



# THE LONG VIEW

---

2015 ANNUAL REPORT



02 Interview with Benoît Potier,  
Chairman and CEO

06 Governance

12 Strategy

## 14 AIR LIQUIDE IN 2015

16 Key figures in action

20 Our Businesses

22 Around the world

## 26 THINKING LONG TERM

28 Sasol, large-scale project

30 Cryocap™, technology of the future

32 Healthcare acquisitions accelerating growth

34 Tomorrow's leaders

## 36 CREATING VALUE TOGETHER

38 Team effort delivers technological breakthrough

40 Partnering up for air quality

42 ALIAD and Sigfox, networked innovation

## 44 MOVING FORWARD WITH DIGITAL

46 Kite: collective intelligence on the rise

48 Digital platform enhances customer experience

50 All you need to know about sleep apnea

## 52 FINANCIAL INFORMATION



Visit [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

Extend your reading experience via your computer, tablet or mobile phone: the digital annual report offers features in videos, interviews and infographics. Look for the symbol above, which indicates the availability of enriched content.

**W**orld leader in gases, technologies and services for Industry and Health, Air Liquide is present in 80 countries with more than 50,000 employees and serves more than 2 million customers and patients. Oxygen, nitrogen and hydrogen have been at the core of the company's activities since its creation in 1902. Air Liquide's ambition is to be the leader in its industry, delivering long-term performance and acting responsibly.

Air Liquide ideas create value over the long term. At the core of the company's development are the commitment and constant inventiveness of its people.

Air Liquide anticipates the challenges of its markets, invests locally and globally, and delivers high-quality solutions to its customers and patients, and the scientific community.

The company relies on competitiveness in its operations, targeted investments in growing markets and innovation to deliver profitable growth over the long-term.

Air Liquide's revenue amounted to €16.4 billion in 2015, and its solutions that protect life and the environment represented more than 40% of sales. Air Liquide is listed on the Paris Euronext stock exchange (compartment A) and is a member of the CAC 40 and Dow Jones Euro Stoxx 50 indexes.

---

# Interview with Benoît Potier

Chairman and CEO

“  
The long term  
is fundamental  
to our  
development.”

## # The title of this year's annual report is “The long view”. Why this choice?

This title refers to both the long term, which is our trademark, and to the vision that inspires us to build the Group's future. The long term is fundamental to our development, to how we manage the company in terms of performance and responsibility, and to how we interact with all of our stakeholders: employees, customers, shareholders, business partners and, more broadly, society. The very nature of our business and our investments encourages us to think long term, which is reflected in our strategy of profitable growth over the long term.

“The long view” also means identifying and observing the major trends - in our environment and in society - that will create new opportunities, as well as anticipating in order to better prepare

for the future. Lastly, it means taking the initiatives today that will nourish tomorrow's growth. That's what we did again in 2015 through our investment decisions, our initiatives for innovation, and our actions to improve competitiveness. Similarly, the signing in November 2015 of the merger agreement for the acquisition of Airgas in the United States is part of this long-term vision. In a world that is changing rapidly and thoroughly, it is useful to remember these fundamentals, which underpin trust over the long term.

## # What are your observations on Air Liquide in 2015?

The Group achieved a solid performance last year, delivering once again an increase in revenue, operating margin, and net profit in the context of slower global growth in 2015. The Group's consolidated revenue increased by +6.7%, while Gas and Services revenue rose by +6.9%. Business growth was driven by momentum in Healthcare and Electronics, as well as the contribution of production unit start-ups in Large Industries. Geographically, growth was driven by the progressive recovery in Europe and by the developing economies. The operating margin increased to 17.6% of revenue, benefiting from a high level of efficiencies - nearly 300 million euros. Net profit increased by +5.5%, to 1.76 billion euros, allowing us to propose a higher dividend to our shareholders at the Annual Shareholders' Meeting in May 2016. So in 2015, our performance is solid. The Group continued to improve its competitiveness and to take growth initiatives through its investment decisions and innovations.

## # 2015 was also marked by the signature of a merger agreement for the acquisition of Airgas in the United States. What are the benefits of this transaction?

The acquisition of Airgas, leading supplier of packaged gases and related products in the United States, will be, once it is completed<sup>(a)</sup>, a major step in the development and transformation of the Group. First and foremost, this acquisition makes good industrial and market sense, offering significant

(a) Once the regulatory clearances are obtained.

## THE LONG VIEW



|

“

Innovation  
is one of the pillars  
of our strategy.

”

|

“

AIR LIQUIDE IS  
WELL POSITIONED  
TO MEET THE  
CHALLENGES OF THE  
TRANSFORMATIONS  
THAT ARE AT WORK  
IN THE WORLD.

”



prospects for development. Air Liquide will gain a stronger presence in the largest market for industrial gases in the world. We will benefit from Airgas's unrivaled regional coverage in the United States, not to mention its e-commerce and telesales capabilities that serve over a million customers. We will also be able to deploy our innovations and technologies in the United States, relying on digital in particular, thus providing greater added value products and services. Last but not least, this acquisition will strengthen Air Liquide's global leadership, increasing Gas and Services revenue by approximately + 30%. Already No. 1 in Europe, Asia-Pacific and the Middle East & Africa, the Group will also become the leader in North America and will be ideally positioned to generate future growth.

**# Air Liquide continues to step up the pace of innovation. What did this strategy achieve in 2015?**

There have been numerous advances in innovation. I will just mention a few examples. We signed a new contract in connection with the ITER international scientific project to supply new cryogenic lines. In November 2015, at our largest unit for producing hydrogen via natural gas reforming in France, we inaugurated the industrial deployment of Cryocap™, a CO<sub>2</sub> cold capture technology. This is a world first. In the field of hydrogen energy, new charging stations for hydrogen electric vehicles were launched in Europe and Japan. We also continued to practice our "open innovation" approach, with many outside collaborations worldwide. The creation of the m-Lab ("m" for molecules and "Lab" for laboratory) in 2015 also contributes to this dynamic: our animation of this international community of scientific experts, both internal and external, positions us as a scientific leader in the field of Essential Small Molecules and opens the way to new applications for our customers. Finally, we created "Global Markets & Technologies," a new activity focused on new markets requiring a global approach, such as those involved in the energy transition. This activity will help to accelerate innovation and make its implementa-

tion more efficient. Innovation is one of the pillars of our strategy. While contributing to the Group's competitiveness, it will open up new markets and create new opportunities for growth.

**# COP21, the 21<sup>st</sup> United Nations conference on climate, was held in Paris in December of 2015. What role did Air Liquide play and what do you think of the agreement that was reached?**

As an official partner of COP21, we conducted several actions before and during the conference. Alongside major international groups, we signed the "Business Proposals for COP21" in May 2015. During the conference, we participated in several events, including "Solutions COP21" at the Grand Palais, where we presented our technologies in the areas of hydrogen energy, biomethane, and refrigerated transport, which contribute specifically to the energy and ecological transition. Air Liquide also inaugurated the first hydrogen charging station in Paris, which enabled the deployment of the first fleet of hydrogen-powered electric taxis. As for the agreement reached in Paris, it includes significant advances. Every country in attendance agreed to a common global objective, that of containing global warming to 2°C, 1.5° if possible, compared to the pre-industrial era. Moreover, we note the recognition of the key role played by cities, regions, and businesses, in speeding up investments and innovation, both to reduce greenhouse gas emissions and attenuate the effects of climate disorder. Of course, the success of the agreement depends on its implementation and making good on the commitments.

**# What are your priorities for 2016?**

In 2016, completing the acquisition of Airgas and then the integration process are a top priority. We will also continue the execution of our pending projects, particularly in terms of competitiveness. We will launch our new 2016-2020 company program that succeeds ALMA. We are also continuing to innovate and materialize these innovations in our offers: all of this in order to generate profitable growth and achieve our goals.

The level of our investments, the many projects underway, the Group's strong capacity for innovation, and the commitment of all our employees around the world give me confidence in the Air Liquide Group's prospects for growth over the medium term. We are well positioned to meet the challenges of the transformations that are at work in the world.

# Board of Directors

as of December 31, 2015

## 2015 Highlights

On December 31, 2015, the Board of Directors has twelve members, eleven of whom are appointed by the Annual Shareholders' Meeting, while the twelfth member representing employees is appointed by the France Group Committee. Nearly half of the elected members are women. A total of six nationalities are represented, from three continents where the Group operates: Europe, the Americas, and Asia. They bring a wealth of competencies ranging from cosmetics and consumer goods to the automotive and oil industries, not to mention health/research, chemical pharmaceuticals, and services.

## Topics examined by the Board in 2015

- **Questions relating to strategy:** the main lines of the new medium-term company program ; the development strategy for the Healthcare activity; Engineering projects; the acquisition of Airgas.
- **Questions of governance:** changes in composition of the Board and its Committees; risk management — in particular, risks specific to the Healthcare activity; changes in the long-term remuneration policy for employees and executives and legal age limits for the Executive Officers; the reappointment of statutory auditors.
- **Questions relating to Corporate Social Responsibility (CSR),** a topic that lies at the heart of the Group's stakes: special presentation and board discussion of the CSR strategy.





9

INDEPENDENT  
MEMBERS

5

WOMEN

6

NATIONALITIES



**a** Geneviève Berger, Director - **b** Pierre Dufour, Senior Executive Vice-President - **c** Sin-Leng Low, Member of the Audit and Accounts Committee - **d** Thierry Peugeot, Member of the Audit and Accounts Committee - **e** Siân Herbert-Jones, Chairman of the Audit and Accounts Committee - **f** Thierry Desmarest, Lead Director, Chairman of the Appointments and Governance Committee, member of the Remuneration Committee - **g** Benoît Potier, Chairman and CEO - **h** Paul Skinner, Member of the Audit and Accounts Committee<sup>(a)</sup> - **i** Jean-Paul Agon, Chairman of the Remuneration Committee, Member of the Appointments and Governance Committee - **j** Annette Winkler, Member of the Remuneration Committee - **k** Philippe Dubrulle, Director representing the employees - **l** Karen Katen, Member of the Appointments and Governance Committee

(a) End of mandate: December 31, 2015

# In immersion with the Healthcare teams

Meeting at Aix-en-Provence, France - September 21, 2015 at 10 am



THE TWELVE MEMBERS OF THE GROUP'S BOARD OF DIRECTORS  
GATHERED NEAR THE CITY OF AIX-EN-PROVENCE IN THE SOUTH OF  
FRANCE, FOR A BOARD MEETING DEVOTED TO HEALTHCARE. THE DUAL  
OBJECTIVE WAS TO PRESENT THE STRATEGIC STAKES OF THE GROUP  
IN THIS ACTIVITY AND TO BETTER UNDERSTAND THE SPECIFICITY  
OF HEALTHCARE BUSINESS OPERATIONS WITHIN THE GROUP.





**Monday September 21, 2015**

**A**fter a working session dedicated to the Group’s global strategy, Board members attended a more detailed presentation of the Air Liquide strategy for its Healthcare businesses. During the presentation, topics of discussion ranged from innovation and geographic expansion to actions designed to increase competitiveness. To help them better understand the operations of a Home Healthcare service provider, each member of the Board of Directors accompanied a nurse or a technician from Air Liquide on visits to the homes of patients suffering from chronic diseases requiring long-term care. Through these visits, Board members got a clearer idea of the added value of the service delivered at home, which entails customized support for each patient to ensure improved compliance to treatment and hence improved quality of life. To close out this first day, Board members took part in a round-table discussion involving three major players in France’s health-care system (healthcare institution, prescriber, patient advocacy group) and devoted to the challenges ahead for the treatment and care of patients suffering from chronic diseases.

**Tuesday September 22, 2015**

Air Liquide’s dedicated center for operating Home Healthcare entities, based in Aix-en-Provence, opened its doors to the Board members. Under the guidance of representatives of the center’s main departments, they were familiarized with the role of each. The experience continued with encounters of experts from various areas that fall under Air Liquide’s Healthcare activity. Several themes were discussed, including the changes at work at the hospital and

in medical gases, home healthcare services for patients suffering from chronic respiratory diseases or requiring treatment by infusion, the development of innovative specialty ingredients for health and cosmetics, and the latest innovations in hygiene and hospital disinfection.

The two-day tour – which was rich in encounters and experiences for Board members – ended with a review of Research & Development activities in Healthcare. Healthcare is a robust and resilient activity that is one of the Group’s long-lasting drivers of growth.

**+ For more information on the Healthcare activity, see page 20.**



# General Management & Executive Committee

---

Pierre  
Dufour



Senior Executive  
Vice-President and Director  
Born in 1955 - Canadian

Chairman and CEO  
Born in 1957 - French



Benoît  
Potier

Jean-Pierre  
Duprieu



Executive Vice-President  
Born in 1952 - French

Michael  
J. Graff



Senior Vice-President  
Houston Hub Executive  
Vice-President, also supervising  
the Electronics business line,  
Safety and Industrial Systems  
Born in 1955 - American

François  
Darchis



Senior Vice-President  
Innovation, Digital, Science,  
Technologies, Industrial  
Merchant business line  
Born in 1956 - French

Guy  
Salzgeber



Senior Vice-President  
Europe Industries Frankfurt Hub  
Executive Vice-President  
Born in 1958 - French

GOVERNANCE



**Jean-Marc de Royere**

Senior Vice-President  
International, Governance,  
Corporate Social Responsibility  
Born in 1965 - French

**François Abrial**



Vice-President  
Group Human Resources  
Born in 1962 - French

Vice-President  
Chief Financial Officer  
Finance, Operations Control,  
also supervising the Diving activity  
Born in 1962 - French

**François Jackow**



Vice-President  
Strategy, Customers,  
also supervising the Dubai Hub  
Born in 1969 - French



**Fabienne Lecorvaisier**

Shanghai Hub  
Executive Vice-President  
Born in 1962 - French

**Pascal Vinet**



Vice-President  
Global Healthcare Operations  
Born in 1962 - French

**Kwong Weng Mok**



Vice-President  
Deputy Head of Asia  
Born in 1953 - Singaporean



**François Venet**



**Augustin de Roubin**

Vice-President, South America  
Born in 1953 - French

# A strategy of profitable growth over the long term

---

AIR LIQUIDE PURSUES A STRATEGY OF PROFITABLE GROWTH OVER THE LONG TERM, BASED ON OPERATIONAL COMPETITIVENESS, TARGETED INVESTMENTS IN GROWING MARKETS, AND CONTINUOUS INNOVATION.



## Competitive operations

By staying competitive, Air Liquide is able to guarantee that its structural costs remain aligned with changes in the consumption needs of industrial customers and the evolution of healthcare prices. Competitiveness is about more than costs and prices; it is also about quality, reliability and safety, as well as about ensuring that the Group's offer is backed by sound and ergonomic technological content. This is how the efficiency gains generated, combined with the continuous improvement of existing offers and initiatives designed to accelerate innovation and technology, make Air Liquide highly competitive.

NEARLY **€300 M**  
IN EFFICIENCY GAINS  
IN 2015

Through Group-wide initiatives and a multitude of local projects, in particular in the areas of industry and purchasing, Air Liquide generates substantial recurring efficiencies. In 2015, the digitization of products and equipment monitoring increased, allowing for better tracking and inventory management, as well as the optimization of on-site maintenance. The optimization of delivery routes in the Industrial Merchant and Healthcare businesses is another key area. The gradual replacement of delivery fleets and efforts to limit their speed on the road are also initiatives that lower costs and improve the environmental footprint of the Group.

## Targeted investments

The Group's development is largely based on its capacity to make selective investments each year in growth and competitiveness. Growth investments are made to generate new revenue and are linked, for example, to the awarding of new contracts in industry or to acquisitions, particularly in the area of healthcare all over the world. Similarly, Air Liquide continues each year to invest in innovation and technologies that will generate its future growth. In addition, a portion of its investments is aimed at making the Group even more competitive. In particular, we are optimizing the safety and performance of our industrial installations, while also achieving cost and energy efficiencies, for example by funding upgrade or installation of new optimization hardware and software.



**€2.4 Bn**  
IN INVESTMENT DECISIONS  
IN 2015

This year, investment decisions are related in particular to the awarding of new contracts in industry. Unchanged versus 2014, industrial investments are split evenly among all geographic regions. The signature of the Sasol project in South Africa is one such investment (see page 28). New acquisitions in home healthcare and hygiene are distributed among Europe, Asia-Pacific, and the Americas (see page 32).

## Continuous innovation

At the heart of the Air Liquide strategy, innovation guarantees the Group's competitiveness and contributes to its growth. The Group relies on its scientific and technological expertise - represented by its Research & Development department, its Engineering and Construction business, and its centers of expertise - as well as structures that promote the entrepreneurial spirit. In creating the new "Global Markets & Technologies" activity in 2015, Air Liquide is focusing on new markets requiring a global approach. Similarly, the i-Lab, the laboratory for new ideas created by Air Liquide, and ALIAD, the venture capital structure set up to invest in technology start-ups, complete the Group's system for innovation. To back this internal ecosystem, Air Liquide initiated a process of "open innovation." Today the Group cultivates external collaborations all over the world: with



customers, universities, research institutes, SMEs, and start-ups. Well connected to the global innovation ecosystem, Air Liquide can better anticipate market trends and practices, explore new growth opportunities, and create value for all its stakeholders.

**6,200**  
EMPLOYEES  
CONTRIBUTE TO  
INNOVATION

In 2015, Research & Development created the m-Lab (m for molecules and Lab for Laboratory), an international community of internal and external scientists and experts (academics, start-ups, researchers and private experts). This open community focuses on the Essential Small Molecules, such as oxygen, nitrogen, hydrogen and carbon dioxide, which represent Air Liquide's scientific territory. They have a wide variety of physical and chemical properties and are essential to life, matter and energy. As part of this effort, the Group launched a contest called "the Air Liquide Essential Molecules Challenge," asking participants to propose scientific research projects on topics related to societal and environmental challenges.



**Bayport industrial site** near Houston in the United States. The site includes air gas, cogeneration and hydrogen production units.



# # AIR LIQUIDE in 2015

---

THROUGHOUT THE YEAR, THE GROUP CONTINUED TO SIGN NEW CONTRACTS, INVEST IN PROMISING MARKETS AND IMPROVE ITS COMPETITIVENESS. IT ALSO CREATED THE ACTIVITY “GLOBAL MARKETS & TECHNOLOGIES” TO ENHANCE ITS INNOVATION STRATEGY.

**T**he Group achieved a solid performance, delivering once again an increase in revenue, operating margin and net profit, in the context of slower global growth in 2015. Healthcare and Electronics were particularly dynamic and Large Industries benefited from start-ups and ramp-ups of new production units. For Industrial Merchant, the situation was more contrasted. Geographically, activity was driven by the gradual recovery in Europe and by the developing economies. The highlights of 2015 include the signature of new industrial contracts in growing markets, for example in South Africa with the customer Sasol (see page 28); new contracts in China for the energy and copper sectors; in Asia-Pacific to supply ultra-pure nitrogen for the semiconductor industry; and in Colombia, with Latin America’s biggest beverage supplier. The Group also successfully started up the Yanbu hydrogen production facility in Saudi

Arabia. In Healthcare, Air Liquide made acquisitions in Home Healthcare and Hygiene (see page 32).

There were also numerous advances in innovation, whether as part of the international scientific project ITER or with the inauguration of the Cryocap™ technology in France, a world first (see page 30). Similarly, new charging stations for hydrogen-powered electric vehicles were launched in Europe and Japan, as well as in the center of Paris during the United Nations’ International Conference on Climate Change. All of these achievements illustrate Air Liquide’s contribution to the diversification of energy sources and environmental protection.

Another highlight of the year was the signature of a merger agreement for the acquisition of Airgas in the United States (see page 24). Once completed, this acquisition will represent a major step in Air Liquide’s history and ideally position the Group to generate future growth.

# 2015 KEY FIGURES *in* ACTION

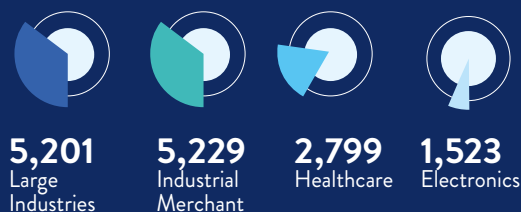
**16,380**  
million euros  
Revenue

Group revenue  
(in millions of euros)

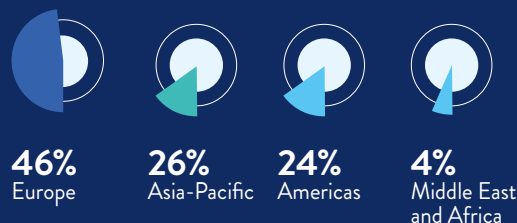


**1,756**  
million euros  
Net profit

Gas and Services  
revenue by world business line  
(in millions of euros)



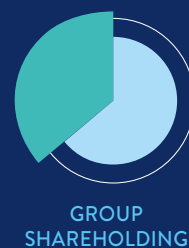
Gas and Services  
revenue by geography



**400,000**  
INDIVIDUAL SHAREHOLDERS



**2.60**  
DIVIDEND PER SHARE<sup>(a)</sup>  
(in euros)



**64%**  
institutional  
shareholders  
**36%**  
individual  
shareholders

(a) Proposed at the May 12, 2016 Annual General Shareholders Meeting.

# A responsible performance

---

IN 2015, THE GROUP ACHIEVED ANOTHER SOLID PERFORMANCE.

THIS PERFORMANCE IS INSEPARABLE FROM THE RESPONSIBLE APPROACH THAT SHAPES THE WAY WE ACT AND WORK OVER TIME WITH ALL OUR STAKEHOLDERS. HERE, THE GROUP'S RESPONSIBLE PERFORMANCE IS DECIPHERED IN 5 KEY POINTS.



Group revenue

€16,380 M

OVER 40%

OF REVENUE IS LINKED  
TO PROTECTING LIFE  
AND THE ENVIRONMENT

## # ENVIRONMENT AND HEALTH

The percentage of Air Liquide's total revenue related to life and the environment grew significantly between 2005 and 2014, from over 30% to over 40% of total Group revenue. This growth demonstrates that Air Liquide is committed to developing applications that protect the lives of patients and enable customers to improve their environmental footprint and reduce their own CO<sub>2</sub> emissions.

In industry, the lines of development are numerous. They include energy efficiency (the use of oxygen in blast furnaces to reduce coke consumption, rare gases to improve the insulation of double glazing, etc.), modified atmosphere packaging to protect foods and reduce the use of chemical additives, the treatment of water with oxygen at sewage plants to reduce the use of chemicals, etc. In the field of healthcare, they include the use of oxygen in hospitals and at the home of patients, hygiene products to help fighting against nosocomial infections, or also the production of vaccine adjuvants.



**+50,000**

EMPLOYEES

**29%**

OF GROUP MANAGERS  
ARE WOMEN

#TALENT

Equality between men and women is an essential point in the expression of the diversity of the Group. Several years ago, Air Liquide established a comprehensive action plan and, between 2003 and 2015, the percentage of women among engineers and managers went from 14% to 29%. This percentage is slightly higher than the overall percentage of women in the Group (28%), illustrating that women are well represented in the ranks of management at Air Liquide. In addition, women represent 38% of employees considered to have high potential. And five women are now members of the Group Board of Directors.

A priority of the human resources policy, diversity among employees is a source of dynamism, creativity, and performance. In particular, it must be reflective of the geographical diversity of Air Liquide's customers. Air Liquide is also working to develop the skills and expertise of all its employees through its training policy, which allows them to work safely and improve their performance and employability.



**+2 MILLION  
CUSTOMERS  
AND PATIENTS**

WORLDWIDE

#CUSTOMERS AND PATIENTS

A priority for Air Liquide, customer and patient satisfaction is measured via satisfaction surveys that lead to action plans for continuous improvement. Relationships with industrial customers of various sizes and from various sectors, as well as relationships with healthcare professionals, patients, and their advocacy groups, are key for the teams and guide the development of the Group. Every entity and every employee are involved. The quality of the relationship is based on the definition of specific commitments that Air Liquide teams strive to respect daily, with professionalism and service. In 2015, 9,800 surveys were accompanied by 450 customer and patient visits and more than 100 new action plans were launched. For the third consecutive year, 25 countries have implemented this program.

**87%**

(39% IN 2011)

PERCENTAGE OF GROUP SALES  
GENERATED BY ENTITIES WHERE  
CUSTOMER AND PATIENT  
SATISFACTION SURVEYS HAVE  
BEEN CONDUCTED, WITH RELATED  
ACTION PLANS

THE TARGET OF 85% SET FOR 2015  
WAS THUS EXCEEDED.





€282 M

EXPENSES DEDICATED TO INNOVATION

ALMOST 60%

OF INNOVATION<sup>(a)</sup> EXPENSES ARE RELATED TO PROJECTS THAT HELP TO PROTECT LIFE AND THE ENVIRONMENT

## # INNOVATION

Innovation, one of the pillars of the Group's strategy, allows Air Liquide to ensure its competitiveness, to open up new markets, and to create new opportunities for growth. Innovation projects that pertain to environmental protection focus on the capture and recovery of CO<sub>2</sub>, second-generation biofuels, and biogas purification. In the field of health and hygiene, research focuses on medical gases used in analgesia, respiratory diseases, as well as on hygiene products.

(a) Innovation expenses correspond to the OECD definition, namely research and development, market launch and marketing expenses for new offers and products.



Geographic footprint

80

COUNTRIES

1.5

EMPLOYEE LOST-TIME ACCIDENT FREQUENCY RATE (PER MILLION HOURS WORKED)

RATE ON A COMPARABLE SCOPE BASIS SHOWS CLEAR IMPROVEMENT OVER THE PREVIOUS YEAR.

## # SAFETY

To sustainably improve the health and safety at work of its employees and its subcontractors, Air Liquide has deployed an industrial management system (IMS) since 2005 that has fundamentally changed the way we work and strengthened the process for managing safety, reliability, environmental protection, and industrial risk management. Prevention, protection, early detection and rapid response... Whatever the country and whatever the actual situation in the field, safety applies in three key dimensions: protect people at work, ensure road safety, and guarantee process safety.



# Our Businesses

## GAS AND SERVICES

### # LARGE INDUSTRIES

We provide our customers with industrial gas solutions essential to their own production, as well as technologies that deliver performance and energy efficiency. Our unmatched networks of production units linked to pipelines worldwide enable us to supply gases to the world's major industrial basins and guarantee customers a high level of reliability and uninterrupted supply of gas over the long term.

**35%** OF 2015 GAS AND SERVICES REVENUE

**419** UNITS WORLDWIDE



### # HEALTHCARE

As a recognized leader in medical gases, home healthcare, hygiene products and healthcare specialty ingredients, we provide to healthcare professionals and patients customized and effective products and services, which contribute to protect vulnerable lives. Present in the continuum of care from hospital to home, we accompany 1.3 million patients in the world and we strive to constantly improve our offer in order to better respond to the needs of patients and healthcare professionals.

**19%** OF 2015 GAS AND SERVICES REVENUE

**7,500** HOSPITALS SUPPLIED WORLDWIDE



### # INDUSTRIAL MERCHANT

With a historical presence in numerous industrial sectors and dense geographic coverage, we offer daily support to more than one million customers worldwide, whether for multinational corporations or independent craftsmen. We offer solutions adapted to every stage of the production process: industrial and specialty gases, application technologies and related services. Inventiveness, strong customer proximity and relationships based on trust guide our teams' commitment to moving industries forward. The applications are infinite — oxy-combustion, water treatment, inerting,... — with permanent development.

**36%** OF 2015 GAS AND SERVICES REVENUE

**+ 1** MILLION CUSTOMERS



### # ELECTRONICS

Long-term provider of innovative solutions for the markets of semiconductors, solar cells and flat panel displays, we contribute to the innovation of the world's most advanced companies in the electronic industry. As a world reference in the design, manufacturing and delivery of molecules, we design for our clients the infinitely small and enable them to think amazingly big. Our wide range of customized services and equipment facilitate uninterrupted on-site management of gas in compliance with the highest standards of safety.

**10%** OF 2015 GAS AND SERVICES REVENUE

**3** MARKETS: SEMICONDUCTORS, PHOTOVOLTAICS AND FLAT PANEL DISPLAYS

OTHER ACTIVITIES

# ENGINEERING AND CONSTRUCTION

Partner of choice for the design, engineering and construction of state-of-the-art production units worldwide, for Air Liquide and third-party customers, we deliver innovative technologies and create durable solutions that respond to the challenges of our customers. Our industrial gas production, energy conversion and gas purification technologies enable customers to benefit from a wide range of industrial process operations and optimize the use of natural resources.

15 ENGINEERING CENTERS  
WORLDWIDE



# GLOBAL MARKETS & TECHNOLOGIES

The new activity "Global Markets & Technologies" focuses on new markets requiring a global approach – those relating to the energy transition, such as hydrogen energy; markets with high technology content (aerospace, space); and those relating to the maritime sector, such as offshore platforms or maritime transport of high value-added molecules. We rely on science, technologies, business models and digital usages.

1,400 EMPLOYEES

# WELDING

Air Liquide Welding develops welding and cutting technologies. In more than 80 countries, it offers its clients a complete range of equipments, consumables and combined services. With our development teams, we are constantly innovating in this field.

5 BRANDS: OERLIKON,  
SAF-FRO, CEMONT, WELDTEAM  
AND WELDLINE



# DIVING

Present in more than 50 countries, Air Liquide subsidiary Aqua Lung International is the world leader in personal aquatic equipment for recreational and professional use. A historical expert in SCUBA diving, Aqua Lung has expanded its offering to complementary areas such as swimming, aqua fitness and free diving.

+70 YEARS OF  
EXPERIENCE

# AROUND *the* WORLD

SALES GROWTH IN 2015 WAS DRIVEN BY EUROPE'S PROGRESSIVE RECOVERY AND BY THE DEVELOPING ECONOMIES. IN NORTH AMERICA, THE YEAR WAS MARKED BY A SLOWDOWN IN SECTORS RELATED TO OIL AND GAS PRODUCTION. REVENUE GROWTH IN ASIA-PACIFIC WAS DRIVEN BY JAPAN'S RESILIENCE AND THE PERSISTENCE OF SUSTAINED GROWTH IN CHINA. AS FOR THE MIDDLE EAST AND AFRICA, SALES REFLECT THE START-UP OF OUR LARGE HYDROGEN PRODUCTION PLANT IN YANBU, SAUDI ARABIA.

Gas and Services revenue.  
All figures are on a comparable basis (2015/2014 changes): adjusted for currency, energy and significant scope impacts.

## Europe



**Dormagen**, state-of-the-art Steam Methane Reformer unit.

In 2015, Europe benefited from the good development in Healthcare and an improvement in certain industrial sectors. Growth for the year reached 3.4%, gaining strength in the second half (+4.8%) that was driven mainly by the start-up of new production units for Large Industries in Germany (see focus) and in Benelux. Industrial Merchant posted positive growth in the second half thanks to a slight increase in liquid gas volumes. Healthcare currently accounts for a third of all business in Europe. Its dynamic development reflects several factors: rising demand in Home Healthcare; acquisitions made during the year in Germany, France, Ireland, and the Czech Republic (see page 32); and strong growth in the Hygiene business.

**€6,749 M**  
2015 GAS AND SERVICES  
REVENUE



# Asia-Pacific



## # DORMAGEN

In April 2015, Air Liquide inaugurated a state-of-the-art Steam Methane Reformer (SMR<sup>(a)</sup>) unit in Germany's Chempark Dormagen site. This highly flexible unit has a production capacity of 22,000 tons of hydrogen and 120,000 tons of carbon monoxide per year. The top priority is to supply large quantities of carbon monoxide and hydrogen to the new plant operated by the German chemical giant Covestro, previously named Bayer MaterialScience. Its plant is dedicated to the production of TDI (toluene diisocyanate), used in particular in the production of polyurethane foams for the auto industry. Connected to Air Liquide's 600 kilometer Rhine-Ruhr pipeline, the new production unit will also allow Air Liquide to provide its other customers in the region with hydrogen.

(a) By steam reforming natural gas, an SMR (Steam Methane Reformer) produces hydrogen and carbon monoxide.

Sales in the region rose by 5.7%. Sales in China rose by 11.4% in 2015, mainly driven by Large Industries and the ramp-up of units that started operating there in 2014. Revenue increased in Japan, boosted by the Electronics activity and in particular by strong sales of advanced molecules. The Electronics activity performed well throughout the region, with sales up +15.1%. Industrial Merchant sales, stable in the region, grew strongly in Southeast Asia excluding Singapore. The Group has completed construction of the new Research & Technology center in Shanghai, China, reinforcing its innovation ecosystem in the area.

**€3,850 M**  
2015 GAS AND SERVICES  
REVENUE

## # ELECTRONICS: NEW CONTRACTS

The enthusiasm for smartphones and other mobile devices on a global scale is also reinforcing demand for more efficient semiconductor components, such as mobile app processors, wireless communication chips, and memory. This trend has gained strength thanks to the Internet of Things and the rise of Big Data. Against this buoyant backdrop, Air Liquide signed several new long-term contracts in 2015 with the major semiconductor manufacturers in Japan, in Singapore, and in Taiwan. The Group will invest more than 100 million euros for the supply of ultra-pure carrier gases – such as nitrogen – to customer fabs that manufacture integrated circuits and memory for consumer electronics and mobile devices. These investments in world class efficiency ultra-high purity on-site nitrogen generation systems represent a total capacity of more than 100,000 Nm<sup>3</sup>/hour of nitrogen.



**Electronics**, serving the development of the Internet of Things.

# Americas



The combination of **Air Liquide** and **Airgas** will bring together two complementary businesses.

## # AIRGAS

Sales in the region increased by a slight 0.3%. In North America, a slowdown occurred in 2015 in sectors related to oil and gas production and metal fabrication, which impacts Industrial Merchant. In Electronics, growth was significant in carrier gases, specialty gases, and services, and remains very dynamic in advanced materials. For Large Industries, growth picked up in the second half of the year in the Americas. In Healthcare, where sales increased by +7.1%, activity was particularly dynamic in Canada and South America.

**€3,595 M**  
2015 GAS AND SERVICES  
REVENUE

In November 2015, Air Liquide signed a merger agreement to acquire Airgas, the leading supplier of industrial, medical and specialty gases in the United States. Once completed, this major combination will strengthen Air Liquide's global leadership position. Already number 1 in Europe, in Middle East and Africa, and in Asia-Pacific, the Group will also become the leader in the North American market, and will swell its presence in the United States. For the customers of the two companies, the opportunities are numerous. Indeed, the strong complementarity of the two companies will allow them to offer products and services with greater added value that are even more innovative, both in North America and the rest of the world. Air Liquide will be ideally positioned to generate the growth of tomorrow thanks to a stronger presence in the U.S. market, the world's largest for industrial gases and a unique platform to accelerate digital transformation in the Industrial Merchant business.



## Middle East and Africa



The Middle East and Africa recorded strong growth of 24.2%, thanks to the start-up of two large hydrogen production units in Yanbu in Saudi Arabia in the 2<sup>nd</sup> quarter (see focus). With this start-up, the Group increased its hydrogen production capacity by 20%. In South Africa, the Group signed a major contract in 2015 to build, own, and operate the largest oxygen production unit in the world (see page 28). Lastly, the Healthcare activity is pursuing its development in this country beyond the respiratory field, providing home healthcare services for patients with chronic diseases.

**€558 M**

2015 GAS AND SERVICES  
REVENUE

### # YANBU

In the first half of 2015, Air Liquide started up its very large-scale hydrogen production site, located in Saudi Arabia's Yanbu Industrial City. Initially announced in 2010, this project, in which more than 350 million euros were invested, is the largest industrial investment and hydrogen outsourcing contract in the Group's history. With a total hydrogen production capacity of 340,000 Nm<sup>3</sup>/hour, the site – composed of two hydrogen production units and

one purification unit – will provide hydrogen for YASREF (a joint venture involving the Saudi-based Saudi Aramco and China's Sinopec), the region's largest refinery. The decision to outsource the hydrogen production of such a large refinery is a first in the Middle East and a good illustration of the Group's ability to offer its customers high value added solutions that contribute to their competitiveness over the long term.

**Yanbu**, the largest industrial project in Air Liquide's history.



Production unit at Rozenburg in the Netherlands, one of Air Liquide's largest sites in the Benelux countries.

# # THINKING long term

---

THINKING LONG TERM IS AN AIR LIQUIDE TRADEMARK.  
CREATED MORE THAN 100 YEARS AGO, THE GROUP  
ALWAYS LOOKS FURTHER.

**A**ir Liquide's long-term vision is rooted in the nature of some of its businesses, such as Large Industries, where contracts of 15-20 years are the norm. It is reflected in the Group's strategy of delivering profitable growth over the long term. This vision is also expressed through the way the Group is managing, investing, opening new markets and innovating. Finally, it is illustrated in how we develop talent and build relations with our stakeholders: employees, customers, shareholders, partners and society as a whole.

Thinking long term also means anticipating the major challenges facing our society. The Group has identified three major trends that represent opportunities for growth: the energy and ecological transition, the changes in healthcare and the digitization (see dedicated chapter on page 44).

The challenges of energy transition are multiple. Through its new large scale proj-

ects, such as for its customer **Sasol** in South Africa (see page 28), or as sources of future technologies like **Cryocap™** in France (see page 30), Air Liquide offers energy solutions that help customers efficiently improve their competitiveness and reduce their ecological footprint.

Air Liquide also provides solutions to the evolving world of healthcare to face the challenges of lengthening lifespans, the increase in chronic diseases and the rising demand for healthcare in developing economies. **Acquisitions** made in the Healthcare sector in 2015 (page 32) demonstrate the company's ongoing commitment to providing new product offerings and services that benefit healthcare professionals and patients.

Finally, Air Liquide also looks to the future in preparing employees to become **tomorrow's leaders** (page 34). Through its training, mentoring and mobility programs, the Group supports employees in their careers over the long term.

# Sasol, large-scale project

---

THE WORLD'S LARGEST OXYGEN PRODUCTION UNIT WILL BE LOCATED AT THE SECUNDA SITE IN SOUTH AFRICA. THE INDUSTRIAL COMPANY SASOL, A LONG-STANDING CUSTOMER, ENTRUSTED AIR LIQUIDE WITH THE UNIT'S CONSTRUCTION AND OPERATION FOR THE NEXT TWENTY YEARS.



Sasol's industrial site at Secunda in South Africa.

**T**hrough their 40-year partnership, Air Liquide and Sasol, an international integrated energy and chemicals company, have worked together in developing a major oxygen production site at Secunda, consisting of 16 Air Separation Units (ASU). The units, the world's largest ever designed, were built for the customer by Air Liquide's Engineering and Construction teams through six successive orders spanning a number of years. The massive 17<sup>th</sup> ASU, with yet unsurpassed dimensions, opens a new chapter of this long-term partnership based on trust.

### **A major milestone**

The 20-year industrial gas supply contract signed in 2015 represents an important step forward in this partnership as it is the first time that Sasol will be outsourcing the

oxygen it needs to produce synthetic fuels at Secunda. Air Liquide will invest around 200 million euros to build and operate the world's largest ASU. With total capacity of 5,000 tons of oxygen per day<sup>(a)</sup>, the unit is designed to ensure maximum efficiency and safety, helping to improve the reliability of the entire Secunda site and extend its life until 2050. It will also enable Air Liquide to supply oxygen, nitrogen and liquid argon to Industrial Merchant customers in the region, capitalizing on the growing market for industrial gases in South Africa.

### **Record-setting ASU**

With start-up scheduled for the end of 2017, the new unit will set new records for size: from the biggest air compressor ever built, driven by a 65-megawatt motor, to the air distillation columns integrating latest

#

## AIR LIQUIDE IN SOUTH AFRICA

Present in the country for over 60 years, Air Liquide employs today 800 people and continues to expand its business. It provides industrial gases and specialty gases in several industries: steel, automotive, food and beverage, mining, petrochemicals, pharmaceuticals and glass. A leader in home healthcare services with nearly 9,000 patients taken care of, Air Liquide is also well positioned in the market for medical gases. With its latest project for Sasol, the Group confirms its industry leadership and expertise in advanced technologies, while renewing its commitment to contributing to southern Africa's development.



### THE WORLD'S BIGGEST ASU

€200 M  
INVESTMENT

170,000  
HOURS OF  
ENGINEERING

### PROJECTED ENERGY SAVINGS

30  
MEGAWATTS SAVED  
EACH YEAR

equivalent consumption  
of 20,000 homes



500,000 m<sup>3</sup>  
OF WATER SAVED EACH YEAR



230,000  
TONS OF CO<sub>2</sub> EMISSIONS  
AVOIDED EACH YEAR



equivalent  
emissions of a  
European city  
of 26,000  
people

design developments, providing efficiency benefits, including during their transportation. Air Liquide is manufacturing them in its new Engineering and Construction Manufacturing Center in Ras-Al-Khaimah, in the United Arab Emirates, located on the seacoast, which will greatly facilitate their transport by ship to South Africa.

In addition to the technological challenge, the new Sasol project represents an extraordinary human achievement, involving Air Liquide teams worldwide. The Engineering and Construction centers in Champigny and Vitry in France, Delhi in India and Johannesburg in South Africa are at the center of the international coordination that is key to the project's success.

### Long-lasting efficiencies

The new ASU will benefit from the most advanced methodologies and technologies implemented by the Engineering and Construction teams, generating efficiencies at different levels. For example, energy use, which has improved by 25% over 40 years. Identifying efficiencies is a focus that begins with the design of the unit in order to ensure optimum levels of reliability as part of a highly responsible approach.

(a) Secunda being located at an altitude of 1,600 meters, the production capacity is equivalent to 5,800 tons per day at sea-level.

# Cryocap™, technology of the future



**100,000**  
TONS OF CO<sub>2</sub>

ANNUAL CAPTURE  
CAPACITY OF CRYOCAP™  
AT THE PORT-JÉRÔME  
SITE



**How is Air Liquide  
investing in  
a decarbonized future?**

Find out on  
[airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)





#

## **DISRUPTIVE TECHNOLOGY**

Cryocap™ allows for the capture of CO<sub>2</sub> emissions released during the production of hydrogen through the natural gas reforming process, while also improving efficiency via higher hydrogen production levels. The Cryocap™ technology entails using low temperatures to compress, liquefy, and then separate gases. Cryocap™ captures the CO<sub>2</sub> generated – up to 90% of total emissions – and recovers the residual hydrogen. To refine this technology of the future, Air Liquide invested around 30 million euros and benefited from public funding to the tune of almost 9 million euros.

**It's a world premiere.** In November 2015, Air Liquide inaugurated in France Cryocap™, a unique industrial installation that enables the capture of CO<sub>2</sub> via a cryogenic process. Implemented for the very first time in Port-Jérôme, at Air Liquide's major hydrogen production unit in France, Cryocap™ is the fruit of a collaborative effort involving Air Liquide's Research & Development, Engineering and Construction, and French operational teams.

### **Upgrading the CO<sub>2</sub>**

Above and beyond the environmental value of Cryocap™, this technology also presents an economic interest. Indeed, the captured CO<sub>2</sub> is purified and packaged for sale. At the Port-Jérôme site, Cryocap™ enables the recovery of 100,000 tons of CO<sub>2</sub> per year, which are valorized to meet the needs of numerous local customers. Among them, food-related industries use it in freezing, beverage carbonation, and food preservation. It is also used in greenhouse farming, where it speeds up the process

of photosynthesis and improves crop yields. Lastly, its slight acidity makes CO<sub>2</sub> a valued component of water treatment, regulating pH content and neutralizing effluents. In addition, it has the ability to remineralize some drinking water.

### **Blue Hydrogen**

Cryocap™ is part of the Blue Hydrogen initiative of Air Liquide, whose aim is to gradually move toward the carbon-free production of hydrogen dedicated to energy applications. Specifically, Air Liquide has pledged that by 2020 it will produce at least 50% of the hydrogen needed for these applications, from carbon-free energy sources by using, for example, the technologies for the capture and enhancement of CO<sub>2</sub>. In fact, the Cryocap™ technology is contributing to carbon-free hydrogen mobility for the hydrogen-powered electric vehicles being put on the market.

# Healthcare acquisitions accelerating growth

THE GROUP'S HEALTHCARE BUSINESS HAS DEVELOPED OVER THE YEARS THROUGH SOLID ORGANIC GROWTH AND TARGETED ACQUISITIONS IN HOME HEALTHCARE AND HYGIENE, BOTH WITHIN AND BEYOND EUROPE.

MORE THAN

€1 Bn

OF INVESTMENT IN HEALTHCARE ACQUISITIONS IN 5 YEARS



**D**uring the past forty years, the Group has become a major actor of healthcare, gaining recognition for its expertise and know-how from both healthcare professionals and patients. In 2015, the Group continued its strategy of targeted acquisitions, enabling it to consolidate its positions, solidify its presence in key countries and extend its service offer to support patients and healthcare professionals throughout the continuum of care. Air Liquide knows how to adapt to various established healthcare systems and their extent of maturity, depending on existing financing mechanisms.

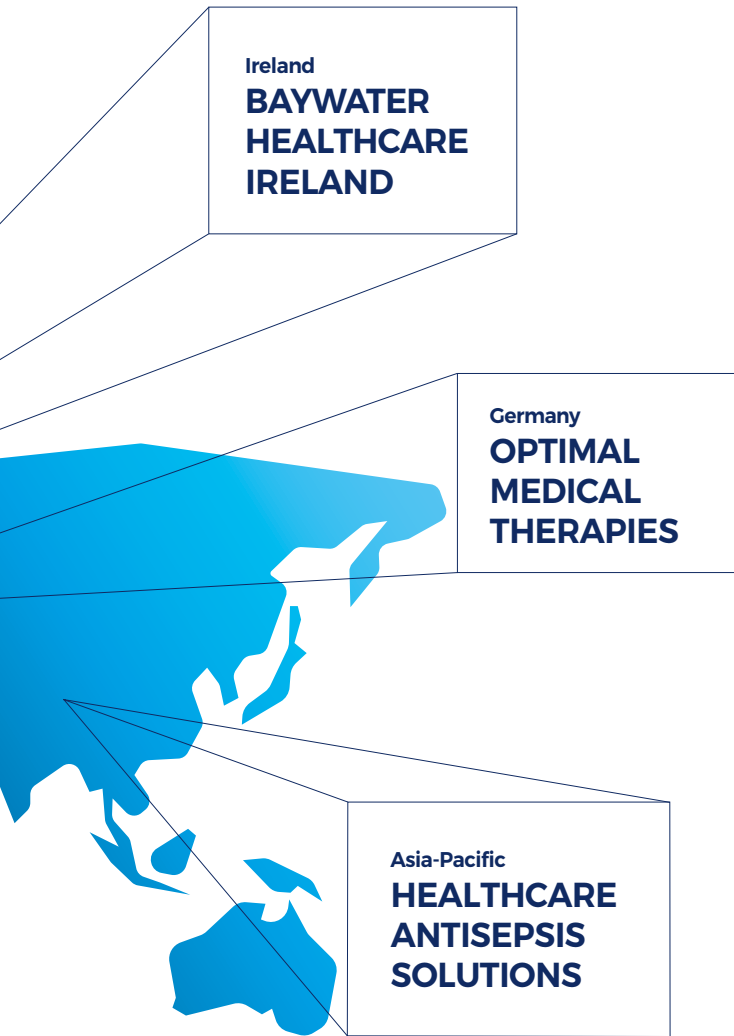
## A strategy of targeted acquisitions

According to local stakes, the Group considers three types of acquisitions. The first are those that strengthen its geographic presence, as is the case in Europe with the Irish company Baywater Healthcare Ireland Ltd. Acquired by Air Liquide in June 2015, the company has been a major player in Ireland's home healthcare sector for thirty years, recognized for its expertise in the treatment and monitoring of respiratory diseases in the patient's home, including oxygen therapy, treatment of sleep

apnea and non-invasive ventilation. The acquisition positions Air Liquide to develop on a new growth market in Europe.

Other targeted acquisitions allow Air Liquide to enter new regions, such as in Eastern Europe with the Czech company Bochemie's hygiene division or in Asia-Pacific with Antiseptics Healthcare Solutions (HAS), the disinfection and skin hygiene business of Advanced Sterilization Products, a division of Ethicon, Inc. (see focus).

Finally, certain acquisitions may lead to the deployment of new services, such as Optimal Medical Therapies, a specialist in providing home healthcare services for patients in Germany suffering from chronic illnesses requiring infusion therapy. In taking a majority stake (65%) in January 2015, Air Liquide reinforced its expertise in infusion therapy, including treatment of pulmonary hypertension. The acquisition illustrates the Group's commitment to combining innovative technologies and high added value care to treat patients suffering from chronic illnesses.



**Responsible approach**

These acquisitions also enable Air Liquide to fully establish its presence in a country by sharing its know-how and expertise and adopting an open innovation approach. Air Liquide applies a responsible policy of integrating new acquisitions, assimilating new team members and deploying its methods and best practices, including in terms of safety. Knowledge sharing between teams is also encouraged in order to best serve patients and healthcare professionals.



**How is Air Liquide reinforcing its expertise on Parkinson's disease?**

Find out on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

#

**HEALTHCARE ANTISEPSIS SOLUTIONS OPENS NEW DOORS IN ASIA-PACIFIC**

The June 2015 acquisition of Healthcare Antiseptic Solutions (HAS) by Schülke – an Air Liquide subsidiary specializing in hygiene, disinfection and prevention of contamination in medical environments - opens new geographies for the Group and enriches its existing product portfolio. The wide range of HAS solutions for skin disinfection in hospitals (antimicrobial gel, antiseptic solutions, disinfectants...) are distributed in numerous countries in the Asia-Pacific region under the renowned Microshield® brand name.

This acquisition represents a major geographic expansion of Air Liquide's Hygiene activities. Leveraging the experience of its existing teams, the Group is pursuing the development and distribution of HAS products in new countries and with an expanded range of proposed solutions.

**Bertrand Masselot**  
Managing Director, Schülke



“

WE WERE ABLE TO COMPLETE THE ACQUISITION OF HAS AND INTEGRATE ITS ACTIVITIES AND TEAMS IN RECORD TIME, THANKS PARTICULARLY TO THE AIR LIQUIDE HEALTHCARE TEAMS ALREADY BASED IN THE REGION. THIS ACQUISITION OPENS UP A NUMBER OF PROSPECTS, INCLUDING IMPROVING OUR GEOGRAPHIC COVERAGE, AND WILL ENRICH OUR PRODUCT LINES, ENABLING US TO OFFER A WIDE RANGE OF SOLUTIONS ACROSS THE ASIA-PACIFIC REGION. THE ACQUISITION ALSO PROVIDES NEW OPPORTUNITIES OF DEVELOPMENT FOR OUR TEAMS.

”

# TOMORROW'S leaders



“

The opportunities I've been provided to develop in a lot of businesses and different cultural environments have broadened my perspective. Rather than choosing just one door, it's been a feeling of choosing many doors at once.

”



## Marilène Turcotte

Energas Managing Director and  
United Kingdom Industrial Packaged Gases Business Unit Manager

Vital to Air Liquide's long-term growth is preparing tomorrow's leaders to manage current and future business challenges. Through specific training programs as well as diverse and international career assignments, managers develop the skills and experience needed to lead teams, accelerate change and improve performance. Marilène Turcotte's career path at Air Liquide is one living example of the Group's focus in talent.



Discover three other talent  
career paths at Air Liquide

on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

### OPENING DOORS

In just 10 years with Air Liquide, Marilène Turcotte has already experienced a lot. Recruited in Canada after completing an MBA (Master of Business Administration) internship with the company, Marilène was expatriated to France to work for the Industrial Merchant activity. Other international postings followed: a special task force mission in Japan, then to Houston as Chemical Market manager and Customer Relationship manager followed by another tour in France working on growth-innovation strategy before her current operational role in the United Kingdom. This diverse career path is no mere coincidence: "I'm now responsible for implementing the strategy I helped develop," she says.



**From mentee to mentor**

For Marilène, the support provided through training and mentoring programs at each step of her career played an important role in her progression. *“My first assignment in France was through a program designed for recent graduates. My manager really helped me to ramp up into the position, to adapt and to contribute. A few years later, I participated in Air Liquide University’s Stretch leadership development program, where we worked directly with senior management on strategic topics and further developed our network and skills.”*

**Driving long-term improvement**

She says that training programs and her professional experience alike have shaped her approach to problem-solving, innovation, leadership and long-term improvement. *“In my position as a manager, I look for ways to empower and inspire others to constantly propose new ideas and to push good ones forward. More frequently, it’s an ongoing stream of small, incremental improvements to solve problems, become more customer-centric and drive toward better performance. Long-term improvement is about striking the right balance between accelerating change while remaining true to our fundamentals.”*



Port-Jérôme site, Air Liquide large hydrogen production unit in France, where the Group inaugurated Cryocap™, an industrial facility unique in the world that enables cold capture of CO<sub>2</sub>.

# # CREATING value together

---

AIR LIQUIDE ENCOURAGES A COLLABORATIVE SPIRIT  
WITHIN ITS TEAMS AS WELL AS CO-CONSTRUCTION  
WITH ITS STAKEHOLDERS. COLLECTIVE INTELLIGENCE  
WHICH FOSTERS THE COMBINATION OF ENERGIES  
AND KNOWLEDGE TO PRODUCE NEW IDEAS  
AND CREATE VALUE.

**C**ultivating a collaborative spirit internally helps generate new ideas and innovation, the sharing of best practices and know-how, and improved efficiency and competitiveness. In actively working together with customers and partners, Air Liquide reinforces its agility and ability to respond quickly to identified needs.

Building together is also essential to innovation. Connected to innovation ecosystems worldwide, Air Liquide has strengthened its external partnerships in recent years with universities, research centers and start-

ups. This open innovation approach unlocks a variety of perspectives and skills that are essential to imagining the products and services of tomorrow. It enables better anticipation of market trends and practices and exploration of new growth opportunities.

Whether the internal collaboration of teams in multiple countries to achieve a breakthrough in semiconductors (see page 38), working closely with a customer to design a customized oxy-combustion solution (see page 40) or supporting open innovation through an investment in the start-up Sigfox by the Group's venture capital entity ALIAD (see page 42), Air Liquide confirms how ideas developed together create value over the long-term.

# Team effort delivers technological breakthrough

---

AIR LIQUIDE IS THE INDUSTRY LEADER IN ELECTRONICS ADVANCED MATERIALS, OFFERING THE ALOHA™ AND VOLTAIX® PRODUCT LINES AS PART OF THE PORTFOLIO. TO RESPOND TO THE INCREASINGLY COMPLEX ARCHITECTURES OF ELECTRONIC DEVICES, THE GROUP CONTINUES TO EXTEND AND IMPROVE MATERIALS, CREATING NEW SYNERGIES AMONG THE TEAMS AND IN THE RESEARCH AND MANUFACTURING ECOSYSTEM.

**A**n intensive company-wide collaborative effort has led to a breakthrough in developing a family of etch gas molecules for the semiconductor industry. Manufacturers use etch gases to selectively remove layers deposited on the tiny surfaces of microchips to improve their performance. It is one among many examples of the technological expertise Air Liquide provides to customers. Collaboration involving multiple Air Liquide teams in multiple countries is an essential element to delivering regular innovation in this field.

## Multinational effort

Initial samples of the molecules are produced at Air Liquide Research & Development Centers in Japan and the United States. The Research & Development teams work closely with Electronics World Business Line teams who maintain direct

contact with customers, helping define the precise technical requirements for the materials.

“

As we approach the physical limits of how much chip size can be reduced, we are finding ways to achieve new levels of performance by changing the intrinsic physical characteristics of the chip.

”

**Ashutosh Misra**

Chief Technology Officer, Electronics, Air Liquide

Equally important to the molecule's development is ensuring its uninterrupted, affordable, high volume production and a robust business continuity plan. Product development teams work on developing the technical capabilities and operational subsidiaries invest in the construction of production facilities to guarantee reliable supply.

Support is also provided by Head Office teams in France in areas such as Contract Management and Intellectual Property. Air Liquide teams in the local countries, responsible for product delivery, work with the customer's fabrication sites, organize storage and supply chain, and ensure required safety measures are in place.

---





#

**OPEN INNOVATION**

The internal teamwork within Air Liquide is mirrored by the significant industry-wide collaboration involved in advancing semiconductor technology. In addition to the customer, Air Liquide teams work with universities and equipment manufacturers on developing molecules that address specific device fabrication challenges.

The creation of new electronic materials marks the emergence of new families of products that respond to demands for faster, more efficient and lower power consuming chips. A collaborative effort that positions Air Liquide at the forefront of technology and innovation in a fast growing market.

Working session in Tokyo with Nathan Stafford, Air Liquide Electronics Product Manager, based in the United States, and project teams in Japan.

“

The expertise of our teams, our global presence and our ability to reliably supply the right product to manufacturing facilities across the world are key reasons for our competitiveness in Electronics markets.

”

**Helena Seiver**

Strategic Account Manager,  
Air Liquide



#

**VOLTAIX®**

The 2013 acquisition of Voltaix®, the world leader in silicon, germanium and boron chemistries, complemented our ALOHA™ product line of advanced precursors, offering a full range of products while strengthening our relations with key customers and partners.

# Partnering up for air quality

IN CHINA, AIR LIQUIDE PARTNERED WITH A LEADING COPPER RECYCLER  
TO DEVELOP A TAILORED SOLUTION THAT ENABLES THE CUSTOMER  
TO MEET STRICT EMISSIONS LIMITS WHILE HALVING  
ITS ENERGY COSTS.

In response to heightened concerns about air quality, the Chinese government has been implementing rigorous new measures to control air emissions. Among the industries required to cut pollution is non-ferrous metal recycling. Shandong Tian Yuan Copper Industrial Company, one of China's major producers of recycled copper, turned to Air Liquide to help meet a triple challenge: reduce emissions of carbon dioxide (CO<sub>2</sub>) and mono-nitrogen oxides (NO<sub>x</sub>), improve its cost competitiveness and finally gain flexibility to enable it to expand future production with existing equipment.

## Customized response

Air Liquide formed a dedicated project team which evaluated Tian Yuan's processes and recommended a customized solution based on its oxy-combustion technology. Oxy-combustion is based on the enrichment of air with pure oxygen in order to reduce fuel consumption – and thus energy costs – while also significantly reducing pollutant emissions.

Although the technology was already in use in glass production, it would be the first time it would be applied to a metal recycling process in China. It also would be Tian Yuan's first time working with Air Liquide.

*“Our comprehensive offer included process expertise to determine the precise fuel and oxygen flows needed to optimize the performance of the furnaces during the copper melting process”, explains Judy Zhang, Industrial Merchant Bulk and On-site Vice President at Air Liquide China. “It also included technical support, training for Tian*



Supplying liquid oxygen at the Tian Yuan site.

Yuan's operators, burners, a unique control system and a substantial, reliable supply of liquid oxygen."

**A partnership built on trust**

Staying in constant contact throughout the project, the two companies' teams succeeded in designing together the solution, conducting the test run, implementing the technology and launching operations in the second quarter of 2015, just four months after the initial contact.

The close collaboration has made Air Liquide much more than a supplier says Yu Youzhen, Production Director at the Tian Yuan site: "After several contacts with Air Liquide's team and an on-site inspection, we established a relationship built on trust. Air Liquide has met all of our expectations in terms of gas supply, equipment operation, technical expertise and commercial services."



**HEAT OXY-COMBUSTION**

During the international COP21 Climate Change conference in December 2015, the France-China Committee<sup>(a)</sup> awarded its 2015 Innovation Awards for "Climate Solutions" and awarded Air Liquide the Innovative Product Award for its Heat Oxy-Combustion technology. Developed by Air Liquide Research & Development teams, this breakthrough technology enables to extract heat from the combustion fumes and use it to heat oxygen and fuel. This innovation maximizes the performance of oxy-combustion - based on the enrichment of air with pure oxygen - by 10%. Compared to air combustion, it provides up to 50% energy savings and cuts CO<sub>2</sub> emissions by half. The technology is generating particular interest in China, home to approximately 50% of the world's glass production.

(a) A private, non-profit organization founded in 1979 at the initiative of the French business community and supported by French and Chinese authorities, the aim of the CFC is to promote economical and commercial understanding and knowledge between the two countries.



Yu Youzhen, Production Director at the Tian Yuan site

“

We established a relationship built on trust. We now consider Air Liquide as our strong business partner.

”

**Yu Youzhen**

Production Director at the Tian Yuan site



Jinping Yan and Judy Zhang, Air Liquide China



Discover the partnership story in video

on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

# ALIAD and Sigfox, networked innovation

---

IN FEBRUARY 2015, AIR LIQUIDE'S CAPITAL INVESTMENT SUBSIDIARY ALIAD ACQUIRED A STAKE IN THE START-UP SIGFOX, AS PART OF A RECORD 100 MILLION-EURO FINANCING ROUND. SIGFOX IS A LEADER AMONG FRENCH HIGH-TECH COMPANIES SPECIALIZING IN THE INTERNET OF THINGS.

ONE YEAR LATER, SIGFOX CEO LUDOVIC LE MOAN AND ALIAD INVESTMENT OFFICER NADIA EL ANDALOUSSI PROVIDE AN UPDATE ON THE YOUNG INNOVATION PARTNERSHIP.



#

## SIGFOX, LEADER IN CONNECTED OBJECTS

Sigfox is a French start-up that has become a world leader in the connectivity of objects and machine-to-machine (M2M) communications. In five years, it has developed the leading cellular network for connected objects.

Unique in the world, the low-speed, low-energy consumption network is independent and international. Today, seven million objects in several European countries and the U.S. are already registered on the Sigfox network and will be progressively connected in the coming months of deployment.



### Who is ALIAD?

Find out on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)



### # Why Sigfox? Why Air Liquide?

**NADIA EL ANDALOUSSI:** Investing in Sigfox - our first investment in digital - combines the Group's strategic interests in the connectivity of objects with the will of Sigfox to attract industrial investors in its capital. Sigfox is what is known as an "enabler." It provides Air Liquide with a lever for its digital transformation and paves the way for genuine business opportunities in the near and medium term.

**LUDOVIC LE MOAN:** Because Air Liquide, a world leader, started very early in the development of machine-to-machine communications and continued on with connectivity. To anticipate its customers' industrial performance needs, Air Liquide is looking for another level of connectivity to go further in its approach.

### # What do you expect now from each other?

**L. LE M.:** Most of all, a model of strong industrial partnership that leverages equity investment and sends a positive message to international investors, industrial companies and digital innovators. Beyond this, we need to share innovation and develop the network to respond to Air Liquide's needs in connectivity and industrial maintenance. Through an open innovation approach, we are working with Air Liquide teams on solutions Sigfox can bring for the Group's future industrial applications.

**N. EL A.:** We have many expectations but the initiatives coming from the investment are mainly focused around new usages and business models that Sigfox technology can help us generate or test. We have held several internal workshops in France, Spain and the United States, bringing together all of the Group's activities. We sense a very strong appetite for this technology. Sigfox brings an insider's perspective and plays a catalytic role in leading change.

### # Have you already identified possible applications for Air Liquide?

**L. LE M.:** Of course, including improving the supply chain, in medical applications...

**N. EL A.:** At the Mobility for Business show in Paris last October, Athélia, Air Liquide's subsidiary specializing in traceability services, joined Sigfox in presenting the django® cloud technology, which uses predictive maintenance to anticipate breakdowns. Installed on a device, this module uses a sensor to monitor the status and collect performance data. We expect to see collaborations such as this gain momentum in the coming months.

“  
Most of all,  
a model of strong industrial  
partnership  
”



**Digital acceleration is revolutionizing usages**  
for Air Liquide customers, patients, shareholders,  
partners and employees.

# # MOVING FORWARD with digital

---

TECHNOLOGICAL LEAPS, CONNECTED NETWORKS,  
A USAGE REVOLUTION... THE DIGITAL TRANSFORMATION  
IS INFLUENCING AIR LIQUIDE'S MARKETS,  
BUSINESSES, PRODUCTS AND ORGANIZATION.  
A NEW FIELD OF POSSIBILITY AND VALUE CREATION  
FOR THE GROUP.

**E**-commerce, cloud, apps, data... everywhere, our world is being rapidly transformed by digital. Following computers and phones, it is the turn for household objects and industrial and health equipment to become connected. A revolution of usages is underway for Air Liquide's customers, patients, partners and employees.

In addition to leveraging it as a driver of growth, Air Liquide views digital as a means to establish new ways of working more collaboratively across boundaries. New infrastructures, technologies and connected devices are enabling development of products and services that transform the user experience for customers and patients, with increased agility and simplicity.

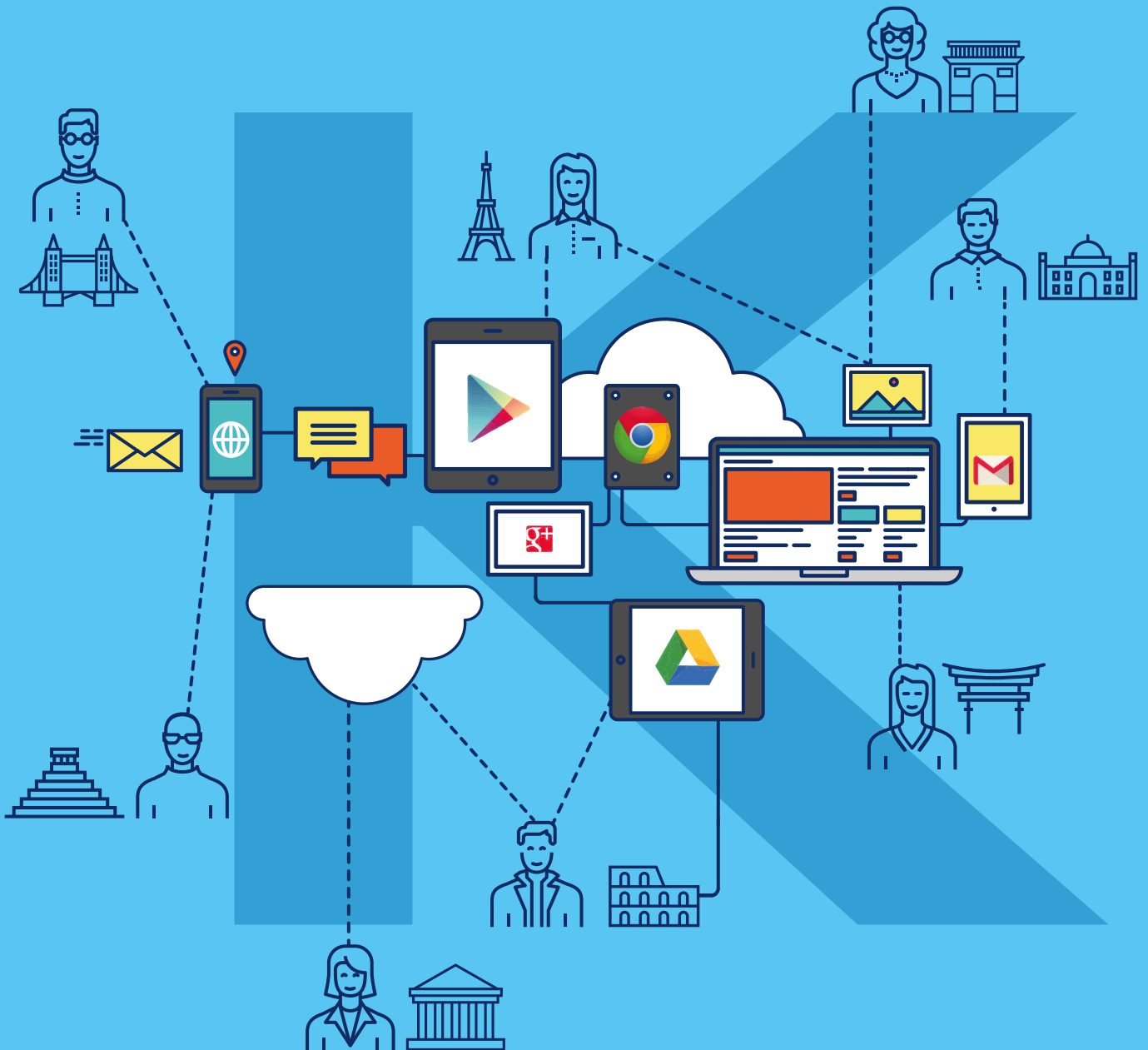
From healthcare to industry and new markets, Air Liquide now has more than 150,000

connected objects. Over two hundred digital initiatives emerged in 2015 within the Group: Big Data, the Internet of Things, communities, customer service portals, mobility and constant connectivity, augmented reality, 3D printing... Among them, the internal collaboration platform Kite (see page 46), an online portal in Scandinavia tested and co-developed with customers and distributors (see page 48) and the sleep apnea website and information app (see page 50).

Tomorrow's developments, such as the introduction of new technologies in production units and the combining of customer and patient data management with external data, will open the way for new services, differentiated offerings and better patient support. So many new fields of endeavor that demonstrate Air Liquide's accelerating digital transformation.

# Kite: collective intelligence on the rise

AIR LIQUIDE'S INTERNAL COLLABORATIVE DIGITAL PLATFORM IS STRENGTHENING THE CULTURE OF TEAMWORK WITHIN THE GROUP.





**L**aunched in 2014, Kite is Air Liquide's internal collaborative digital platform. The new 100% digital work environment is already increasing the Group's agility, efficiency and competitiveness. How? By providing employees with tools to better organize their work and make the best use of their time as well as to share information faster and benefit from the wealth of knowledge that exists within the Group.

#### **A simple and agile platform**

Shared across the Group's 80 countries, the Kite digital platform offers significant added value for a global leader like Air Liquide. Easy to use, fully integrated and secure, it enables employees anywhere in the world to work on the same document simultaneously. The result: savings in time, cost efficiency and productivity.

#### **Collaborative work, a daily reality**

More than a year after its launch, Kite has led to new ways of working and collaborating. Following Kite's introduction to employees and the gradual adoption of messaging tools, contacts and shared calendars, the collaborative Phase 2 was launched in October 2015 to strengthen networking and further develop the Group's collaborative culture. Implementation of new tools such as shared document libraries, personalized intranet sites and discussion forums encourage communities of experts to share best practices, regardless of their location. The new agile, cross-company approach, embraced by employees, exemplifies Air Liquide's digital culture and creates new synergies with customers and partners. Through the leveraging of collective intelligence made possible by Kite, Air Liquide is finding new ways to respond to stakeholder expectations.

With the Kite digital platform, teams can share information faster and benefit from the wealth of knowledge that exists within the Group.

“

Kite opens a world of possibilities. More than an IT tool, its value lies above all in its ability to help us work better together, including with our customers and partners. It's transforming the way we work daily.

”

**Vincent Roulet**

Director of the Kite project, Air Liquide

# Digital platform enhances customer experience

ORDERING GAS SUPPLIES IS BECOMING QUICKER AND EASIER FOR AIR LIQUIDE CUSTOMERS THANKS TO A NEW ONLINE PORTAL PILOTED IN 2015 IN SCANDINAVIA. THE EASY-TO-ACCESS PORTAL REDEFINES HOW CUSTOMERS EXPERIENCE AIR LIQUIDE AND FURTHER INCREASES THEIR SATISFACTION.

#

## DISTRIBUTOR BENEFITS

Digital solutions are also bringing changes to Air Liquide's relationship with its distributor network. For the company's 350 distributors in Scandinavia, the online portal is helping to retain existing customers and attract new ones, as more of them look exclusively for digital interactions today. And for each new contract signed online, the customer picks up his gas at the distributor's sellhouse, creating new opportunities for distributors to cross-sell additional products and services.



Discover a distributor's testimony

on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

Using the new portal, customers are able to place their orders online in less than a few minutes, even if they are first-time Air Liquide customers. In four clicks, visitors can select the right gas for the right application, get a customized price proposition and generate the contract. A final click and the order is complete and ready for delivery or pick-up through Air Liquide's vast distributor network. In addition to the ease of finding and choosing the product best adapted to the customer's needs and personalized profile, customers can also easily access follow-up information (invoices, delivery notes, stock balance), request assistance, file claims, track order status and get quick answers to their questions.

### Customer tested

Key to the portal's rapid adoption by customers in Scandinavia were intensive consultations with existing customers and distributors during the design phase. More than 100 customers took part in testing the portal prior to its launch and are providing ongoing feedback being used to further improve the portal's capabilities. This focus on customer expectations has contributed to the portal's success, reflected in a significant conversion rate of new customers for ordering and con-

sulting information, and also increased loyalty by existing customers. The digital interaction is also providing valuable data and insights into customer needs and behaviors, opening new business opportunities.

### Reshaping the customer journey

As digital solutions and platforms continue to expand within the Group, they are transforming the "customer journey,"<sup>(a)</sup> offering an easier, more agile and transparent means of doing business with Air Liquide for both existing and future customers. The importance of the initiative to Air Liquide's relationship with customers, distributors (see focus) and other stakeholders is reflected in the breadth of company departments involved in the project, including supply chain, marketing, communications, IT, business and sales teams. This internal ecosystem is working to make the digital transformation a growth enabler and a source of sustainable competitive advantage for Air Liquide.

(a) The customer journey encompasses all of the touch points experienced by the customer in interacting with a company and its brand, including Choosing a product or a service, Purchasing, Service & Support and Retention.



“

IN DESIGNING OUR APPROACH, WE MADE SURE THAT CUSTOMERS WERE HIGHLY INVOLVED IN THE PROCESS AND KEPT OUR FOCUS ON THEIR EXPECTATIONS. WE'RE NOW IMPROVING THE SYSTEM BASED ON FEEDBACK TO BUILD ON THE INITIATIVE'S SUCCESS.

”

## Vincent Dauchy

Digital Strategy Manager for the project, Air Liquide



**Air Liquide Scandinavia, initiator of the project,** regularly organizes workshops in Copenhagen between the different teams to guide the platform's development.



“

AIR LIQUIDE'S DIGITAL PORTAL IS FULLY CONSISTENT WITH THE GROWING TREND TOWARD ORDERING SERVICES ONLINE AND THE KIND OF INITIATIVE I'VE COME TO EXPECT FROM THEM AS A LONG-STANDING CUSTOMER. IT HAS CERTAINLY MADE DOING BUSINESS WITH AIR LIQUIDE EASIER, QUICKER AND EVEN MORE RELIABLE AND TRANSPARENT.

”

## Jacob Bryde Frisk

Operational Laboratory Manager, Intertek, Denmark



# All you need to know about sleep apnea

A KEY PLAYER IN THE MANAGEMENT OF OBSTRUCTIVE SLEEP APNEA SYNDROME, AIR LIQUIDE HAS DEVELOPED AN ARRAY OF DIGITAL TOOLS FOR THE PUBLIC, PATIENTS AND HEALTHCARE PROFESSIONALS TO INCREASE UNDERSTANDING OF THE DISEASE AND FACILITATE PATIENT MONITORING.



**W**ith [all-about-sleep-apnea.com](http://all-about-sleep-apnea.com) Air Liquide launched its first website for patients and the public at large in September 2015. Available in English and French, the site provides practical information on the still frequently misunderstood and under-diagnosed syndrome, helping patients and their families and friends to cope with the disease and better understand the treatment. By facilitating the patient's journey and raising awareness of the importance of adherence to treatment, Air Liquide seeks to improve quality of life for all.

#### **The connected information source**

Simple and immersive, [all-about-sleep-apnea.com](http://all-about-sleep-apnea.com) offers a complete exploration of the disease, from knowledge to treatment, includ-

---

**1 TO 6%**

OF ADULTS SUFFER FROM SLEEP APNEA WORLDWIDE<sup>(\*)</sup>.

NEARLY

**80%**

OF PEOPLE WITH OBSTRUCTIVE SLEEP APNEA SYNDROME (OSA) ARE UNAWARE THEY HAVE IT<sup>(\*)</sup>.

---

ing how to recognize, diagnose and live with sleep apnea and how to discuss it with one's doctor. Going further, the site offers a test to determine whether the user is at risk and encourages those with concerns to seek expert medical advice.

The site experience is enriched through written testimonies and videos from patients and medical experts and regular news updates provide practical and thematic advice, adapted to the concerns of patients. Air Liquide has also launched a Twitter newsfeed -@SleepApneaAbout - making key information on sleep apnea available for easy sharing.



**@SleepApneaAbout**  
**#patientmonitoring#treatmentcompliance**  
**#qualityoflife**



#

## WHAT IS KNOWN ABOUT SLEEP APNEA?

Obstructive sleep apnea syndrome (OSAS) is the most common form of sleep apnea.<sup>(b)</sup> Caused by a temporary airway obstruction in the throat<sup>(c)</sup>, it is characterized by involuntary and repeated breathing interruptions during sleep. These interruptions can last 10 seconds or more<sup>(d)</sup> and be repeated up to hundreds of times a night. The condition affects men and women of all ages.<sup>(e)</sup> In the absence of treatment, the disease can directly affect quality of life and health, including causing serious cardiovascular disorders. The reference treatment<sup>(f)</sup> is sleeping with a continuous positive pressure ventilation unit, which keeps the airway open.

<sup>(b)</sup> The World Health Organization. Chronic respiratory diseases  
[www.who.int/gard/publications/chronic\\_respiratory\\_diseases.pdf](http://www.who.int/gard/publications/chronic_respiratory_diseases.pdf)

<sup>(c)</sup> Obstructive Sleep Apnea – A guide for GPs – British Lung Foundation (NHS)

<sup>(d)</sup> Rules for Scoring Respiratory Events in Sleep: Update of the 2007 AASM Manual for Scoring of Sleep and Associated Events – Journal of Clinical Sleep Medicine, Vol. 8, No. 5, 2012

<sup>(e)</sup> Sleep breathing disorders – European Respiratory Society WhiteBook (chapter 25)

<sup>(f)</sup> Clinical Guidelines for the Manual Titration of Positive Airway Pressure in Patients with Obstructive Sleep Apnea, Positive Airway Pressure Titration Task Force of the American Academy of Sleep Medicine, Journal of Clinical Sleep Medicine, Vol. 4, No. 2, 2008

### Prolonged experience

To complement this information system, Air Liquide developed a mobile app dedicated to sleep apnea. Presented in September 2015 at the Annual International Congress of the European Respiratory Society in Amsterdam, the app extends support beyond the home to help patients better manage their condition. Designed to deliver therapeutic educational content, it helps patients manage their chronic illness and encourages dialogue with healthcare professionals and Air Liquide teams.

This is also a goal of the medical remote monitoring device NOWAPI<sup>TM(a)</sup>, which Air Liquide has further refined to optimize patient-physician interaction and encourage better treatment compliance.

(a) Produced by Air Liquide Medical Systems S.A. It is classified as a IIa medical device under EU regulations, CE marking CE0459. This information is not intended to substitute for a prescribed treatment from a physician, who is and must remain the patient's authoritative partner and source for medical advice. The usage manual should be read closely. January 2016

# POSITION ÉNERGÉTIQUE

VOUS AVEZ EXPLOREZ ET TESTÉ L'APP DE VOS  
ENTOURÉ GRÂCE AUX TABLETTES À VOTRE  
DISPOSITION !

Basé sur un réseau d'agents connectés, e-Share  
For My Air + réalise ses mesures en temps  
réel de la qualité de l'air à partir de...



#

# FINANCIAL

Information



Presentation of the digital services for shareholders  
at the Air Liquide stand during the Actionaria Fair,  
France, November 2015.

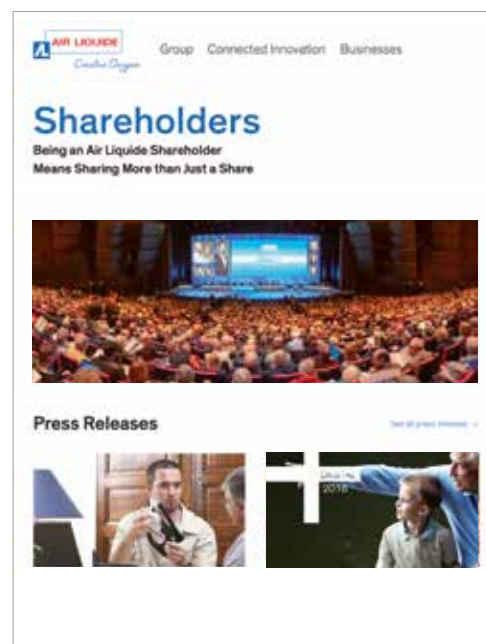
# New digital era

THE WEBSITE IS A KEY FORUM FOR DIALOGUE BETWEEN A COMPANY AND ITS SHAREHOLDERS - 9 OF 10 VISITORS CONSULT THE WEBSITES OF COMPANIES IN WHICH THEY INVEST.<sup>(a)</sup> AIR LIQUIDE ENSURES THAT ITS WEBSITE OFFERS VISITORS A UNIQUE DIGITAL EXPERIENCE.

#

## MY PERSONAL SPACE

[airliquide.com](http://airliquide.com) also innovates through its customized services offer to Group shareholders. The shareholders section is the most visited area of the site. In three clicks, registered shareholders can access their secure personal space or consult their portfolio, their rights to the loyalty bonus and their personal information. They can also customize by choosing the news and publications of most interest to them. Registered shareholders can place their share trading orders 24/7, view the history of their transactions, find the average unit price of their share and access useful documents: IFU (single tax form), etc.



### Window on the Group

The primary point of entry to the company's universe, [airliquide.com](http://airliquide.com) – for which the new version went online in 2015 – functions like an international hub. Both educational and innovative, the new website offers visitors quick access to all relevant information according to their profile. User-oriented, simplified and immersive, it was designed by analyzing the surfing habits of its various audiences in order to serve them better. Rich in video and graphics, testimony, stories and illustrations, it provides each visitor with an unparalleled digital experience through which to discover the diversity of the Group's activities.



Discover the testimony of an Air Liquide shareholder on his digital experience

on [airliquide.com/2015annualreport](http://airliquide.com/2015annualreport)

### Permanent dialogue

Still rare among major companies in France, Air Liquide's web conferences have proved popular. A November 30, 2015 event, on the topic of transfer of assets, was broadcast live from Air Liquide headquarters, with 60 shareholders attending in person and nearly 1,100 participants following online and able to ask questions directly to Group experts. A recording of the broadcast also has been posted on the website.

In addition, for the first time, a post General Shareholders' Meeting will be webcast on May 24, 2016 from Bordeaux, with Benoît Potier responding to shareholders' questions via an online forum. The new interactive experience enriches a well established digital channel that has produced items such as the shareholder app, the invitation to the General Shareholders' Meeting and digital editions of the Shareholders Letter and Shareholder's Guide.

(a) Source: *Le revenu*, October 2015

# An ongoing dialogue

---

AIR LIQUIDE ATTACHES PARTICULAR IMPORTANCE TO THE QUALITY OF ITS RELATIONSHIPS WITH INDIVIDUAL AND INSTITUTIONAL SHAREHOLDERS. INVESTOR RELATIONS DIRECTOR AUDE RODRIGUEZ TALKS ABOUT THE LONG-TERM DIALOGUE WITH INSTITUTIONAL SHAREHOLDERS.

## GROUP SHAREHOLDING (at December 31, 2015)

**64%**  
INSTITUTIONAL  
SHAREHOLDERS

**36%**  
INDIVIDUAL  
SHAREHOLDERS

### # Who are Air Liquide's institutional shareholders?

**AUDE RODRIGUEZ:** They're mainly investment funds, pension funds and large French and foreign insurance companies that employ financial analysts who specialize by industry (chemistry for Air Liquide) and portfolio managers. They favor long-term investment and have regularly followed our Group, its vision and its results, sometimes for more than 10 years! This helps us to build a long-lasting relationship based on trust.

### # How do you cultivate that relationship?

**A. R.:** More than all else, their loyalty is based on our performance. With their detailed knowledge of our business, they are able to question and challenge us. We therefore have a permanent dialogue with them. This major commitment to educating and explaining, which requires a lot of availability and responsiveness, is valuable for investors, helping them to save considerable time.



### # What events do you organize to encourage this long-term dialogue?

**A. R.:** First, the publication of the quarterly financial results is a key benchmark for investors. We organize a conference call during which the General Management discusses the company's performance during the quarter. It is followed by a question and answer session. In addition, we conduct road shows during which the General Management meets with investors in the major financial centers, London, Frankfurt, New York, Boston and, of course, Paris. Investors can also visit us at the headquarters in Paris. Another highlight of the relationship are the visits to our sites that we organize regularly to reinforce investor interest in the Group. The most recent visit was to the Dormagen production site in Germany in May 2015. Finally, Air Liquide's Capital Markets Day, held every two or three years, is a highly awaited event at which the Group shares its strategic vision with investors and provides a framework for assessing Air Liquide's medium-term performance.

---



## Consolidated income statement (summarized)

FOR THE YEAR ENDED DECEMBER 31

(in millions of euros)	2014	2015
<b>REVENUE</b>	<b>15,358</b>	<b>16,380</b>
Purchases	-6,007	-6,164
Personnel expenses	-2,653	-3,069
Other income and expenses	-2,825	-2,885
<b>Operating income recurring before depreciation and amortization</b>	<b>3,873</b>	<b>4,262</b>
Depreciation and amortization expense	-1,239	-1,372
<b>Operating income recurring</b>	<b>2,634</b>	<b>2,890</b>
Other non-recurring operating income and expenses	16	-132
<b>Operating income</b>	<b>2,650</b>	<b>2,758</b>
Net finance costs	-229	-227
Other financial income and expenses	-22	-41
Income taxes	-678	-666
Share of profit of associates	4	14
<b>Profit for the period</b>	<b>1,725</b>	<b>1,838</b>
- Minority interests	60	82
- Net profit (Group share)	1,665	1,756
<b>Basic earnings per share (in euros)</b>	<b>4.85</b>	<b>5.12</b>
<b>Diluted earnings per share (in euros)</b>	<b>4.83</b>	<b>5.10</b>

## Consolidated balance sheet (summarized)

FOR THE YEAR ENDED DECEMBER 31

(in millions of euros)	December 31, 2014	December 31, 2015
<b>ASSETS</b>		
Goodwill	5,259	5,730
Other intangible assets and property, plant and equipment	15,318	16,555
Other non-current assets <sup>(a)</sup>	862	936
<b>TOTAL NON-CURRENT ASSETS</b>	<b>21,439</b>	<b>23,221</b>
Inventories and work-in-progress	876	981
Trade receivables and other current assets	3,441	3,711
Cash and cash equivalents <sup>(a)</sup>	969	1,028
<b>TOTAL CURRENT ASSETS</b>	<b>5,286</b>	<b>5,720</b>
<b>TOTAL ASSETS</b>	<b>26,725</b>	<b>28,941</b>
<b>EQUITY AND LIABILITIES</b>		
<b>Shareholders' equity</b>	<b>11,537</b>	<b>12,406</b>
<b>Minority interests</b>	<b>290</b>	<b>365</b>
<b>TOTAL EQUITY</b>	<b>11,827</b>	<b>12,771</b>
Provisions and deferred taxes	3,357	3,435
Non-current borrowings	5,884	6,291
Other non-current liabilities <sup>(a)</sup>	305	475
<b>TOTAL NON-CURRENT LIABILITIES</b>	<b>9,546</b>	<b>10,201</b>
Provisions	294	271
Trade payables and other current liabilities	3,628	3,728
Current borrowings <sup>(a)</sup>	1,430	1,970
<b>TOTAL CURRENT LIABILITIES</b>	<b>5,352</b>	<b>5,969</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>26,725</b>	<b>28,941</b>

(a) Included derivatives.

# Consolidated cash flow statement

FOR THE YEAR ENDED DECEMBER 31

(in millions of euros)	2014	2015
<b>Operating activities</b>		
<b>Cash flow from operating activities before changes in working capital</b>	<b>2,943</b>	<b>3,150</b>
Changes in working capital	74	-258
Other	-187	-60
<b>Net cash flows from operating activities</b>	<b>2,830</b>	<b>2,832</b>
<b>Investing activities</b>		
Purchase of property, plant and equipment and intangible assets	-1,902	-2,028
Acquisition of subsidiaries and financial assets	-179	-384
Proceeds from sale of property, plant and equipment and intangible assets and financial assets	245	131
<b>Net cash flows used in investing activities</b>	<b>-1,836</b>	<b>-2,281</b>
<b>Financing activities</b>		
Dividends paid		
• L'Air Liquide S.A.	-839	-924
• Minority interests	-46	-51
Proceeds from issues of share capital	60	86
Purchase of treasury shares	-116	-178
Transactions with minority shareholders	-95	-11
<b>Net cash flows used in financing activities excluding increase (decrease) in borrowings</b>	<b>-1,036</b>	<b>-1,078</b>
Effect of exchange rate changes, opening net indebtedness of newly acquired companies and other	-202	-406
<b>Change in net indebtedness</b>	<b>-244</b>	<b>-933</b>
<b>NET INDEBTEDNESS AT THE BEGINNING OF THE PERIOD</b>	<b>-6,062</b>	<b>-6,306</b>
<b>NET INDEBTEDNESS AT THE END OF THE PERIOD</b>	<b>-6,306</b>	<b>-7,239</b>

---

**Cautionary note regarding forward-looking statements**

This document contains certain statements that are “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, as amended. L’Air Liquide S.A. (“Air Liquide”) has identified some of these forward-looking statements with words like “believe,” “may,” “could,” “would,” “might,” “possible,” “will,” “should,” “expect,” “intend,” “plan,” “anticipate,” or “continue,” the negative of these words, other terms of similar meaning or the use of future dates. Forward-looking statements in this document include without limitation statements regarding the expected timing of the completion of the transactions described in this document, Air Liquide’s operation of the business of Airgas, Inc. (“Airgas”) following completion of the contemplated transactions, and statements regarding the future operation, direction and success of Airgas’ businesses. Such statements are qualified by the inherent risks and uncertainties surrounding future expectations generally, and actual results could differ materially from those currently anticipated due to a number of risks and uncertainties. Risks and uncertainties that could cause results to differ from expectations include: uncertainties as to the timing of the contemplated transactions; the possibility that the closing conditions to the contemplated transactions may not be

satisfied or waived, including that a governmental entity may prohibit, delay or refuse to grant a necessary regulatory approval; the effects of disruption caused by the announcement of the contemplated transactions making it more difficult to maintain relationships with employees, customers, vendors and other business partners; the risk that stockholder litigation in connection with the contemplated transactions may affect the timing or occurrence of the contemplated transactions or result in significant costs of defense, indemnification and liability; other business effects, including the effects of industry, economic or political conditions outside of the control of the parties to the contemplated transactions; transactions costs; actual or contingent liabilities; and other risks and uncertainties discussed in Airgas’ filings with the U.S. Securities and Exchange Commission (the “SEC”), including the “Risk Factors” sections of Airgas’ most recent annual report on Form 10-K. You can obtain copies of Airgas’ filings with the SEC for free at the SEC’s website ([www.sec.gov](http://www.sec.gov)). Air Liquide does not undertake any obligation to update any forward-looking statements as a result of new information, future developments or otherwise, except as expressly required by law. All forward-looking statements in this announcement are qualified in their entirety by this cautionary statement.

---

**PUBLISHED BY THE COMMUNICATIONS DEPARTMENT OF AIR LIQUIDE GROUP, APRIL 2016  
75 QUAI D’ORSAY, 75007 PARIS, FRANCE**

Photos credits: Airgas, Inc., Interlinks Image/Gilles Leimdorfer, Pierre-Emmanuel Rastoin, CAPA-pictures/Cyril Abad, CAPA-pictures/Augustin Detienne, CAPA-pictures/Julien Lutt, CAPA-pictures/Luca Sage, CAPA-pictures/Ty Stange, CAPA-pictures/Jeremie Souteyrat, CAPA-pictures/Patrick Wack, LaCompany/Stéphane Rémaël, David Hogsholt, Sasol, Photothèque Air Liquide, Getty, Shutterstock, X.

L’Air Liquide S.A. company established for the study and application of processes developed by Georges Claude  
with issued capital of 1,893,224,316.50 euros

**Consulting, Design, Creation & Production**

**TERRE DE SIENNE Paris**

[www.terredesienne.com](http://www.terredesienne.com)



## INTERNET

See our annual publications:  
Annual Report, Reference Document,  
Shareholder's Guide, Interactions and more.  
[www.airliquide.com](http://www.airliquide.com)



## YOUTUBE

*Air Liquide Corp Channel*



## TWITTER

*@AirLiquideGroup*



## LINKEDIN

*[linkedin.com/company/airliquide](https://linkedin.com/company/airliquide)*