholders' Meeting.

## Ordinary Shareholders' Meeting

### Resolution 17 Powers

#### Purpose

The **17<sup>th</sup> resolution** is a standard resolution required for the completion of publications and legal formalities.

#### SEVENTEENTH RESOLUTION (Powers for formalities)

Full powers are granted to a holder of a copy or extract of the minutes of this Shareholders' Meeting to perform all official publications and other formalities required by law and the regulations.

## STATUTORY AUDITORS' REPORTS

### Statutory Auditors' Special Report on related party agreements and commitments

*This is an unofficial translation into English of the Statutory Auditors' Special Report on related-party agreements and commitments that is issued in the French and provided solely for the convenience of English speaking readers.*

*This report should be read in conjunction with, and construed in accordance with, French law and professional standards applicable in France.*

*It should be understood that the agreements and commitments reported on are only those provided for by the French Commercial Code (Code de commerce) and that the report does not apply to those related-party transactions described in IAS 24 or other equivalent accounting standards.*

To the Shareholders of L'Air Liquide,

In our capacity as Statutory Auditors of your Company, we hereby report on the agreements and commitments with related parties.

We are required to inform you, based on the information provided to us, of the characteristics and principal terms and conditions as well as the reasons justifying the interest for your Company of those agreements and commitments of which we have been informed or which we discovered at the time of our engagement, without expressing an opinion on their usefulness and appropriateness or seeking to identify other agreements or commitments. It is your responsibility, pursuant to article R. 225-31 of the French Commercial Code (*Code de commerce*), to assess the benefits resulting from the conclusion of these agreements and commitments prior to their approval.

Furthermore, we are required, where applicable, to inform you in accordance with article R. 225-31 of the French Commercial Code (*Code de commerce*) relating to the performance, during the past fiscal year, of the agreements and commitments already approved by the Annual Shareholders' Meeting.

We performed those procedures which we considered necessary to comply with professional guidance issued by the national auditing body (Compagnie nationale des commissaires aux comptes) relating to this type of engagement. These procedures consisted in verifying that the information provided to us is consistent with the documentation from which it has been extracted.

#### AGREEMENTS AND COMMITMENTS SUBMITTED FOR APPROVAL OF THE ANNUAL SHAREHOLDERS' MEETING

We hereby inform you that we have not been advised of any agreements or commitments authorized in the course of the year to be submitted to the General Meeting of Shareholders for approval in accordance with article L. 225-38 of the French Commercial Code (*Code de commerce*).

#### AGREEMENTS AND COMMITMENTS ALREADY APPROVED BY SHAREHOLDERS' MEETING

##### Agreements and commitments approved during prior fiscal years

Pursuant to article R. 225-30 of the French Commercial Code (*Code de commerce*), we have been informed that the performance of the following agreements and commitments already approved by the Annual Shareholders' Meeting during prior fiscal years, continued during the last fiscal year.

**With Mr Benoît Potier, Chairman and Chief Executive Officer**

##### a) Defined contribution pension plan

###### *Nature, purpose and conditions*

Mr Benoît Potier benefits from the defined contribution pension plan applicable to all employees for the portion of remuneration amounting to less than eight times the annual social security ceiling.

This agreement was last authorized by the Board of Directors on November 12, 2010 and approved by the Annual Shareholders' Meeting on May 5, 2010.

The amount of contributions paid by your Company in respect of the defined contribution pension plan in 2018 totals 9,500 euros.

##### b) Life insurance contract

###### *Nature, purpose and conditions*

Executives Directors no longer benefiting from the defined contribution pension plan for senior managers and executives, Mr Benoît Potier benefits from a life insurance contract for the portion of his Reference remuneration amounting to between zero and twenty-four times the annual social security ceiling. The Reference remuneration includes the fixed remuneration and the variable remuneration within the limit of 100% of the fixed remuneration.

The rights resulting from the contributions paid have been definitely acquired by Mr Benoît Potier and are available at any time.

This agreement was last authorized by the Board of Directors on November 20, 2014 and approved by the Annual Shareholders' Meeting on May 6, 2015.

The amount of the contributions paid in respect of this contract in 2018 totals 211,831 euros for Mr Benoît Potier.

### c) Unemployment insurance

#### *Nature, purpose and conditions*

As an Executive Officer, Mr Benoît Potier benefits from the unemployment insurance for company managers and corporate officers taken out by your Company.

This agreement was last authorized by the Board of Directors on May 10, 2006 and approved by the Annual Shareholders' Meeting on May 9, 2007.

The amount of the contributions paid in this respect by your Company in 2018 totals 7,731 euros.

### d) Death and disability benefit plan

#### *Nature, purpose and conditions*

Since January 1, 2015, Mr Benoît Potier has benefited from the unified death and disability benefits plan, covering all employees and the executive officers duly authorized to benefit from the plan, in which the remuneration taken into account for the calculation of the contributions is capped at (i) sixteen times the annual social security ceiling for the incapacity and disability cover; (ii) twenty-four times the annual social security ceiling for the death cover.

This plan guarantees the payment of a pension in the event of incapacity and of a lump-sum payment in the event of death.

Pursuant to its decision on November 20, 2014, the Board of Directors authorized Mr Benoît Potier to benefit, as from January 1, 2015, from this unified death and disability benefits plan. This agreement was approved by the Annual Shareholders' Meeting on May 6, 2015.

The amount of the contributions paid in this respect by your Company in 2018 totals 4,673 euros.

### Agreements and commitments approved during the year

We have been notified of the execution, during the fiscal year, of the following agreements and commitments, already approved by the Annual Shareholders' Meeting on May 16, 2018 upon Statutory Auditors' Special Report of March 2, 2018.

### With Mr Benoît Potier, Chairman and Chief Executive Officer

#### a) Defined benefits pension plan

##### *Nature, purpose and conditions*

The agreement related to the defined benefits pension plan "Regime S" for the portion of his remuneration exceeding twenty-four times the annual social security ceiling, was approved by the Boards of directors on February 12, 2010 and February 17, 2014 and approved by the Annual Shareholders' Meeting on May 5, 2010 and May 7, 2014.

Mr Benoît Potier benefits from the defined benefits pension plan "Regime S" applicable to senior managers and executives and corporate officers having a remuneration exceeding twenty-four times the annual social security ceiling and three years of seniority. Benefits are equal to 1% per year of service of the average of the three best years over the last five years of annual fixed and variable remuneration, whether paid by the Company or any French or Foreign subsidiary, exceeding twenty-four times the annual social security ceiling ("Reference remuneration"). Total pension benefits, under all pension plans, may not exceed 45% of the Reference remuneration. For the purpose of this calculation, the average of the variable portions of remuneration taken into account may not exceed 100% of the average of the fixed portions. Should this ceiling be reached, the amount paid under the defined benefit plan would be reduced accordingly. In addition, it is specified that the above-mentioned limit of 45% includes all pension plans, of public or private origin, in France or a foreign country. In the event of termination of the corporate office at the Company's initiative, Mr Benoît Potier shall retain his rights, if he does not resume any professional activity until his retirement or in the event of a disability of second or third category.

In light of the renewal of the term of Mr Benoît Potier as Chairman and Chief Executive Officer, the Board of Directors held on February 14, 2018 decided that the annual increase in Mr Benoît Potier's benefits pursuant to the defined benefits pension plan "Regime S" will be subject to performance conditions. The annual increase in Mr Potier's benefits pursuant to the defined benefit pension plan "Regime S" described above, is subject to conditions linked to Mr Benoît Potier's performance assessed in light of your Company's performance, as defined below:

1. The increase, in respect of each fiscal year, in Mr Benoît Potier conditional right will depend and the amount of that increase shall be adjusted in accordance with the average of the annual gap between the Return On Capital Employed after tax (R.O.C.E) and the Weighted Average Cost of Capital (W.A.C.C), assessed on the accounting net equity, calculated on the average of the three annual gaps for the last three years prior to the said fiscal year.
2. The proportion of the annual increase in the conditional rights will be determined with a rate of increase per linear segments between each of the threshold below.

Average of the annual gaps (R.O.C.E. / W.A.C.C.) over 3 years	Proportion of Increase
≥ 300 bps*	100%
250 bps	66%
200 bps	50%
100 bps	25%
< 100 bps	0%

\* bps : basis points

Regarding the period that followed the renewal of the term of office of Mr Benoît Potier as Chairman and Chief Executive Officer in 2018, the Board of Directors held on February 13, 2019 acknowledged that the performance conditions were 100% fulfilled with an increase of 1% of his conditional rights of 1% corresponding to a potential acquisition of an additional 1% of the Reference remuneration for the year considered.

## b) Termination indemnity

### Nature, purpose and conditions

In light of the renewal of the term of office of Mr Benoît Potier as Chairman and Chief Executive Officer, the Board of Directors held on February 14, 2018 approved the conditions regarding his termination indemnity.

In the event of a forced departure (removal from office, request for resignation of his corporate office as Chairman and Chief Executive Officer)

- (a) related to a change of strategy, or
- (b) that takes place within six months following the acquisition of control of your Company (pursuant to article L. 233-3 of the French Commercial Code – *Code de commerce*) by a person acting alone or several persons acting in concert

and subject to the conditions and limitations set below, your Company undertakes to pay to Mr Benoît Potier a fixed aggregate indemnity in full discharge equal to twenty-four months of gross fixed and variable remuneration, the calculation being based on the average monthly amount of gross fixed and variable remuneration received by Mr Benoît Potier during the twenty-four months prior to departure. It is specified that in the case referred to in paragraph (b) above, the indemnity is due, whether or not the forced departure is related to a change of strategy but without Mr Benoît Potier being able to receive such indemnity in conjunction with that due pursuant to paragraph (a).

The payment of the indemnity due in respect of forced departure as described above is subject to compliance with conditions related to:

Mr Benoît Potier's performance assessed in light of the Company's performance, defined as follows:

- The entitlement to the indemnity will depend on and the amount of the indemnity will be adjusted on the basis of, the average of the annual gap between the Returned On Capital Employed after tax (R.O.C.E.) and the Weighted Average Cost of Capital (W.A.C.C.) (assessed on the accounting net equity), calculated on the average of the three annual gaps for the last three fiscal years prior to the fiscal year during which such departure takes place. These performance conditions will be re-examined by your Board of Directors and modified, where applicable, to take into account, in particular, any changes that have taken place in the Company's environment at the time of each renewal of Mr Benoît Potier's term of office and, where applicable, during the course of his term of office.
- The proportion of the indemnity due will be established with an increase in the indemnity by straight-line segments between each of the thresholds below:

Average over 3 years of the annual (R.O.C.E. /W.A.C.C.) gaps	Proportion of the indemnity due
≥ 300 bps*	100%
250 bps	66%
200 bps	50%
100 bps	25%
< 100 bps	0%

\* bp: basis points

In the event that the forced departure takes place during the twenty-four months prior to the date to which the term of office of Mr Benoît Potier as Chairman and Chief Executive Officer terminates pursuant to the age limit provided by the articles of association, the amount of the indemnity will be capped to the number of month of gross compensation for the period between the date of the forced departure and the date on which the age limit will be reached. No indemnity will be paid if, at the date of the forced departure, the beneficiary claims his pension entitlements.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
French original signed by

PricewaterhouseCoopers Audit  
Olivier Lotz

Séverine Scheer

ERNST & YOUNG et Autres  
Jeanne Boillet

Emmanuelle Mossé

## Statutory Auditor's Report on the share capital reduction

(Combined Shareholders' meeting of May 7, 2019 – 10<sup>th</sup> resolution)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company and pursuant to the provisions of article L. 225-209 of the French Commercial Code (*Code de commerce*) relating to share capital reductions, in particular as regards the cancellation of shares bought back by the Company, we hereby report to you on our assessment of the reasons for and the terms and conditions of the proposed share capital reductions.

The shareholders are asked to delegate to the Board of Directors full powers to cancel, any or all of the shares bought back by the Company under the share buyback program, within the limit of 10% of the capital as of the date of the cancellation, per twenty-four-month period. These powers would be exercisable for a period of twenty-four months from the Shareholders' Meeting, in accordance with article L. 225-209 of the French Commercial Code (*Code de commerce*).

We performed the procedures we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in ensuring that the reasons for and the terms and conditions of the proposed capital reductions, which are not considered to affect shareholder equality, comply with the applicable legal provisions.

We have no matters to report on the reasons for or terms and conditions of the proposed capital decrease.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
*French original signed by*

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## Statutory Auditors' Report on the issuance of shares and various securities with preferential subscription rights

(Combined Shareholders' meeting of May 7, 2019 – 11<sup>th</sup> and 12<sup>th</sup> resolutions)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in compliance with article L. 228-92 of the French Commercial Code (*Code de commerce*), we hereby report to you on the proposed delegation of authority to the Board of Directors to issue shares or various securities, operations upon which you are called to vote.

Based on its report, the Board of Directors proposes that the shareholders delegate to the Board of Directors, for a period of twenty-six months, the authority to decide on and set the final conditions of an issue, with preferential subscription rights (11<sup>th</sup> resolution), (i) of ordinary shares of the Company, (ii) of securities governed by articles L. 228-91 et seq. of the French Commercial Code (*Code de commerce*), consisting of equity securities of the Company giving access to other equity securities of the Company and/or giving the right to the allocation of debt securities of the Company and/or (iii) of securities representing debt securities, whether governed or not by articles L. 228-91 et seq. of the French Commercial Code (*Code de commerce*), giving access or likely to give access to equity securities to be issued by the Company, such securities also potentially giving access to existing equity securities and/or debt securities of the Company.

The total nominal amount of the share capital increases that may be carried out, immediately or in the future may not, pursuant to the 11<sup>th</sup> resolution, exceed 470 million euros, from which shall be deducted the issuance amount of shares arising from the stock options or performance shares granted under the 18<sup>th</sup> and 19<sup>th</sup> resolutions of the Extraordinary Shareholders' Meeting of May 12, 2016, the amount of the share capital increases carried out in accordance with the 13<sup>th</sup> and 14<sup>th</sup> resolutions of the Extraordinary Shareholders' Meeting of May 12, 2016, and the amount of share capital increases carried out pursuant to the 15<sup>th</sup> and 16<sup>th</sup> resolutions of this Shareholders' Meeting.

The total nominal amount of securities representing debt securities giving access to the Company's share capital that are likely to be issued may not, pursuant to the 11<sup>th</sup> resolution, exceed 3 billion euros, from which shall be deducted the amount of the issues carried out under the 12<sup>th</sup> resolution.

If you adopt the 12<sup>th</sup> resolution, these maximum amounts will take into account the additional number of securities to be issued under the delegation of authority presented in the 11<sup>th</sup> resolution, in accordance with article L. 225-135-1 of the French Commercial Code (*Code de commerce*).

It is the Board of Directors' responsibility to prepare a report in accordance with articles R. 225-113 et seq. of the French Commercial Code (*Code de commerce*). It is our responsibility to express an opinion on the fairness of the financial information taken from the financial statements and on other information relating to the issue provided in this report.

We performed the procedures that we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in verifying the information provided in the Board of Directors' Report relating to these issues and the methods used to set the issue price of the equity securities to be issued.

As this report does not specify the methods used to determine the issue price for the equity securities to be issued pursuant to the 11<sup>th</sup> resolution, we do not express an opinion on the basis used to calculate this issue price.

In addition, we do not express an opinion on the final terms and conditions of the issuance, as they have not yet been set.

In accordance with article R. 225-116 of the French Commercial Code, we will prepare an additional report if and when the Board of Directors uses this delegation of authority.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
French original signed by

PricewaterhouseCoopers Audit  
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Jeanne Boillet

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## Statutory Auditors' Report on the authorization to grant share subscription or purchase options

(Combined Shareholders' meeting of May 7, 2019 – 13<sup>th</sup> resolution)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in compliance with articles L. 225-177 and R. 225-144 of the French Commercial Code (*Code de commerce*), we hereby report to you on the authorization to grant share subscription or purchase options to employees and Executive Officers of the Company or its French or foreign subsidiaries within the meaning of article L. 225-180 of the French Commercial Code (*Code de commerce*), an operation upon which you are called to vote.

The total number of options granted pursuant to this authorization may not give beneficiaries the right to a total number of shares exceeding 2% of the Company's share capital on the date they are granted by the Board of Directors, it being specified that, pursuant to this authorization, the total number of options granted to the Company's Executive Officers may not give beneficiaries the right to a total number of shares exceeding 0.2% of the Company's share capital on the date they are granted by the Board of Directors.

The nominal amount of the share capital increases that may be carried out under this authorization will be deducted from the overall limit of 470 million euros stipulated in the eleventh resolution of this Extraordinary Shareholders' Meeting.

On the basis of its report, your Board of Directors proposes that the shareholders authorize it to grant share subscription or purchase options for a period of 38 months from the date of this Extraordinary Shareholders' Meeting.

It is the Board of Directors' responsibility to prepare a report on the reasons for granting share subscription or purchase options and on the proposed methods for setting the subscription or purchase price. It is our responsibility to express an opinion on these methods.

We have performed the procedures that we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in verifying that the methods proposed for setting the subscription or purchase price are specified in the Board of Directors' Report and that they comply with the applicable legal and regulatory provisions.

We have no matters to report on the proposed methods for setting the share subscription or purchase price.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
*French original signed by*

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## Statutory Auditors' Report on the authorization to grant existing shares or shares to be issued

(Combined Shareholders' meeting of May 7, 2019 – 14<sup>th</sup> resolution)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in compliance with article L. 225-197-1 of the French Commercial Code (*Code de commerce*), we hereby report to you on the authorization to grant free existing shares or shares to be issued to employees and Executive Officers of the Company and of the entities that are related to it within the meaning of articles L. 225-197-2. of the French Commercial Code (*Code de commerce*), an operation upon which you are called to vote.

The existing shares or shares to be issued that are granted pursuant to this authorization may not represent more than 0.5% of the Company's share capital on the date of the Board of Directors' decision to grant them, it being specified that, pursuant to this authorization, shares granted to Executive Officers may not represent more than 0.1% of the Company's share capital on the date of the Board of Directors' decision to grant them.

The nominal amount of the share capital increases that may be carried out under this authorization will be deducted from the overall limit of 470 million euros set by the eleventh resolution of this Extraordinary Shareholders' Meeting.

On the basis of its report, your Board of Directors proposes that the shareholders authorize it to grant free existing or newly issued shares for a period of 38 months from the date of this Extraordinary Shareholder's Meeting.

It is the Board of Directors' responsibility to prepare a report on the proposed transaction. It is our responsibility to provide you with our observations, if any, in respect of the information provided to you on the proposed transaction.

We have performed the procedures that we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted primarily in verifying that the proposed terms and conditions described in the Board of Directors' Report comply with the applicable legal provisions.

We have no matters to report on the information provided in the Board of Directors' Report concerning the proposed authorization to grant shares.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
French original signed by

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## Statutory Auditors' Report on the issue of ordinary shares and other equity securities giving rights to the share capital reserved for members of a Company or Group savings plan

(Combined Shareholders' meeting of May 7, 2019 – 15<sup>th</sup> resolution)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in compliance with articles L. 228-92 and L. 225-135 et seq. of the French Commercial Code (*Code de commerce*), we hereby report to you on the proposed delegation of authority to the Board of Directors to issue, without shareholders' preferential subscription rights, ordinary shares and equity securities giving rights to the share capital, reserved for the employees of the Company and of any French or foreign companies affiliated to it within the meaning of article L. 225-180 of the French Commercial Code (*Code de commerce*) and article L. 3344-1 of the French Labor Code (*Code du travail*), provided that such employees are members of a Company or Group savings plan, an operation upon which you are called to vote.

The maximum nominal amount of share capital increases likely to be performed under this resolution may not exceed 22 million euros (corresponding to the issue a maximum of 4 million shares), it being specified that:

- the total amount of share capital increases that may be carried out pursuant to the fifteenth and sixteenth resolutions of this Extraordinary Shareholders' Meeting, may not exceed the aforementioned nominal amount of 22 million euros;
- the maximum nominal amount of share capital increases that may be carried out pursuant to the fifteenth and sixteenth resolutions, will be deducted from the overall limit of 470 million euros stipulated in the eleventh resolution of this Extraordinary Shareholders' Meeting.

This operation is submitted for your approval in accordance with the provisions of article L. 225-129-6 of the French Commercial Code (*Code de commerce*) and articles L. 3332-18 et seq. of the French Labor Code (*Code du travail*).

Your Board of Directors proposes that, on the basis of its report, the shareholders delegate to it the authority, for a period of 26 months as from the date of this Extraordinary Shareholders' Meeting, to decide one or several issuances and to cancel your preferential subscription rights to the shares to be issued. Where applicable, the Board of Directors will be responsible for setting the final terms and conditions of any such issue.

It is the Board of Directors' responsibility to prepare a report in accordance with articles R. 225-113 et seq. of the French Commercial Code (*Code de commerce*). It is our responsibility to express an opinion on the fairness of the information taken from the financial statements, on the proposed cancellation of shareholders' preferential subscription rights and on certain other information relating to this issue, contained in this report.

We have performed the procedures that we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in verifying the information provided in the Board of Directors' Report pertaining to the transaction and the methods used to set the issue price of the shares to be issued.

Subject to a subsequent examination of the terms and conditions of the proposed issue, we have no matters to report on the methods used to set the issue price of the securities given in the Board of Directors' Report.

Since the final terms and conditions of the issue have not been set, we do not express an opinion in this respect or consequently, on the proposed cancellation of shareholders' preferential subscription rights.

In accordance with article R. 225-116 of the French Commercial Code (*Code de commerce*), we will prepare an additional report in the event that the Board of Directors exercises this delegation of authority to issue shares and marketable securities granting entitlement to equity securities to be issued.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
French original signed by

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	Jeanne Boillet
	Emmanuelle Mossé

## Statutory Auditors' Report on the issue of ordinary shares and other equity securities giving rights to the share capital reserved for a category of beneficiaries

(Combined Shareholders' meeting of May 7, 2019 – 16<sup>th</sup> resolution)

*This is a free translation into English of the Statutory Auditors' Report on the financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction with, and construed in accordance with French law and professional auditing standards applicable in France.*

To the Shareholders,

In our capacity as Statutory Auditors of your Company, and in compliance with articles L. 228-92 and L. 225-135 et seq. of the French Commercial Code (*Code de commerce*), we hereby report to you on the proposed delegation of authority to the Board of Directors for the issue of ordinary shares and other equity securities giving rights to the Company's share capital, without preferential subscription rights and reserved for the category of beneficiaries set out below, an operation upon which you are called to vote.

The issue is reserved for any financial institution or subsidiaries thereof appointed by your Company and which would subscribe to shares, or other equity securities issued by the Company pursuant to this resolution, with the sole aim of allowing employees and Executive Officers of foreign companies related to the Company, within the meaning of articles L. 225-180 of the French Commercial Code (*Code de commerce*) and L. 3344-1 of the French Labor Code (*Code du travail*), to benefit from a share ownership or investment mechanism with a similar economic profile to any employee share ownership plan implemented in connection with a share capital increase, pursuant to the fifteenth resolution of this Extraordinary Shareholders' Meeting, taking into account the locally applicable regulatory, tax and/or social framework for employees and Executive Officers of the above-mentioned foreign companies.

The maximum nominal amount of share capital increases likely to be performed under this resolution may not exceed 22 million euros (corresponding to the issue of a maximum of 4 million shares), it being specified that:

- the total amount of share capital increases that may be carried out immediately or in the future pursuant to the fifteenth and sixteenth resolutions of this Extraordinary Shareholders' Meeting, may not exceed the aforementioned nominal amount of 22 million euros;
- the maximum nominal amount of share capital increases that may be carried out pursuant to the fifteenth and sixteenth resolutions, will be deducted from the overall limit of 470 million euros stipulated in the eleventh resolution of this Extraordinary Shareholders' Meeting.

This issue is submitted to the shareholders for approval in accordance with the provisions of article L. 225 129 6 of the French Commercial Code (*Code de commerce*) and articles L. 3332-18 et seq. of the French Labor Code (*Code du travail*).

Your Board of Directors proposes that, on the basis of its report, the shareholders delegate to it the authority, for a period of 18 months as from the date of this Extraordinary Shareholders' Meeting, to decide one or several issuances and cancel your preferential subscription rights to the shares to be issued. Where applicable, the Board of Directors will be responsible for setting the final terms and conditions of any such issue.

It is the Board of Directors' responsibility to prepare a report in accordance with articles R. 225-113 et seq. of the French Commercial Code (*Code de commerce*). It is our responsibility to express an opinion on the fairness of the information taken from the financial statements, on the proposed cancellation of preferential subscription rights and on certain other information relating to this issue, contained in this report.

We have performed the procedures that we deemed necessary in accordance with professional standards applicable in France to such engagements. These procedures consisted in verifying the information provided in the Board of Directors' Report pertaining to the transaction and the methods used to set the issue price of the shares to be issued.

Subject to a subsequent examination of the terms and conditions of the proposed issue, we have no matters to report on the methods used to set the issue price of the securities given in the Board of Directors' Report.

Since the final terms and conditions of the issue have not been set, we do not express an opinion in this respect or consequently, on the proposed cancellation of shareholders' preferential subscription rights.

In accordance with article R. 225-116 of the French Commercial Code (*Code de commerce*), we will prepare an additional report in the event that the Board of Directors uses this delegation of authority to issue shares or marketable securities granting entitlement to equity securities to be issued.

Neuilly-sur-Seine and Paris-La Défense, March 1, 2019

The Statutory Auditors  
French original signed by

PricewaterhouseCoopers Audit  
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## SHARE CAPITAL

### Trends in share capital over the past three years

Issue date	Type of transaction	Number of shares issued	Aggregate number of shares	Share capital increase	Issue premiums and reserves	Share capital
<i>(in euros, except for shares)</i>						
February 15, 2016	Exercise of share subscription options	327,988	344,222,603	1,803,934.00	19,187,472.00	1,893,224,316.50
May 10, 2016	Share capital reserved for employees	999,143	345,221,746	5,495,286.50	71,942,681.50	1,898,719,603.00
July 29, 2016	Exercise of share subscription options	354,628	345,576,374	1,950,454.00	19,875,625.41	1,900,670,057.00
September 12, 2016	Exercise of share subscription options	41,303	345,617,677	227,166.50	2,361,106.80	1,900,897,223.50
October 11, 2016	Increase in share capital	43,202,209	388,819,886	237,612,149.50	3,045,755,734.50	2,138,509,373.00
February 14, 2017	Exercise of share subscription options	78,644	388,898,530	432,542.00	4,626,159.78	2,138,941,915.00
May 3, 2017	Cancellation of shares	(1,100,000)	387,798,530	(6,050,000.00)	(109,287,860.00)	2,132,891,915.00
September 26, 2017	Exercise of share subscription options	439,965	388,238,495	2,419,807.50	23,264,528.21	2,135,311,722.50
September 26, 2017	Free share attribution (1 for 10)	38,823,849	427,062,344	213,531,169.50	(213,531,169.50)	2,348,842,892.00
September 26, 2017	Free share attribution (1 for 100)	990,504	428,052,848	5,447,772.00	(5,447,772.00)	2,354,290,664.00
February 14, 2018	Exercise of share subscription options	390,657	428,443,505	2,148,613.50	25,990,743.26	2,356,439,277.50
May 16, 2018	Cancellation of shares	(654,000)	427,789,505	(3,597,000.00)	(59,799,789.00)	2,352,842,277.50
July 27, 2018	Exercise of share subscription options	481,736	428,271,241	2,649,548.00	28,247,932.03	2,355,491,825.50
December 7, 2018	Share capital reserved for employees	1,049,529	429,320,770	5,772,409.50	86,255,757.19	2,361,264,235.00

Note: Between July 1 and December 31, 2018, 102,664 options were exercised, giving rise to an outstanding capital as at December 31, 2018 of 2,361,828,887.00 euros divided up into 429,423,434 actions.



## Changes in share capital ownership over the last three years

	2016	2017	2018
Individuals shareholders	33%	32%	32%
French institutional investors	20%	19%	18%
Non-French institutional investors	47%	49%	50%
Treasury shares	> 0%	> 0%	> 0%

### THRESHOLD NOTIFICATIONS

During the fiscal year ended December 31, 2018 the following legal threshold notifications were declared:

Date	Company	% Share capital	% voting rights
05/30/2018	BlackRock	4.99% ↘	4.99%
06/08/2018	BlackRock	5.10% ↗	5.10%
06/15/2018	BlackRock	4.99% ↘	4.99%
06/20/2018	BlackRock	5.02% ↗	5.02%
06/21/2018	BlackRock	4.96% ↘	4.96%
11/02/2018	BlackRock	5.00% ↗	5.00%
11/05/2018	BlackRock	4.94% ↘	4.94%

To the Company's knowledge, there is no other shareholder that holds either directly or indirectly, alone or jointly, more than 5% of the capital or voting rights.

## Share capital and voting rights for the last three years

	Number of shares comprising share capital	Theoretical number of voting rights (including treasury shares)	Actual number of voting rights (excluding treasury shares)
2016	388,875,761	388,875,761	387,749,196
2017	428,397,550	428,397,550	426,838,237
<b>2018</b>	<b>429,423,434</b>	<b>429,423,434</b>	<b>427,970,430</b>

There are no double voting rights. To the best of the Company's knowledge, there are no shareholders' agreements or joint or concerted action agreements. The portion of the L'Air Liquide S.A. share capital comprising the direct registered shares owned by the main shareholders and pledged is not material.

## Amount of share capital held by employees

Since 1986, L'Air Liquide S.A. has given the employees of certain Group companies the possibility to subscribe to capital increases reserved for them. At the end of 2018, the share of capital held by employees and former employees of the Group is estimated at 2.4%, of which 1.7% (within the meaning of article L. 225-102 of the French Commercial Code), that is 7,170,515 shares, corresponds to shares subscribed by employees during employee reserved capital increase operations or held through mutual funds.

## Delegations of authority granted at the Shareholders' Meeting

Nature of the delegation	Validity of the delegation	Authorized amount	Utilization in 2018
Share buyback	Granted by: SM of May 16, 2018 (4 <sup>th</sup> )* For a period of: <b>18 months</b> Maximum price: 165 euros	10% of share capital, representing 42,839,755 shares, for a maximum amount of 7,068,559,575.00 euros	<b>Treasury shares</b> As of December 31, 2018, the Company owned 1,234,488 shares at an average purchase price of 95.80 euros, i.e. a balance sheet value of 118,265,288 euros. <b>Liquidity contract changes:</b> Under the liquidity contract, as of December 31, 2018 a total of 9,500 shares were on the balance sheet for a net value of 1,006,876 euros. For more details, see pages 310-311 in the present Reference Document.
Cancellation of shares	Granted by: SM of May 16, 2018 (15 <sup>th</sup> )* For a period of: <b>24 months</b>	10% of share capital	654,000 shares canceled in May 2018 for a total carrying amount of 63,396,789 euros (or an average price of 96.94 euros). (See Information on the completion of the Company's share buyback program on page 310)
<b>Increase in share capital</b> via the issuance of shares or marketable securities, with retention of shareholders' preferential subscription rights	Granted by: SM of May 3, 2017 (13 <sup>th</sup> )* For a period of: <b>26 months</b>	530 million euros nominal amount (overall limit) Maximum nominal amount of marketable securities: 3 billion euros Amounts may be increased by a maximum of 15%, in the event of oversubscription (14 <sup>th</sup> resolution SM of May 3, 2017)	None
<b>Capital increase</b> via capitalization of reserves	Granted by: SM of May 16, 2018 (16 <sup>th</sup> ) For a period of: <b>26 months</b>	For a maximum nominal amount of 300 million euros	None
<b>Share capital increase</b> reserved for employees: ■ as part of a Group savings plan ■ as part of a comparable scheme abroad	Granted by: SM of May 3, 2017 (15 <sup>th</sup> )* For a period of: <b>26 months</b> Granted by: SM of May 3, 2017 (16 <sup>th</sup> )* For a period of: <b>18 months</b>	30.25 million euros nominal value and 5.5 million shares. To be deducted from the aforementioned overall limit of 530 million euros	1,049,529 shares issued at per value of 5.50 euros as part of the employee share ownership transaction, in December 2018.
Bond issuance	Granted by: SM of May 12, 2016 (13 <sup>th</sup> ) For a period of: <b>5 years</b>	20 billion euros	As of December 31, 2018, outstanding bond issues of 302 million euros for L'Air Liquide S.A., 12.4 billion euros for the Air Liquide Group.
Stock options	Granted by: SM of May 12, 2016 (18 <sup>th</sup> )* For a period of: <b>38 months</b>	2% of the capital on the day the options were granted 0.3% of the capital on the date the options were granted to the Executive Officers	73,380 stock options granted by the Board on September 25, 2018.
Performance shares	Granted by: SM of May 12, 2016 (19 <sup>th</sup> )* For a period of: <b>38 months</b>	0.5% of the capital on the day the shares were granted 0.15% of the capital on the date the shares were granted to the Executive Officers	393,774 performance shares were granted by the Board on September 25, 2018.
<b>Issuance of marketable securities</b> without preferential subscription rights: ■ by public offering ■ by private placements	Granted by: SM of May 12, 2016 (23 <sup>rd</sup> ) For a period of: <b>26 months</b> Granted by: SM of May 12, 2016 (24 <sup>th</sup> ) For a period of: <b>26 months</b>	Deducted from the 470 million euro overall limit (12 <sup>th</sup> SM of May 6, 2015) Amounts may be increased by a maximum of 15%, in the event of oversubscription (25 <sup>th</sup> SM of May 12, 2016)	None

\* Renewal to be proposed to the Combined Shareholders' Meeting on May 7, 2019.

## GENERAL INFORMATION

### General information

#### **Law applicable to L' Air Liquide S.A.**

French law.

#### **Incorporation and expiration dates**

The Company was incorporated on November 8, 1902, for a set term expiring on February 17, 2028.

#### **Business and Company register**

552 096 281 RCS Paris

APE code: 7112B

#### **Consulting legal documents**

The articles of association, Minutes of Shareholders' Meetings and other Company documents may be consulted at Company headquarters.

#### **Fiscal year**

The Company's fiscal year starts on January 1, and ends on December 31, of the same year.

#### **Address and phone number of the Head Office**

75, quai d'Orsay, 75007 Paris

+33 (0)1 40 62 55 55

### Articles of association

#### Section I

#### **NAME – PURPOSE – HEAD OFFICE – TERM**

##### **Article 1: Form and name**

The Company is a joint stock company, with a Board of Directors. This Company will be governed by the laws and regulations in force and these articles of association.

The Company's name is "L' Air Liquide, société anonyme pour l'Étude et l'Exploitation des procédés Georges Claude".

##### **Article 2: Purpose**

The Company's corporate purpose includes:

- the study, exploitation, sale of the patents or inventions of Messrs. Georges and Eugène Claude pertaining to the liquefaction of gases, the industrial production of refrigeration, liquid air and oxygen, and the applications or utilizations thereof;
- the industrial production of refrigeration, of liquid air, the applications or uses thereof, the production and liquefaction of gases, and in particular oxygen, nitrogen, helium and hydrogen, the applications and uses thereof in all forms, pure, in blends and combinations, without any distinction as to state or origin, in all areas of application of their physical, thermodynamic, chemical, thermochemical and biological properties, and, in particular, in the domains of propulsion, the sea, health, agri-business and pollution;

- the purchase, manufacturing, sale, use of all products pertaining directly or indirectly to the aforementioned corporate purpose, as well as all sub-products resulting from their manufacturing or their use, of all machines or devices used for the utilization or application thereof and, more specifically, the purchase, manufacturing, sale, use of all products, metals or alloys, derived or resulting from a use of oxygen, nitrogen and hydrogen, pure, blended or combined, in particular of all oxygenated or nitrogenous products;
- the study, acquisition, direct or indirect exploitation or sale of all patents, inventions or methods pertaining to the same corporate purposes;
- the exploitation, directly or through the incorporation of companies, of all elements connected, directly or indirectly, with the Company's purpose or likely to contribute to the development of its industry;
- the supply of all services, or the supply of all products likely to develop its clientele in the industry or health sectors.

The Company may request or acquire all franchises, perform all constructions, acquire or lease all quarries, mines and all real property, and take over all operations connected with its corporate purpose, sell or lease these franchises, merge or create partnerships with other companies by acquiring Company shares or rights, through advances or in any appropriate manner. It may undertake these operations either alone or jointly.

Lastly, and more generally, it may carry out all industrial, commercial, real estate, personal or financial operations pertaining directly or indirectly to the corporate purposes specified above.

**Article 3: Head office**

The Company's head office is located at 75, quai d'Orsay, Paris.

It may be transferred upon a Board of Directors' decision to any other location in Paris or a neighboring department, subject to the ratification of such decision by the next Ordinary General Shareholders'

**Section II****SHARE CAPITAL – SHARES – IDENTIFICATION OF SHAREHOLDERS****Article 5: Share capital**

The share capital has been set at 2,361,264,235.00 euros divided into 429,320,770 fully paid-up shares of a par value of 5.50 euros each.

Share capital is increased under the conditions stipulated by law either by issuing ordinary or preferred shares, or by raising the par value of existing shares. It may also be increased by exercising the rights attached to marketable securities granting access to share capital, under the conditions stipulated by law.

In accordance with prevailing legal provisions, unless otherwise decided by the Shareholders' Meeting, the shareholders have, in proportion to the amount of shares they own, a preferential subscription right to the shares issued in cash in order to increase share capital.

The share capital may also be reduced under the conditions stipulated by law, in particular, by reducing the par value of the shares, or by reimbursing or redeeming shares on the stock exchange and by canceling shares, or by exchanging existing shares for new shares, in an equivalent or lesser number, with or without the same par value, and with or without a cash balance to be paid or received. The Shareholders' Meeting may always compel the shareholders to sell or purchase existing shares to permit the exchange of existing shares for new shares, with or without a cash balance to be paid or received, even if such reduction is not a result of losses.

**Article 6: Shares**

If the new shares are not fully paid up upon issuance, calls for payment shall be performed, on dates set by the Board of Directors, by means of announcements posted one month in advance in one of the Paris official legal publications chosen for the legal publication of the Company's deeds.

Shares not fully paid up shall be held as registered shares until they are fully paid up.

Each payment on any subscribed shares will be registered in an account opened in the name of the subscriber.

All late payments shall automatically bear interest, for the benefit of the Company, as of the due date, without any formal notice or legal action, at the legal interest rate, subject to any personal action that the Company may take against any defaulting shareholder and the compulsory execution measures provided by law.

Meeting, and anywhere else by virtue of a decision by an Extraordinary Shareholders' Meeting.

**Article 4: Term**

The Company's term has been fixed at 99 years beginning on February 18, 1929, except in the event of early dissolution or extension.

**Article 7: Type of shares**

Paid-up shares are registered as registered shares or bearer shares depending on the choice of the shareholder.

The provisions of the aforementioned paragraph also apply to other securities of any nature issued by the Company.

**Article 8: Rights and obligations governing shares**

Shareholders shall not be liable above the amount of their subscription.

Share ownership automatically binds shareholders to the articles of association and the decisions of the Shareholders' Meetings.

Subject to legal and regulatory restrictions, voting rights attached to the shares are proportionate to the capital quota they represent and each share confers the right to one vote. In accordance with the option provided for in paragraph 3 of article L. 225-123 of the French Commercial Code, double voting rights will not be conferred to paid-up shares and for which a nominative registration for at least two years in the name of the same shareholder can be proved.

Any share grants entitlement, during the Company's term, as in the event of liquidation, to the payment of an identical net amount for any distribution or redemption.

Shares are freely transferable under the conditions provided by law.

**Article 9: Identification of shareholders**

The Company may avail itself at any time of the legal and statutory provisions in force permitting the identification of the owners of shares conferring immediately or in the future the right to vote in Shareholders' Meetings, as well as the number of shares they own.

In addition to the legal obligations to notify the Company, any person, acting alone or jointly, coming in direct or indirect possession of a fraction of the Company's capital or voting rights equal to or greater than 2%, or a multiple of 2% of capital or voting rights (including above the 5% threshold), is required to inform the Company within fifteen days as of the date on which the threshold is exceeded and, as the case may be, independently of the effective transfer date of share ownership. The person shall state the number of shares and marketable securities granting entitlement to capital that he or she owns on the date of notification. Any decrease below the 2% threshold or a multiple of 2% of capital or voting rights shall be notified in the same manner.

In the event of a failure to meet this additional notification obligation, one or several shareholders, owning a fraction of the Company's capital or voting rights amounting to at least 2%, may, at a Shareholders' Meeting, request that the shares exceeding the fraction which should have been reported, be stripped of their voting rights for any Shareholders' Meeting held until the end of a two-year period following the date on which the notice is rectified. The request is recorded in the Minutes of the Shareholders' Meeting.

### Article 10: Co-ownership and usufruct

As all shares are indivisible from the point of view of the Company, all joint owners of shares are required to be represented vis-à-vis the Company by a single owner selected from among them or proxy under the conditions provided by law.

## Section III

### MANAGEMENT OF THE COMPANY

#### Article 11: Composition of the Board of Directors

The Company is managed by a Board of Directors, comprising a minimum of three members and a maximum of fourteen members (unless temporarily waived in the event of a merger), physical persons or legal entities.

The members of the Board of Directors are appointed by the Ordinary Shareholders' Meeting for a term of four years expiring at the close of the Shareholders' Meeting held to approve the financial statements for the previous year and which is held in the year during which the mandate expires. As an exception to this rule, the members of the first Board of Directors who exercised functions as members of the Supervisory Board in the Company under its former mode of administration shall be appointed for a period equal to the remaining term of their mandate as members of the Supervisory Board.

The members of the Board of Directors may be re-elected.

Each Director must own at least 500 registered shares in the Company during the term of his functions. If, on the date of his appointment, a Director does not own the required number of shares or if, during his term, he ceases to own them, he is deemed to have resigned with immediate effect if he has not rectified the situation within a period of three months.

In the event of a vacancy of one or more seats due to death or resignation, the Board of Directors may, between two Shareholders' Meetings, make temporary appointments. Provisional appointments made by the Board of Directors are subject to the approval of the next Ordinary Shareholders' Meeting. If the number of Directors falls below the legal minimum, the remaining Directors must immediately convene an Ordinary Shareholders' Meeting in order to make up the numbers of the Board.

No individual over the age of 70 shall be appointed as a member of the Board of Directors if his appointment increases the number of the members of the Board of Directors who have passed this age to over one third. If during their term, the number of the members of the Board

The voting right attached to the share is exercised by the beneficial owner at both Ordinary and Extraordinary Shareholders' Meetings. However, the bare-owner shall be entitled to attend all Shareholders' Meetings. He or she may also represent the beneficial owner at Shareholders' Meetings.

The heirs, creditors, trustees or successors of a shareholder may not, on any grounds whatsoever, call for the affixing of seals on the Company's assets and securities, request the distribution thereof, or interfere in any manner whatsoever in its administration.

In order to exercise their rights, they must consult the Company's records and decisions of the Shareholders' Meetings.

of Directors who have passed 70 years of age exceeds one third of the Board's members, the oldest member of the Board of Directors who has not carried out management functions in the Company is deemed to have resigned at the end of the Annual Shareholders' Meeting held following the occurrence of this event.

During the Company's term, Directors are appointed and their mandates renewed under the conditions provided by law.

They may be dismissed by the Ordinary Shareholders' Meeting at any time.

#### Director(s) representing employees

In accordance with statutory requirements, if the number of members of the Board of Directors, calculated in accordance with article L. 225-27-1-II of the French Commercial Code, is less than or equal to 12, the Group Committee in France shall proceed to appoint a Director representing employees.

If the number of members of the Board of Directors, calculated in accordance with article L. 225-27-1-II of the French Commercial Code, is more than 12, and provided this criterion is still fulfilled on the date of the appointment, a second Director representing employees shall be appointed by the European Works Council.

If the number of members of the Board of Directors, calculated in accordance with article L. 225-27-1-II of the French Commercial Code, was originally more than 12 members but becomes less than or equal to 12 members, the Director appointed by the European Works Council shall remain in office until his term of office expires.

As an exception to the foregoing, the Director representing employees appointed by virtue of this clause is not required to hold at least 500 registered shares during his term of office.

The Director representing employees shall be appointed for a four-year term expiring at the close of the Shareholders' Meeting called to approve the financial statements for the previous year and which is held in the year in which his term of office expires. The tenure of the Director representing employees may be renewed.

The tenure of the Director representing employees shall be terminated in accordance with statutory requirements and the provisions contained in this clause, particularly in the event of termination of said Director's employment contract; if the criteria for the application of article L. 225-27-1 of the Commercial Code are no longer met, the tenure of the Director(s) representing employees shall expire at the end of the meeting during which the Board of Directors observes that the Company has been released from this obligation.

In the event that the seat of a Director representing employees is vacant for any reason whatsoever, the vacant seat shall be filled under the conditions set forth in article L. 225-34 of the French Commercial Code.

In addition to the provisions of the second paragraph of article L. 225-29 of the French Commercial Code, it is stipulated, if need be, that any failure to appoint a Director representing employees by the body designated herein, in accordance with the law and with this clause, shall not invalidate the resolutions of the Board of Directors.

### **Article 12: Organization and management of the Board of Directors**

The Board of Directors elects from among its members who are individuals, a Chairman. It determines his remuneration and sets his term of office which may not exceed his term of office as Director. The Chairman may be re-elected.

The Chairman of the Board of Directors performs the duties entrusted to him by law. He chairs the Board of Directors, organizes and manages its work and reports on such work to the Shareholders' Meeting. He ensures that the Company's bodies operate properly and, in particular, that the Directors are able to fulfill their assignments.

The Board may also appoint from among its members one or more Vice-Chairmen, whose term of office shall be determined within the limit of their term as Director and whose role it is, subject to the legal provisions applicable in the event of the temporary impediment or death of the Chairman, to convene and chair Board meetings or chair Shareholders' Meetings in accordance with these articles of association when the Chairman is impeded.

No Director who does not also assume the role of Chief Executive Officer may be appointed as Chairman of the Board of Directors after the age of 70 (or 72 if the Board decides at its discretion to derogate from this limit in exceptional circumstances). If, during the term of office, this age limit is reached, the Chairman's mandate shall terminate at the close of the Shareholders' Meeting held to approve the financial statements for the year during which he has reached the age limit.

If the Chairman of the Board of Directors also assumes the role of Chief Executive Officer, the applicable age limit is that applicable to the Chief Executive Officer.

The Chairman and each Vice-Chairman may be dismissed by the Board of Directors at any time. They may also be re-elected.

The Board may appoint a secretary who need not be a shareholder or one of its members.

## **Article 13: General Management**

### **Management organization**

In accordance with the law, the Company's General Management is assumed either by the Chairman of the Board of Directors or by any other physical person, Director or not, appointed by the Board of Directors and who assumes the role of Chief Executive Officer.

The choice between either of the two General Management organizations described above is made by the Board of Directors. The Board of Directors makes its decision relating to the choice of General Management organization under the quorum and majority conditions stipulated in article 14 of these articles of association. The shareholders and third parties are informed of the Board of Directors' decision under the conditions stipulated by the regulations in force.

When the Company's General Management is assumed by the Chairman of the Board of Directors, the Board of Directors must appoint, among its members considered as independent by the Board of Directors, a Lead Director. The conditions of appointment, the tasks and powers of the Lead Director (in particular, if applicable, the power to ask to convene a meeting of the Board of Directors), are set out in the Board of Directors' internal regulations.

The choice made by the Board of Directors remains valid until it decides otherwise.

The Board of Directors will review, as necessary, the choice made each time the mandate of the Chairman of the Board of Directors or the Chief Executive Officer comes up for renewal.

### **Chief Executive Officer**

If the Company's Chief Executive Officer is assumed by the Chairman of the Board of Directors, the following provisions relating to the Chief Executive Officer are applicable.

The Board of Directors sets the term of office and determines the remuneration of the Chief Executive Officer.

No individual over the age limit set by law may be appointed as Chief Executive Officer. If, during the term of office, this age limit is reached, the Chief Executive Officer's mandate shall terminate at the close of the Shareholders' Meeting held to approve the financial statements for the year during which he has reached the age limit set by law.

The Chief Executive Officer may be dismissed at any time by the Board of Directors. The discharge of a Chief Executive Officer who does not assume the role of Chairman may give rise to damages if decided without reasonable cause.

The Chief Executive Officer may always be re-elected.

### **Powers of the Chief Executive Officer**

The Chief Executive Officer is vested with the broadest powers to act in all circumstances on behalf of the Company within the limit of the Company's corporate purpose, the articles of association, and subject to the powers expressly granted by law to Shareholders' Meetings and the Board of Directors.

The Board of Directors is responsible for defining the decisions of the Chief Executive Officer that require its prior approval. The Board of Directors' prior approval should be sought particularly for external



acquisitions or sales of interests or assets, and for investment commitments, in each case under the conditions and exceeding the amounts corresponding to an efficient operation of the Company as set by the Board of Directors. It should also be sought for financing operations of any amount likely to substantially alter the Company's financial structure and for any decision likely to substantially alter the Company's strategic orientations determined by the Board of Directors.

### Senior Executive Vice Presidents

On the Chief Executive Officer's proposal, whether he be Chairman of the Board of Directors or any other person, the Board of Directors may appoint one or more physical persons as Senior Executive Vice Presidents to assist the Chief Executive Officer.

The maximum number of Senior Executive Vice Presidents is set at three.

In accordance with the Chief Executive Officer, the Board of Directors determines the scope and term of the powers granted to the Senior Executive Vice Presidents and sets their remuneration.

The Senior Executive Vice Presidents have the same powers as the Chief Executive Officer vis-à-vis third parties.

In the event of impediment of the Chief Executive Officer or the cessation of his functions, the Senior Executive Vice Presidents shall maintain, unless decided otherwise by the Board of Directors, their functions and powers until a new Chief Executive Officer is appointed.

The Senior Executive Vice Presidents may be dismissed at any time by the Board of Directors, at the Chief Executive Officer's proposal. They are subject to the age limit provided by law.

Senior Executive Vice Presidents may be re-elected.

### Article 14: Board of Directors' Meetings and deliberations

The Board of Directors meets as often as the interest of the Company so requires, by notice from its Chairman or in the case of impediment, from the oldest Vice-Chairman, if one or more Vice-Chairmen have been appointed, at the Head Office or in any other location indicated in the Notice of Meeting.

The agenda is set by the Chairman and may only be finalized at the time of the Meeting.

Directors representing at least one third of members of the Board of Directors may, while specifying the meeting's agenda, ask the Chairman to summon the Board if it has not met for more than two months.

Likewise, the Chief Executive Officer, if he does not chair the Board of Directors, may ask the Chairman to summon the Board of Directors on any specified agenda.

The Chairman is bound to the requests made to him.

In the event that the Chairman is impeded or fails in performing the aforementioned tasks, the oldest Vice-Chairman, if one or more Vice-Chairmen have been appointed, shall have the authority to call the Board and set the meeting's agenda at the request of at least one third of members of the Board of Directors or the Chief Executive Officer, as the case may be. In the absence of a Vice-Chairman, the minimum of one third of members of the Board of Directors or the

Chief Executive Officer, depending on the case, shall have the authority to call the Board and set the meeting's agenda.

Notices may be made by all means, including verbally.

The presence of one half of the members of the Board of Directors is required for the validity of the Board's decisions.

Decisions are made by a simple majority of the votes of the members present or represented. In the event of a tie, the Chairman shall have the casting vote.

The Board of Directors will set its internal rules that it may amend by simple resolution.

The Board of Directors may stipulate in its internal rules that the members of the Board of Directors who take part in the Board's meeting by videoconference or telecommunications in accordance with the conditions provided by the regulations in force shall be considered as present for calculating the quorum and voting majority of the members, for all decisions in which the law does not exclude such possibility.

### Article 15: Powers of the Board of Directors

The Board of Directors determines the orientations of the Company's activities and ensures their implementation.

Subject to the powers expressly attributed to Shareholders' Meetings by law and these articles of association and in accordance with the corporate purpose, the Board deals with any issues concerning the smooth running of the Company and manages corporate business pursuant to its decisions.

The Board of Directors may conduct controls and verifications as it deems appropriate.

The Board is authorized to issue bonds pursuant to a delegation granted by the Ordinary Shareholders' Meeting.

It may also decide to create Committees of its members responsible for analyzing issues which it itself or its Chairman submits thereto for review. The Board determines the composition and powers of the Committees which conduct their activities under its responsibility.

Issues related to the performance, remuneration and, where appropriate, the renewal of the term of office of the Chairman and Chief Executive Officer, or the Chief Executive Officer, shall be decided by the Board of Directors as and when required, and at least once a year, after analysis by the Committee(s) of the Board of Directors that deal with appointment and remuneration issues.

### Article 16: Remuneration

The Ordinary Shareholders' Meeting may allocate to the members of the Board of Directors, as remuneration for their activity, a fixed annual amount in Directors' fees. The Board of Directors is free to distribute the overall sum thus allocated among its members. It may also allocate a greater amount to the Directors who are members of Committees set up within the Board than that allocated to the other Directors.

The Board may allocate exceptional sums to remunerate assignments or mandates entrusted to the members of the Board.



## Section IV

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### STATUTORY AUDITORS

#### Article 17: Audit of the Company

At the Ordinary Shareholders' Meeting, the shareholders appoint, under the conditions and with the assignments set by law, the principal and deputy Statutory Auditors.

## Section V

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### SHAREHOLDERS' MEETINGS

#### Article 18: Shareholders' Meetings

The Shareholders' Meeting is comprised of all the shareholders, regardless of the number of shares they own, provided that all shares are fully paid up and that they are not stripped of voting rights.

The right to attend Shareholders' Meetings of the Company shall be justified by the recording of the shares, in the book-entry form, in the name of the shareholder or of the intermediary registered on behalf of the shareholder within the time frames and under the conditions provided for by French law.

The owners of registered shares or bearer shares must furthermore have filed a proxy or absentee ballot form, or a single document presented in lieu thereof, or if the Board of Directors has so decided, a request for an admission card, at least three days prior to the meeting. The Board of Directors may however reduce this time period if it deems appropriate. It may also authorize the submission to the Company of the proxy or absentee ballot forms by teletransmission (including electronically) in accordance with prevailing regulatory and legal provisions.

The electronic signature can, when used, take the form of a process that satisfies the conditions defined in the first sentence of section 2 of article 1316-4 of the French Civil Code.

The Shareholders' Meeting, duly constituted, represents all of the shareholders.

Ordinary and Extraordinary Shareholders' Meetings, and where necessary, Special Shareholders' Meetings are convened, meet and deliberate under the conditions provided by law and these articles of association.

Meetings take place at the head office or at any other place designated by the author of the notice, even outside of the Head Office or the Head Office's department.

Shareholders' Meetings are chaired by the Chairman of the Board of Directors or, in his absence, by the Vice-Chairman or the oldest

Vice-Chairman of the Board, if one or more Vice-Chairmen have been appointed, or otherwise by a Director specifically appointed for this purpose by the Board. In the event of impediment of the Vice-Chairman or Vice-Chairmen when Vice-Chairmen have been appointed or if the Board has not appointed a Director, the shareholders shall themselves appoint the Chairman.

The two members of the Shareholders' Meeting with the highest number of votes and having accepted the position act as ballot inspectors for the Shareholders' Meeting. The officers of the meeting appoint a secretary who need not be a shareholder.

In the event that the meeting is convened by a Statutory Auditor or by a judicial representative, the Shareholders' Meeting is chaired by the author of the notice.

Upon the decision of the Board of Directors published in the Notice of Meeting or notice of convocation to rely on means of telecommunication, the shareholders who take part in the Shareholders' Meeting by videoconference or using telecommunications means permitting their identification in accordance with the conditions provided by prevailing law, shall be considered as present for calculating the quorum and voting majority.

#### Article 19: Powers of Shareholders' Meetings

Ordinary and Extraordinary Shareholders' Meetings, and where necessary, Special Shareholders' Meetings allow shareholders to exercise the powers defined by law and these articles of association.

During the Ordinary Shareholders' Meeting, shareholders decide or authorize the issue of bonds secured, where necessary, by specific collateral in accordance with prevailing laws and regulations and authorize the Chairman to grant such collateral. They may delegate to the Board of Directors the competence and powers necessary to issue such bonds, in one or more installments, within a period set by them, and to determine the terms and conditions of the issuance of such bonds. The guarantees set up subsequent to the issue of the bonds are granted by the Chairman of the Board of Directors upon the Board's authorization.

## Section VI

### INVENTORY – RESERVES – DISTRIBUTION OF PROFITS

#### Article 20: Fiscal year

The fiscal year begins on January 1 and ends on December 31.

#### Article 21: Inventory, distribution of profits

The Company's net proceeds, established in the annual inventory, after deducting overheads and other costs, including all amortization, depreciation and provisions, constitute the net profits.

From these profits, less, as the case may be, previous losses, a deduction of at least 5% is first of all made to create the reserve required by law. This deduction ceases to be mandatory when the reserve amounts to 10% of the share capital. It is resumed if this reserve is ever used.

The distributable profits are made up of the annual net profits, less previous losses, as well as the sums to be placed on reserve pursuant to law, plus the profit carried forward.

From these profits, a deduction is made of the amount necessary to pay the shareholders, as a first dividend, 5% of the sums paid-up on their shares, and not amortized, and 5% of the sums from premiums on shares issued in cash, and appearing in a "share premium" account, without it being possible, if the profits of a given year do not permit this payment, for the shareholders to claim such amounts from the profits of subsequent years.

The Shareholders' Meeting may decide to earmark any portion of the available surplus of said profits it wishes for the creation of general or special providence or reserve funds, under any name whatsoever or even simply as an amount carried forward.

The balance constitutes a surplus fund which is intended for the distribution of the second dividend as well as the amount provisionally assessed as necessary to pay a 10% increase to the registered shares satisfying the following conditions.

Starting on January 1, 1996, the shares registered at December 31 of each year in registered form for at least two years, and which remain registered until the date of the payment of the dividend, will entitle their owners to collect a dividend per share which is 10% higher, rounded down if necessary to the lower centime, than the dividend per share distributed in respect of other shares, provided that the amount of the dividend per share prior to any increase is at least equal to the amount of the dividend per share prior to any increase distributed in the preceding year, adjusted to take into account the change in the number of shares from one year to the next resulting in a capital increase by capitalizing premiums, reserves or profits or a share split.

In the event that, starting on January 1, 1996, the Board of Directors, with the approval of the shareholders decides to increase the capital by capitalizing reserves, profits or premiums, the registered shares held on December 31 prior to the attribution for at least two years and that remain held until the day before the share attribution date will entitle their owners to an attribution of shares which is 10% higher than the attribution made in favor of other shares, and according to the same procedure.

The new shares created in this manner will be comparable in all respects to the existing shares from which they are issued, for calculating the entitlement to the higher dividends and the higher attributions.

The increases defined in each of the two preceding paragraphs may be modified or eliminated by simple decision during the Extraordinary Shareholders' Meeting, according to the procedures it determines.

Pursuant to law, the number of shares eligible for these increases shall not for any given shareholder exceed 0.5% of the Company's share capital.

The Shareholders' Meeting held to approve the financial statements for the year shall have the possibility of granting to each shareholder, for all or part of the dividend or interim dividends, an option for payment of the dividend or interim dividends in either cash or shares.

## Section VII

### LIQUIDATION

#### Article 22: Liquidation

At the expiration of the Company's term, or in the event of early dissolution, the shareholders determine the method of liquidation, in accordance with the conditions stipulated by law. They appoint and determine the powers of one or more liquidators.

The liquidators may, pursuant to a decision of the shareholders, transfer to another company or sell to a company or to any other entity or person, all or part of the assets, rights and obligations of the dissolved Company.

The duly constituted Shareholders' Meeting retains the same prerogatives during the liquidation as during the Company's term. In particular, it has the power to approve the accounts of the liquidation and to grant a discharge thereof.

After the Company's commitments have been settled, the net proceeds from the liquidation are used first to fully redeem the shares, and the surplus is then distributed equally among them.

## Section VIII

## DISPUTES

## Article 23: Disputes

All disputes which may arise during the Company's term or liquidation, either between the shareholders and the Company or among the shareholders themselves, regarding Company affairs, are settled in accordance with law and submitted to the jurisdiction of the competent Paris courts.

For this purpose, in the event of disputes, all shareholders shall elect domicile in Paris, and all summonses and notices are duly served at this domicile.

Failing election of domicile, summonses and notices are validly served at the Office of Public Prosecution of the French Republic at the High Court of Paris.

## Dividends

Year	Paid	Ordinary dividend <sup>(a)</sup> Loyalty dividend <sup>(b)</sup>	Number of shares	Distribution (in euros)
2016 <sup>(e)</sup>	May 17, 2017	2.60 <sup>(a)</sup>	386,747,297	1,005,542,972
		0.26 <sup>(b)</sup>	100,099,466	26,025,861
				<b>1,031,568,833</b>
2017 <sup>(e)</sup>	May 30, 2018	2.65 <sup>(a)</sup>	426,786,117	1,130,983,210
		0.26 <sup>(b)</sup>	113,814,089	29,591,663
				<b>1,160,574,873</b>
2018 <sup>(c)(d)</sup>	May 22, 2019	2.65 <sup>(a)</sup>	429,423,434	1,137,972,100
		0.26 <sup>(b)</sup>	128,524,663	33,416,412
				<b>1,171,388,512</b>

(a) Ordinary dividend paid on all shares.

(b) Loyalty dividend paid only on registered shares held continuously for two full calendar years.

(c) Subject to the approval of the General Shareholders' Meeting on May 7, 2019.

(d) For 2018, amounts distributed are theoretical values calculated based on the number of shares as of December 31, 2018.

(e) For 2016 and 2017, amounts actually paid.

## Statements

Pursuant to the statements made to the Company by each corporate officer, the Company confirms that corporate officers do not have any family ties with another corporate officer and have not been convicted of fraud at least during the last five years.

No incrimination and/or official public sanction has been pronounced against them by statutory or regulatory authorities (including professional organizations) and they have not been prevented by a court from acting in their capacity as a member of an administration, management or supervisory body or interfering in the management or carrying out of business of an issuer during at least the last five years. They have no conflicts of interest even potential with L'Air Liquide S.A.

No arrangements or agreements have been made with the significant shareholders, customers, suppliers or others, pursuant to which the corporate officers of L'Air Liquide S.A. have been chosen as such. There exist no restrictions accepted by these persons as to the transfer, within a certain time period, of their interest in the capital of L'Air Liquide S.A. except for the rules on prevention of market abuse and the obligation set forth in the articles of association requiring the members of the Board of Directors appointed by the Annual Shareholders' Meeting to own at least 500 registered shares of the Company during the term of their office and the obligation to hold shares imposed on executive corporate officers. Corporate officers have not been associated with any bankruptcy, any receivership or liquidation during the last five years.

## Property, plant and equipment

The Group's facilities and establishments are located in 80 countries around the world, with extremely diversified production capacities and characteristics.

No material tangible fixed asset exists at Group level.

The number of main plants by unit types is detailed in the Environmental and societal reporting – page 293.

## Documents accessible to the public

Documents, or copies of the documents listed below may be consulted during the period of the Reference Document's validity at Shareholder Services located at the Head Office of Air Liquide (75, quai d'Orsay, 75007 Paris) and, if applicable, on the Company's Internet website ([www.airliquide.com](http://www.airliquide.com)), subject to the documents made available at the Company's head office or Internet site under the applicable laws and regulations:

- the Company's articles of association;
- all reports, letters and other documents, historical financial information, evaluations and official assertions and declarations prepared by an expert at the Company's request, some of which are included or referred to in this Reference Document;
- historical financial information of the Group, for each of the two fiscal years preceding publication of this Reference Document.

## Incorporation by reference

Pursuant to the article 28 of the EC Regulation No. 809/2004, the following information is included in this Reference Document:

- The consolidated and parent company financial statements for the year ended December 31, 2016, accompanied by the Statutory Auditors' Reports which appear on pages 311 and 312 and on pages 330 and 312, respectively, of the 2016 Reference Document filed on March 7, 2017 with the French financial markets authority (AMF) under number D.17-0130;
- The financial information shown on pages 10 to 64 of the 2016 Reference Document filed on March 7, 2017 with the French financial markets authority (AMF) under number D.17-0130;

- The consolidated and parent company financial statements for the year ended December 31, 2017, accompanied by the Statutory Auditors' Reports which appear on pages 293 to 298, and on pages 313 to 315, respectively, of the 2017 Reference Document filed on March 7, 2018 with the French financial markets authority (AMF) under number D.18-0107;
- The financial information shown on pages 10 to 66 of the 2017 Reference Document filed on March 7, 2018 with the French financial markets authority (AMF) under number D.18-0107.

The sections not included in these documents serve no useful purpose to investors or are already covered in this Reference Document.

## INFORMATION RELATING TO PAYMENT DEADLINES FOR SUPPLIERS AND CUSTOMERS

Pursuant to the provisions of article D. 441-4 of the French Commercial Code and Decree No. 2015-1553 of November 25, 2015, the breakdown of the balance of trade payables and receivables of L'Air Liquide S.A. as at December 31, 2018 is as follows:

Invoices received outstanding at the closing date of the financial year that has ended						
	0 day	1 to 30 days	31 to 60 days	61 to 90 days	91 days or more	Total (1 day and more)
A) Late payment tranches						
Number of invoices concerned	1,455					2,452
Total amount of invoices concerned (all taxes included) <i>(in millions of euros)</i>	15.2	2.7	1.9	0.7	1.2	6.5
Percentage of total amount of purchases net of taxes for the financial year	4.5%	0.8%	0.6%	0.2%	0.4%	1.9%
B) Invoices excluded from (A) relating to disputed and unrecorded debts						
Number of invoices excluded				17		
Total amount of invoices excluded <i>(in millions of euros)</i>				1.3		
C) Reference payment terms used (contractual or statutory period - article L. 441-6 or article L. 443-1 of the French Commercial Code)						
Payment deadlines used to calculate late payments	Contractual deadlines:	0 to 60 days				

Invoices issued outstanding at the closing date of the financial year that has ended						
	0 day	1 to 30 days	31 to 60 days	61 to 90 days	91 days or more	Total (1 day and more)
A) Late payment tranches						
Number of invoices concerned	56					67
Total amount of invoices concerned (all taxes included) <i>(in millions of euros)</i>	1.3	2.7	-	0.2	0.6	3.4
Percentage of total amount of purchases net of taxes for the financial year	1.1%	2.4%	-	0.2%	0.5%	3.1%
B) Invoices excluded from (A) relating to disputed and unrecorded debts						
Number of invoices excluded						
Total amount of invoices excluded <i>(in millions of euros)</i>						
C) Reference payment terms used (contractual or statutory period - article L. 441-6 or article L. 443-1 of the French Commercial Code)						
Payment deadlines used to calculate late payments	Contractual deadlines:	0 to 60 days				

## PERSON RESPONSIBLE FOR THE REFERENCE DOCUMENT

### Person responsible for the Reference Document

Benoît POTIER, Chairman and CEO of L'Air Liquide S.A.

### Certification by the person responsible for the Reference Document

I hereby attest, after having taken all reasonable measures for such purpose, that the information contained in this Reference Document reflects, to the best of my knowledge, the current situation and does not omit any information that could alter its scope.

I certify that, to the best of my knowledge, the financial statements have been prepared in accordance with applicable accounting standards and give a true and fair view of the assets and liabilities, and of the financial position and results of the Company and of its consolidated subsidiaries, and that the Management Report of the annual Financial Report defined on the Cross-reference table available in chapter 6 of this Reference Document pages 357 and 358 provides a true and fair view of the evolution of the business, results and financial condition of the Company and of its consolidated subsidiaries, and a description of the main risks and uncertainties the Company and its consolidated subsidiaries are subject to.

I have obtained a work completion letter from the Statutory Auditors indicating that they have, in accordance with French professional standards, verified the information on the financial position and the financial statements and have reviewed all of the information presented in the Reference Document.

Paris, March 5, 2019

**Benoît Potier**

Chairman and CEO

## CROSS-REFERENCE TABLE FOR THE REFERENCE DOCUMENT

The cross-reference table identifies the main information required by Regulation No. 809/2004 of the European Commission dated April 29, 2004 (the "Regulation"). The table indicates the pages of this Reference Document where is presented the information related to each item. The table indicates, when required by the Regulation, the pages of the Reference Document related to the year ended December 2017, filed on March 7, 2018 under the number D.18-0107 (the "DDR 2017"), and the pages of the Reference Document related to the year ended December 2016, filed on March 7, 2017 under the number D.17-0130 (the "DDR 2016"), which are incorporated by reference in this document.

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N°	Items of the Annex I of the Regulation	Pages
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13.3	Preparation of the forecast or estimate	N/A
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N°	Items of the Annex I of the Regulation	Pages
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## CROSS-REFERENCE TABLE FOR THE ANNUAL FINANCIAL REPORT

In order to facilitate the reading of this document, the cross-reference table, hereafter, enables to identify in this Reference Document the information which constitutes the annual Financial Report that must be published by the listed companies in accordance with article L. 451-1-2 of the French Monetary and Financial Code and article 222-3 of the French financial markets authority's general regulations.

N°	Required element	Chapter / Pages
1.	Company annual financial statements	Chapter 3 / p. 253 to 266
2.	Consolidated financial statements	Chapter 3 / p. 183 to 248
3.	Management Report (within the meaning of the French Commercial Code)	Refer to the cross-reference table for the Management Report on page 357
4.	Statement of the persons responsible for the annual Financial Report	Chapter 6 / p. 351
5.	Statutory Auditors' Report on the Company's annual financial statements and the Consolidated financial statements	Chapter 3 / p. 249 to 252, 267 to 269

## CROSS-REFERENCE TABLE FOR THE MANAGEMENT REPORT

In order to facilitate the reading of this document, the cross-reference table, hereafter, enables to identify in this Reference Document the Management Report information required by articles L. 225-100 et seq., L. 232-1 et seq. and R. 225-102 et seq. of the French Commercial Code (Code de commerce).

Required element	Reference text	Chapter / Pages
<b>Group situation and activity</b>		
Objective and comprehensive analysis of changes in business, results and the financial situation of the Company and the Group	L. 225-100-1, I-1°, L. 232-1, II, L. 233-6 and L. 233-26 of the French Commercial Code	Key figures / p. 1, 2 to 8 Chapter 1 / p. 10 to 13, 19 to 30, 54 to 70
Key non-financial performance indicators relating to the Company and the Group's specific activity	L. 225-100-1, I-2° of the French Commercial Code	Key figures / p. 4, 8 Chapter 1 / p. 70 to 80
Significant events occurring between the fiscal year closing date and the Management Report preparation date	L. 232-1, II and L. 233-26 of the French Commercial Code	Chapter 3 / p. 243
Description of the main risks and uncertainties and indication of the use of financial instruments by the Company and the Group	L. 225-100-1, I-3° and 6° of the French Commercial Code	Chapter 1 / p. 40 to 45 Chapter 3 / p. 234 to 239
Internal control and risk management procedures implemented by the Company	L. 225-100-1, I-5° of the French Commercial Code	Chapter 1 / p. 45 to 53
Description and management of the environmental and climatic risks	L. 225-100-1, I-4° of the French Commercial Code	Chapter 1 / p. 43 to 44, 50 to 51
Significant acquisitions during the fiscal year of equity interests in companies which have their registered office in France	L. 233-6, paragraph 1 of the French Commercial Code	Chapter 5 / p. 308
Company and Group foreseeable trends and outlook	L. 232-1, II and L. 233-26 of the French Commercial Code	Chapter 1 / p. 31 to 39, 88
Research and Development activities	L. 232-1, II and L. 233-26 of the French Commercial Code	Chapter 1 / p. 81 to 87
<b>Report on corporate governance</b>		
List of all terms of office and functions held in any company by each Executive Officer during the fiscal year	L. 225-37-4, 1° of the French Commercial Code	Chapter 2 / p. 90 to 92, 113 to 124
Composition, preparation and organization of the work of the Board of Directors	L. 225-37-4, 5° of the French Commercial Code	Chapter 2 / p. 93 to 112
Limits brought by the Board of Directors on Chief Executive Officer's powers	L. 225-37-4, 7° of the French Commercial Code	Chapter 2 / p. 99
Reference to a Code of corporate governance and application of the principle comply or explain	L. 225-37-4, 8° of the French Commercial Code	Chapter 2 / p. 93, 112
Principles and criteria for determination, allocation and distribution of the fixed, variable and exceptional elements of the total remuneration and the benefits of all kinds that may be granted to the Executive Officers	L. 225-37-2 of the French Commercial Code	Chapter 2 / p. 156 to 163
Remuneration and benefits of all kinds paid during the fiscal year to each Executive Officer by the Company	L. 225-37-3 paragraph 2 of the French Commercial Code	Chapter 2 / p. 127 to 149
Commitments of any kinds made by the Company for the benefit of its Executive Officers, corresponding to elements of remuneration, indemnities or benefits due or likely to be due as a result of the assumption, termination or change in their duties, or thereafter	L. 225-37-3 paragraph 3 of the French Commercial Code	Chapter 2 / p. 143 to 147
Agreements between an Executive Officer or a major shareholder and a subsidiary	L. 225-37-4, 2° of the French Commercial Code	N/A
Specific conditions governing shareholders' attendance at the Annual General meeting	L. 225-37-4, 9° of the French Commercial Code	Chapter 2 / p. 112 Chapter 6 / p. 342 to 343, 346
Summary table of delegations of authority currently in force granted by the Shareholders' Meeting relating to an increase in capital	L. 225-37-4, 3° of the French Commercial Code	Chapter 6 / p. 340

Required element	Reference text	Chapter / Pages
Description of diversity policy concerning the Board of Directors, description of the objectives of this policy, its way of implementing and the results obtained during the fiscal year / information on a manner in which the Society seeks for equal representation of women and men in the committees put in place by Executive Management and results with respect to the mixity in 10% of positions at the highest level of responsibilities	L. 225-37-4, 6° of the French Commercial Code	Chapter 2 / p. 93, 94, 108
Information that may have an impact in the event of a takeover bid	L. 225-37-5 of the French Commercial Code	Chapter 2 / p. 178 to 179
<b>Share ownership and capital</b>		
Structure and change in Company capital and threshold notifications	L. 233-13 of the French Commercial Code	Key figures / p. 7 Chapter 4 / p. 283 Chapter 6 / p. 338 to 339
Acquisition and disposal by the Company of treasury shares	L. 225-211 of the French Commercial Code	Chapter 5 / p. 310 to 311 Chapter 6 / p. 339
Employee share ownership	L. 225-102, paragraph 1 of the French Commercial Code	Chapter 2 / p. 164 to 175 Chapter 6 / p. 339
Shares acquired by employees as part of a management buyout	L. 225-102, paragraph 2 of the French Commercial Code	N/A
Possible adjustments for securities giving access to share capital in case of buybacks of shares or financial transactions	R. 228-90 and R. 228-91 of the French Commercial Code	Chapter 2 / p. 165 to 167, 169 to 171
Information on Company's shares trading by Executive Officers and related persons	L. 621-18-2 of the French Monetary and Financial Code	Chapter 2 / p. 177
Attribution and retention of stock options by Executive Officers Attribution and retention of free share grants to Executive Officers	L. 225-185 of the French Commercial Code L. 225-197-1 of the French Commercial Code	Chapter 2 / p. 132 to 138, 141 to 142, 159 to 160
Amount of dividends paid out in respect of the three previous fiscal years	243 bis of the French Tax Code	Chapter 5 / p. 309, 315 Chapter 6 / p. 348
<b>Extra-financial Performance Declaration</b>		
Business model	R. 225-105, I of the French Commercial Code	Chapter 1 / p. 14 to 18
Information on the manner in which the Groupe considers societal and environmental implications of its activity: - description of principal risks related to the activity - description of procedures implemented by the Groupe to prevent, identify and mitigate these risks - results of these procedures, including key performance indicators	L. 225-102-1, III and R. 225-105 of the French Commercial Code	Chapter 1 / p. 43 to 44 Chapter 1 / p. 50 to 51  Chapter 1 / p. 70 to 80, Chapter 4 / p. 275 to 300
Specific information for companies operating at least one site classed Seveso "high threshold"	L. 225-102-2 of the French Commercial Code	Chapter 4 / p. 293 to 298
Fight against corruption and tax evasion Information on respect of human rights Vigilance plan	L. 225-102-1, III and R. 225-105, II-B-1° and 2° of the French Commercial Code L. 225-102-4 of the French Commercial Code	Chapter 1 / p. 51 Chapter 1 / p. 18, 72 Chapter 1 / p. 50 to 51
<b>Additional information</b>		
Additional tax information	223 quater and 223 quinquies of the French Tax Code	N/A
Injunctions or financial penalties in respect of anti-competitive practices	L. 464-2 of the French Commercial Code	N/A
Information on suppliers and customers payment terms	D. 441-6-1 of the French Commercial Code	Chapter 6 / p. 350
Table of Company results over the past five fiscal years	R. 225-102 of the French Commercial Code	Chapter 3 / p. 270

## GLOSSARY

### Financial glossary

#### A

##### **Adjusted price**

Share price adjusted to take account of changes in capital (issue of new shares, share split, etc.). The adjusted share price is used to produce meaningful comparisons of price changes over time.

##### **AMF (Autorité des marchés financiers, the French financial market authority)**

The AMF governs and oversees the conduct and professional ethics of the markets and protects the interests of investors and shareholders.

#### B

##### **Bearer share**

Share held in a security account at the shareholder's financial broker.

##### **Bond**

Tradable debt security issued by a public or private company, a group, an association or a government. Bonds carry fixed interest for a specific period and are redeemable on maturity.

#### C

##### **CAC 40 (cotation assistée en continu – Continuous Automated Trading)**

The flagship stock market index of Euronext in Paris, the CAC 40 tracks the evolution of a selection of 40 stocks registered on this stock market. A Committee of Euronext specialists regularly revises its composition to ensure that it remains representative. Air Liquide has been included in the CAC 40 since its inception in 1988.

##### **Capital employed**

Balance sheet capital corresponding to financial resources used by a company to develop its business. It is the sum of equity, minority interests and net debt.

##### **Capital gain**

Gain realized on the sale of a security, that is, the difference between its sale price and its original purchase price, or book value.

##### **Cash flow**

This indicator provides the exact measure of annual cash flow that the Company is able to generate from its operations, independently of the evolution of the working capital requirement, which can be seasonal or erratic. This indicator is before tax, dividends and cost of financing.

##### **Conditional grant of shares to employees (CGSE)**

Means of remuneration that grants free shares of the Company to all the employees or a specific employee category. The employee only becomes the owner of the shares after a given acquisition period and according to the plan's conditions. If the acquisition period is shorter than four years, the law provides that the employee must keep his/her shares for a minimum additional two-year period.

##### **Custody fees**

Fees charged by a financial intermediary for maintaining a share account. They generally represent a percentage of the portfolio or a set fee per line of shares held. Air Liquide's Shareholder Services provide this service free of charge for shares held in a direct registered account.

#### D

##### **Deferred settlement service (SRD)**

Fee-based service available for the most traded stocks through which settlement for orders or delivery of shares is deferred to the last trading day of the month. Air Liquide shares are eligible for this service.

##### **Diluted earnings per share (Diluted EPS)**

Net profit Group share divided by the average weighted number of shares which would be outstanding, assuming conversion of all potential shares (exercise of share subscription options, definitive grant of free shares, etc.). The equivalent accounting term is diluted net profit by share.

##### **Direct registered shares**

Direct registered shares are managed by Air Liquide and registered in its accounts. They are held in a securities account opened at Air Liquide.



**E****Earnings per share (EPS)**

Net profit Group share divided by the average weighted number of shares outstanding. The equivalent accounting term is net profit per share.

**ESG (Environmental, Social and Corporate Governance)**

Environmental, social and corporate governance are the three main areas appraised by SRI analysts. A positive appraisal of these criteria is a guarantee of quality. It reflects the sustainability of a company's development.

**Euronext Paris**

Name of the firm which organizes, manages and develops the securities market in Paris, and acts as market regulator (financial transactions, monitoring of companies listed on the stock market) with the delegated authority of the AMF.

**Euro Stoxx 50**

Stock Exchange index composed of 50 of the highest capitalizations and most actively traded stocks listed in the eurozone.

**F****Fractional right**

Part of a share that cannot be distributed in the case of a free share attribution or subscription if the number of shares held is not a multiple of the transaction. Example: in a 1 for 10 free share attribution, a shareholder holding 68 shares is allocated 6 new shares and 8 fractional rights.

**Free float**

The part of a company's capital publicly available and tradable on the stock markets. The higher the free float, the greater the liquidity of the shares. Nearly 100% of Air Liquide's capital is floated.

**Free share attribution**

Transaction by which the Company issues new shares by capitalizing undistributed earnings at no cost to shareholders, and allocates new shares in proportion to the number of shares already held. Air Liquide allocates regularly such free shares.

**G****Goodwill**

Difference between the purchase price of a company and its net tangible assets on the day of the acquisition.

**I****IFRS (International Financial Reporting Standards)**

International accounting standards with effect from January 1, 2005, conceived by the International Accounting Standards Board, or IASB, for quoted companies to harmonize the presentation and increase the transparency of their financial statements.

**Indirectly/intermediary registered shares**

Indirectly/intermediary registered shares are registered in the Air Liquide accounts and held in a securities account at the shareholder's financial institution.

**L****Liquidity**

Ratio of the volume of shares traded over the total number of shares outstanding, which make up the capital.

**Loyalty bonus**

The loyalty bonus increases the dividend distributed and the number of free shares attributed by 10% for registered shares held for more than two full calendar years and subject to the conditions defined by Air Liquide's articles of association.

**Loyalty dividend**

Pursuant to Air Liquide's articles of association, a dividend premium of 10%, granted to loyal shareholders for registered shares held continuously for more than two full calendar years and until the date of the payment of the dividend.

**M****Market capitalization**

A company's market value equal, at any given time, to the quoted share price multiplied by the total number of shares outstanding.

**Market sheet**

The market sheet presents all the buy and sell orders for a share, as well as the latest orders executed. Investors can only have access to the five best offers (sales) and the five best demands (purchases).

**N****Net Dividend Per Share**

The part of a company's net profit distributed to shareholders. Shareholders vote the dividend at the Annual General Meeting after approval of the financial statements and the allocation of earnings proposed by the Board of Directors.

**Net profit (Group share)**

Profit or loss made by the Company. It is calculated by adding operating income recurring, other non recurring operating expenses, net finance costs, other net financial expenses, share of profit of associates, profit (loss) from discontinued operations, then subtracting Company tax and minority interests.

**O****OPCVM (Organisme de placement collectif en valeurs mobilières – pooled investment funds)**

A savings product that makes it possible to hold part of a collective marketable security portfolio handled by a professional, like SICAVs (open-ended investment companies) or FCPs (mutual funds).

**Operating income recurring**

Annual sales minus the cost of producing, distributing and selling products and the depreciation or amortization on capital expenditures. It provides an operating performance indicator before financing and taxes.

**P****Par value**

The issue price of a share as defined in a company's articles of association. A company's total capital is the par value of the share multiplied by the total number of shares outstanding.

**PER (Price Earnings Ratio)**

The ratio of the market price of a share over earnings per share.

**Preferential subscription right**

Tradable right giving shareholders priority in subscribing to a number of new shares in proportion to the number of shares already held in the event of a share issue. This is a negotiable right in the stock exchange. In exceptional cases, the Company may ask its shareholders to suspend their subscription right at an Extraordinary Shareholders' Meeting.

**Q****Quorum**

Minimum percentage of shares with voting rights required to be present or represented for a General Shareholders' Meeting to be validly constituted.

**R****Registered share**

Share registered in the Air Liquide accounts.

**Retained earnings**

Undistributed profit, held by the Company until further decision.

**Roadshow**

Organized series of meetings during which a listed company, represented by its management or an Investor Relations team, travels to meet with institutional investors in their offices.

**ROCE (Return On Capital Employed)**

Return On Capital Employed after tax: ((net profit after tax before deduction of minority interests – net cost of debt after taxes) over 2016) / (average (shareholders' equity + minority interests + net indebtedness) at the end of the three last semesters (H2 2015, H1 2016 and H2 2016)).

**ROE (Return On Equity)**

The ratio of Net Profit over shareholders' equity. It represents the net return on money invested by shareholders.

**S****Share**

Tradable security representing a portion of a company's capital. The owner of a share, the shareholder, is a part-owner of the Company and enjoys certain rights. Shares can be held as registered or bearer shares.

**Share buyback**

Transaction by which a company buys its own stock on the market, up to the limit of 10% of its capital. The transaction requires shareholder approval at the Company's General Shareholders' Meeting. Bought back shares are not taken into account in the net earnings per share calculation and do not receive any dividends.

**Shareholders' equity**

The part of the Company's capital belonging to its shareholders. It includes the value of issued shares, retained earnings and Net Profit for the financial year.

**SRI (Socially Responsible Investment)**

Socially responsible investment integrates, over and above the standard financial criteria, environmental, social and corporate governance (ESG) criteria in the analysis process and investment decision.

**Stock option**

A subscription option that offers the right to subscribe, at a price set in advance, for a fixed period, a company's shares.

**Share split**

Split of a share's par value to improve its liquidity. A share split leads, in the same proportions, to a split in the share's market value and the multiplication of the number of shares comprising the capital. The value is unchanged.

**U****Usufruct**

The legal right to use and derive profit or benefit from property that belongs to another person, as long as the property is not damaged. The holder of an usufruct has the right to use and enjoy the property, as well as the right to receive profits from the fruits of the property.

**V****Volatility**

The degree of variation of a share over a given period. It is a risk indicator: the greater the volatility, the higher the risk.

**Y****Yield**

Ratio of dividend per share over market share price.

## Technical glossary

### **Advanced materials**

Replaces the ALOHA range and the advanced precursors and includes ALOHA and Voltaix.

### **Alternative energy**

Energy that represents an alternative to traditional energies, produced by transformation of natural gas or coal using gasification and/or gas cleaning techniques.

### **ASU**

Air Separation Unit.

### **Biogas**

Renewable energy that is produced during the methanization of biomass (treatment of household waste, industrial or agricultural waste, sewage sludge), then transformed using Air Liquide purification and liquefaction technologies.

### **Bio-GNV**

Clean fuel, produced from biogas.

### **Carrier gases**

Carrier gases (nitrogen, oxygen, hydrogen, etc.) are used to transport and dilute process gases or to protect semiconductors from minute dust particles.

### **Cogen**

Cogeneration is the simultaneous production of electricity and steam. It is an environmentally virtuous process as it avoids energy loss by harnessing the heat emitted during electricity production to produce steam.

### **Cold technologies**

All cryogenic-related technologies used, primarily, in the production of air gases.

### **Cryogenics**

Very low temperatures, necessary to the liquefaction of air gases, hydrogen and helium. Concerns temperatures below -150 degrees Celsius.

### **Fab**

Production facility in the electronics sector.

### **Fellow**

The second highest international level of expertise (among four) in the Air Liquide Technical Career Ladder. Fellows are recognized as worldwide authorities within their given field of expertise. Fellows are consultants of the top management in long-term company strategy.

### **Hot technologies**

All heat-producing technologies, such as combustion processes. For Air Liquide, hot technologies comprise steam reforming of methane to produce hydrogen and carbon monoxide and cogeneration units.

### **HyCO unit**

Unit that simultaneously produces hydrogen (H<sub>2</sub>) and carbon monoxide (CO).

### **On-site**

On-site installations consist of gas production units installed directly on Industrial Merchant or Electronic customer premises, thanks to which truck deliveries can be avoided.

### **Orders in hand**

They represent the contractual value of all Group and third-party engineering and construction contracts managed by the Engineering & Construction entities, excluding projects under warranty, from the signature date.

### **Orders intake**

They represent the sum of all Group and third-party engineering contracts which entered into force during the period.

### **Renewable energy**

Forms of energy whose production does not lead to a decline in resources on a human scale, e.g. solar, wind, geothermal and hydroelectric energies.

### **Syngas**

Syngas, or synthesis gas, is a gas mixture consisting primarily of hydrogen, carbon monoxide, and in some cases carbon dioxide.

### **Substrate**

Material on or in which components of a micro-electronic system or circuit are manufactured.

### **Take-or-Pay**

Contracts used in Large Industries integrating fixed minimum payments below minimum volume thresholds.

### **Traditional energy**

As opposed to renewable energies, energy whose production exhausts resources by consuming them more quickly than they are created. It is directly produced from fossil fuels: coal, oil, natural gas.



## — TEN-YEAR CONSOLIDATED FINANCIAL SUMMARY —

	2009	2010	2011
<b>Key figures</b> (in millions of euros)			
<b>Consolidated income statement</b>			
Revenue	11,976.1	13,488.0	14,456.9
thereof Gas & Services	10,191.8	11,885.7	13,046.0 <sup>(i)</sup>
Operating Income Recurring	1,949.0	2,252.2	2,408.7
Operating Income Recurring / Revenue	16.3%	16.7%	16.7%
Net profit (Group share)	1,230.0	1,403.6	1,534.9
<b>Consolidated cash flow statement</b>			
Cash flow from operating activities before changes in working capital	2,274.5	2,660.9	2,728.1
Purchase of property, plant and equipment and intangible assets	1,411.0	1,449.8	1,755.0
Purchase of property, plant and equipment and intangible assets / Revenue	11.8%	10.7%	12.1%
Acquisition of consolidated companies and financial assets	109.2	239.9	99.5
Total capital expenditures / Revenue <sup>(a)</sup>	12.7%	13.2%	12.9%
Dividends related to fiscal year and paid in the following year <sup>(b)</sup>	609.2	684.2	729.1
<b>Consolidated balance sheet</b>			
Shareholders' equity at the end of the period	7,583.7	8,903.5	9,758.6
Net indebtedness at the end of the period	4,890.8	5,039.3	5,248.1
Gearing	63.1%	55.3%	52.5%
Capital employed at the end of the period <sup>(c)</sup>	12,642.7	14,151.8	15,243.8
<b>Share capital</b>			
Number of shares issued and outstanding at the end of the period	264,254,354	284,095,093	283,812,941
Adjusted weighted average number of shares outstanding <sup>(d)</sup>	384,466,031	387,412,817	388,959,728
<b>Key figures per share</b> (in euros)			
Net profit per share <sup>(e)</sup>	3.20	3.62	3.95
Dividend per share	2.25	2.35	2.50
Adjusted dividend per share <sup>(f)</sup>	1.53	1.71	1.82
<b>RATIOS</b>			
Return on equity (ROE) <sup>(g)</sup>	17.2%	17.0%	16.8%
Return on capital employed after tax (ROCE) <sup>(h)</sup>	11.6%	12.1%	12.1%

**Loyalty dividend:**

Since 1995, a 10% loyalty dividend is attributed to shareholders holding their shares in registered form for at least two years on the December 31 preceding the period of distribution, and owned until the date of payment of the dividend.

The dividend proposed to the Annual General Meeting for fiscal year 2018 amounts to 2.65 euros per share, and the enhanced dividend to 0.26 euro per share representing a total distribution of 1,164.8 million euros.

(a) Purchase of property, plant and equipment, intangible assets and long-term investments. Industrial and financial capital expenditures and transactions with minority shareholders are included.

(b) Including a loyalty dividend of 32.7 million euros in 2018, 29.6 million euros in 2017, 26.6 million euros in 2016, 26.8 millions euros in 2015, 25.7 million euros in 2014, 23.2 million euros in 2013, 22.7 million euros in 2012, 19.5 million euros in 2011, 16.5 million euros in 2010 and 14.7 million euros in 2009.

(c) Capital employed at the end of period: shareholders' equity + minority interests + net indebtedness.

(d) Adjusted to take into account, on a basis of a weighted number of shares outstanding, capital increases by capitalization of reserves and additional paid-in capital (2017, 2014, 2012, 2010), cash subscription of 2016 and treasury shares.

# TEN-YEAR CONSOLIDATED FINANCIAL SUMMARY

2012	2013	2014	2015 restated <sup>(f)</sup>	2016	2017	2018
15,326.3	15,225.2	15,358.3	15,818.5	18,134.8	20,349.3	21,011.1
13,912.0	13,837.0	13,800.1 <sup>(k)</sup>	14,752.3	17,331.0	19,641.9	20,106.9
2,553.0 <sup>(i)</sup>	2,580.6	2,633.8	2,856.2	3,023.9	3,363.8	3,448.5
16.7% <sup>(i)</sup>	16.9%	17.1%	18.1%	16.7%	16.5%	16.4%
1,591.1 <sup>(i)</sup>	1,640.3	1,665.0	1,756.4	1,844.0	2,199.6	2,113.4
2,885.9 <sup>(i)</sup>	2,948.5	2,942.7	3,149.5	3,523.2	4,133.0	4,138.2
2,007.9	2,156.1	1,901.7	2,027.7	2,258.6	2,182.5	2,249.2
13.1%	14.2%	12.4%	12.8%	12.5%	10.7%	10.7%
879.4	391.9	179.0	384.4	12,165.3	140.4	129.2
18.9%	16.7%	13.5%	15.2%	79.5%	11.4%	11.3%
803.4	820.9	905.1	921.6	1,032.0	1,162.0	1,164.8
10,190.4 <sup>(i)</sup>	10,625.1	11,536.5	12,405.7	16,741.8	16,317.9	17,783.1
6,102.5	6,061.9	6,306.3	7,238.7	15,368.1	13,370.9	12,534.9
58.5%	55.7%	53.3%	56.7%	89.7%	80.0%	68.8%
16,525.5	16,950.0	18,133.2	20,009.5	32,493.1	30,089.3	30,742.3
312,281,159	312,831,676	344,872,883	344,163,001	388,875,761	428,397,550	429,423,434
388,401,234	387,885,964	388,507,626	388,058,094	397,747,479	426,409,142	426,674,123
4.10	4.23	4.29	4.53	4.64	5.16	4.95
2.50	2.55	2.55	2.60	2.60	2.65	2.65
2.00	2.04	2.25	2.30	2.36	2.65	2.65
16.1% <sup>(i)</sup>	16.0%	15.3%	14.7%	13.5%	13.5%	12.6%
11.6% <sup>(i)</sup>	11.1%	10.8%	10.3%	7.8%	8.2%	8.0%

(e) Calculated on the adjusted weighted number of shares outstanding during the year excluding treasury shares.

(f) Adjusted to take into account share capital movements.

(g) Return on equity: (Net profit Group share)/(weighted average of shareholders' equity over the year).

(h) Return on capital employed after tax: ((Net profit after tax before deduction of minority interests – net cost of debt after taxes) for 2018 / (weighted average of shareholders' equity + minority interests + net indebtedness) at the end of the three last semesters (H2 2017, H1 2018 and H2 2018)).

(i) The specialty ingredients activities of Seppic and its subsidiaries were reclassified from "Other activities" to "Gas & Services".

(j) Corresponds to the amounts as of December 31, 2012 restated for the impacts of IAS 19 revised "Employee Benefits".

(k) Restatement related to the new business line, Global Markets & Technologies.

(l) Restatement related to the new classification in accordance with IFRS 5 "Non-current Assets Held for Sale and Discontinued Operations".

## Cautionary note regarding forward-looking statements

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This Reference Document contains information on the Group's prospects, objectives and trends for growth. These forward-looking statements can be identified by the use of the future tense, conditional or of forward-looking terms such as "consider", "intend", "anticipate", "believe", "estimate", "plan", "expect", "think", "aim", or, as the case may be, the negative of these words, or any other terms with a similar meaning. This information is not based on historical data and should not be considered as a guarantee that the prospects and objectives described will be achieved. These statements are based on data, assumptions and estimates considered reasonable by the Group as of the date of this Reference Document. They may be affected by known or unknown risks, uncertainties and other factors which might impact future results, performances and achievements of the Group in a way that is substantially different from the objectives described. This information might therefore change due to uncertainties relating notably to the economic, financial, competitive and regulatory environment or due to the occurrence of certain risks described in chapter 1 of this Reference Document. This information is given solely as of the date of this Reference Document. All forward-looking statements contained in this Reference Document are qualified in their entirety by this cautionary note.



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Air Liquide - Company established for the study and application of processes developed by Georges Claude  
with issued capital of 2,356,439,277.50 euros