



2016
**Sustainable
Development Report**

Extracts from the Reference Document



2016 SUSTAINABLE DEVELOPMENT REPORT

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> INTRODUCTION

Air Liquide strives to contribute to a more sustainable world. As part of the NEOS 2016-2020 company program, Air Liquide has set itself the objective of improving air quality for environmental and health reasons and of pursuing an active dialogue with its stakeholders.

The report uses the indicators monitored year on year to summarize the Group's progress in three areas: governance, air and environment, and its commitment to stakeholders.

It illustrates this through the specific actions undertaken in 2016.

The report has started to incorporate Airgas data (safety, transportation, as well as certain human resources indicators). This will be completed in the 2017 report.

Just like the financial report, this extra-financial report has been reviewed each year since 2003 by an independent verifier. This verifier analyzes and verifies a selection of indicators not only at the corporate level, but also on industrial sites and within subsidiaries. This year, 17 subsidiaries were audited.

For further information the Group's website also has a section dedicated to Sustainable Development, accessible at <https://www.airliquide.com/group/contributing-sustainability>.

> AIR LIQUIDE'S SUSTAINABLE DEVELOPMENT STRATEGY

Air Liquide's Sustainable Development strategy, approved by the Board of Directors, is centered on the following areas:

Two prerequisites: safety and ethics

Safety is Air Liquide's priority. This strong focus on safety relates to employees and subcontractors, industrial installations, transport and the implementation of Group products and services at customers' premises and in patients' homes.

An ethical approach is also imperative for Air Liquide. The Group refers to the Global Compact of which it is a signatory and has set standards on this subject for conducting its business.

Two objectives

1. IMPROVING AIR QUALITY FOR ENVIRONMENTAL AND HEALTH REASONS

Air quality is a major societal issue for the planet. The year 2016 saw many pollution episodes across the world. In addition to peaks, daily pollution is the reason why more than 80% of the planet's inhabitants do not enjoy the quality of air recommended by the World Health Organization (WHO). For the wellbeing of everyone, the air we all breathe must be protected and atmospheric pollution managed in order to avoid millions of premature deaths each year, the damage to the most fragile populations, children and the elderly, or simply the deterioration of our daily life.

Air Liquide wants to contribute to improving air quality. The Group's activities, its expertise in terms of air, breathing and healthcare as well as its products and services in the energy transition, enables it to work towards improving air quality.

2. PURSUING AN ACTIVE DIALOGUE WITH ITS STAKEHOLDERS.

We must tackle social problems in an open and collaborative manner. This is why Air Liquide works on these questions not only with its customers, suppliers, and of course its employees, but also with various other parties from civil society and the world of science. Through its operations over thousands of sites worldwide, Air Liquide is also concerned for the social development of the local communities where it operates and acts for this purpose, particularly through the Air Liquide Foundation.

NOTE ON CLIMATE CHANGE:

Climate change is a major challenge for our planet. Many of Air Liquide's actions help to reduce greenhouse gas emissions. This report contains multiple illustrations.

A program

In 2016, the Group defined a five-point Corporate Sustainability Program (CSP):

- contribute to cleaner industries;
- contribute to cleaner transportation;
- produce clean;
- buy clean;
- re-inforce community involvement.

This year, the Sustainable Development Report also presents the progress of this program.

This report shows that the Corporate Sustainability Program impacts our investments, purchases, technology portfolio, and municipal and local authority relations. It also requires the full commitment of our employees.



Air Pollution affects health & quality of life

More than 80% of the world's population is impacted ^(a). Several hundred million people breathe severely degraded air, every day.

The consequences are:

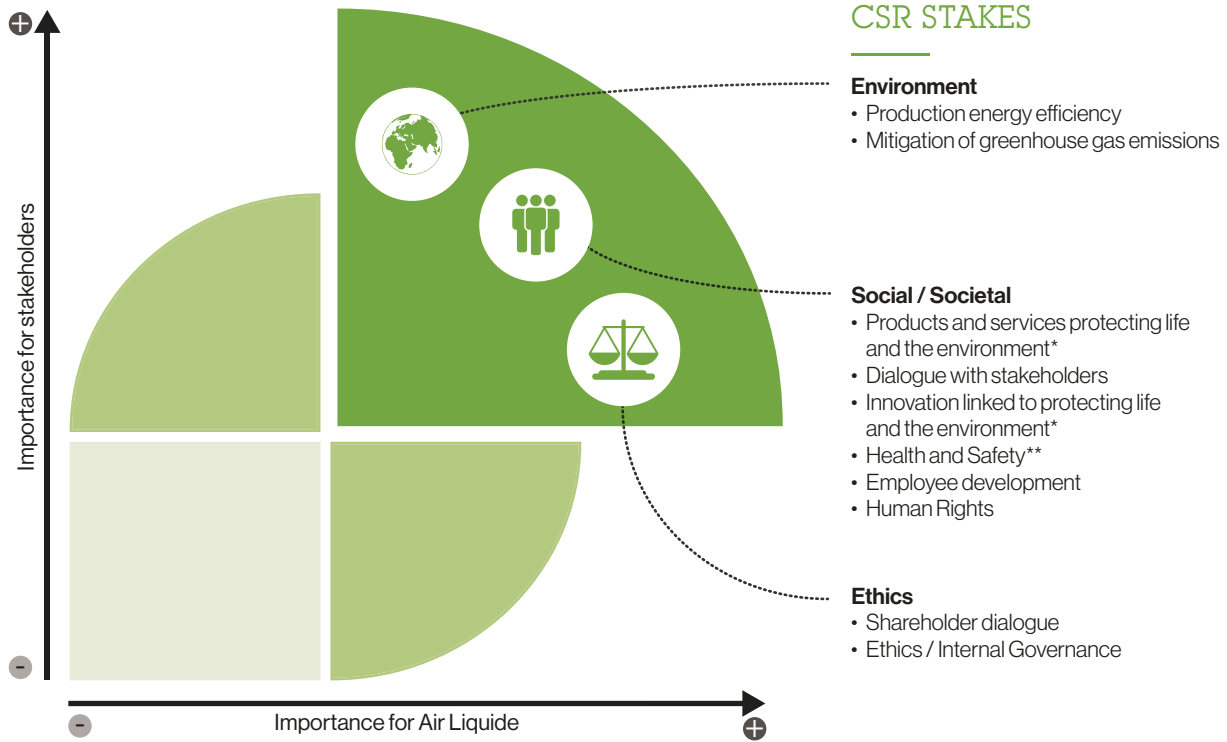
- **ill health** (particularly of the young & the elderly);
- **premature deaths** (3.5 million every year) due to cardiovascular, neurovascular, respiratory conditions;
- **and a poor quality of life.**

The cost to society is several 100 billion euros a year.

(a) Data from World Health Organisation.

➤ MAPPING OF SUSTAINABLE DEVELOPMENT STAKES

Mapping of Air Liquide's CSR Stakes



* Particularly for climate change and air quality.

** Including the safety of Group employees, subcontractors, and temporary workers; the safety of Air Liquide facilities, product transport safety; safety of products and their implementation at the customers' sites.

APPROACH

Our commitment to stakeholders is a key focus of Air Liquide's Sustainable Development strategy, as set out in the NEOS company program.

The Group consulted its stakeholders regarding its Sustainable Development stakes. This approach enabled a map to be drawn up which will be updated regularly.

METHOD

To draw up this map or materiality matrix, Air Liquide brought together a working group composed of various Group departments. The main stakeholders were consulted to assess the importance of these stakes to each of them: customers, patient associations, suppliers, investors, journalists, NGOs, panels of employee representatives and of individual shareholders.

This consultation was supplemented by the data analysis of non-financial rating agencies and the conclusions of a quantitative survey of the French general public which was carried out on this subject in 2015. The results were then consolidated by assigning an equal weighting to the statements of each stakeholder.

The horizontal X-axis positions these stakes according to their importance to the Company and on the Y-axis they are positioned according to their importance to the stakeholders.

RESULTS AND USE

The results of this consultation formalized Air Liquide's ten most pertinent Sustainable Development stakes. These stakes are classified according to three categories: the environment, social and societal, and ethics. The latter includes internal governance and shareholder relations. These ten stakes are included in this report.

GOVERNANCE, AIR AND THE ENVIRONNEMENT, COMMITMENT TO STAKEHOLDERS

1. Governance

1.1. Safety: our priority

Safety is our top priority and our license to operate. Continuously and durably improving employees' and subcontractors' health and safety in the workplace is one of Air Liquide's major concerns, which is expressed by the keywords "zero accidents" on every site, in every region, in every entity. Employees are mobilized through active and regular communication. In addition, safety objectives – like the other Sustainable Development objectives – are part of the variable remuneration of the Group's senior managers.

Prevention, protection, early detection and rapid reaction are at the heart of the Group's concerns. With its Industrial Management System (IMS)^(a) in use for over 10 years, Air Liquide has changed work methods significantly and improved processes involving safety management, reliability, protection of the environment and industrial risk management.

The Group has set up procedures, training sessions and an appropriate follow-up to encourage each employee to work responsibly and in total safety, respecting the laws and regulations in force. A central team of experts leads networks of specialists on-site to see to the proper implementation of the IMS. Together, they provide local managers in the Group's various entities with technical and methodological support and participate in managing industrial risks.



Safety successes on sites in 2016

The large scale construction site for an industrial gases complex in Fujian, China, which during the most intensive period of work involved 1,700 people representing 5.8 million hours works, was completed without any lost-time accidents.

At the same time, the Sasol 17 site in Secunda, South Africa, recorded nearly one million hours worked in 2016 without any lost-time accident, to set up the largest air gas separation unit (ASU) ever built by the Group.

These excellent safety results are due to an outstanding working team, a high level of involvement from all project's stakeholders, training, strict respect of safety rules and of the Industrial Management System (IMS).

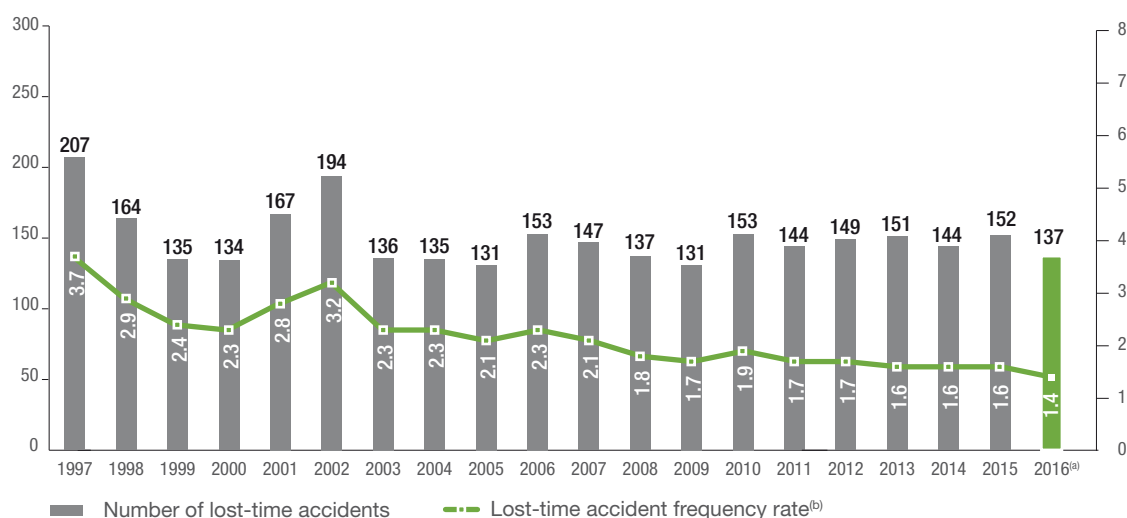
In terms of safety, for 2016 the Group organized its programs in three complementary areas which are: employee safety, procedure safety, and road safety. Group initiatives and local entities initiatives led safety in these three areas. These initiatives support the attention to safety in everyone's daily life. Each field manager and their team are involved in working in a safe manner.

The "Life-Saving Rules" are based on the Group's operations and increase awareness of major risks at production sites. These rules apply to Air Liquide employees as well as to temporary workers and subcontractors.

Feedback from these safety events is an essential practice in Air Liquide's safety approach. The Fault Tree method is used to analyze lost-time accidents and potentially serious safety incidents. The combination of events that were generated are determined and depicted and their root causes identified so that lessons can be learned and an action plan set up to prevent similar events occurring. These lessons are then shared. This approach is a fundamental element in ongoing prevention for safety.

(a) More information on IMS in chapter 26 Industrial Management System and certifications.

NUMBER AND FREQUENCY OF LOST-TIME ACCIDENTS OF GROUP EMPLOYEES SINCE 1997



(a) Excluding Airgas, including Diving and Welding.

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

Safety indicators for the Group as a whole

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^(f)
Number of accidents involving lost time of at least one day of Group employees ^(a)	147	137	131	153	144	149	151	144	152	137
Accident frequency of Group employees ^(b)	2.1	1.8	1.7	1.9	1.7	1.7	1.6	1.6	1.6	1.4*
Accident severity rate ^(c)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Number of accidents of subcontractors and temporary workers ^{(d) (e)}		154	148	155	118	142	110	92	94	91
Frequency of accidents of subcontractors and temporary workers							2.2	2.3	2.2	2.0

(a) Fatal work accidents since 2011: 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, or at a customer site, or as a delivery vehicle driver.

(e) Fatal work accidents since 2011: 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) Excluding Airgas and including Diving.

* Indicator verified by the independent verifier.

Within Airgas since June 1, 2016, 54 lost-time accidents involving employees occurred which corresponds to a frequency rate of 2.7.

1.2. Ethics and Internal Governance

1.2.1. AIR LIQUIDE'S ETHICAL APPROACH

Air Liquide's action is set on strong ethical principles. 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 has four priorities:

1. behavior expected from all employees: Integrity and Transparency which are part of the General Statement of the Group's Principles of Action;
2. the tools: Codes relayed through internal procedures;
3. the awareness-raising and training program;
4. the whistleblowing and control system.

To support the roll-out of this Ethical program, the following dedicated organization was set up:

- 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 must also suggest improvements to the ethical program by integrating best practices from comparable groups, regulatory developments and strategic challenges. It relies on a network of ethics correspondents which represent the Group's geographic regions and business lines worldwide;
- an Ethics Committee, composed of Air Liquide's various global functions (e.g. the Human Resources, Legal, Group Control, Operations, Sustainable Development Departments), validates the Ethical program's guidelines and may, if necessary, make post-fraud sanction recommendations.

1.2.2. COMMITMENTS TO RESPECT HUMAN RIGHTS AND THE ENVIRONMENT

Air Liquide is dedicated to the highest standards for the conduct of its business. The Group 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.

- Support and respect the protection of internationally proclaimed Human Rights.
- Make sure that they are not complicit in Human Rights abuses.
- Uphold the freedom of association and the effective recognition of the right to collective bargaining.
- Contribute to the elimination of forced or compulsory labor.
- Contribute to the effective abolition of child labor.
- Contribute to the elimination of all forms of discrimination in respect of employment and occupation.
- Support a precautionary approach to environmental challenges.
- Take initiatives that promote greater responsibility in terms of the environment.
- Encourage the development and diffusion of environmentally friendly technologies.
- Work against corruption in all its forms, including extortion and bribery.



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, an initiative of the International Council of Chemical Associations which aims to improve global performances in the chemical industry in terms of health, safety and the protection of the environment.



1.2.3. INTEGRITY AND TRANSPARENCY

Integrity and transparency are the cornerstones of the Group's ethical approach and govern its behavior and actions. Integrity, the first cornerstone of the Group's ethical approach, includes honesty and impartiality. Transparency, is based on the principles of sincerity and openness.

Individual and collective commitment is key to adopt behavior based on integrity and transparency in order to act ethically and contribute to the Group's continuity.

Thus, the Group's Principles of action, the employee Code of Conduct and the anti-corruption Code of Conduct describe the expected behavior and the promoted values within the Group.

1.2.4. CODES AND PROCEDURES

Shared by all, Codes of Conduct are set out in particular within the following documents:

The Group's Principles of action

Since 2006, the Group has formalized the Principles of action in a document that explains its approach to all its stakeholders. This document is shared with all entities. It is also available in the Group section of the website: <https://www.airliquide.com/group/groups-principles-action>.

Air Liquide is committed to the highest possible standards in terms of conducting its business, notably with respect for Human Rights, social rights and the environment pursuant to its Sustainable Development approach.

In each location where the Group is present, Air Liquide complies with local cultures and traditions by respecting its values through the local commitment of its employees.

Air Liquide respects laws and regulations, in particular rules of fair competition, and does not tolerate any form of corruption.

Employee Code of Conduct

The Group's subsidiaries must implement a local 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.

In 2016, 96% of the Group's employees belonged to subsidiaries that have a local Code of Conduct. The 4% of employees who do not yet have a local Code of Conduct primarily belong to entities recently acquired by the Group and undergoing consolidation. Currently, these Codes of Conduct are available in 23 languages.

These Codes of Conduct must adhere to the following key concepts:

- respect for laws and regulations;
- respect for people: health and safety conditions in the workplace, prevention of discriminatory actions, respect for third parties;
- respect for the environment;
- respect for competition law;
- respect for rules on market abuse, particularly insider trading;

- prevention of conflicts of interest: links to a competitor, customer or supplier, respect for anti-corruption rules;
- protection of Air Liquide's activities: protection of information, property and resources;
- transparency and integrity of information;
- internal controls and audits;
- sanctions for disregard of the Code of Conduct;
- implementation of Codes of Conduct.

Full details of these key concepts are available in the Group section of the website at <https://www.airliquide.com/group/key-principles-code-conduct>.

The anti-corruption Code of Conduct

Within the Group, the anti-corruption program demonstrates the importance of this subject and underlines Air Liquide's commitment to preventing acts of corruption.

As part of this program, the Group has formalized an anti-corruption Code of Conduct. This Code has been made available to all entities and a copy is also 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, particular 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 Supplier Code of Conduct includes a chapter on the prevention of corruption.

Respect for Competition Law

Codes at the Group level were established in regard to proper behavior concerning respect for competition law, especially in Europe and the United States. The most important rules on competition law 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 in this area or any deviations observed. Awareness-raising meetings on compliance with competition law are regularly held throughout the Group. Finally, an e-learning program was launched at the Group level on competition law related practices and international principles.

1.2.5. ETHICS TRAINING

Several initiatives have been introduced to facilitate the roll-out of the ethics approach within the Group.

An e-learning module exists on the Employee Code of Conduct. It introduces the Group's ethical approach and presents key concepts through case scenarios. This module is mandatory and must be followed by all employees each year.

A second 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 categories of employees, training sessions given by external providers are also organized.

1.2.6. A WHISTLEBLOWING SYSTEM

In 2015, the Group introduced a formal whistleblowing system at all its entities called Ethicall, whereby employees can anonymously alert an independent external service provider of any deviations to 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, accessible via the Group's Intranet. All reports are dealt with confidentially and as quickly as possible. The processing of these alerts 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.

At the end of 2016, the system covered 60 countries, representing 97% of the Group's employees.

For the moment, the platform receives 10 alerts per month on average, i.e. around one alert per 500 employees. Two-thirds of the alerts relate to Human Resources issues and the remaining third cover fraud or potential conflicts of interest and other subjects such as Safety, for example. Around half the number of alerts are sufficiently detailed to be acted on and are therefore processed by the Ethics Officer and the Departments in question.

To raise awareness of Ethicall, a billboard and communications campaign was rolled out worldwide presenting ways of contacting the alert platform. In 2017, the e-learning modules will be updated to include Ethicall.

1.3. Safety and ethical prerequisites for suppliers

Safety and fair business practices are at the heart of Air Liquide's procurement policy. The Group attaches great importance in the ability of its suppliers to offer long-term partnerships and to ensure a high level of security, reliability, competitiveness and innovation. Air Liquide therefore strives to build long-lasting and balanced relationships with its suppliers, in an environment of mutual trust. The Group, for example, formalized this commitment in France by signing the Mediation Inter-Enterprise's Charter for responsible supplier relations.

Several tools and procedures set out the behavior expected from Air Liquide buyers and suppliers:

- **the Procurement Code of Conduct**, translated into 13 languages, applies to all Group employees engaged in Procurement activities. It sets out the ethical and sustainable development principles that govern the Group's procurement;
- **the Supplier Code of Conduct** is routinely sent to all Group suppliers in order to promote and enforce practices relating to

Human Rights, the environment and safety. This Code, which can be found on Air Liquide's website, applies to existing and new suppliers. Air Liquide expects each of its suppliers to respect the Group's ethical principles and ensure that all their employees and subcontractors comply with this Code of Conduct.

The Supplier Code of Conduct is based on internationally-recognized principles such as the Universal Declaration of Human Rights, the United Nations Guidelines on companies and human rights, the United Nations Global Compact, OECD Guidelines for Multinational Enterprises and the fundamental conventions of the International Labour Organization (ILO).

It imposes on suppliers, in particular, the prohibition of child labor and forced labor, that they guarantee decent and healthy working conditions without danger for all employees and that they respect the environment and the preservation of natural resources.



Assessment of suppliers' performances in terms of Sustainable Development

The assessment of suppliers' performances in terms of Sustainable Development relies on the following tools:

- **the supplier qualification questionnaire, completed during the selection process, includes a specific section relating to policies and practices in place at the supplier, governing health, safety, ethics and the environment. Certain answers are considered eliminatory, such as the absence of a commitment to health and safety, of regular inspections of high-risk tools, of compliance with local legislation on the minimum wage, or of measurement of energy consumption;**
- **a sustainable Development clause is routinely included in the Group's new contracts and framework agreements. 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 emissions into the atmosphere, and social rights;**
- **for critical suppliers, i.e. the suppliers where their activity and/or geographic location represent high environmental and social risks or those that are subject to significant expenditure by Air Liquide, the Group carries out, with the support of a partner specialized in sustainable procurement, comprehensive performance evaluations covering the following subjects: environment, social, fair business practices and suppliers' own sustainable procurement policy. Since this approach was introduced in 2010, 737 of Air Liquide's critical suppliers have been assessed, of which 177 in 2016. Suppliers performing below expectations are examined and are presented with a corrective action plan that may go as far as the disqualification of the supplier;**
- **since 2014, the Group also conducts on-site Sustainable Development audits for certain suppliers that are considered to be particularly at risk in this area, due to unsatisfactory evaluations. These audits mainly cover social and environmental factors. They are conducted according to recognized external benchmarks, often by a specialized external auditor. Close to 10 on-site audits of suppliers were carried out, in Asia, South America and Europe. Following these audits, corrective action plans were drawn up. In certain cases, commercial relationships were suspended while the supplier brought its practices into compliance.**

These selection rules help to give priority to suppliers who offer solutions which respect good safety, ethical and environmental conditions.

2. Air and the environment

With the launch of its company program NEOS 2016-2020, Air Liquide has set itself the objective of improving air quality for health and the environment.

As part of this program, the Group is progressively establishing a sustainable development program centered on the different stages of the industrial and medical gases value chain (production, distribution and use).

Starting from the customers, the stages are as follows:

- **contribute to cleaner industries**, by helping customers to reduce their greenhouse gas emissions and their air pollutant emissions;

- **contribute to cleaner transportation**, primarily in our own delivery operations of gas but also with new technologies implemented in transports, such as hydrogen energy or biomethane;

- **produce clean**, by improving the energy efficiency and the environmental impact of our production operations, particularly air gas and hydrogen;

- **buy clean**, particularly by encouraging low carbon electricity purchases.



Air pollutants

Particulate Matter (PM)

Affects more people than any other pollutant. It is composed of a mix of sulphates, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water. Reduces life expectancy 6-18 months^(a). PM10 concentrations should be < 20µg/m³.

Nitrogen dioxide (NO₂)

Causes inflammation of the airways; also a source for PM_{2.5} & O₃ (asthma, lung conditions). NO₂ concentrations should be < 40µg/m³.

Sulfur dioxide (SO₂)

Can affect the respiratory system; combined with water, causes acid rain. SO₂ concentrations should be < 20µg/m³.

(a) Data from World Health Organisation.

2.1. Contribute to cleaner industries

2.1.1. EMISSIONS AVOIDED AT OUR CUSTOMERS' FACILITIES THANKS TO THE SUPPLY OF OUR PRODUCTS

A significant number of products and services provided by Air Liquide enable its customers to reduce their own CO₂ emissions and improve their environmental impact.

For example, Air Liquide supplies large volumes of oxygen to the steel industry, which significantly reduces CO₂ emissions:

- the injection of oxygen in blast furnaces reduces the consumption of coke, whose production and use release an important volume of CO₂ and other pollutants, by partially replacing it with pulverized coal or natural gas;
- the use of oxygen in electric furnace burners can significantly reduce their consumption of electricity.

A detailed methodology has been introduced in order to assess the avoided CO₂ emissions by customers for these two steel applications. This methodology is based on an analysis of the oxygen volumes supplied by Air Liquide in 2016 for these two applications, site by site and customer by customer. The avoided emissions are calculated by using ratios derived from the modeling of corresponding customer processes and validated by Group experts. In 2016, Air Liquide estimates that the use of oxygen in these two applications enabled its customers to avoid 11.2 million tons of CO₂ emissions. This included 10.8 million tons related to oxygen injection in blast furnaces and 0.4 million tons related to the use of oxygen in electric furnace burners.

2.1.2. EXAMPLES OF SOME AIR LIQUIDE SOLUTIONS THAT CONTRIBUTE TO CLEANER INDUSTRIES

By providing its expertise to its customers, Air Liquide develops and offers solutions that contribute to cleaner industries as shown in the examples listed below:

Heat oxycombustion

Heat oxycombustion is an innovative technology which makes the oxycombustion process even more efficient. It consists of extracting heat from combustion fumes in order to heat oxygen and fuel, thus improving the performance of the process by 10%. Compared to air combustion, this technology provides up to 50% energy savings and up to 50% CO₂ emission reduction. Moreover, these oxycombustion technologies reduce the nitrogen oxide emissions of glass furnaces by 60% to 95%.

So far, this technology has been implemented in several glass production factories in Europe owned by leaders in the sector. It is of particular interest for the Chinese market which represents about 50% of worldwide glass production.

Therefore, the Group contributes to the improvement of air quality by enabling its customers in the glass industry to lower their nitrogen oxide emissions while increasing their energy efficiency.

Solidia Technologies

The partnership between Air Liquide and US start-up Solidia Technologies developed and marketed a "sustainable concrete".

The Solidia process replaces water with carbon dioxide (CO₂) in order to harden concrete. This new generation of cement enables the whole industrial chain to reduce the environmental footprint of the pre-cast concrete by up to 70%.

This breakthrough technology also reduces the hardening time of the concrete to less than 24 hours and the required amount of water. In addition to capturing large quantities of CO₂, the quality of the concrete achieved is greatly improved.

Air Liquide will supply the new carbon dioxide injection equipment for production of the Solidia Concrete™ and will be the benchmark global supplier of the gas used in the patented processes of Solidia Technologies.



CO₂, a molecule which is essential to life, involved in climate change

CO₂, or carbon dioxide, is a colorless and odorless gas present in the air at about 0.04%. It contributes to making our planet habitable by playing a key role in the regulation of the average temperature of the Earth's surface (15°C). Without CO₂ in the atmosphere, its temperature would fall below 0°C, putting life on Earth at risk. CO₂ contributes to approximately 20% of the natural greenhouse effect, through its ability to absorb heat. CO₂ and methane are the main Greenhouse Gases (GHG). It is now common to express greenhouse gas emissions in "CO₂-equivalent".

Global warming: limiting the increase to less than 2°C

The average temperature of the Earth's surface is currently 15°C. Since the industrial revolution, this average value has increased by 0.8%. Specialists agree that the increase in temperature must be limited to less than 2°C in order to avoid major risks of disruption in our ecosystem.

The Paris Agreement

The Paris agreement is an international agreement adopted on December 12th, 2015 during the 21st Conference Of the Parties (COP21) held in Paris. This agreement entered into force on November 4th, 2016 thirty days after the date on which at least 55 Parties to the Convention, accounting for at least an estimated 55% of the total global greenhouse gas emissions, deposited their instruments of ratification. The major purpose of this agreement is to keep the global temperature increase this century well below 2°C above pre-industrial levels and to pursue efforts in order to limit the temperature increase even further to 1.5°C.

In order to reach this objective, article 4 of the agreement stipulates that each party shall prepare a Nationally Determined Contribution (NDC) aiming to present the strategies, policies and measures that they think are the most appropriate, depending on their geographic, energetic and economic situation. NDCs are made public to ensure complete transparency about each party's engagements. These contributions shall be revised every 5 years and each new version shall show the progress made compared to the previous one. A large number of the parties who signed the agreement have already submitted their intended NDC.

According to article 4, each party shall also prepare a long-term low greenhouse gas emission strategy. Several parties have already submitted their long-term strategy, including the United States, Canada, France and Germany. They all target reduction of 80% in greenhouse gas emissions by 2050.

2.2. Contribute to cleaner transportation

Hydrogen is a high potential energy vector that is clean and safe. It can be used in order to produce energy or as a raw material in the industry and can easily be stored on a large scale. This gas can be produced from electricity (renewable) or from low carbon emission fossil fuels and its use generates zero emissions. Multiple uses are possible because it can be stored and transported at high energy density in liquid or gas and can be recovered or used in fuel cells to generate heat and electricity. This versatility provides hydrogen with an essential role in the area of transportation, but also in the residential and industrial sectors as well as for large scale storage of renewable energies: a promising solution to meet energy transition challenges.

2.2.1. HYDROGEN TO DESULFURIZE FUELS

Hydrogen is mainly used in refineries in order to desulfurize fuels and as a result to contribute to cleaner forms of transport. Thus, the use of these fuels almost no longer generates sulfur oxide emissions, one of the main atmospheric pollutants. In 2016, the hydrogen supplied by Air Liquide to its customers' refineries resulted in the avoidance of 1.4 million tons of sulfur oxide emissions being discharged into the atmosphere, which is more than eight times as much as the total sulfur oxide emissions of a country like France.

In 2016, Air Liquide commissioned the largest hydrogen storage site in the world in Beaumont, Texas (United States). Located 1,500 meters below ground, this facility can store a quantity of hydrogen equivalent to 30 days of production by a large hydrogen unit. This initiative provides a large-scale storage system that improves the reliability and efficiency of customers' hydrogen supply. Approximately two-thirds of the stored hydrogen will be used for the desulfurization of fuels. This hydrogen storage site complements Air Liquide production units located along the Gulf Coast, thus offering greater flexibility and a more reliable hydrogen supply of Air Liquide's pipeline network in this region.

2.2.2. HYDROGEN ENERGY: MEETING THE CHALLENGES OF THE ENERGY TRANSITION

Fuel Cell Electric Vehicles

With the arrival on the market of mass produced fuel cell electric vehicles, hydrogen represents a real high-quality alternative in the drive for clean transportation. For example, from January 2017, Paris is becoming the first restricted driving zone in France in its fight against pollution and preservation of air quality. Vehicles driving in the capital must have an air quality certificate (Crit'Air), established by the Ministry of Ecology and Sustainable Development, i.e. a label indicating their pollution level. Fuel cell electric vehicles are therefore considered as "zero emission engine" vehicles and can obtain the air quality certificates that provide the following benefits:

- preferential parking methods;
- preferential driving conditions;
- driving within the restricted driving zone.

Fuel cell electric vehicles have a particularly high performance as they require less than five minutes to recharge and can cover a distance of around 500 km. They do not emit CO₂ or particles and only discharge water. Moreover, fuel cell electric vehicles are completely noiseless.

Even though these vehicles just arrived on the market, there are already more than 3,000 fuel cell electric vehicles currently circulating worldwide and this figure should reach 8,000 in the next 12 months. The automobile manufacturers have already planned a significant increase in production capacity of these vehicles by 2020.



Hydrogen Council

On January 17, 2017 in Davos, Switzerland, 13 leaders from energy, transport, and industry sectors launched a Hydrogen Council, global initiative, in order to share their vision and ambition for hydrogen as an accelerator of the energy transition and to meet climate change targets. During this launch, the members of the Hydrogen Council, of which Air Liquide is a founding member, demonstrated their desire to intensify their investments in the development of the market of hydrogen and fuel cells. Their investments are currently estimated at 1.4 billion euros per year and could increase by more than 40% in the next five years.

HYPE: hydrogen taxis in Paris

Opened in December 2015, the first hydrogen charging station installed by Air Liquide in central Paris, near the Group's headquarters, was an opportunity for its partner STEP to create one of the very first fleets of hydrogen-powered electric taxis in the world called HYPE. This fleet – initially composed of 12 mass-produced Hyundai ix35 cars – should have around 60 additional vehicles within the next year and several hundred within five years. The objective, shared by the mayor of Paris, is to lead the way in gradually converting the fleet of 17,000 Parisian taxis in circulation to zero emission vehicles. A permanent network of hydrogen charging stations, mainly intended for this fleet of taxis, should be gradually installed in Paris region.

The hydrogen charging station network

Air Liquide is building a hydrogen charging station network throughout the world. The Group contributes, alongside automobile makers and public authorities, to the development of hydrogen energy. End of 2016, Air Liquide provided more than 75 hydrogen charging stations throughout the world. By the end of 2017, more than 300 hydrogen charging stations will be installed worldwide all party involved, enabling a massive deployment of fuel cell electric vehicles.

Blue Hydrogen

Hydrogen can be produced from a various range of energy sources. As part of its "Blue Hydrogen" approach, Air Liquide is committed to supply at least 50% of the hydrogen requirements of these CO₂ emission-free energy applications by 2020 by combining:

- the reforming of biogas;
- the use of renewable energies in water electrolysis;
- energy efficiency, carbon capture and storage of the CO₂ 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 hydrogen-powered electric cars decreases greenhouse gas emissions by at least 20% compared with combustion vehicles.

2.2.3. CIRCULAR ECONOMY AND TRANSPORTATION



Circular economy

The circular economy is based on a closed-loop production and consumption model, as opposed to the linear economy (extract, manufacture, consume and throw away). The aim of the circular economy is therefore to optimize the use of natural resources, mineral raw materials, animal and plant resources, water and energy, and as a result to protect the environment. The circular economy calls upon public players, companies and consumers.

Upgrade of biogas

Air Liquide promotes several initiatives in favor of circular economy, such as the upgrade of biogas.

The Group is a committed player throughout the value chain of biomethane for sustainable transport from biogas sourcing and purification in order to produce biomethane (which can be injected into the natural gas pipeline network), to the distribution to the end customer with biomethane stations or clean multi-energy stations (biomethane, nitrogen, and hydrogen).

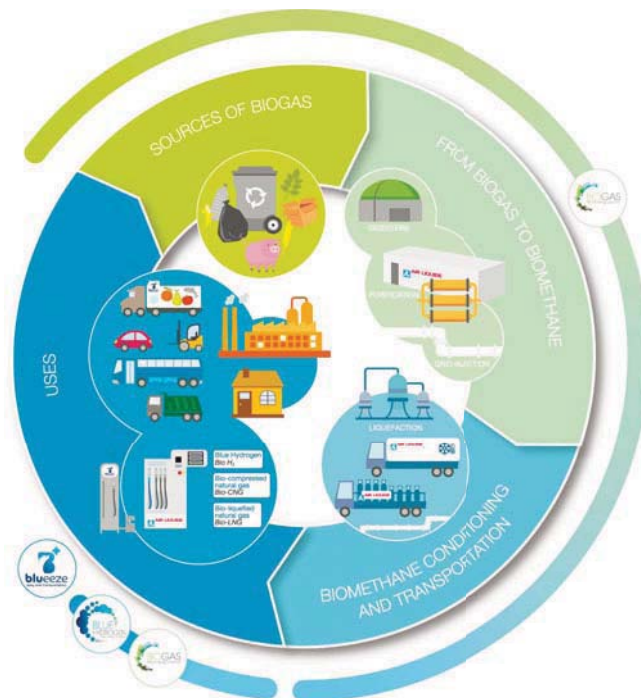
From waste used to produce biomethane until mobility, Air Liquide works in cooperation with various partners in the biogas circular economy. Air Liquide therefore designs and implements purification technologies (gas separation membranes produced by the subsidiary Medal) in order to extract biomethane. The Group also acquired FordonsGas, a Swedish biomethane distribution company for the transport market.

Biomethane in transport

The biomethane recovered by Air Liquide is mainly used as fuel, and is therefore called Bio – “Natural Gas for Vehicles” (Bio-NGV). This Bio-NGV comes in two forms:

- CNG (Compressed Natural Gas), a fuel which is used in stations for light-duty vehicles that are part of a captive fleet, cars, trucks, vans, buses;
- LNG (Liquefied Natural Gas), which is easy and safe to transport, this fuel is used in stations for trucks and cars.

Biomethane is also used in the production of carbon-free hydrogen for clean mobility as part of Air Liquide’s “Blue Hydrogen” commitment.



Capture and storage of CO₂

The capture and storage of carbonic gas is another example of a circular economy within the Group’s technologies. For more than a year, Air Liquide has operated a unique industrial facility that enables CO₂ capture during hydrogen production using a technology called Cryocap™, developed and marketed by Air Liquide. This facility is located at Air Liquide’s largest hydrogen production unit in France, in Port-Jérôme, Normandy. Cryocap™ is the first CO₂ cryogenic capture technology. It enables the capture of CO₂ emissions resulting from the production of hydrogen by natural gas reforming while improving the unit’s efficiency which leads to an increase of hydrogen production. After being purified and liquefied, the captured CO₂ can be used in order to meet a variety of industrial needs for carbonic gas supply (carbonation of sparkling beverages, food preservation and freezing, etc.). This unit has an annual capture capacity of 100,000 tons of CO₂.

2.2.4. ENVIRONMENTAL IMPACT OF ROAD TRANSPORTATION

Transportation in the Industrial Merchant Business Line

In 2016, trucks delivering Air Liquide liquid gases or gas cylinders in the Industrial Merchant activity traveled 540 million kilometers throughout the world and emitted about 600,000 tons of CO₂.

(a) Including Airgas since June 1st, 2016.



Combined rail/road solutions in the Industrial Merchant Activity

Transportation is a major challenge for Air Liquide in terms of safety, efficiency, cost control and environmental impact. Air Liquide France Industrie's Industrial Merchant teams, whose trucks cover three million kilometers each year, have tested a new solution which combines transport by road and rail. In 2016, this pilot project covers the Vitrolles site in the South of France, and those of Blanc-Mesnil and Bobigny in the Paris region. The majority of kilometers were covered by rail, thus avoiding 160,000 km per year of road haulage. The reliability of schedules, and gains in time and cost have encouraged the subsidiary to study the possibility of extending combined rail/road solutions to other routes such as Lyon-Paris.

Transportation in the Industrial Merchant Business Line	2012	2013	2014	2015	2016
Kilometers traveled by all vehicles delivering gas in liquid or cylinder form (in millions of km)	428	420	428	426	540* ^(b)
Estimate of CO ₂ emissions generated by these vehicles in the Industrial Merchant activity (in thousands of tons)	471	462	471	468	600* ^(b)
Evolution of the distance traveled per ton of liquid industrial gas delivered (oxygen, nitrogen, argon, carbon dioxide) ^(a) (truck delivery)	97.8	95.3	94.8	92.2	90.3* ^(c)
Estimate of truck transport kilometers avoided through on-site customer units (in millions of km)	-68	-72	-72	-74	-63 ^(c)
Estimate of CO ₂ emissions avoided by these on-site units (in thousands of tons)	-68	-72	-72	-74	-63 ^(c)
Percentage of deliveries of air gases and hydrogen via pipeline or on-site	86%	86%	86%	87%	85% ^(c)

(a) In kilometers per ton delivered for the Industrial Merchant activity. 2007 base of 100.

(b) Including Airgas.

(c) Excluding Airgas.

* Indicator verified by the independent verifier.

Transportation in the Healthcare Business Line

In 2016, the total number of kilometers traveled for deliveries of gas cylinders for the Home Healthcare activity was 173 million kilometers. The quantity of CO₂ emitted during these deliveries was 38,000 tons.

In addition, the number of kilometers traveled for the delivery of medical gases to hospitals amounted to 27 million kilometers, which represented 24,000 tons of CO₂ in 2016.

Transportation: Healthcare business line	2012	2013	2014	2015	2016 ^(a)
Transportation in the Home Healthcare activity					
Kilometers traveled (in millions of km)	141	161	149	161	173
Associated CO ₂ emissions (in thousands of tons)	35	38	35	39	38
Transportation in the Medical Gases activity					
Kilometers traveled (in millions of km)	20	26	26	28	27
Associated CO ₂ emissions (in thousands of tons)	17	23	23	25	24
TOTAL KILOMETERS TRAVELED HEALTHCARE BUSINESS LINE (in millions of km)	161	187	175	189	200
TOTAL ASSOCIATED CO₂ EMISSIONS (in thousands of tons)	52	61	58	64	62

(a) Excluding Airgas.

In 2016, Air Liquide Healthcare's Home Healthcare activity signed a three-year partnership in France with Prévention Routière (the French road safety association) in order to raise awareness among employees who visit patients at their home about good driving practices. The partnership agreement provides the Home Healthcare teams with a catalog of comprehensive training courses (awareness raising tools, conferences and practical workshops run by Prévention Routière

volunteers, to continuously keep employees updated about good driving practices, in both professional and private contexts. These courses are in addition to driving courses that are already included in the training programs of drivers. Air Liquide Healthcare therefore strengthens its commitment to improving the safety of its teams in a permanent and sustainable way.

2.3. Produce clean

2.3.1. SUSTAINABLE DEVELOPMENT CRITERIA IN THE GROUP'S INVESTMENT DECISIONS

Sustainable Development criteria, particularly those relating to greenhouse gas emissions, water consumption and relations with local communities, are included in the decision-making processes of the main Group investments.

Moreover, Air Liquide has started to incorporate an internal price for carbon for its investment decisions. This internal carbon price is voluntarily sets by the Group in order to assess the economic cost of greenhouse gas emissions generated by its large investment projects.

2.3.2. PRODUCTION UNITS AND THEIR ENVIRONMENTAL IMPACT

The environmental elements that are most representative of the Group's activities and part of the Air Liquide Sustainable Development reporting are described below. They cover a total of 535 Air Liquide production units worldwide.

Type of production unit	Number of production units ^(a)	Applications and environmental impact
Large air separation units (ASU)	330	Large air separation units produce oxygen, nitrogen and argon, with some sites also producing rare gases such as krypton and xenon. These factories "without chimneys" do not use any combustion processes. Since they discharge almost no CO ₂ , sulfur oxide (SO _x) or nitrogen oxide (NO _x), they are particularly environmentally friendly. They use almost exclusively electrical energy: worldwide they use about 3,600 MW at any given moment. The electricity purchased to 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.
Hydrogen and carbon monoxide units (HyCO)	45	Large hydrogen and carbon monoxide units also produce steam for some customers. They primarily use natural gas as raw material and also 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 sulfur-free fuels is one of the main applications of hydrogen. These units emit CO ₂ and nitrogen oxides (NO _x) but practically no sulfur oxide (SO _x). They also consume electricity and their cooling systems require back-up water.
Cogeneration units	18	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 other units of the Group. Combustion of natural gas produces CO ₂ and leads to nitrogen oxide (NO _x) emissions, but practically no sulfur oxide (SO _x) emissions.
Acetylene units	52	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.
Nitrous oxide units	7	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.

Type of production unit	Number of production units ^(a)	Applications and environmental impact
Carbon dioxide liquefaction and purification units	66	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. Carbon dioxide is most often a by-product of chemical units operated by other manufacturers. In some cases, it is found naturally in underground deposits, 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. In this unit, carbon dioxide is reused for other industrial applications instead of being emitted directly into the atmosphere.
Units for the Hygiene and Specialty Ingredients activity	5	These production units for the Hygiene and Specialty Ingredients activity are located in France, Germany and China and belong to the subsidiaries Schülke (Hygiene activity) and SEPPIC (Specialty Ingredients activity). 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 ₂ .
Engineering & Construction units	5	Units for the Engineering & Construction activity 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.
The main Research and Development sites	7	The main sites are based in France, Germany, the United States, China, Korea, and Japan.

(a) Excluding Airgas.

2.3.3. GREENHOUSE GAS EMISSIONS AVOIDED IN OUR OPERATIONS OF PRODUCTION

Energy efficiency is a key focus of the Group's business lines and activities, with the Group constantly striving to minimize the energy and environmental footprint of its products and services. This optimization is a combined result of:

- technological solutions proposed by Air Liquide in its production process;
- scale effects, co-production and synergies, in particular through the development of its pipeline networks;
- the operational optimization of its production units;
- and the solutions chosen for energy and commodities supplies.

The products and services that Air Liquide supplies therefore enable the Group's customers to consume less energy, and as a result avoid more CO₂ emissions than an "alternative reference system" where customers own and operate their own production units.

In 2015, the Group introduced a detailed methodology in order to assess the corresponding avoided CO₂ emissions. This assessment is carried out within the Large Industries activity, which represents more than 90% of the Group's energy consumption, and thus CO₂ emissions. The methodology is based on an analysis of the total volume of industrial gases supplied to customers over 2016, site by site and customer by customer, i.e. at over 1,300 delivery points per pipeline. For each customer facility, we assess the emissions of the reference system by modeling the energy consumption and CO₂ emissions, both direct and indirect, that would be generated by a production unit dedicated to supplying the facility. This model is based on a protocol which takes into account the latest developments in terms of energy efficiency, as well as the size and type of production unit.

Air Liquide therefore estimates that the total emissions avoided by its production operations in 2016 were 4.7 million tons of CO₂, broken down as follows:

- 1.4 million tons of indirect CO₂ emissions for the supply of air gases;
- 2.1 million tons of direct CO₂ emissions for the supply of hydrogen and carbon monoxide;
- 1.1 million tons of direct CO₂ emissions for cogeneration units that produce steam and electricity from natural gas simultaneously, which are on average 21% more efficient than technologies which produce steam and electricity separately.

Moreover, in the Industrial Merchant activity, small on-site nitrogen, oxygen and hydrogen units reduced truck deliveries, a source of CO₂ emissions. In 2016, these on-site units saved 63 million kilometers in truck deliveries, thus avoiding 63,300 tons of CO₂ emissions.

2.3.4. ENERGY EFFICIENCY

Born from an invention that considerably reduced the energy used in the separation of air gases, Air Liquide has always been concerned with minimizing its energy consumption and environmental footprint. The Group has initiated an approach that aims at continually minimizing the environmental footprint of its activities and helping to improve the one of its partners and customers.

Through its Engineering & Construction activity, the Group designs its own production units. For example, the design of these units can be adapted to customers' needs, technological developments and energy costs. Air Liquide has operated air separation units and hydrogen units for many years. Therefore, it benefits from a virtuous circle of steady improvement thanks to the design management and operating experience of these units. Old units are replaced by new ones that are more energy efficient whenever circumstances enable it.

Energy efficiency of new production units

Moreover, the Group builds increasingly large units that generally have a better energy efficiency thanks to scale effects. For example, the production unit under construction in order to supply oxygen to SASOL in South Africa enables energy savings of 30% compared with the first unit provided to SASOL by Air Liquide in the 1980s. As a consequence,

230,000 tons per year of CO₂ emissions are avoided by the Group due to energy efficiency, which is the equivalent of a town of 26,000 inhabitants in terms of CO₂ emissions.

The significant improvement in SMR technologies (hydrogen production) by Air Liquide has become real with SMR-X, in Antwerp (Belgium). This technology has enabled the production of hydrogen without simultaneously producing steam since 2012, leading to a 5% decrease in natural gas consumption compared to conventional technology.

Energy efficiency and reliability

Air Liquide has also set up a program in order to improve the reliability of its units' operation. In addition to providing better service to customers, this program has direct consequences on energy efficiency. As every shutdown and start-up of these units creates a sequence that consumes energy, increasing reliability, i.e. reducing the number of excessive shutdowns, results in more energy-efficient production units.

Energy efficiency and pipeline network

Large units are often interconnected through a pipeline network supplying a customer industrial basin. This group of interlinked units creates operational synergies for both production and energy consumption. The steady development of the Group's oxygen, nitrogen and hydrogen pipeline network clearly helps to improve its energy efficiency. Lastly, ever more efficient smart technologies are being rolled out in order to centralize the monitoring and management of the Group's large units so that production can be adjusted to customers' needs. This initiative also contributes to improving energy efficiency.

Energy and efficiency indicators for the Group as a whole

	2012	2013	2014	2015	2016 ^(a)
Annual electricity consumption (in GWh) ^(b)	27,578	28,305	30,341	31,650	32,834*
Annual thermal energy consumption (in LHV terajoules) ^(c)	229,177	232,270	226,036	266,153	281,043* ^(d)
Evolution of energy consumption per m ³ of air gas produced ^{(e)(f)}	98.8	99.0	99.3	98.7	100.3*
Evolution of energy consumption per m ³ of hydrogen produced ^{(e)(g)}	98.4	97.9	97.5	99.3	99.5*

(a) Excluding Airgas.

(b) Includes a share of steam and compressed air purchased by the Group.

(c) LHV: Lower Heat Value, which includes the fact that energy from water vaporizing in fuel is not recovered.

(d) Approximately 78,000 GWh LHV.

(e) Calculated using a base of 100 in 2007.

(f) Gases produced (oxygen, nitrogen, argon) calculated in m³ of equivalent gaseous oxygen.

(g) Hydrogen and carbon monoxide.

* Indicator verified by the independent verifier.

Our oxygen unit energy efficiency indicator fell in 2016 mainly due to significant maintenance operations on large units, as well as because of the sizable growth in new units directly using steam to power the machines in place of electricity.

Our hydrogen unit energy efficiency indicator was slightly down in 2016 mainly due to the increase in large production units that have not yet reached maximum efficiency.

2.3.5. ENVIRONMENTAL MANAGEMENT ^(a)

Water management

In 2016, Air Liquide used 77 million m³ of water, broken down as follows:

- approximately 60% by air separation units for cooling air after compression. 70% of this water is evaporated and 30% is treated on-site or by treatment plants in neighboring municipalities;
- approximately 40% in other industrial processes such as hydrogen production units and cogeneration units. Approximately 80% of the water used by these units is supplied and then consumed in the form of steam by Air Liquide's customers.

With regard to air separation units, there are several types of cooling systems. Around 83% of these units have semi-open water recirculating systems which require back-up water. Around 8% of these units have open systems. In such cases, water comes from natural resources or third-party industrial circuits. It is discharged back into the original source, without causing pollution or changing the water's physical-chemical characteristics. Lastly, around 9% of these units have closed systems that consume no water. 4% of Air Liquide's sites are located in countries that, according to the World Resources Institute ^(b), will be under extremely high hydric stress in 2020. Today, this represents 5% of the annual water consumption of Air Liquide's industrial sites.

Air Liquide takes its responsibility as an industrial company, working on reducing the volumes used, especially in the hydric stress areas. Several action plans have been implemented in the Group's different activities in the world.

Water management (in millions of m³)

	2012	2013	2014	2015	2016 ^(a)
Annual water consumption (estimation in millions of m ³)	66	68	70	79	77* ^(b)

(a) Excluding Airgas.

(b) Represents less than 0.5 one-thousandth of the industrial water consumption of the economies under review.

* Indicator verified by the independent verifier.

Discharges into air and water

Other indicators concerning Air Liquide's business are also monitored. Among them, the table below summarizes the atmospheric discharge of nitrogen oxide (NO_x), sulfur oxide (SO_x), and Volatile Organic Compounds (VOC), along with the discharge into water of oxidizable matter and suspended solids.

Discharges into air and water (in tons)

	2012	2013	2014	2015	2016 ^(a)
Air discharge: NO _x (nitrogen oxide)	3,940	4,400	3,200	3,270	3,563
Air discharge: SO _x (sulfur oxide)	<300	<250	<250	<250	<250
Volatile organic compounds (VOCs) discharged into the atmosphere (estimate)	124	110	110	99	76
Discharge to water: oxidizable matter	<1,700	<1,000	<1,000	<1,000	<1,000
Discharge to water: suspended solids	<1,500	<1,500	<1,500	<1,500	<1,500

(a) Excluding Airgas.

(a) Due to its industrial activity, the fight against food waste is not considered as a priority area for Air Liquide.

(b) The World Resources Institute (WRI) is an American think tank created in 1982 and based in Washington. The WRI is specialized in environmental issues.

Waste and by-products

Although the amount of waste and by-products resulting from Industrial and Medical Gas activities is low, Air Liquide nevertheless publishes estimated figures in this regard in the interests of exhaustive reporting. The main waste and by-products produced by the Group's production units are lime from the acetylene production units, metal waste, oils, paints and solvents. The average recycling ratio of waste^(a) is over 80%.

Waste and by-products

	2012	2013	2014	2015	2016 ^(a)
Non-hazardous waste and by-products					
Annual quantity of lime produced (extracted dry equivalent) by the acetylene production units (in tons)	30,400	32,500	32,000	29,000	26,000
% recycled	>80%	>80%	>90%	>80%	>80%
Metal waste (in tons) ^(b)	9,200	9,800	9,000	7,600	5,700
% recycled	>99%	>99%	>99%	>99%	>99%
TOTAL NON-HAZARDOUS WASTE AND BY-PRODUCTS (estimate in tons)	39,600	42,300	41,000	36,600	31,700
Hazardous waste					
Paints and solvents (in tons)	101	150	100	104	106
% recycled	43%	63%	63%	59%	63% ^(c)
Oils (in tons)	825	800	600	650	696
% recycled	91%	88%	83%	92%	91% ^(d)
TOTAL WASTE AND BY-PRODUCTS (estimate in tons)	926	950	700	754	802
TOTAL WASTE AND BY-PRODUCTS	40,526	43,250	41,700	37,354	32,502

(a) Excluding Airgas.

(b) Non-hazardous metal waste.

(c) In addition, 35% is incinerated.

(d) In addition, 9% is incinerated.

2.3.6. BIODIVERSITY

The impact of Air Liquide's activities on biodiversity is limited because the Group's production units are generally located on small 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.

In recent years, the Foundation has sponsored the following:

- the under The Pole II expedition to Greenland. The Air Liquide Foundation is sponsoring an environmental research program in the Arctic. Its aim is to study interactions between the ice pack, atmosphere and ocean by assessing the amount of CO₂ trapped deep in the ocean. The Foundation is thus playing its part in protecting biodiversity in the Arctic world;

- the work of the Institut de Recherche pour le Développement (IRD) and WWF France respectively on mangroves in the Indo-Pacific region and the Gabonese forests. These works aim at quantifying and qualifying the carbon cycle of mangroves and forests with an objective: protecting these ecosystems which are the home to a wide range of biodiversity;
- the Observatoire Français d'Apidologie's (OFA) project aims at increasing bee populations in France and Europe. The OFA is carrying out a study on the selection of bees capable of resisting a parasite called varroa which attacks certain types of bees. The decline in bee populations is a major threat to biodiversity and agricultural production. The aim of the OFA's project is to develop a natural and non-chemical solution that can sustainably be used to fight against this parasite.

(a) Calculation is based on the weight of the waste.

2.4. Buy clean

2.4.1. ENERGY AND TRANSPORT PROCUREMENT

As a major consumer of electricity, 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 energy suppliers who have made the choice to supply low-carbon solutions.

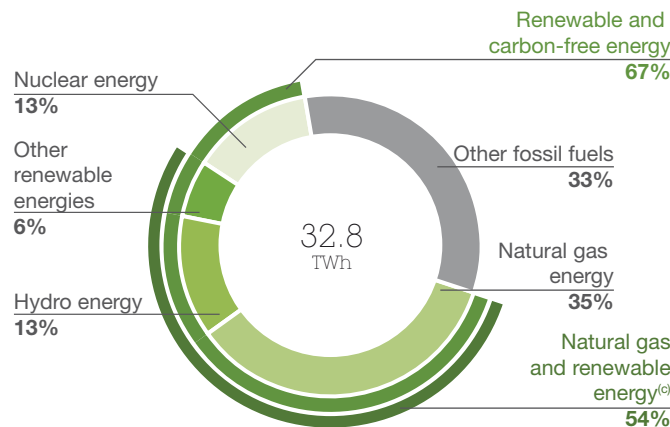
Transport procurement is also a lever that helps reducing the Group's environmental impact. Air Liquide is currently considering taking into account greenhouse gases and pollutants (NO_x and particles) emissions in the selection process of subcontractor carriers and procurement of transport materials.

2.4.2. SOURCE OF ELECTRICITY USED BY THE GROUP ^(a)

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 by the Group. This calculation also takes into account the electricity produced from natural gas by the Group's cogeneration units. In 2016, 19% of electricity consumed was from a renewable source and 35% from natural gas composed mainly of methane, a molecule which contains a carbon atom and four hydrogen atoms, the combustion of which generates around two-times less CO₂ emissions than coal per kWh of electricity produced. In addition, combustion of natural gas produces small amounts of atmospheric pollutants.

In total, 67% of the electricity used by the Group is fully carbon-free or comes from natural gas.

ORIGIN OF ELECTRICITY USED IN 2016 ^(b)



2.5 Summary of Group's greenhouse gas emissions

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.

Nearly 96% 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 ^(d);

(a) Also including a small share of steam and compressed air purchased by the Group notably to power the air separation units.

(b) Calculation takes into account the primary energy source that each country uses to produce electricity (source: International Energy Agency). Excluding Airgas.

(c) In 2015, this percentage was 53%.

(d) Some hydrogen and carbon monoxide production unit also use other raw materials such as naphtha (a liquid similar to gasoline that comes from the distillation of oil) and various gases produced by refineries.

■ **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 of Scopes 1 and 2 represented 99% of the Group's total emissions in 2016.

■ **Scope 3** corresponds to other indirect emissions generated, for example, by Group employees traveling on business or those linked to home-office commuting.

Group Scopes 1 and 2 emissions

	2012	2013	2014	2015	2016 ^(a)
Scope 1: total direct greenhouse gas emissions (GHG) <i>(in thousands of tons of CO₂ eq.)</i> ^(b)	11,272	11,846	11,569	13,552	14,062*
Scope 2: total indirect GHG emissions <i>(in thousands of tons of CO₂)</i> ^(c)	9,546	9,915	11,405	11,716	11,174*
TOTAL DIRECT AND INDIRECT EMISSIONS OF GHG <i>(in thousands of tons of CO₂ eq.)</i>	20,818	21,761	22,974	25,268	25,236*

(a) Excluding Airgas

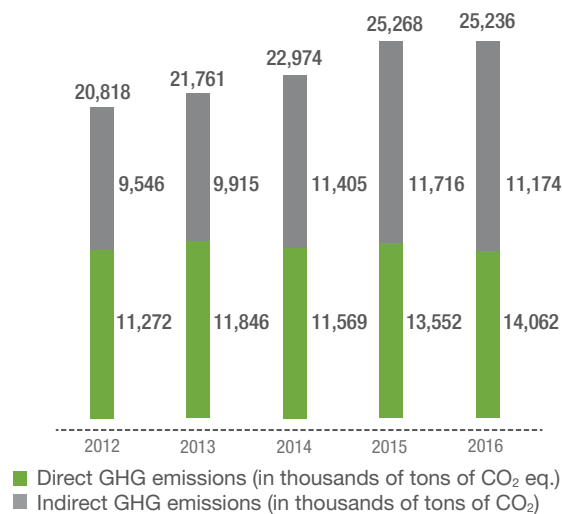
(b) Includes CO₂ emissions and nitrous oxide emissions.

(c) Total of indirect GHG emissions generated by the production of electricity purchased outside the Group. The indirect emissions only concern CO₂ emissions. Calculation takes into account the primary energy source that each country uses to produce electricity (source: International Energy Agency).

* Indicator verified by the independent verifier.

DIRECT "SCOPE 1" EMISSIONS AND INDIRECT "SCOPE 2" GREENHOUSE GAS EMISSIONS

(in thousands of tons of CO₂ eq. and excluding Airgas)



The Group's total emissions (direct and indirect) were almost stable, moving from 25.3 million tons of CO₂ equivalent in 2015 to 25.2 million tons of CO₂ equivalent in 2016.

DIRECT AND INDIRECT EMISSIONS

The Group's direct emissions increased from 13.6 million tons of CO₂ equivalent in 2015 to 14.1 million tons in 2016, i.e. an increase of 3.8%. This growth is mainly due to an increase in the use of cogeneration units and the ramp-up of several hydrogen units, in particular the unit in Yanbu (Saudi Arabia).

The Group's indirect emissions decreased from 11.7 million tons of CO₂ equivalent in 2015 to 11.2 million tons in 2016, i.e. a fall of 4.6%. This drop is the combination of an increase in volumes produced and a significant fall in the carbon content of the electricity used worldwide.

SCOPE 3 EMISSIONS RELATED TO BUSINESS TRAVEL

Business travel by plane, car or train is the main source of Scope 3 CO₂ emissions.

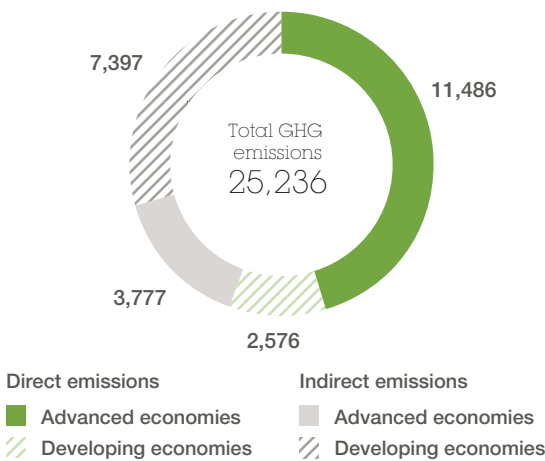
These emissions represent around 150,000 tons of CO₂ in 2016 for all subsidiaries, representing less than 1% of the Group's total emissions.

The Group has installed teleconferencing rooms in order to enable remote meetings to be organized, offering participants a presence similar to a physical meeting. They can also be used for meetings with customers, partners and investors.

Moreover, with the roll-out during the last two years of the collaborative work platform, called Kite, several meetings have taken place via the visual communication tool by webcam: Hangout. This technology therefore reduces the CO₂ emissions generated by employees' business travels.

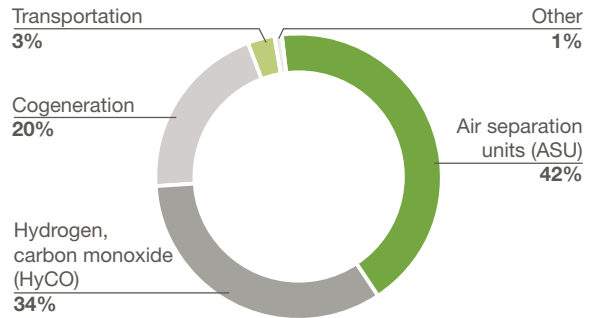
BREAKDOWN OF GREENHOUSE GAS EMISSIONS BETWEEN ADVANCED AND DEVELOPING ECONOMIES

(in thousands of tons of CO₂ and including Airgas road transportation)



BREAKDOWN OF DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS BY UNITS

(including Airgas road transportation)



2016 Greenhouse Gas emissions (GHG) & avoided GHG emissions

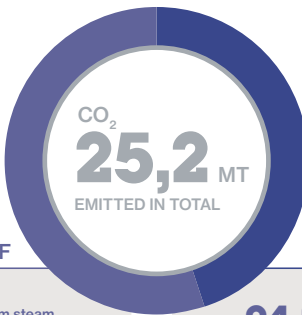
GHG EMISSIONS

DIRECT EMISSIONS*

14 MT

COMPOSED OF

- 8,1 MT** from steam methane reformer
- 5,2 MT** from cogenerations
- 0,7 MT** from transportation activities



INDIRECT EMISSIONS**

11,2 MT

at **94 %** for the supply of air separation units

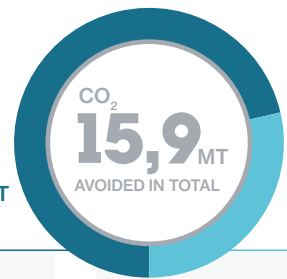
AVOIDED GHG EMISSIONS

BY CUSTOMERS

11,2 MT

BY

- the use of oxygen in processes
- oxygen injection in blast furnaces
- use of oxygen in electric arc furnaces



BY AIR LIQUIDE

4,7 MT

Thanks to Air Liquide's industrial efficiency compared to customers' self-production (network effects, size effect,...)

Figures are given in CO₂ eq
 (*) Emissions generated by the production and the transportation activities
 (**) Emissions linked to electricity production and bought of steam

(a) In this report, the advanced economies are defined in accordance with the financial reporting: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, Japan, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United States. The developing economies refer to the other countries in which Air Liquide operates.

2.6. Industrial Management System and certifications

2.6.1. INDUSTRIAL MANAGEMENT SYSTEM

More than 10 years ago, Air Liquide introduced an Industrial Management System (IMS) dedicated to its businesses. It is designed to strengthen the process for managing safety, reliability, environmental protection and industrial risk management. It has been rolled out throughout the Group.

An indicator was implemented in order to track the percentage of revenue covered by the Group's IMS internal audits over the last five years. From 2012 to 2016, 92 entities have been audited, representing nearly 80% of the Group's activity in revenue terms. This means that a significant part of the Group has been audited over a five year period on the implementation of its Industrial Management System (IMS).

Industrial Management System and certifications (global scope)

	2012	2013	2014	2015	2016 ^(a)
Estimate of revenue of Group entities covered by an ISO9001 quality certification	76%	72%	70%	72%	66%
Estimate of revenue of Group entities covered by an ISO14001 environmental certification	29%	27%	27%	27%	26%
Estimate of revenue of Group entities covered by the OHSAS18001 occupational Health and Safety certification	18%	15%	16%	15%	14%

(a) Excluding Airgas.

2.6.2. REGULATIONS

European REACH regulation

REACH (Registration, Evaluation, Authorisation and restriction of CHemicals) is a European Union regulation that governs the registration, assessment and authorization of chemical substances produced in or imported to the European Union. 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. This rule is part of the product stewardship approach developed by the chemicals industry.

The European REACH regulation went into effect on June 1, 2007 and registration and authorization procedures were spread over about 12 years for products already on the market.

Air Liquide's main products such as oxygen, nitrogen, hydrogen, CO₂, helium and rare gases are excluded from the scope of REACH. Until now, four products (carbon monoxide, acetylene, methanol^(a) and lime^(b)) have been registered in compliance with the schedule established by this regulation. Nitrous oxide and a few specialty gases in

Alongside this approach and to meet the requests of certain customers, the Group entities carry out other initiatives such as ISO certifications.

For example, the ISO9001 quality certifications cover about 66% of the Group's revenue. Likewise, the ISO14001 certifications, an international benchmark in environmental management, cover 26% of the Group's revenue.

In recent years, the Group has undertaken a certification approach in certain zones concerning health and safety in the workplace called "OHSAS18001 certification", which now covers 14% of the Group's revenue.

the Electronics activity, such as nitrogen trifluoride, were registered on June 1, 2013 for annual quantities of between 100 and 999 tons.

In addition, certain products in the Healthcare Specialty Ingredients activity fall under the REACH regulation, including many SEPPIC products stemming from plant-based raw materials. Depending on the annual tonnage manufactured, SEPPIC has already registered its main products and will register all products concerned by May 31, 2018 at the latest, in compliance with the REACH regulation.

Air Liquide must also make sure that the raw materials in use are in compliance with the REACH regulation. In 2016, Group sales covered by REACH represented less than 3% of the Group's revenue.

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.

(a) Methanol is the raw material used to produce hydrogen at one of the Group's units.

(b) Lime is a by-product of the Acetylene business.

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 supplying products to local and international customers have already implemented the principles of GHS in terms of product compliance with local and regional regulations.

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 III "upper tier" and "lower tier". In Europe, 95 "lower tier" and 23 "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, 31 other Group sites would be covered.

CO₂ 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 assist 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 installations subject to the ETS. For Air Liquide, seven cogeneration sites in Germany, France and the Netherlands, and all of the Group's large hydrogen product sites in Europe were affected by this directive in 2016. With regard to hydrogen production units, CO₂ emission quotas are mostly allocated for free, according to a benchmark set for the top performing European facilities. Air Liquide obtains CO₂ 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.

A greenhouse gas emissions quota system was put in place in South Korea in 2015. It affects all of Air Liquide's air gas production and hydrogen and carbon monoxide units in Korea, with an allocation of free emission quotas based on historical emissions. This free emission quota volume will then be gradually reduced.

China announced ambitious targets for reducing the carbon intensity of its economy by 2030. The Chinese government has launched in 2013 and 2014 pilot "ETS" programs in seven regions (the provinces of Guangdong and Hubei, and the cities of Beijing, Tianjin, Shanghai, Chongqing and Shenzhen). Air Liquide production sites in those regions (air gas and hydrogen units) are actively participating in the pilot programs. At the end of 2015, the Chinese government announced the implementation of a national emissions trading scheme as of end-2017, the terms of which are currently being defined.

2.6.3. 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 gases 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 2016, there were a total of six 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, hydric 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 14 million euros.

3. Commitment to stakeholders

3.1. Local development

Air Liquide entities are located in communities for which respect is at the heart of the concerns of the Group's employees. They are fully aware that each decision and each action commits them toward customers and partners, but also toward those individuals or firms that are affected directly or indirectly by the Group's activities. The consideration of these communities' needs is necessary to guarantee the sustainability of the environment where the Group operates.

Air Liquide's teams are wholeheartedly committed to playing their part in the local economic life near the Group's sites. 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.

In industrial areas where Air Liquide sites are located (several thousand with strong growth following the Airgas acquisition), the Group also seeks to develop subcontracting and local procurement in order to contribute to the local economic life.

In addition, the Group's activities, 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 CLICs and CLIEs. These local 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.

3.1.1. THE AIR LIQUIDE FOUNDATION

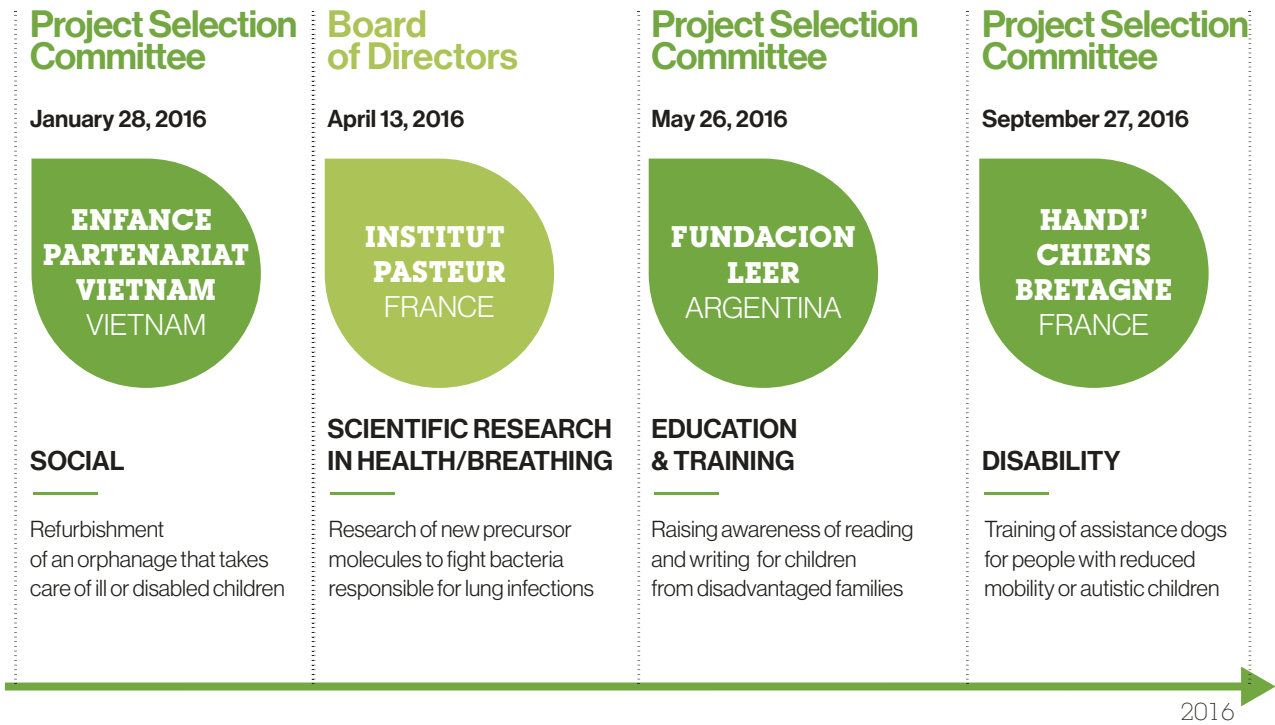
Social and human commitment is an ongoing concern for Air Liquide. Since its very beginning, the Group has carried out corporate philanthropic actions, especially in fields related to the environment and local development.

Created in 2008, the Air Liquide Foundation has a worldwide scope and supports projects in all countries in which the Group operates. With a budget of almost 3 million euros over five years, the Air Liquide Foundation provides financial, material and Human Resources to the supported projects.

The Air Liquide Foundation's action is in line with the Group's Sustainable Development strategy which aims at improving air quality and is committed to the stakeholders of the Group. In this context, it has set the following three missions:

- **environment:** support scientific research projects in the environmental protection field that contribute to preserving our planet's atmosphere;
- **health/breathing:** support scientific research projects aimed at improving respiratory function and gas metabolism in the human body in the healthcare field or exploration fields (space, deep-sea diving, sport);
- **local development:** support local development micro-initiatives which contribute to improving living conditions in communities in the following fields: access to water, energy and care, the environment, disability, micro-entrepreneurs, social education and training.

Examples of projects supported by the Air Liquide's Foundation in 2016

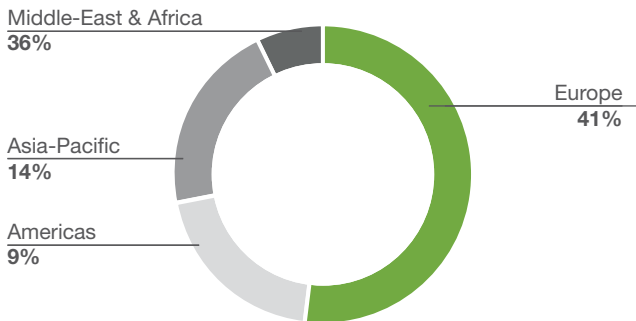


In 2016, the Foundation's undertook projects in 16 countries, including three new countries, Bulgaria, Poland and Portugal:

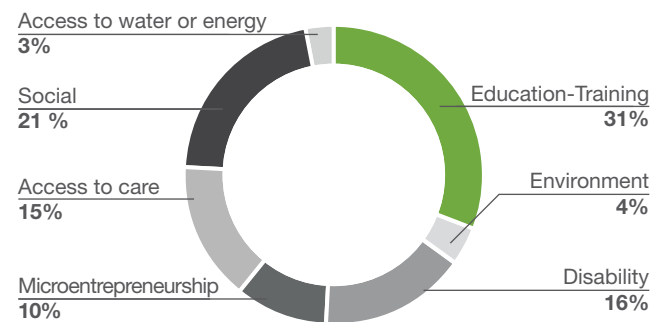
- an environmental research project;
- three health/breathing research projects;
- 31 local development micro-initiatives.

The Air Liquide Foundation has supported 254 projects, including 222 local development micro-initiatives and 32 environment and health/breathing scientific research projects in around 50 countries since its creation.

BREAKDOWN OF LOCAL DEVELOPMENT MICRO-INITIATIVES SUPPORTED BY CONTINENT

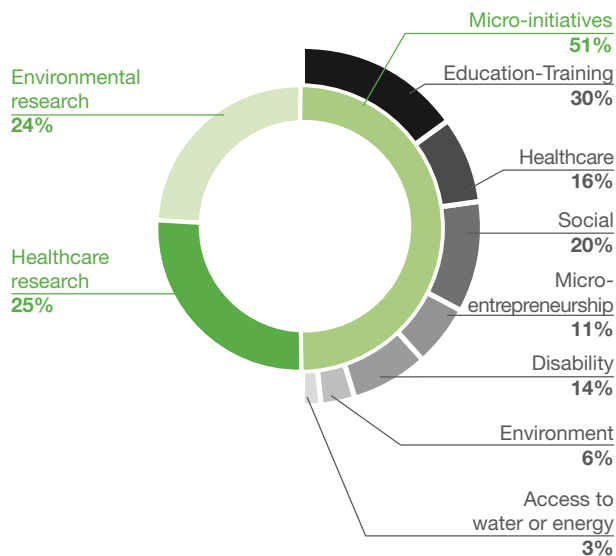


BREAKDOWN OF LOCAL DEVELOPMENT MICRO-INITIATIVES SUPPORTED BY FIELD



A dedicated Air Liquide Foundation website enables projects to be directly submitted online, in French or English. The website address is: <https://www.fondationairliquide.com/en>.

THE AIR LIQUIDE FOUNDATION'S ACTIONS PER MISSION SINCE ITS CREATION IN 2008 ^(a)



(a) By amount contributed to the projects supported.

The Foundation and the environment

Forests and mangroves are known for being an excellent ecosystem for capturing CO₂, but tangible data must be measured and collected. For this reason, the Air Liquide Foundation in 2016 supported the work of:

- the Institut de Recherche pour le Développement (IRD) on mangroves in the Indo-Pacific region: Vietnam, New Caledonia, New Zealand. The IRD is carrying out a quantitative and qualitative study of CO₂ flow in these mangroves located in different climatic regions;
- WWF France which is implementing a sustainable surveillance system of carbon storage in Gabonese forests.

The aim of the IRD and WWF France is to assign value to the forest and the mangroves in order to ensure their conservation.

Furthermore, in order to protect the planet's atmosphere, it is important to understand past climate change and pollution. In 2016, the Foundation's Board of Directors approved a program, in Antarctica, to create an archive of ice cores from mountain glaciers, which are endangered due to climate change. These glaciers carry information regarding past atmospheric composition. The Foundation of the University of Grenoble-Alpes, which runs this project with other international scientific organizations, will analyze these ice samples to determine their composition in terms of pollutants. This ice archive conserved in Antarctica, will enable future generations of scientists to carry out other types of analysis with new technologies that have not yet been invented.

The Foundation and Health/Breathing

The Foundation has joined forces with two major research institutes in the fight against respiratory infections triggered by viruses and bacteria:

- the Institut National de la Recherche Agronomique (National Institute of Agronomic Research – INRA) in France, in partnership with the Helmholtz Institute of Shandong University in China is conducting research on therapeutic molecules to fight respiratory diseases caused by the Respiratory Syncytial Virus. This virus is a common factor in respiratory diseases like bronchiolitis, pneumonia, and chronic pulmonary infections;
- the Institut Pasteur in Paris is conducting research on bacteria responsible for respiratory infections. These bacteria are increasingly resistant to antibiotics. Scientists from the Institut Pasteur in Paris, working with Cochin hospital, are conducting research on new precursor molecules capable of fighting against these bacteria. The results obtained are of particular interest to patients suffering from cystic fibrosis, who are the most vulnerable to respiratory infections.

In 2016, the Foundation approved a total of three Health/Breathing Research projects.

The Foundation and Local Development

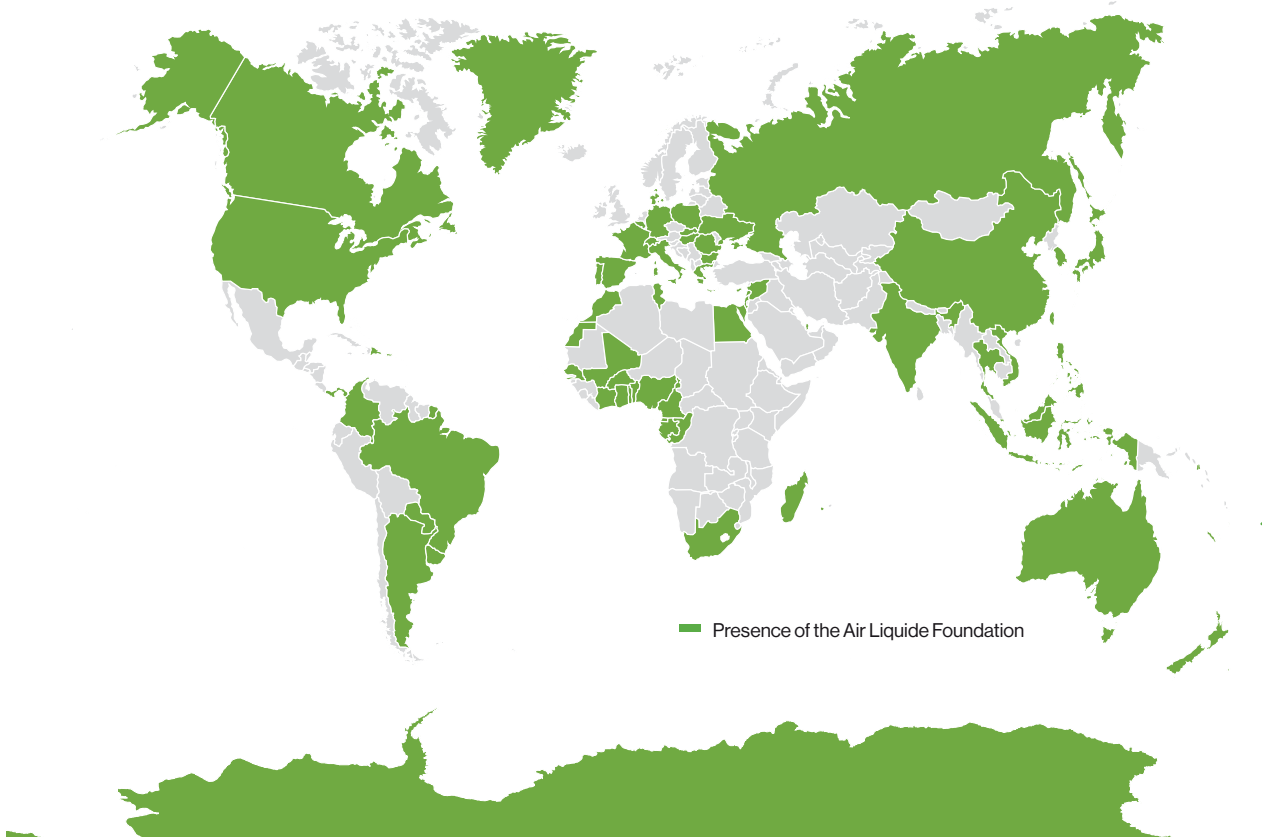
In the framework of its micro-initiatives support program, the Foundation favors actions aimed at developing local communities over the long term in countries in which the Air Liquide Group operates.

In 2016, the Foundation supported projects in the fields of education and training (12 projects in nine countries), access to care (three projects in three countries), the environment (one project), disability (five projects in two countries), social (11 projects in seven countries).



Focus on a micro-initiative

The association L'Envol, based in the Paris region (France), cares for children suffering from serious illnesses, such as leukemia. L'Envol offers them the possibility of going to summer holiday camps, either alone or with their families. The children regain confidence and learn to socialize again through the therapeutic (recreational) activities. The children are accompanied by an educational and medical team 24 hours a day. The Foundation's grant enabled L'Envol to purchase medical equipment and soft furnishings to decorate the infirmary.



Employee commitment

Air Liquide employees support the Foundation's works by sponsoring local development micro-initiatives. It provides employees who wish to take part in community work with the opportunity to express their social and human commitment. The role of a sponsor is broken down into three steps:

- **making contact and feasibility study:** the sponsor visits the project in order to meet the organizational teams on site. The sponsor checks that the micro-initiative meets the Foundation's selection criteria and is eligible to receive its support. The sponsor is also involved in assessing the project's technical feasibility and financial viability. The sponsor's report is submitted to the Foundation's Project Selection Committee;
- **follow up and support:** the sponsor visits a project supported by the Foundation at its mid-way point and prepares a project advancement report with the project initiator;
- **final evaluation:** when the project is completed, the sponsor visits the site of the initiative to compile a report on the implementation of the project.

Moreover, Group employees are also encouraged to recommend projects in organizations close to their hearts.

Currently, 330 employees are involved in the Foundation's activities.

2016 Awards of the Air Liquide Foundation

The Air Liquide Foundation, on January 13, 2016, presented its first Awards as a recognition for the most innovative organizations among the ones supported by the Foundation.

- The Air Liquide Foundation Scientific Research Awards, in the Environmental and Health/Breathing fields, were issued respectively to the **CNRS**, for its study of natural insecticides in French Guiana, and to the **PremUp Foundation**, for its research work on premature babies' lungs.

In this category, two other organizations were also nominated: the **Institut du Cerveau et de la Moelle Épineuse**, and **Inserm** in partnership with the Bichat hospital, both located in Paris.

- The Air Liquide Foundation Social Innovation Awards were granted to three associations in recognition of their local development micro-initiatives:
 - Agronomes et Vétérinaires Sans Frontières, for their projects aimed at upgrading fruit production by rural families in **Brazil**, and at providing access to energy in **Senegal**;
 - Energie Jeunes, for their fight against school drop-out in priority education areas in **France**;
 - Village Pilote, for its program focused on the work integration of street children in Dakar, **Senegal**.

Two other associations were also nominated in this category: **Initiatives**, for an educational project in Morocco, and the **World Federation of Societies of Anesthesiologists**, for an access to care project in Togo.

In addition to the Foundation's support for all of the projects, each of the winning organizations received 10,000 euros.

Air Liquide shareholders' commitment: the Project Selection Committee

Air Liquide shareholders also contribute to the Foundation's missions. A shareholder may also be 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: shareholders provide 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.

The Committee assists the Foundation's Board of Directors which is chaired by Benoit Potier, the Air Liquide's CEO. The Board is composed of senior managers of the Group, a staff representative and outside experts, and meets twice a year to determine corporate philanthropy focuses and to examine the scientific research projects selected by the Project Selection Committee.

3.1.2. SUBSIDIARIES' DIRECT CORPORATE PHILANTHROPY

Subsidiaries committed to communities

Throughout the world, and in addition to the initiatives of the Air Liquide Foundation, subsidiaries are also directly involved with the communities, supporting local corporate philanthropy initiatives. As well as financial support, these actions were successfully conducted with the enthusiastic involvement of employees.

In October 2016, a category five cyclone (the highest level) struck the Caribbean, leading to major loss of lives and the destruction of homes in Haiti. Air Liquide employees from the neighboring Dominican Republic took part in rescue efforts and supplied the large tarpaulins required to insulate the shelters of those who had lost their homes. Air Liquide's teams were also in contact with the hospitals to provide oxygen for emergency care.

Air Liquide's teams in Spain and Japan also rallied to help children.

In 2016, in Spain, Air Liquide Healthcare joined forces with the Theodora Foundation, whose mission is to bring a little cheer to hospitalized children. For example, visits by artists, who are specially trained to work in medical environments, were organized as well as several workshops.

In Japan, Air Liquide donated musical instruments to an elementary school in Sendai, in the north east of the country. Since 2011, Air Liquide in Japan has been supporting particular areas affected by earthquakes and tsunamis.

3.1.3. DEVELOPING THE LOCAL ECONOMY THROUGH SUPPLIERS

The total amount of Group procurement in 2016 was 9.9 billion euros ^(a), including energy and transportation procurement.

Sub-contracting

In 2016, sub-contracting for Air Liquide came to a total of 1.57 billion euros. Sub-contracted activities are mainly those which are too far-removed from the Group's activities or that require specific resources or that are linked to a concentrated workload at particular times.

Since 2008, Air Liquide has published the number of lost-time accidents of its subcontractors and temporary workers. In 2016, there were 91 lost-time accidents of this type, including one fatal road accident recorded.

Local procurement

More than 80% of Air Liquide's procurement expenditures are made locally, limiting the environmental impact relating to transportation and developing the local economy. 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 2016, of the 55 public and private corporate accounts, the association gave Air Liquide the best score for its exemplary approach to the development of collaborative working relationships with SMEs. One of the Group Procurement initiatives involves the launch of a physical network for the coordination and consolidation of the work done in France by the Air Liquide's Procurement teams. This approach rallies the Group's 26 Procurement teams around a central objective: the creation of value through the development of collaborative working relationships with our ecosystem of suppliers (open innovation platform, sharing of expertise, best practices in terms of intellectual property, etc.) which contribute to the growth of French SMEs. The Group's Procurement Department has started discussions with other countries to launch similar initiatives.

(a) Including Airgas.

3.2. Development and commitment of employees

Air Liquide employees, through their knowledge and their commitment, make the Group what it is and contribute to its long-term performance. Meeting the expectations of customers who have a wide range of different activities worldwide, requires a wide range of talents and the capacity for innovation. Air Liquide is also involved in promoting diversity, facilitating and accelerating knowledge transfer, motivating and involving its employees, and encouraging social and human commitment.

As part of the NEOS 2016-2020 company plan, Air Liquide's Human Resources has set a goal of developing and recruiting employees in a more organized and efficient manner by relying on new methods of

working to gain agility and promoting talent in a constantly changing environment.

In 2016, this change was highlighted by the acquisition of Airgas in the United States. This marks the beginning of a new chapter for the Group, which now has 66,700 employees in 80 countries forming multicultural teams with a host of skills.

The role of the Group's Human Resources in the years ahead will therefore be to support the transformation which employees experience and introduce worldwide.

Group employees^(a)

	2012	2013	2014	2015	2016
Group employees	49,500	50,250	50,300	51,500	66,700* ^(e)
■ Women	12,800	13,500	13,600	14,200	17,000 ^{(e) (f)}
as a %	26%	27%	27%	28%	25% ^(e)
■ Men	36,700	36,750	36,700	37,300	49,700 ^{(e) (f)}
as a %	74%	73%	73%	72%	75% ^(e)
Joining the Group ^(b)	19.9%	14.9%	14.8%	16.5%	17.1% ^(g)
Leaving the Group ^(c)	12.7%	13.1%	14.7%	14.0%	15.1% ^(g)
% of employees having resigned during the year ^(d)	4.6%	4.9%	5.8%	5.3%	5.4% ^(g)

(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) Including Airgas and Welding.

(f) Estimation.

(g) Excluding Airgas and Welding.

* Indicator verified by the independent verifier.

Human Resources indicators in the Group

	2012	2013	2014	2015	2016 ^(h)
Parity and diversity					
Diversity					
% of women among managers and professionals	26%	27%	28%	29%	30%*
% of women among managers and professionals hired during the year	28%	36%	31%	34%	39%*
% of women among employees considered as high potential	41%	40%	41%	38%	40%
Number of nationalities					
Among expatriates	44	45	44	50	44
Among Senior Managers	29	28	31	33	30
Among employees considered as high potential	44	46	44	48	49
Number of nationalities among senior managers/Number of countries where the Group is present	36%	35%	39%	41%	38%
Training					
% of total payroll allocated to training	About 2%	About 2%	About 2%	About 2%	About 2%
Average number of days of training per employee, per year (order of magnitude)	3.6 days	3.5 days	3.5 days	3.5 days	3.1 days ^(a)
% of employees who attended a training program at least once during the year (order of magnitude)	78%	75%	78%	77%	72%*
Performance review					
% of employees who have had a performance review meeting with their direct supervisor during the year	79%	78%	79%	80%	76%*
% of employees who have had a career development meeting with the HR department during the year	17%	14%	16%	15%	17%
Remuneration					
% of employees with an individual variable share as part of their remuneration	54%	56%	58%	60%	63%
Absenteeism					
Absence rate of Air Liquide employees (estimate)	3.2% ^(b)	3.6% ^(c)	2.4% ^(d)	2.7% ^(d)	2.7% ^(d)
Ethics					
% of employees belonging to an entity with a local Code of Conduct	91%	94%	94%	97%	96%
Employee loyalty					
Average seniority in the Group	10 years	10 years	10 years	10 years	10 years
Retention rate of managers and professionals over a year ^(e)	95.4%	94.8%	93%	95%	95%
Social performance					
% of disabled employees ^(f)	1.3%	1.4%	1.3%	1.4%	1.4%
% of employees having access to a representation/dialogue/consultation structure	76%	76%	76%	79%	82%
% of employees belonging to an entity at which an internal engagement survey was conducted within the last three years	>50%	>50%	>55%	68%	65%
Employee shareholders					
% of capital held by Group employees ^(g)	1.5%	1.6%	1.5%	1.5%	1.5%
% of Group employees that are shareholders of L'Air Liquide S.A.	Almost 50%	More than 50%	More than 50%	Almost 50%	More than 50%

(a) 23 hours a year according to counting in hours (base: 1 day = 7.5 hrs).

(b) Calculated for France.

(c) Calculated for Europe.

(d) Calculated Worldwide.

(e) This rate takes only dismissals into account.

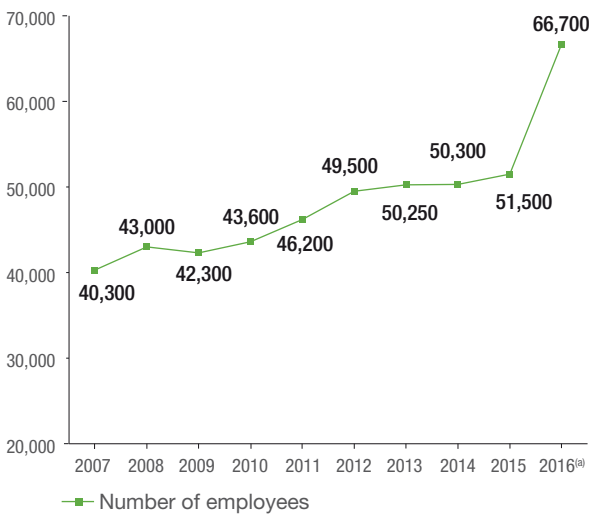
(f) For the countries where regulations allow this data to be made available.

(g) Within the meaning of article L. 225-102 of the French Code of Commerce.

(h) Excluding Airgas and Welding.

* Indicator verified by the independent verifier.

GROUP EMPLOYEES



(a) Including Airgas and Welding.

3.2.1. NEW WAYS OF WORKING

Today's trends encourage companies to adapt rapidly to their external environment by responding to changes in the world of work which include Digital Transformation, collaboration and performance.

A new organizational structure

To meet these challenges and encourage efficient decision making, Air Liquide has introduced a more decentralized organizational structure which relies on its hubs and Clusters (groups of countries or entities) located throughout the world. This global scale network structure is more agile, fosters efficiency and initiatives and strengthens proximity with customers.

Collaborative working methods

Digital Transformation has led to the blossoming not just of new ways of working, but also of collaborating, creating and maintaining networks within the Company.

Kite: a digital workplace

A collaborative workplace called "Kite" was launched Group-wide in 2014.

Technologically innovative, Kite is changing the ways of working, making it more collaborative and participatory, and represents a major digital evolution for the Group, improving its agility and responsiveness, including with customers. Kite is constantly changing to offer new services to its users. For example, a new customizable portal is now available for all Air Liquide employees on computers, tablets and mobile phones. Resources have been made available to employees to help familiarize them with the Kite platform: the Kite Corner, a Google

extension dedicated to training, as well as a MOOC (an online training course open to all) and the Kite Champions within each team, who are on hand to answer any questions employees may have. Kite Champions receive training to become leaders of change within their entities and train employees in these new tools and any changes to them. At the beginning of 2017, an exchange day was organized to provide information and support to users. A "Fly with Kite" community also provides employees with the opportunity to share their experiences.

Google+ communities

Networking and collective intelligence drive innovation and entrepreneurship. The Group therefore provides employees with the opportunity to create and access Google+ communities through the Kite collaborative workplace. The topics of these communities vary – expertise, tools, events, processes, shared interests, etc. – but they are all based on the same desire to share information and best practices. The growth of internal networks, which is driven by new tools, has also led to improved performance and a better service for the Group's customers and patients.

At Air Liquide, the arrival of Google+ communities has introduced a new state of mind. Community members are opening themselves up to the eyes and comments of others. Communities also contribute to creating commitment and getting employees involved in many subjects. Finally, they transform ways of working, placing an emphasis on agility, efficiency, diversity and collective intelligence.

Example of the NEOS Google+ community

When the NEOS company program was announced, in March 2016, the Google+ NEOS community was created. Rapidly joined by almost 3,000 employees, it is the largest of the Group's communities to date. Its aim is to enable employees to adopt this program and to take part in the various stages of its implementation. The success of this community highlighted the power of collaborative work: it led to a rush of ideas and a wide range of contributions.

Digital solutions and Human Resources management

In order to meet the objectives set out in the NEOS company program, the Group's Human Resources rely on digital solutions to facilitate the implementation and monitoring of projects and to improve agility and efficiency.

Thus, the MyTalent Online platform, which harmonizes Human Resources processes within the Group, is accessible to all employees and covers the following fields in one personal online account:

- **attracting talent with the "Talent Acquisition System"**, which lists all of the Group's internal mobility offerings. This platform is also used by HR Departments around the world for external recruitment;
- **talent management with the "Talent Management System"**, a space dedicated to Air Liquide employees, their managers and HR professionals for performance reviews and career management;

- **training with the “Learning Management System”**, which provides a platform dedicated to training and employee development.

A passport for a digital journey

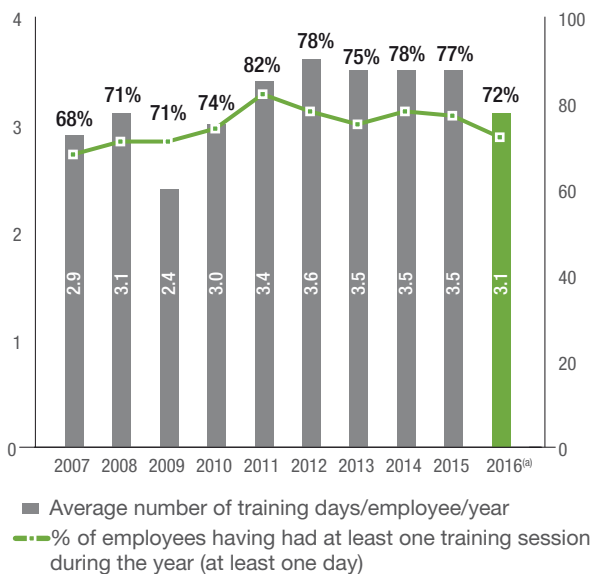
To support the Group's Digital Transformation, Air Liquide University has launched a training course which leads to the award of a digital passport. This consists of several self-assessment questionnaires on digital culture in general, but also on the knowledge of Kite (with various levels: basic, intermediate and advanced). The digital passport will first be tested in English, and then rolled out in several other languages in 2017.

3.2.2. DEVELOPING TALENT

Training

Air Liquide takes particular care to develop the competencies and expertise of its employees. The Group enables its employees to improve their performance, their contribution and their employability. In 2016, 72% of the Group's employees had at least one training session during the year. The average number of training days per employee, per year was 3.1 in 2016. This represents a total of more than 1,130,000 training hours for 2016.

AVERAGE NUMBER OF TRAINING DAYS PER EMPLOYEE, PER YEAR AND PERCENTAGE OF EMPLOYEES HAVING ATTENDED AT LEAST ON TRAINING SESSION DURING THE YEAR



(a) Excluding Airgas.

University for all!

Through its Corporate University, Air Liquide develops its training programs to meet the needs of employees while incorporating the Group's values. The Air Liquide University is based on a decentralized model and trains Group employees with modern pedagogic techniques like e-learning.

The University has a dual objective:

- formalizing and rolling out the training processes and disseminating good practices that go hand in hand with the Group's training dynamic;
- offering about 20 specific programs, ranging from integrating new employees to developing leadership abilities, as well as “professional” training programs given by the different business lines. The Group's values, Principles of action and key challenges are systematically included in the various modules.

At the university, a digital training library

An e-learning platform provides employees with support for their training. It offers more than 1,400 interactive training modules (in more than 10 languages) designed by the Air Liquide University, the business lines and the entities. At the end of 2016, e-learning modules were followed by more than 44,000 Group employees and more than 220,000 modules were completed.

During the “Printemps des Universités d'Entreprise” event, which gathered more than 400 decision-makers, heads of Human Resources, corporate university managers, representatives from a number of Ministries and several professional bodies, Air Liquide University was awarded the trophy for “best digital integration”. This award recognizes digital integration within the learning and development mechanism, through a smart combination of tools, methods and topics such as e-learning modules, virtual classes, videos, etc. Digital Transformation and its impact are therefore recurrent topics in the programs developed by the University. The jury was particularly impressed by the fact that digital programs are available to a wide internal public, and even certain external participants (customers, service providers and shareholders). This successful digital integration promotes new ways of working in the 80 countries in which Air Liquide is present.



Sustainable procurement awareness-raising and training

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 has been completed by 555 Air Liquide employees. 68% of those who have completed this module consider that they have become more efficient in their role as buyers;

- 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, in line with preceding years. To date, more than 150 buyers worldwide have received training in these tools;
- the main social, environmental and ethical risks relating to procurement have been mapped and monitored since 2010 so that they can be assessed and their development checked over time. Factsheets presenting sustainable development challenges specific to certain purchasing categories and certain geographic locations are available, enabling buyers to identify the most critical subjects;

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. Thus, more than 20 Air Liquide Heads of Procurement in France met for a conference on sustainable procurement.

A training module covering social and environmental audits of Air Liquide suppliers' sites will be rolled out at the beginning of 2017. It will enable buyers to better understand audit tools and be capable of identifying crucial factors and areas for improvement at suppliers' sites in terms of social and environmental factors during on-site visits.

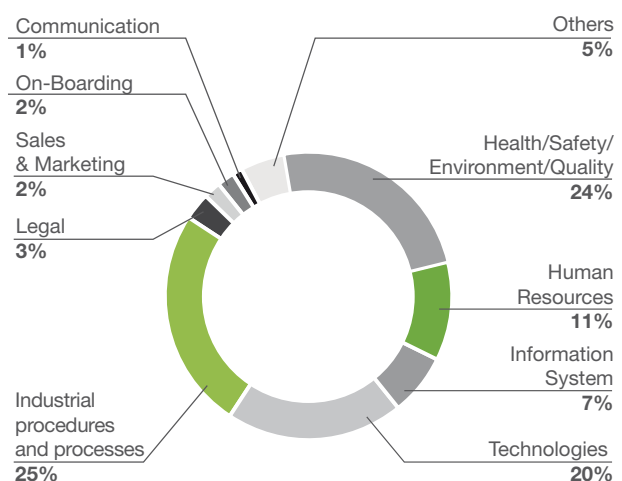
Training topics

The online training offer is upgraded every year and covers many topics such as safety, ethics, Human Resources processes, digital technology and management.

For example, the Industrial Safety Department and the Air Liquide University have provided Group employees with five online training modules concerning safety.

Topics include: personal protection equipment, confined spaces, falling and slipping, and defensive driving. Analysis of the Group's accidents show that these subjects involve 30% of accidents occurring in the activities. These modules include videos and questionnaires and have been made widely available. They are available in several languages.

BREAKDOWN OF TRAINING TOPICS ^(a)



(a) Excluding Airgas – This breakdown includes over 3/4 of the Group entities in which the Learning Management System has been rolled out.

Employee performance reviews

Employee performance is monitored and measured during performance review meetings that each employee has every year with his or her direct supervisor, but also during career development meetings that enable each employee to talk about more long-term prospects with the local Human Resources Department. The Group's Human Resources Department fosters these meetings as they are one of the cornerstones of the Company's Human Resources policy. In 2016, 76% of employees had a performance review meeting with their immediate supervisor. In addition, 17% of employees had a career development meeting with their entity's Human Resources Department.

Technical expertise recognition and enhancement

Technical expertise is crucial to design innovative solutions and anticipate customers' needs. Air Liquide has a portfolio of 11,000 patents.

The Technical Community Leaders (TCL) program plays a role in strengthening this expertise over the long term. Launched in 2003, this program enables talent in the technical sectors to access careers that offer recognition, satisfaction and influence. The Group's experts therefore have the opportunity to develop their talent in their chosen field. Since TCL was created, more than 3,200 experts have been recognized, thus playing a key role in sharing expertise, knowledge and technical excellence. In 2016, two International Fellows, 18 International Senior Experts and 71 International Experts from several regions of the world received recognition. TCL experts are invited to work in a network organization. A directory showing the contact details of all TCL experts is available to all employees. This tool is accessible via the My Talent Human Resources platform. The directory currently lists more than 800 international experts and will soon be expanded to include more than 2,000 local experts.

This community of the Group's technology experts contributes to the transfer of technical know-how, to the sharing of best practices, and to the long-term development of the skills that Air Liquide will need in the future. Experts are selected for their strong expertise in science and technology and their active contribution to innovation. They also demonstrate entrepreneurial spirit, their customer-oriented mindset, analytical and decision-making skills.

Each TCL expert contributes in the following four areas:

- communication & network: submit publications, grow networks, deliver audits and represent the Group externally;

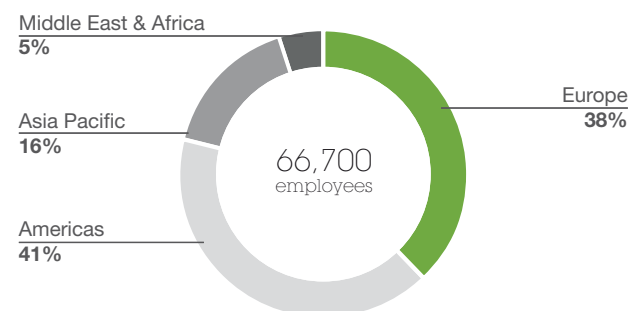
- innovation & technology: lead their technological area, contribute to strategic decision-making, develop creative new ways of working and anticipate needs;
- business development: design solutions, submit patents, and identify new project opportunities;
- knowledge management: design and deliver training, mentor talent and peers, develop TCL locally and contribute to knowledge sharing.

Internal mobility: a key element in career development

Mobility corresponds to an employee's ability and commitment to change job or location, either within the same country or abroad, to meet the Company's needs and develop on a personal level.

Internal mobility, whether in terms of shifting job function or geography, is encouraged by the Group. This talent management practice not only promotes diversity within teams but also opens a wide range of career opportunities for employees. Internal mobility also builds extremely strong and lasting networks within the Group.

BREAKDOWN OF GROUP EMPLOYEES BY GEOGRAPHIC REGION IN 2016 ^(a)



(a) Including Airgas and excluding Welding.

The choice of diversity

Diversity is a priority of Air Liquide's Human Resources policy and the Group considers it a source of dynamism, creativity and performance. A team in the Human Resources Department is in charge of steering the diversity projects. The five axes of the Group's Human Resources diversity policy are: nationality, gender, educational background, age and disability. Through this diversity policy, Air Liquide is strongly committed to fight any form of discrimination.

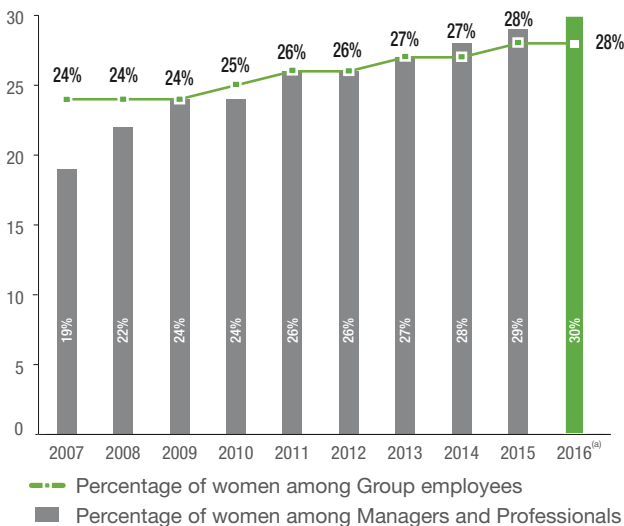
Nationality

Air Liquide's senior managers are of 30 different nationalities. The Group's Board of Directors is composed of six different nationalities.

Gender

Equality between men and women is an essential point in the expression of this diversity. Between 2003 and 2016, the percentage of women who were hired for managerial and professional positions rose from 14% to 30%^(a). The percentage of women among managers and professionals is higher than the overall percentage of women in the Group (28%)^(a), which illustrates the good representation of women in Air Liquide's management. Women now represent 40% of employees considered as high potential. Five women are now members of the Group's Board of Directors.

PERCENTAGE OF WOMEN AMONG MANAGERS AND PROFESSIONALS (INCLUDING OR EXCLUDING AIRGAS)



(a) Excluding Airgas and Welding.

These results are the fruit of a concrete, global Human Resources strategy based on the following four priorities:

- 1. Recruiting:** strengthening the place of women in the Group, in particular through hiring managers and professionals.
- 2. Developing careers and increasing responsibilities for women in the Company:**
 - for every management position that becomes available, Human Resources examines the application of at least one woman among the applicants;
 - a meeting before and after maternity leave has been organized in a certain number of entities in France.

(a) Excluding Airgas and Welding.

3. Involving all the managers:

In the framework of Air Liquide's policy on promoting equality, the hiring and career development of women and strengthening their place and responsibilities in the Company, a program on awareness-raising and discussions on the benefits that equality brings was organized in the Group, aimed at managers.

4. Better balancing of professional and private life:

The Diversity Charter that Air Liquide signed in France is available online and is an illustration of the Group's commitment to diversity. Air Liquide renewed its commitment in 2015.

Within the Air Liquide management training program called GEAR UP, one session is dedicated to theme of diversity and the value of differences. More than 4,000 managers worldwide have already received this training.

Each year Air Liquide joins forces with International Women's Day, celebrated on March 8. This is also when Air Liquide takes part in the annual InterElles seminar. The Cercle InterElles brings together the networks of 13 technology companies which are focused on promoting gender equality and equal opportunities. The Cercle InterElles network has stood out in recent years as a pioneer in the battle against stereotyping and as a supporter of gender equality in companies and of equal opportunities.

Educational background

Air Liquide is continually looking to recruit different profiles to build multidisciplinary 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.

Age

The Group has invested in better professional qualifications and training programs for young people to facilitate their integration into the business world. As a result, in France, almost 580 young people have benefited from work-study contracts and around 450 in internships, combining theoretical learning in their university or school and a practical internship at Air Liquide.

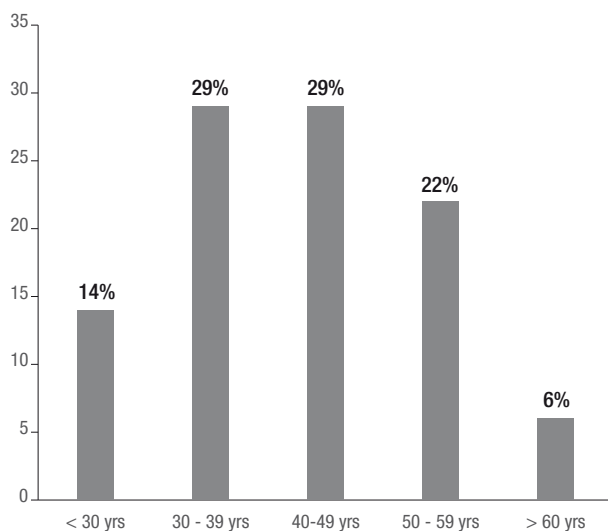
Each year, a "Happy Trainees" survey is carried out with interns from more than 800 companies in France. The results published in the press revealed that Air Liquide is ranked as the second best rated company: 93% of interns recommend the Group.

The survey includes several aspects: career development, working environment, management, motivation, enjoyment and pride. The Company's contribution to personal development of young people is also a key criteria of the analysis.

This ranking awards the commitment of the Group to supporting its interns. In Air Liquide entities in France, each trainee benefits from an adapted program that offers a real support from their arrival and throughout their experience. CV workshops, exploratory interviews about their career plans... opportunities are numerous for the students joining Air Liquide each year!

Seniors will represent an increasing share of Air Liquide employees in the coming years. Their contribution to mentoring and training programs aimed at younger generations will be further promoted.

DISTRIBUTION OF EMPLOYEES BY AGE BRACKET IN 2016 ^(a)



■ Distribution of employees by age bracket

(a) Including Airgas and excluding Welding.

Disability

Disability can be a factor of openness, innovation, unity and performance. That is why Air Liquide is committed to making the integration of employees with disabilities commonplace within the Company.

Air Liquide's disability policy has five axes:

- recruitment and integration;
- job security and career development;
- training;
- informing and raising awareness among all employees;
- relations with, and subcontracting to, firms which are part of the adapted and protected sector ^(a), particularly in France.

(a) Sector of economic activity giving priority to employing workers with disabilities.

In 2016, employees with a disability represented 1.4% of the Group's employees worldwide.

In France, the Air Liquide's "Mission Handicap" calls on employees who are "disability advisors" divided among the main French subsidiaries. They are supported by multidisciplinary working groups that meet several times a year to work on different subjects connected to disabilities.

Within the scope of the 4th Workplace agreement signed in 2016 in favor of recruiting employees with disabilities over the 2016-2018 period, Air Liquide has committed to an employee, intern and work-study recruitment objective in order to contribute to improving the employment rate for workers with a disability.

A Disability Hotline has also been set up. This Hotline is committed to providing free and confidential advice to questions relating to disabilities at Air Liquide (disability policy, agreement, beneficiaries' conditions, disability in general).

In France, since 2007, the rate of employment of workers with a disability at Air Liquide has more than doubled.

Air Liquide spends over one million euros in France in the adapted and protected work sector, and is actively committed to increasing the amount of socially inclusive procurement. To do so, the Group organizes training measures.

For example, during a day to raise awareness of socially inclusive procurement, buyers from the French subsidiaries visited an Adapted Company, who has been a partner of Air Liquide Medical Systems for almost 20 years, which assembles and packages medical devices in a controlled atmosphere.

Moreover, thanks to a partnership between the Procurement Department and a specialized association, several tools (directory listing all establishments in the protected and adapted sector, online marketplace, etc.) are available to Air Liquide's buyers.

During European Disability Employment Week, Air Liquide organized a day of collaborative workshops on the theme "Our differences are our strength". Around 150 people from Air Liquide took part in this day aimed at co-creating measures for 2017 to promote the inclusion of people with disabilities.

The Air Liquide Foundation takes part in Group measures to promote the inclusion of people with disabilities. It supports disability-related projects as part of its Local Development mission. In 2016, five projects in France and Egypt were supported, such as projects providing access to artistic and educational activities; projects which boost the personal development of children and adults with disabilities. Since its creation in 2008, the Foundation has supported 36 projects in eight countries which represents 14% of projects supported by the Foundation.

3.2.3. EMPLOYEES' COMMITMENT

Participation of employees in the capital of Air Liquide S.A.

The Group wishes to continue increasing the involvement of its employees at the global level in its development by having its employees more broadly participate in the capital of L'Air Liquide S.A. Thus, since 1986, 13 capital increase operations have been reserved especially for Group employees, so that they can take advantage of preferential conditions. These employee share ownership transactions contribute significantly to increasing employee motivation and sense of belonging to the Group.

At the end of 2016, the share of capital held by the Group's current and former employees was estimated at 2.4%, of which 1.5% (within the meaning of article L. 225-102 of the French Code of Commerce) corresponds to shares subscribed by employees during employee reserved capital increase operations or held through mutual funds.

Remuneration

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. In 2016, 63% of employees received an individual variable portion as part of their remuneration. Most of the managers and professionals have a variable remuneration, which includes sustainable development objectives. 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, safety for example, but also sustainable development program targets for their entity.

Remuneration may also include benefits such as disability-incapacity-death insurance, health insurance, profit sharing^(a) or solutions to help balance work and family life which vary by country (for example, childcare places).

(a) This method of remuneration, used in certain countries, is at the Company's initiative or in response to local legislation or market requirements.

In 2016, almost 100% of employees benefited from some sort of social security coverage through the Group, in particular in terms of pension plans.

Health and safety at the workplace

Integrated safety

Individual responsibility is a key factor in developing a culture of safety within the Group. This individual responsibility is based on three factors: implication, sharing and vigilance.

The Group encourages its employees to play an active role in the drawing up and implementation of corrective and preventive measures to achieve its "zero accidents" objective but also to engage in dialogue and the sharing of experience.

Air Liquide also encourages its employees to adapt their behavior and in particular their work habits to carry out tasks safely for themselves and for their surrounding colleagues. The Group's safety statistics highlight that behavior is the main cause of 80% of all accidents. Group employees are also encouraged to act when they witness a situation in which a colleague is about to carry out a dangerous act. It is each individual's responsibility to react.



Safety Awards

Over the past six years, the European Safety Awards have been organized to recognize the best safety achievements in the Industrial Gases and Healthcare activities. This event highlights the contributions of the most safety-aware employees. During the 6th European Safety Awards, which took place in 2016, 21 European sites were awarded for their outstanding safety initiatives.

Similar Awards are also organized in the United States.

Prevention in the field of health in the workplace

Air Liquide is particularly concerned with ensuring that its employees' working conditions do not present any health risks. This includes preventive measures in various areas.

In 2016, several preventative actions were undertaken by different entities.

For example, in terms of the ergonomics of workstations, Air Liquide regularly organizes awareness-raising campaigns and trainings in the subsidiaries on safety, health and risk management, especially in the working environment, such as the risk of musculoskeletal disorders (MSD).

At the new Shanghai Research and Technology Center (SRTC) in China, an ionisation and filtration system has been installed which ensures a better indoor air quality with regards to small particles and organic components in the air. The Engineering & Construction (E&C) entity in Hangzhou, measured noise levels in its workshop. With the installation either of a sound absorbing wall or the provision of movable sound-absorbing shields the noise level has been successfully reduced.

In South Africa, a focus has been put on health check's for drivers and employees who spend a lot of time on the road.

In the countries of Western Africa, infrared body temperature measurements at the entrance to Air Liquide sites have been introduced during the Ebola crisis and are still in place.

In order to minimize the exposure to extreme heat conditions, the working schedule has been adjusted at filling centers in Greece during summer.

Subcontractors' safety

The Group has responsibilities in terms of the health and safety of its subcontractors.

Working with subcontractors implies that each party understands the role entrusted to it in terms of health and safety. At the subcontractor selection stage, Health and Safety specifications are included in the call for tender to guarantee the Group's requirements in this area. Moreover, several departments are involved in the validation of a new subcontractor (Procurement, Safety, HSE, Logistics and the local entity).

Communication with subcontractors is also important to ensure that requirements in terms of health and safety in the workplace are fully understood. When suppliers themselves subcontract, these subcontractors must also follow and comply with the same rules and this must be included in the contractual provisions.

Regular meetings with subcontractors at the managerial and operational level are organized to address, in particular, measures relating to strengthening their culture of safety, their compliance with life-saving rules, feedback or analysis of any accidents or near-miss incidents.

Well-being

The official definition of well-being in the workplace provided by the World Health Organization (WHO) considers well-being in the workplace 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, in 2015, the 193 UN Member states set 17 Sustainable Development Goals (SDGs) for 2030. Almost all of these goals have a health component or contribute to improving global health. One sustainable development goal is specifically focused on health and well-being. It aims to "ensure healthy lives and promote well-being for all at any age".

The quality of life in the workplace may also have a direct impact on the motivation of employees and their productivity. In order to strengthen occupational well-being within Air Liquide, various initiatives were implemented in France to promote the personal/professional life balance of its employees:

- an e-portal enabling employees to access practical, administrative and legal information to facilitate daily life. It can be used by the employee and his or her family via a personal access code. Over 70% of the Group's employees in France now have access to this portal;
- a telephone service enables employees to call, from their office or home, specialists (for example, doctors, legal specialists, social workers, guidance counselors, etc.) who answer their questions with complete confidentiality on areas as varied as the family, housing, well-being and healthcare, unforeseen events, budget management, taxation and retirement. Air Liquide is a forerunner in this area as the Group is currently one of the few in France to offer its employees such a large range of services;
- nursery places in inter-company crèches are offered to employees of subsidiaries covered by this partnership. At the end of 2016, 51 places had already been financed by Air Liquide for its employees;
- the CESU (Universal Service Employment Check), whose aim inter alia is to facilitate childcare in the home, has been implemented for certain entities in France for men and women in the Group who have young children;
- in September 2016, workshops were offered to employees at the head office in Paris to discover, learn and experiment with what could help to improve their well-being. These workshops, covering sleep, nutrition and the optimization of work postures, were run by healthcare professionals.

Raising employee awareness of Sustainable Development

An increasing number of initiatives are created at Air Liquide to raise employee awareness on Sustainable Development issues and encourage employees to promote them in their daily activities.

Conferences on air quality

In 2016, Air Liquide organized two conferences for its employees, in Shanghai and Paris, to raise awareness about the improvement of air quality which is one of the aims of the NEOS company program.

In Shanghai, the seminar held on November 10 brought together Air Liquide China's employees. Tony Xie, Head of the Clean Air Alliance of China (CAAC), presented the health issues in China caused by poor air quality, as well as solutions that will be implemented to improve this situation. Participating companies, including Air Liquide, presented their clean technologies during this workshop.

Air quality was also the subject of a conference entitled “Restoring air quality, a challenge for public health” at the Paris head office, on December 5, at the beginning of a week of disruption for the city due to poor air quality. PhD Linda Fried, Dean of Columbia University’s School of Public Health in the United States, spoke about the consequences of poor air quality and encouraged the industry to play an active role in solving this issue.

Air quality at the heart of the Group’s Corporate Sustainability Program

With its NEOS objective to improve air quality, Air Liquide recognizes that the situation is worrying in several parts of the world. In 2016, the Group defined a five-point Corporate Sustainability Program. This program promotes clean industry and transport, as well as the improvement of our supply chain, in addition to our local social responsibility initiatives.



Employees’ commitment to the Foundation’s projects

The Foundation is supported in its work by Air Liquide employees who sponsor local development micro-initiatives. It provides employees who wish take part in community work with the opportunity to express their social and human commitment. For further information, see section 3.1.1 “The Air Liquide Foundation”.

3.2.4. SOCIAL DIALOGUE AND THE ORGANIZATION OF WORKING HOURS

Social dialogue

In accordance with its Principles of action, Air Liquide is particularly committed to respect the highest standards in ethics and safety. The Group ensures that social dialogue is encouraged and in this context, 82% of Air Liquide’s employees have access to a representation, dialogue or consultation structure.

The European Works Council has 28 employee representatives from 13 countries^(a).

The composition of the Council evolves with the Group’s acquisitions or disposals, the expansion of the European Union and according to the rules established by the Council’s constitutional agreement. An agreement was signed in 2014 to strengthen the role and nature of exchanges within this body. It meets at least twice per year under the chairmanship of a member of the Executive Committee. The main themes dealt with during this discussion and consultation are safety,

the 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 2016 in France, 151 agreements were signed in total with the unions in various areas, including profit sharing and incentives for employees in the Company’s performance, planned management of jobs and skills (GPEC), professional equality between men and women, disability, the youth-employment contract, as well as working time organization, particularly in the context of the agreements relating to telecommuting.

In the other European countries, 11 collective agreements were also signed during 2016. For example, several agreements have dealt with working time, particularly in Sweden and Finland. The agreement on annual working hours signed by Finland is directly related to the subsidiary’s competitiveness. In Poland, an agreement was signed on the aspects of variable remuneration for employees who do not have an individual variable remuneration. Agreements involving social benefits ranging from healthcare to mobility were signed in Bulgaria, Greece, and Italy. Italy also implemented a telecommuting system for the first time.

Organization of legal working hours

In France, the general framework of legal working hours has been defined by all of the agreements signed more than 10 years ago. Very few activities operate with shift work. These concern fewer than 10 plants in France, mainly in the Large Industries business line. A project is currently underway within this activity to reduce shift work. On the other hand, most of the industrial activities, as well as those in Healthcare, include on-call systems that are regularly discussed with the unions.

With regard to telecommuting, the pilot program negotiated and signed as a one-year fixed-term agreement set up in France in 2013 at Air Liquide France Industrie and Air Liquide Santé France was extended and made permanent. It meets the needs of employees as expressed during a prior survey on work-life balance. Following a dialogue phase with various stakeholders, almost 500 employees and managers have chosen to work from home, on the basis that it is a voluntary arrangement, that involves trust and that employees retain the option to return to the workplace. Under the supervision of the individual entities’ Human Resources Departments, a series of educational and training measures was conducted among employees, managers and unions to support the shift to telecommuting. This resulted in many additional ideas and demonstrated the benefits as well as the limitations of this method of working.

These agreements demonstrate the wish of all parties to modernize managerial and organizational practices. The aim is to improve quality of life and working conditions, promote a better personal/professional life balance for employees, and implement a new method of organizing working hours.

(a) Austria, Belgium, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Poland, Portugal, Romania, Spain and Sweden.

3.3. Responsible share ownership

Air Liquide's long-term profitable growth strategy and its commitment to its shareholders, regardless of whether they are individual shareholders or institutional investors, are closely linked. To preserve the balance between individual shareholders and institutional investors and satisfy everyone's needs, the Group has set up a dedicated organization:

- Shareholder Services, which reports directly to the Chairman & Chief Executive Officer, is dedicated to individual shareholders;
- the Investor Relations Department, attached to the Finance Department, is dedicated to institutional investors and financial analysts of brokerage companies.

Air Liquide is committed on a daily basis to a close relationship based on dialogue with its shareholders that is founded on the following key principles:

- promoting long-term share investment;

- encouraging shareholder loyalty through registered shares;
- offering a made-to-measure organization and services;
- promoting dialogue and meetings;
- recognizing and promoting the shareholder's key role.

3.3.1. PROMOTING LONG-TERM SHARE INVESTMENT

Shareholders have been contributing to and supporting the Group's growth since its creation and represent an element of stability and independence. Today, it is thanks to their loyal support that the Company can continue to change and grow. At end-2016, the 410,000 individual shareholders owned 33% of the capital, the highest percentage among companies in the CAC 40. French and non-French institutional investors represent respectively 20% and 47% of the capital.

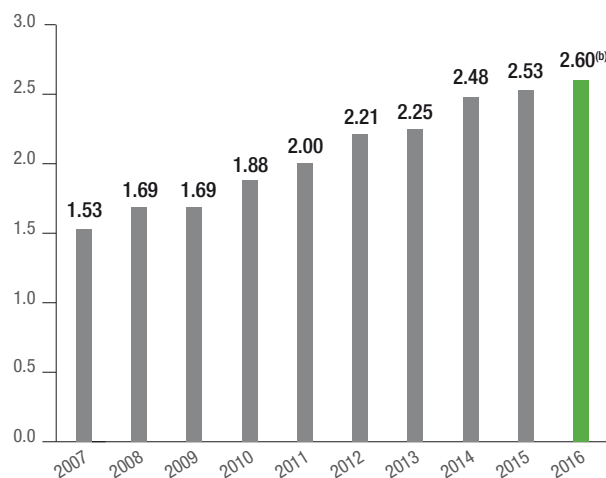
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Individual shareholders	37%	38%	38%	36%	37%	37%	36%	37%	36%	33%
French institutional investors	30%	26%	26%	23%	21%	19%	19%	17%	18%	20% ^(b)
Non-French institutional investors	32%	35%	36%	40%	42%	44%	45%	46%	46%	47% ^(b)
Treasury shares	1%	1%	>0%	< 1%	>0%	>0%	>0%	>0%	>0%	>0%
Registered capital	37% ^(a)	33%	32%	34%	35%	36%	35%	36%	36%	33%
Capital eligible for the loyalty bonus	26%	26%	25%	25%	28%	29%	30%	30%	30%	26%

(a) In 2007, the share of registered capital increased in particular following the entry of a large institutional investor who sold its shares in 2008.

(b) In 2016, the proportion of institutional investors in the Group's capital increased due to their over-subscription to the capital increase.

Air Liquide has always shared the fruits of its growth and rewards its shareholders' confidence through a remuneration and loyalty policy that is based on regular dividend distribution, free share attribution and a loyalty bonus.

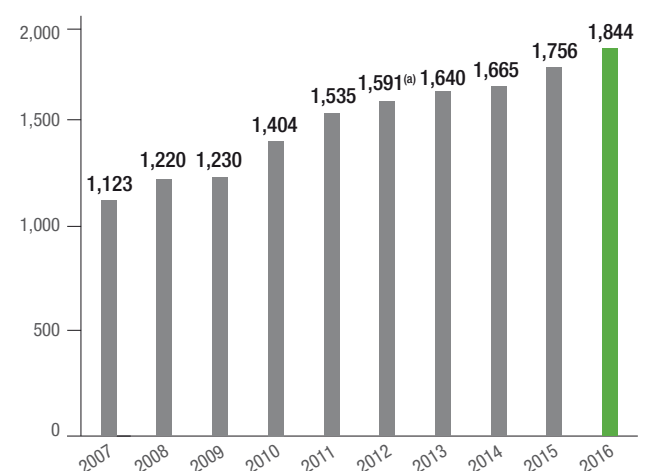
ADJUSTED DIVIDEND PER SHARE (in euros/share) ^(a)



(a) Adjusted to take into account the 2007 share split, free share attributions and the 2016 share capital increase due to the acquisition of Airgas.

(b) Subject to the approval of the Combined Shareholders' Meeting of May 3, 2017.

NET PROFIT – GROUP SHARE (in millions of euros)



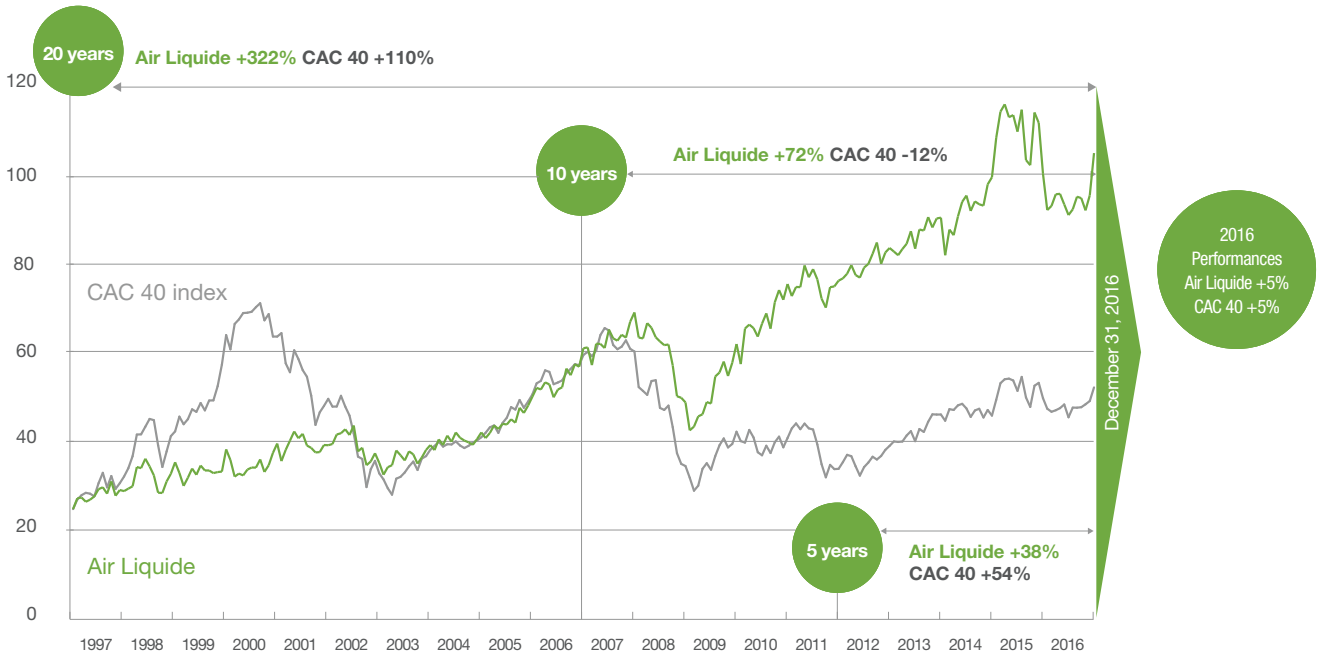
(a) Corresponds to the amounts as of December 31, 2012 restated for the impacts of IAS19 revised "Employee Benefits".

Since it was first listed on the French Stock Market in 1913, the Company has always shown a profit. Over the last 20 years, Air Liquide's revenue has shown an average annual growth rate of +6.4%. This growth has been profitable: the Group's adjusted net earnings per share have followed a similar trend with an average annual growth rate of +7.7%.

Over the same period, the dividend has seen an average annual growth rate of +9.5%.

During the last 10 years, more than 50% of earnings have been distributed to shareholders.

STOCK MARKET PRICE EVOLUTION (in euros)



TSR, as of December 31, 2016

Over 20 years, Total Shareholder Return (TSR) on invested capital is +10.9% for Air Liquide registered shares^(a), and +10.3% for Air Liquide bearer shares^(a), versus +7.8% for the CAC 40 index with reinvested^(b) dividends. TSR is an annualized return rate for a shareholder who buys shares at the beginning of a period and sells them at the end of the

period. This calculation takes into account the share price performance, dividends paid, including loyalty bonuses, considering that they are reinvested in shares, as well as free share attributions. Since 1962, the Group has carried out 28 free share attributions.

Preferential Subscription Rights related to the capital increase carried out in September 2016 are accounted for as if they had been sold and then reinvested in shares.

(a) Based on the average annual number of shares (excluding treasury shares) and adjusted to account for increases in capital via capitalization of reserves or additional paid-in capital, cash subscription and the two-for-one share split on June 13, 2007.

(b) Subject to the approval of the Combined Shareholders' Meeting of May 3, 2017.

3.3.2. ENCOURAGING SHAREHOLDER LOYALTY THROUGH REGISTERED SHARES



Different shareholding options

Direct registered shares:

Direct registered shares are managed by Air Liquide and recorded in its register. They are held in a securities account opened at Air Liquide.

Intermediary registered shares:

Intermediary registered shares are registered in 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.

To increase the investment value of shares and reward long-term shareholders, Air Liquide seeks to showcase registered shares which offer several advantages. This option allows shareholders to benefit from 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 directly manages the accounts of its shareholders who hold direct registered shares. 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.

3.3.3. OFFERING A MADE-TO-MEASURE ORGANIZATION AND SERVICES

Shareholder Services, with approximately 30 employees, is a unique service at Air Liquide and reports directly to the Chairman & Chief Executive Officer. It provides expertise in all aspects of account management. This team manages the accounts of some 92,000 shareholders who hold direct registered shares and supports them by offering personalized services, without intermediaries.

This service meets shareholders' needs at the dedicated Shareholders' Lounge at corporate headquarters, or by telephone via the toll-free number. Access to information and services is also supported by digital solutions: mobile application, personal online account, interactive publications, web conferences, live chat, webcasts, electronic invitations and voting by Internet for the Shareholders' Meeting.

Innovating and educating

Educating is a major issue in information documents and media for shareholders such as the Annual Report, the Shareholders' Guide and the Invitation to the Shareholders' Meeting which presents resolutions submitted to shareholders and which is sent to all shareholders who own at least one share. 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. These publications are available in French and English.

The website provides detailed information which is personalized according to the Internet user's profile, with sections dedicated in particular to shareholders' and investors. The Shareholders section provides share price information and Group news, access to tax simulators and differed access to videos on key events in the Group's calendar.

Direct registered shareholders have access to a personal secure space on the Internet, so that they can consult their share portfolio and documents useful for managing their account and also 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 share account.

Moreover, Air Liquide was the first company to set up a Shareholders' Communication Committee (SCC). The SCC is made up of 12 shareholders and is consulted on a regular basis. Apart from plenary meetings with the Chairman & CEO, the Committee is involved through the year in working groups. A Committee member is part of the Air Liquide Foundation's Project Selection Committee.

3.3.4. PROMOTING DIALOGUE AND MEETINGS

The Shareholders' Meeting, a privileged moment of exchange and the expression of shareholder democracy

Each year, all the Air Liquide shareholders who hold at least one share are invited to the Shareholders' Meeting. In order to attend, more than one month before the Shareholders' Meeting, they receive all the documentation relating to their vote either by mail or by email. 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 also voting by Internet.

In 2016, almost 4,000 people came to the Shareholders' Meeting. During the event, attendees were given a preview of the exhibition presenting the Group's business lines, the Air Liquide Foundation and Shareholder Services through the mobile application "Periscope". The entire Shareholders' Meeting is broadcasted online on the Group's website.

On this occasion, Sustainable Development was also showcased by a presentation of the Group's sustainable development stakes' mapping. Moreover, Bénédicte Faivre-Tavignot, Director of Air Liquide Foundation, a lecturer at HEC Business School, and founder of the "Social Business / Enterprise and Poverty" chair, gave her expert view on Corporate Social Responsibility. The immense social and environmental challenges facing our society present opportunities for growth and reinventing companies. They offer powerful innovation potential for companies such as Air Liquide. By placing social challenges at the heart of their strategy, companies take practical action for the future of the planet, adopting a long-term approach.

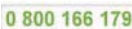

After the Shareholders' Meeting, the Chairman & CEO continues his discussions with shareholders by traveling to several towns and cities in France for regional meetings during which he presents the Group's results, strategy and outlook. His speech is followed by a panel discussion and a question and answer session. For the first time this year, one of these regional meetings was live webcast on the Group website and Internet users could ask their questions directly to the Chairman & CEO.

The dates for the next Air Liquide Combined Shareholders' Meeting are Wednesday May 3, 2017; Wednesday May 16, 2018; Tuesday May 7, 2019.

Moreover, the Director of Shareholder Services regularly meets with shareholders during conferences and trade shows. In 2016, more than 8,500 individual shareholders attended these meetings. He also hosts talks at business schools, universities and colleges, so that the economic agents and decision-makers of the future have an early awareness of the culture of the stock market and of the major role of the shareholder in financing the economy.

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The Investor Relations Department organizes roadshows and takes part in conferences to present international institutional investors with the solidity of Air Liquide's business model, the dynamism of its growth levers and the soundness of its strategy. In addition, sustainable development-focused roadshows are regularly organized in Paris and London. On average, the Investor Relations Department meets over 300 institutions each year. It also regularly organizes Investor Days, bringing together the international financial community and Air Liquide's management, with a theme that varies according to economic issues and current events.

3.3.5. RECOGNIZING AND PROMOTING THE SHAREHOLDER'S KEY ROLE

Individual shareholders have been key to Air Liquide's development from the beginning. The shareholders funded the Group's initial development through successive capital increases. It was, therefore, natural that Air Liquide would want to involve them in the Group's development and growth as part of the capital increase carried out in September 2016 for the refinancing of the Airgas acquisition. The capital increase offered to existing Air Liquide shareholders through the allocation of Preferential Subscription Rights (PSR), gave each eligible shareholder the opportunity to expand their share portfolio by exercising their PSR, or to sell these on the market and obtain an immediate inflow of cash. For this, Air Liquide rolled out a unique system to directly manage its direct registered shareholders.

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 supports, 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 Investors and Investment Clubs).

3.4. Sustainable relationships with customers and patients

3.4.1. REVENUE LINKED TO LIFE AND THE ENVIRONMENT

Numerous applications of industrial and medical gases protect the environment for the Group's customers and the life of patients. These applications represent 44% of revenue ^(a).

■ In the Environmental field:

- using hydrogen in refineries to remove sulfur from hydrocarbons and convert them into lighter fuels which respect current regulations, thus reducing the emissions of sulfur oxide, which are responsible for acid rain;
- using oxygen in blast furnaces to reduce the consumption of coke, whose production and usage is very polluting;
- modified atmosphere packaging to protect foods and reduce chemical additives;
- inerting with nitrogen for the safety of industrial installations;
- fusing glass by using pure oxygen, which considerably reduces emissions of nitrogen oxides, one of the gases that causes acid rain;
- treating water with oxygen at sewage plants to reduce the use of chemicals;
- using rare gases, like krypton, to improve the insulation of double-glazed windows;
- using industrial gases for photovoltaic cells fabrication;
- selling equipment for valorizing biogas.

■ In the Healthcare field:

- using oxygen in hospitals and for the Home Healthcare activity;
- using hygiene products in the fight against nosocomial infections;
- manufacturing adjuvants for vaccines.



The percentage of Air Liquide's revenue related to life and the environment increased sharply between 2005 and 2016, going from 33% to 44% of the Group's total revenue. This growth illustrates the development of the applications linked to protecting life and the environment in Air Liquide's global revenue.

3.4.2. INNOVATION RELATED TO LIFE AND THE ENVIRONMENT

Almost 60% of the Group's innovation expenses in 2016 were related to work to improve air quality, health and the environmental footprint.

Close to 30% of the Group Innovation expenses is devoted to reducing CO₂ emissions (by reducing carbon content of its products or those of its customers).

■ Environment:

- research and development programs for new technologies that improve the energy efficiency of the Group's production units and thus reduce the environmental impact of the Group's activities and help to improve that of its customers and partners;
- all the hydrogen production and distribution processes, whether removing the sulfur from hydrocarbons in the refineries or supporting the roll-out of hydrogen energy;
- CO₂ capture and recovery;
- biogas purification for sale in the form of Natural Biogas or as Bio-NGV fuel;
- work on mobile refrigeration with liquid nitrogen for transporting fresh produce.

■ Healthcare:

- research and development on medical gases, in particular for analgesia and in respiratory diseases;
- support for patients through remote-monitoring platforms;
- work on hygiene and disinfection products to fight against nosocomial infections;
- development of ingredients and active ingredients for cosmetics.

Detailed information on these innovative initiatives for our customers and our patients is presented in the "Innovation" section of Chapter 1 of the Reference Document.

3.4.3 CUSTOMERS AT THE HEART OF AIR LIQUIDE'S STRATEGY

Air Liquide contributes to the performance of its customers. The Group is attentive to the satisfaction of its customers and patients and puts action plans in place to continually improve on this satisfaction. The Group enables its industrial customers to carry out their production in a safer, cleaner and more economical manner. It supports them in their national and international development.

(a) 2015 data. 2016 data will be available mid-2017.

Proximity and expertise

Air Liquide serves more than two million customers in 80 countries. These customers come from various sectors such as steel, the food industry, electronics, pharmaceuticals and craftsmen. The Group aims to support its customers by acquiring a deep understanding of their business in order to offer them innovative services and solutions.

The Group's organization enables each entity, in each geographic region, to meet the specific expectations of local customers, 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 key strategic accounts helps support them and meet their specific needs. The program relies on a team of Key Account Managers, whose task is to develop a thorough knowledge of these customers.

THE CUSTOMER AT THE HEART OF ATTENTION AND ACTION

In an ever more dynamic and competitive environment, Air Liquide focuses its attention on its customers and their satisfaction in order to bring growth to them over the long term. In order to strengthen this priority and continue to make progress in this area, the "Customer Development Group" department is supervised by a member of the Executive Committee. The goal of this team, which is organized in such a way as to cross all business lines, is to ensure that customers are the key focus of the Group's thinking and actions. The "Customer Development Group" is the control center for customer satisfaction measurement and customer experience improvement programs, for managing the Group's strategic accounts, for commercial excellence, and for sharing best practices across regions and the various business lines of the Group.

Customer safety in product use

Air Liquide makes sure that its customers know how to use its products and equipment safely and are aware of the related risks, especially through specific training programs. In addition, the Group constantly updates safety information on its products through product safety data sheets and also responds to requirements of national and international directives (REACH – Registration, Evaluation, Authorisation and Restriction of CHemical substances; GHS – Globally Harmonized System of Classification and Labelling of Chemicals). This information is available in the Air Liquide Gases Encyclopedia, available on the Group's Internet site at the following address: encyclopedia.airliquide.com or using a freely available app.

Dialogue with customers about Sustainable Development

Air Liquide also responds to its customers' growing requirements regarding its sustainable development approach. This enables the Group to contribute to its customers' own sustainable development approach. Over the last five years, in addition to many questions asked at a local level, about a hundred customers have questioned the Group on this subject, including through detailed questionnaires. The Group's

Sustainable Development Department therefore provides support to local entities so that they can respond to this type of customer request.

Moreover, Air Liquide, as a supplier, was assessed in 2016 based on Responsibility and Sustainable Development criteria. The Group scored 67/100, ranking Air Liquide as an "advanced" supplier in terms of sustainable development and in the "gold" category by EcoVadis, the main global rating platform for the social and environmental performance of supply chains. The assessment covered the following subjects: environment, social, business ethics and responsible procurement.

Air Liquide also works with this platform to assess the sustainable development performance of its own suppliers.

From listening to action

The Group carries out surveys to measure customer satisfaction and establishes action plans to continuously improve satisfaction levels. Air Liquide's relationship with industrial customers of very diverse sizes and sectors as well as with healthcare professionals, patients and associations in the Healthcare activities are at the heart of the concerns of the Group's teams and guide the Company's development. The quality of this relationship involves each entity and employee. It is based on the definition of precise commitments that the Group's teams endeavor to respect in their daily activities, in a spirit of professionalism and service.

In a context of a change in its customers' expectations and growing diversity of its customers and patients, the Group has set itself the following objectives:

- ensure customer loyalty over the long term;
- gain the trust of new customers to ensure the Group's growth.

The Group has implemented a customer satisfaction measurement program for all of its World Business Lines around the world. The tool is rolled out at all subsidiaries as part of an on-going improvement in a three-step process:

1. Listening to customers through interviews conducted by specialized companies, along with customer site visits, and measuring the improvement in satisfaction from one satisfaction survey to the next.
2. Creating action plans and getting Group employees involved in areas for improvement as identified through survey analysis and interviews conducted in the field.
3. Implementing action plans: managers are responsible for implementing the action plans and measuring their progress. Some action plans are shared with customers.

In 2016, the percentage of the Group's revenue concerning the units where customer satisfaction surveys and action plans were carried out during the past two years was about 86%.

In 2017, the customer satisfaction measurement program will be upgraded with the launch of the digital platform for collecting customer feedback. This tool will enable all Group subsidiaries to listen to customers even more closely.

A commitment to customers which is bringing results

In the past two years, the 21,000 industrial customer satisfaction surveys conducted in all regions revealed that 93% of industrial customers are satisfied or very satisfied with Air Liquide. Customers particularly appreciated product and service quality, safety, and the behavior and efficiency of teams in contact with them. The somewhat dissatisfied customers are subject to a specific follow-up by teams and specific action plans are implemented in order to improve their satisfaction.

NEOS: a customer-focused transformation

As part of the customer-focused transformation strategy announced within the NEOS program, Air Liquide is increasing its initiatives to offer an exceptional customer experience. For the Group, this means striving to further satisfy customers by strengthening proximity, particularly through digital tools, by guaranteeing operational excellence, and by putting forward ever more innovative proposals. Therefore, in 2016 in Germany, a pilot program was launched within the Industrial Merchant activity. Following the analysis of satisfaction surveys and the organization of collaborative workshops with distributors, customers and employees, areas of improvement were identified. To address these issues, solutions were put forward at various key stages of the customer experience. In two months, two of these solutions were tested on a sample of customers and their satisfaction was measured on-the-spot. This simple and efficient methodology, which relies on collective intelligence, is currently being rolled out in other countries.

Innovation at the service of our customers

At the end of 2016, Air Liquide organized a Hackathon, a 24-hour challenge bringing together start-ups, designers, and developers of digital solutions around problems specific to Air Liquide. Nineteen start-ups took part in this challenge and the winning projects are undergoing incubation by the Group.

Working with start-ups is essential to accelerate our digitization and improve our customer experience.

3.4.4. AIR LIQUIDE AND ITS PATIENTS: PROTECTING VULNERABLE LIVES

Air Liquide provides patients, from the hospital to their home, with medical products, specialty ingredients and services that help to protect vulnerable lives. Vulnerability refers to the fragility of existence. At any stage of our lives, each one of us can become vulnerable, whether temporarily or permanently either as a consequence of age, illness or loss of independence that increases our exposure to this risk. Air Liquide's aim is to be one of the leaders in the healthcare sector by demonstrating its long-term performance and behaving responsibly.

Our current society is faced with many public healthcare challenges:

- 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;
- urbanization and lifestyle changes;
- the evolution of hospitals, which is becoming a social challenge.

To meet these public healthcare challenges, Air Liquide relies on its fundamentals – placing the patient at the heart of its strategy, promoting the growth of the Healthcare activity and its geographic expansion – and the objectives of its NEOS company program.

Air Liquide's areas of expertise

With a long-term vision and in order to provide services all along the continuum of care, Air Liquide, in its role as a benchmark healthcare player, provides products and services in hospitals and in patients' homes in the following areas:

- Home Healthcare;
- Hospital Healthcare;
- Hygiene and
- Specialty Ingredients.

Home Healthcare

Air Liquide's Home Healthcare activity cares for more than 1.4 million patients worldwide in their homes suffering from chronic diseases. These treatments require medical respiratory equipment or nutritional assistance and treatment through perfusion. The human dimension is extremely important in this field because it focuses on having patients and their families accept a treatment which can be long term and 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 multidisciplinary 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 reinforce treatment follow-up and increasing their autonomy.

The Home Healthcare activity sits at the heart of the healthcare system between the patient, hospital, doctors, nurses, health insurance organizations and pharmacists. Air Liquide supplies the products and 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 care chain by ensuring patients' follow-up care at home. This activity 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.

In 2016, Air Liquide opened EXPLOR! in Gentilly (France), a new center of expertise dedicated to home healthcare. This center brings together a wide range of activities under one roof with three main objectives: expertise, assessment and exchange. It also provides the scientific community with a place to foster dialogue. The center mainly focuses on fields, such as perfusion and breathing – including sleep disorders and oxygen therapy. Experts, who publish the results of their work in scientific journals, also train Air Liquide's Home Healthcare employees to use the various medical apparatus and equipment.

Hospital care

Air Liquide is one of the world leaders in medical gas production and distribution for hospitals and related services. The Group supplies medical oxygen for emergency wards operating theaters and intensive care units. Air Liquide aims to help the professionals to care for their patients by facing the constantly arising challenges in the healthcare environment, by supplying medical gases, expertise, and innovative solutions. For example, the Group supplies medical oxygen for operating theaters and intensive care units. Air Liquide has developed a global solution bringing together the gas and 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 carried out at dental surgeries. Air Liquide also offers services for example "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. 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.

Hygiene

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^(a). 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 offer particularly dedicated to hospital healthcare, 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.

(a) WHO. *Background to Clean Care is Safer Care*. <http://www.who.int/gpsc/background/en/>.

In 2016, Air Liquide announced the acquisition of Vic Pharma by its subsidiary Schülke. Founded in 1990, Vic Pharma, the second largest independent player in the Brazilian hygiene market, has more than 100 employees. It offers a broad range of hygiene products for disinfecting surfaces, instruments and medical devices, as well as antiseptic solutions for pre- or post-operative care. Through this acquisition, Air Liquide has strengthened its Healthcare position in South America.

Air Liquide currently supplies more than 15,000 hospitals and clinics worldwide with these products and services.

Specialty ingredients

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.

Air Liquide announced in 2016 that its subsidiaries Seppic and Schülke had laid the cornerstone for an ultra-modern production site in Sandston, Virginia in the United States. The commissioning of this new unit is scheduled for the first half of 2018. This new site will produce ingredients for the global cosmetics and pharmaceuticals industry. Specialty ingredients for cosmetics represent a market of more than 10 billion dollars worldwide, of which 25% in the United States. This production unit will allow the two companies to strengthen their proximity with their US customers. It will be managed by Polykon Manufacturing, a joint-venture between SEPPIC and Schülke. The resulting synergies will help to create value added in their fields of expertise and also meet the growing needs of these markets in terms of innovation.

Partnership with patient associations

Since 2011, the Group's Healthcare World Business Line has worked in partnership with the EFA (European Federation of Allergy and Airways Diseases Patients' Associations). This Brussels-based European organization brings together the national associations of patients with respiratory ailments, with 22 countries represented. In the framework of this partnership, Air Liquide supports the actions on information and raising awareness initiated by the EFA in public opinion and the European authorities.

Through its partnership with the EFA, Air Liquide also contributed to a publication establishing care standards for patients with COPD, incorporating the patients' point of view and distributing the publication to the European Commission and healthcare professionals. Air Liquide has also supported a study on patients with portable oxygen concentrators wishing to travel by air in Europe.

Specific indicators for the Home Healthcare activity linked to the issue of socially responsible bonds

In 2012, Air Liquide issued its first SRI-labeled bond^(a) 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 about the Home Healthcare activity led to this issue being given an SRI label. This evaluation is based on the social, environmental and governance criteria of the Home Healthcare activity that concerns more than 1.4 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 activity in the area of the environment, safety and employee diversity.

Number of patients treated	2012	2013	2014	2015	2016
Total number of patients treated by the Air Liquide Home Healthcare Division	1,000,000	1,100,000	1,200,000	1,300,000	1,400,000
Group employees					
Home Healthcare activity employees ^(a)	7,303	7,748	8,183	9,112	9,492
Safety					
Number of lost-time accidents of at least one day among employees ^(b)	42 ^(b)	77 ^(b)	62 ^(b)	79 ^(b)	63 ^(b)
Number of accidents of subcontractors and temporary workers ^(c)	10 ^(b)	13 ^(b)	9 ^(b)	16 ^(b)	21 ^(d)
Equality					
% of women among managers and professionals	55%	56%	58%	58%	57%
% of women among managers and professionals hired during the year	40%	70%	56%	58%	62%
Training					
Average number of days of training per employee, per year	1.6	2	2	1.6	2.1 ^(e)
Kilometers driven and CO₂ emissions related to transportation					
Kilometers driven per patient monitored per year	155	147	124	123	131
CO ₂ emissions related to transportation per patient (kgCO ₂ /patient) per year	39	35	29	30	29

(a) Employees under contract, excluding temporary employees.

(b) No fatal work accidents.

(c) Personnel working under an Air Liquide contract at a Group site, or at a customer site, or as a delivery vehicle driver.

(d) Fatal accident (road accident).

(e) 16 hours a year according to counting in hours (base: 1 day = 7.5 hrs).

Digital technology serving Public Healthcare

In 2016, Air Liquide Healthcare created a digital information platform entirely dedicated to sleep apnea, a pathology which is often overlooked by the general public and of which little is known among patients. Sleep apnea is a pathology characterized by short and repetitive pauses of breathing during sleep. This syndrome affects the patient's quality of life and can trigger serious side effects including major cardiovascular disorders. This syndrome affects 1% to 6% of the global adult population; however only one in five people are currently diagnosed and therefore monitored.

Present for more than 20 years as an expert in the treatment of this illness, in September 2015 Air Liquide Healthcare launched the

<http://www.all-about-sleep-apnea.com> website aimed at raising awareness and providing information to the general public and patients by providing accounts from healthcare professionals. This educational website includes short and informative articles on the subject of sleep apnea syndrome. This platform currently exists in French and English, but will soon be available in other languages. Meanwhile of the website, Air Liquide has developed a mobile app and a Twitter account.

This approach highlights one of the NEOS company program guidelines which involves becoming more connected with stakeholders and, in this case, using digital solutions. By using new digital tools, Air Liquide Healthcare plays a key role in bringing the Group closer to the general public and its patients.

(a) Socially Responsible Investment: application of sustainable development principles to investment. Approach consisting in systematically considering the three dimensions – environment, social/societal, governance – in addition to the usual financial criteria.

3.5. Relationships with the public sphere

Socio-economic changes in recent decades, such as the development of the digital economy (Big Data, the Cloud, the Internet of Things), the necessary energy transition (greenhouse gas emissions, energy efficiency, renewable energy sources, clean mobility) and finally health challenges (home healthcare, chronic diseases) are all strategic priorities for Air Liquide.

Air Liquide has formalized a "Public Affairs" policy governing the Group's interactions with public authorities worldwide and more generally the national, regional and international public sphere (institutions, professional bodies, non-governmental organizations (NGOs), think tanks, etc.) to develop growth opportunities for the Group, reduce risks relating to regulatory changes, and more generally make the Group an active player in public debate.

This policy specifies that Air Liquide work with the public authorities of each country in which it does business, constructively and in a 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 thus registered in the "Transparency Register" of European institutions and has committed to following the rules enacted by this register's Code of Conduct.

Managers specialized in public affairs have been appointed in the principal countries, comprising a network of around 20 people worldwide, coordinated at Group level by the European and International Affairs Division. The coordination and operation of this network allows the Group to work together 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. This coordination also relies on close internal cooperation with the Group's thematic experts which ensures the sharing of relevant information, a closer analysis of impacts and technical support during interactions with the public sphere.

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. Air Liquide's Public Affairs policy aims to establish and develop constructive and sustainable

relationships with public authorities and professional bodies which represent the sectors in which the Group operates. This includes political leaders (members of government, parliament), public institutions (administrations and public bodies), but also 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, currently chaired by Air Liquide's Chairman & CEO, Benoit Potier. 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 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;
- extra-financial 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.

REPORTING METHODOLOGY

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 IMS (Industrial Management System) and the global protocol for Group Policies, Codes and Procedures called the BLUEBOOK.

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.

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 certain specific ones:

- information on the impact of transportation (kilometers traveled by delivery trucks, CO₂ emitted) is calculated on the basis of data collected in the main countries where the Group is established around the world;
- information on kilometers saved and CO₂ emissions avoided through on-site air gas production 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 CO₂ 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 Division.

Reporting 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 CO₂ 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 Management System Department using a dedicated Intranet tool, and includes:
 - for all units, 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 activities), the Engineering & Construction business units, the Research & Development sites and the Technical Centers, all indicators (energy use, atmospheric emissions, water consumption, discharge to water, etc.);
- indicators on Industrial Merchant transportation are the responsibility of this business line;
- indicators on the transportation of 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 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.

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.

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 CO₂ emissions avoided, water consumption, kilometers avoided per on-site unit, and training.

INDEPENDENT VERIFIER'S REPORT

Independent verifier's report on the consolidated social, environmental and societal information presented in the management report

This is a free translation into English of the original report issued in the French language 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 standards applicable in France.

To the Shareholders,

In our quality as independent verifier of L' Air Liquide of which the admissibility of the application for accreditation has been accepted by the COFRAC, under the number n° 3-1050^(a), we present our report on the consolidated social, environmental and societal information established for the year ended December 31, 2016, presented in the chapter "Corporate Social Responsibility and Sustainable Development Report" of the management report, hereafter referred to as the "CSR Information," pursuant to the provisions of article L. 225-102-1 of the French Commercial Code (*Code de commerce*).

RESPONSIBILITY OF THE COMPANY

It is the responsibility of the Board of Directors to establish a management report including CSR Information referred to in article R. 225-105-1 of the French Commercial Code (*Code de commerce*), in accordance with the protocols used by the company (hereafter referred to as the "Criteria"), mainly composed of BLUEBOOK protocols, supported by the procedures defined in the Industrial Management System which were applicable in 2016, and of which a summary is included in the chapter "Reporting methodology" of the management report and available on request.

INDEPENDENCE AND QUALITY CONTROL

Our independence is defined by regulatory requirements, the Code of Ethics of our profession as well as the provisions of article L. 822-11 of the French Commercial Code (*Code de commerce*). In addition, we have implemented a quality control system, including documented policies and procedures to ensure compliance with ethical standards, professional standards and applicable laws and regulations.

RESPONSIBILITY OF INDEPENDENT VERIFIER

It is our role, based on our work:

- to attest whether the required CSR Information is present in the management report or, in the case of its omission, that an appropriate explanation has been provided, in accordance with the third paragraph of article R. 225-105 of the French Commercial Code (*Code de commerce*) (Attestation of presence of CSR Information);
- to express a limited assurance conclusion, that the CSR Information, overall, is fairly presented, in all material aspects, in accordance with the Criteria (Limited assurance on CSR Information).

Our verification work was undertaken by a team of six people between October 2016 and February 2017 for an estimated duration of fifteen weeks.

We conducted the work described below in accordance with professional standards applicable in France and the Order of May 13, 2013 determining the conditions under which an independent third-party verifier conducts its mission, and in relation to the opinion of fairness, in accordance with the international standard ISAE 3000.^(b)

(a) Scope available at www.cofrac.fr

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

1. Attestation of presence of CSR Information

NATURE AND SCOPE OF THE WORK

We obtained an understanding of the company's CSR issues, based on interviews with the management of relevant departments, a presentation of the company's strategy on sustainable development based on the social and environmental consequences linked to the activities of the company and its societal commitments, as well as, where appropriate, resulting actions or programs.

We have compared the CSR Information presented in the management report with the list as provided for in article R. 225-105-1 of the French Commercial Code (*Code de commerce*).

In the absence of certain consolidated information, we have verified that the explanations were provided in accordance with the provisions of article R. 225-105-1, paragraph 3, of the French Commercial Code (*Code de commerce*).

We verified that the CSR Information covers the consolidated perimeter, namely the entity and its subsidiaries, as aligned with the meaning of article L. 233-1 of the French Commercial Code (*Code de commerce*) and the entities which it controls, as aligned with the meaning of article L. 233-3 of the same Code, with the limitations related to the progressive inclusion of Airgas, specified in each of the chapters concerned.

CONCLUSION

Based on this work, and given the limitations mentioned above, we confirm the presence in the management report of the required CSR information.

2. Limited assurance on CSR Information

NATURE AND SCOPE OF THE WORK

We undertook more than ten interviews with people responsible for the preparation of the CSR Information in the departments in charge of the data collection process and, if applicable, the people responsible for internal control processes and risk management, in order to:

- Assess the suitability of the Criteria for reporting, in relation to their relevance, completeness, reliability, neutrality, and understandability, taking into consideration, if relevant, industry standards;
- Verify the implementation of the process for the collection, compilation, processing and control for completeness and consistency of the CSR Information and identify the procedures for internal control and risk management related to the preparation of the CSR Information.

We determined the nature and extent of our tests and inspections based on the nature and importance of the CSR Information, in relation to the characteristics of the Company, its social and environmental issues, its strategy in relation to sustainable development and industry best practices.

For the CSR Information which we deemed to be the most important^(a):

- At the level of the consolidating entity and business lines, we consulted documentary sources and conducted interviews to corroborate the qualitative information (organization, policies, actions, etc.), we implemented analytical procedures on the quantitative information and verified, on a test basis, the calculations and the compilation of the information, and also verified their coherence and consistency with the other information presented in the management report.
- At the level of the representative selection of entities and sites that we selected^(b), based on their activity, their contribution to the consolidated indicators, their location and a risk analysis, we undertook interviews to verify the correct application of the procedures and undertook detailed tests on the basis of samples, consisting in verifying the calculations made and linking them with supporting documentation. The sample selected therefore represented on average 20% of the energy consumption (thermal and electric), and 18% of Group employees, that were considered as representative characteristics of the environmental and social domains.

For the other consolidated CSR information, we assessed their consistency in relation to our knowledge of the company.

Finally, we assessed the relevance of provided explanations related to, if appropriate, the partial or total absence of certain information, by taking into account, if appropriate, good professional practice.

We consider that the sample methods and sizes of the samples that we considered by exercising our professional judgment allow us to express a limited assurance conclusion; an assurance of a higher level would have required more extensive verification work. Due to the necessary use of sampling techniques and other limitations inherent in the functioning of any information and internal control system, the risk of non-detection of a significant anomaly in the CSR Information cannot be entirely eliminated.

CONCLUSION

Based on our work, we have not identified any significant misstatement that causes us to believe that the CSR Information, taken together, has been fairly presented, in compliance with the Criteria.

Paris-La Défense, 3rd of March 2017

The independent verifier

ERNST & YOUNG et Associés

Eric Duvaud – Sustainable Development – Partner

Bruno Perrin – Partner

(a) Environmental and societal information:

– Indicators (quantitative information): Annual electricity (GWh) and thermal energy consumptions (TJ PCI), evolution of energy consumption per m³ of air gas produced and per m³ of hydrogen produced (base 100 in 2007), evolution of the distance traveled per ton of industrial gas delivered as liquid (oxygen, nitrogen, carbon monoxide, base 100 in 2007), direct & indirect greenhouse gas (GHG) emissions (scopes 1 & 2, in MtCO₂), estimation of the annual water consumption (Mm³).

– Qualitative information: General environmental policy (management of the industrial system and certification), sustainable use of resources (energy consumption, measures undertaken to improve energy efficiency), water supply considering local constraints, economic and social territorial impacts (impact on regional and local populations especially regarding homecare activities) measures taken in favor of consumer health and safety, relation with stakeholders (activities related to life and environment), climate change (the most significant greenhouse gas emissions generated as a result of the company's activity, in particular the use of the goods and services it produces).

Social information:

– Indicators (quantitative information): Headcount (Nb), recruitments and departures (% headcount), rate of women within the managers and professionals population (present and hired %), rate of employees having attended at least a training session during the year (%) and number of days of training per employee per year, rate of performance appraisals performed by managers during the year (%), accident frequency rate of the group employee.

– Qualitative information: health and safety at the work place, training policies, diversity and equality of treatment and opportunities (The measures taken on gender equality, the employment and integration of disabled people, the fight against discrimination).

- (b) Environmental indicators: Air separation units and conditioning site of industrial merchant of Dabrowa Gornizca (Poland), the air separation units of the air gases network managed by OCC Houston (Bayport – Golf Coast pipeline) in the USA, the hydrogen units of Yanbu 1 & 2 (Saudi Arabia) and Bayport in the USA, cogeneration units of Bayport (USA). Follow-up audits of the air separation units of Rizhao and Huai'an (China).

Safety & Social indicators: On-site audits of AL Canada, AL Advanced Materials (New Jersey, USA), ALKAT (Poland), AL Khafrah Industrial Gases (Saudi Arabia), AL Advanced Technologies and Orkyn (France). Follow-up audits of large industries AL China and AL Morocco.

> APPENDIX

Link between Air Liquide's Sustainable Development indicators and the indicators of the Global Reporting Initiative (GRI)^(a)

Air Liquide indicators	GRI indicators
Human Resources	
Group employees	G4-LA1
Distribution of employees by geographic area	G4-LA1
Turnover of employees (leaving the Group)	G4-LA1
Retention rate of managers and professionals	G4-LA1
% of women in the Group	G4-LA12
% of women among managers and professionals	G4-LA12
Average number of days of training per employee, per year	G4-LA9
% of employees who have had a performance review meeting with their direct supervisor during the year	G4-LA11
Diversity indicator (number of nationalities)	G4-LA12
Safety	
Number of lost-time accidents of Group employees	G4-LA6
Accident frequency of Group employees	G4-LA6
Number of lost-time accidents of subcontractors and temporary workers	G4-LA6
Energy and environment	
Total annual electricity consumption	G4-EN3/EN4
Total annual thermal energy consumption	G4-EN3/EN4
Evolution of energy consumption per m ³ of air gas produced (ASU)	G4-EN5
Evolution of energy consumption per m ³ of hydrogen produced (HyCO)	G4-EN5
Evolution of the distance traveled per ton of gas delivered	G4-EN30
Total annual water consumption	G4-EN8
Total direct greenhouse gas emissions	G4-EN15
Total indirect greenhouse gas emissions	G4-EN16
Total direct and indirect greenhouse gas emissions	G4-EN15/EN16
Consumption of materials (calcium carbide, ammonium nitrate, raw materials for the Welding business)	G4-EN1
Emissions into the atmosphere (NO _x)	G4-EN21
Emissions into the atmosphere (SO _x)	G4-EN21
GHG emissions avoided in Air Liquide operations and at customers' facilities	G4-EN19
Estimate of emissions into the atmosphere (VOCs)	G4-EN21
Discharge to water (oxidizable matter, suspended solids)	G4-EN22
Total mass of waste by type and waste treatment	G4-EN23
Transportation	
Estimate of CO ₂ emissions generated by truck delivery	G4-EN30
Estimate of CO ₂ emissions avoided through on-site units	G4-EN19
Social	
% of employees belonging to a unit with a local Code of Conduct	G4-SO3
Responsibility	
% of Group sales concerning entities where a customer or patient satisfaction survey has been conducted	G4-PR5

(a) Global Reporting Initiative (GRI): an independent body that designs and promotes guidelines aimed at improving the quality, stringency and usefulness of reporting on economic, environmental and social performance.



INTERNET

See our annual publications:
Annual Report, Reference Document,
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