

2012 CORPORATE SOCIAL RESPONSIBILITY AND SUSTAINABLE DEVELOPMENT REPORT



INNOVATE

AIR LIQUIDE IS THE WORLD LEADER IN GASES FOR INDUSTRY, HEALTH AND THE ENVIRONMENT



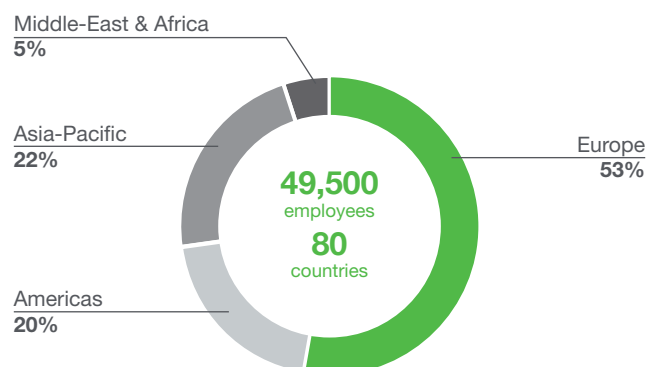
KEY FIGURES

Extra-Financial indicators

4 Stakeholders

EMPLOYEES

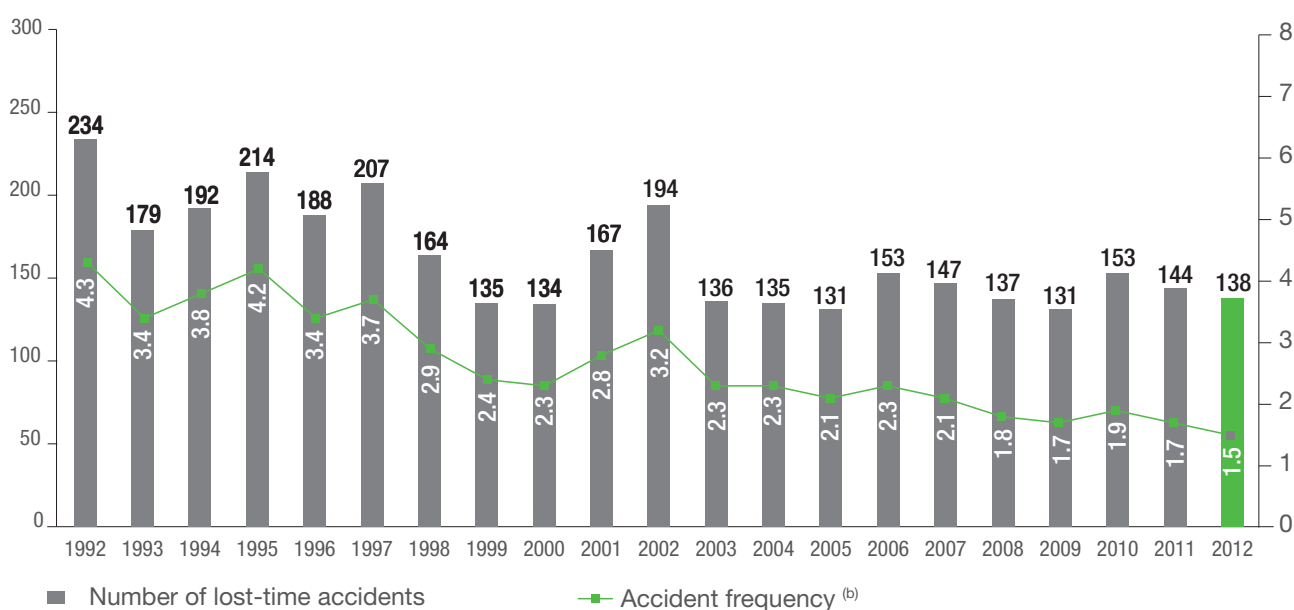
2012 employees by zone



SHAREHOLDERS

TSR ^(a) +13.9%
per year as of December 31, 2012
for a registered shareholder over 10 years.

Number of lost-time accidents and accident frequency ^(a) since 1992



CUSTOMERS AND PATIENTS

In 2012: 1 million customers

1 million patients

supported by the Air Liquide Home Healthcare business line

Customer and patient satisfaction surveys cover patients

66% of the Group sales

COMMUNITIES

Air Liquide Foundation

126 projects in 33 countries supported since its creation

42% in developing countries

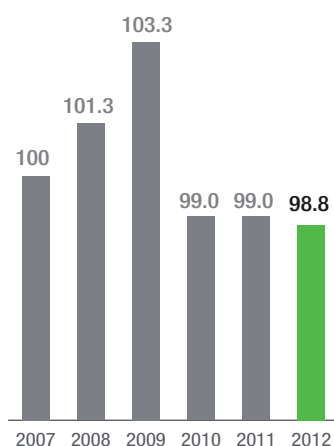
160 employees involved

^(a) Total Shareholder Return.

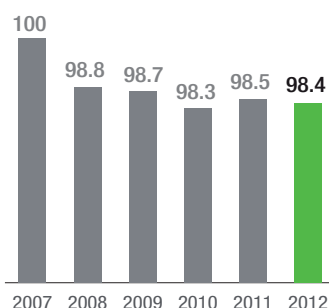
^(b) Number of lost-time accidents per million hours worked by Group employees.

3 Fields of action

ENVIRONMENTAL FOOTPRINT

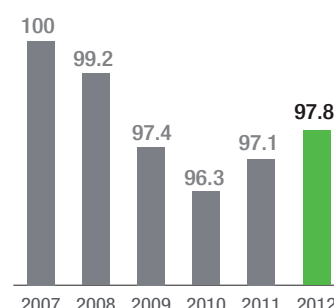
Energy consumption per m³ of produced gas (2007 average base 100)

Air separation

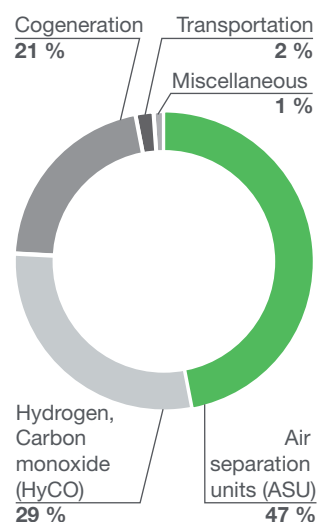


Hydrogen

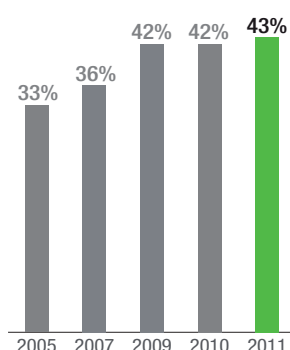
Distance traveled per ton of gas delivered (2007 average base 100)



2012 direct and indirect greenhouse gas emissions

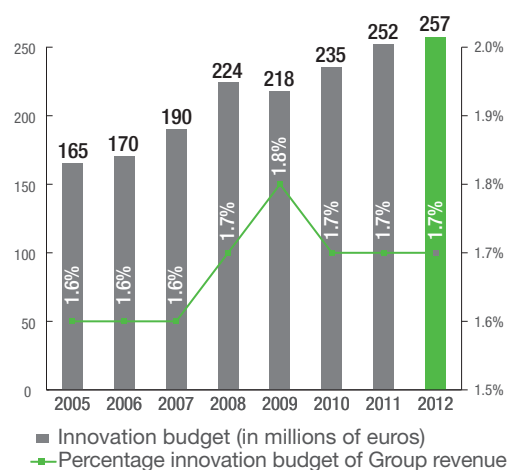


Revenue linked to life and environment



INNOVATION

Innovation budget



RULES OF CONDUCT AND GOVERNANCE

Corporate governance in 2012

75% of Board members are independent directors

25% of Board members are women

Internal governance in 2012

91% of the Group's employees belong to subsidiaries that have a local Code of Conduct

93% of the Group's revenues have been covered by the Industrial Management System audit over the last five years

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<http://www.airliquide.com> > Company > Sustainable Development



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2012 Corporate Social Responsibility and Sustainable Development Report

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> INTRODUCTION

The search for economic performance and the attention paid to society's major issues, notably, the preservation of the environment, are closely linked. Companies are no longer solely evaluated on their financial performance, but also on their respect for their commitments and their achievements in the area of responsibility. An integral part of Air Liquide's strategy, responsibility creates new opportunities, stimulates innovation and constitutes a lever of performance while providing solutions that respond to society's major issues. In this way, the Group creates a **virtuous dynamic by connecting Performance and Responsibility**.

At the end of 2010, Air Liquide asserted its ambition "of being the leader of its industry through **Performance and Responsibility** over the long term". The Group's conviction is that it is by developing responsibility that it will best ensure its **timelessness** over the long term. The **Corporate Social Responsibility** – CSR – approach designates how the Group and its employees take **the interest of all the stakeholders** into account to orient its action and achieve its results. It is the framework that makes sure that the responsibility commitments are clearly anchored in the heart of the Company's strategies and practice. This approach includes the **Sustainable Development** policy rolled out since 2003 and that is at the heart of the **strategy** developed in the **ALMA** corporate program.

Air Liquide has defined its **commitments** toward the **four stakeholders**:

- shareholders;
- customers and patients;
- employees;
- communities.

It also relies on **three fields of action**:

- reducing the environmental impact;
- strengthening corporate rules of conduct and governance;
- innovating relentlessly.

Each of these **commitments** is supervised by a member of the Executive Committee and corresponds to a part of this report. A certain number of the **responsibility objectives for 2015** and their corresponding **key indicators** are presented in it. Other objectives and key indicators will be gradually communicated.

The Corporate Social Responsibility and Sustainable Development Report, an integral part of the Air Liquide Responsibility approach, relies on **reporting** on over 170 indicators, presented in the following pages, to measure the Group's sustainable development performance. Most of these indicators are collected worldwide.

Just like financial reporting, extra-financial reporting has been **reviewed each year since 2003 by the Statutory Auditors**. They conduct a mission of analysis and verification on a selection of indicators not only on the corporate level but on industrial sites and Human Resources Departments of the subsidiaries. This year, 18 industrial sites or Human Resources Departments of subsidiaries were examined. Since 2003, nearly 80 sites and departments have been verified.

Air Liquide was one of the first CAC 40 companies to have this review done by the Statutory Auditors and to include the Corporate Social Responsibility and Sustainable Development Report **in the Reference Document**. In 2012, this review became a legal obligation in France. At the end of the Corporate Social Responsibility and Sustainable Report, you will find the Statutory Auditors Report in the framework of this new obligation.

> SHAREHOLDERS

Commitment

Deliver long-term performance thanks to a regular increase in investment value, attest respect and consideration in the relationship with shareholders.

Key Responsibility Indicator

Total Shareholder Return (TSR) ^(a)

On December 31, 2012, the Total Shareholder Return (TSR) was 11.4% per year over 20 years for a registered shareholder.

The Group has instituted a relationship of confidence with its shareholders by associating them with its continuous growth and successful business model through a strong and steady distribution policy maintained over time.

Being an Air Liquide shareholder means backing, over the long term, a responsible actor who demonstrates his or her commitment to human, social and societal issues.

The Corporate Social Responsibility and Sustainable Development approach *vis-à-vis* shareholders is based on the following four principles:

- consideration and respect for all shareholders;
- remuneration and increased value of their investments in the long term;
- listening to and informing shareholders;
- specific services for registered shareholders.

Consideration and respect for all shareholders

Financial performance is not enough to sum up the relationship between Air Liquide and its shareholders. Air Liquide maintains a dialogue of proximity with its shareholders to best meet their needs because they are genuine partners over the long run who have supported the Group's growth since its creation and especially since its listing on the Paris Stock Market in 2013 whose 100th anniversary will be celebrated in 2013.

To make sure that these expectations and their evolution are identified and understood, Air Liquide endeavors to get to know its shareholders in their diversity. To this end, it notably proposes that they place their shares in registered form.

STABLE AND BALANCED SHARE OWNERSHIP

It is important for Air Liquide to preserve the balance between individual shareholders and institutional investors. The Group's strategy, focused on the long term, and the soundness of its business model, offer shareholders a sustainable and regular return on their investment.

The 390,000 individual shareholders hold 37% of the capital. French and non-French institutional investors represent respectively 19% and 44% of the capital.

(a) Total Shareholder Return (TSR) is an annualized return rate for a shareholder who buys a share at the beginning of a period and sells it at the end of the period. This calculation takes into account the change in the share price, dividends paid, including loyalty bonuses, considering that they are also reinvested in shares, as well as free share attributions.

Shareholders

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Individual shareholders	40%	39%	38%	38%	37%	38%	38%	36%	37%	37%
French institutional investors	23%	24%	25%	24%	30%	26%	26%	23%	21%	19%
Non-French institutional investors	35%	36%	36%	37%	32%	35%	36%	40%	42%	44%
Treasury shares	2%	1%	1%	1%	1%	1%	>0%	<1%	>0%	>0%
Registered capital	28%	30%	31%	32%	37% ^(a)	33%	32%	34%	35%	36%
Capital eligible for the loyalty bonus	24%	24%	25%	26%	26%	26%	25%	25%	28%	29%

(a) In 2007, the share of capital owned by institutional investors holding direct registered shares increased notably due to one important institutional investor that sold its shares in 2008.

THE SHAREHOLDERS' MEETING, A PRIVILEGED MOMENT OF EXCHANGE

Each year, all the Air Liquide shareholders **who hold at least one share** are invited to the Shareholders' Meeting. They are helped in their voting by all the relevant documents over a month before the Meeting, sent by mail and available on the Company's Internet site: practical information on the voting procedure and clear explanations of the resolutions and their objectives. Didactic animations detailing the voting procedure are also available online. Air Liquide endeavors to make all its supports in English available to its non-French shareholders in similar time frames. In certain countries, systems have been set up with intermediary banks to facilitate and ensure a fluid transmission of the votes of the shareholders concerned.

Air Liquide centralizes its Shareholders' Meeting by directly collecting its shareholders' votes. Starting in 2013, the Company will propose **voting via the Internet** through the Votaccess platform.

The day of the Meeting, the bureau, composed of the Chairman of the Board of Directors, two polling officials and a secretary, ensure that the Meeting is held in compliance with the law. The officials

are representatives of the two investors that hold the largest number of shares who have agreed to fulfill this function. They are asked about a month before the event and a *vade mecum* is given to them two weeks before the Meeting. This document describes their tasks as well as the welcome and voting procedures set up by the Company.

The Shareholder Services advisors as well as the Investors Relations team are also mobilized to answer by telephone and at the Shareholders Lounge at corporate headquarters in Paris all the individual and institutional shareholders' questions on voting and participation in the Shareholders' Meeting.

In 2012, over 5,000 people were welcomed at this Shareholders' Meeting.

The dates for the next Air Liquide Combined Shareholders' Meeting are:

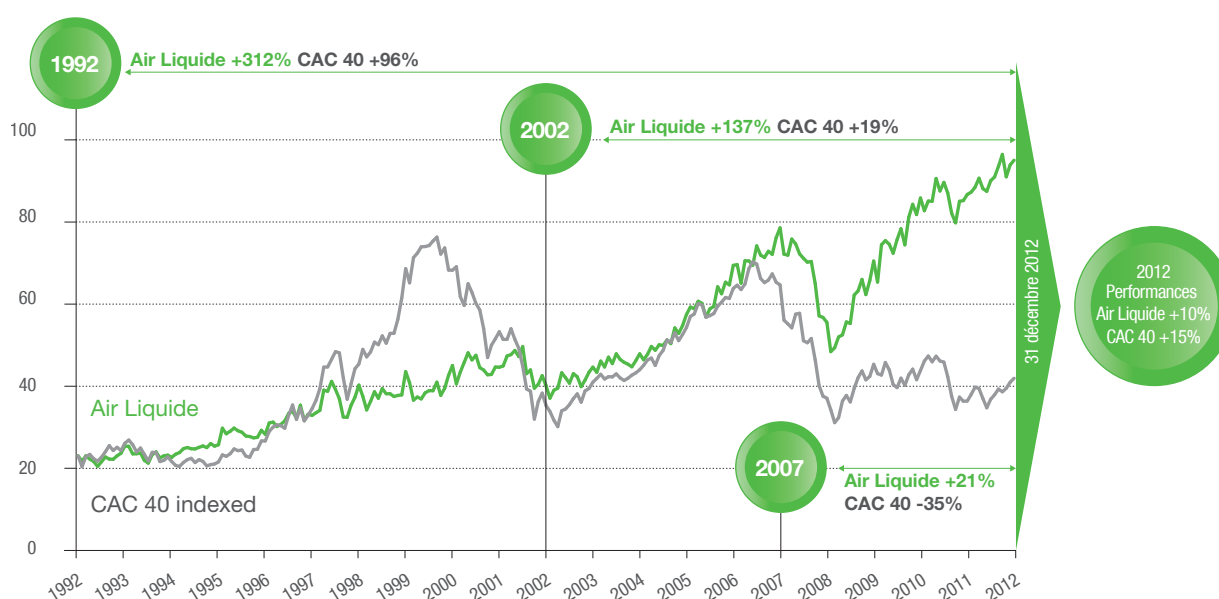
- Tuesday, May 7, 2013;
- Wednesday, May 7, 2014;
- Wednesday, May 6, 2015.

Remuneration and increased value of the shareholders' investments in the long term

AIR LIQUIDE, A CONTINUOUS GROWTH

The share's value is based on the rise in its stock market price over the long term and the distribution of dividends. Since its creation in 1902, Air Liquide has always shared the fruits of its growth and rewards its shareholders' confidence through a remuneration and loyalty policy that is based on regular dividend distribution, free share attribution and a loyalty bonus.

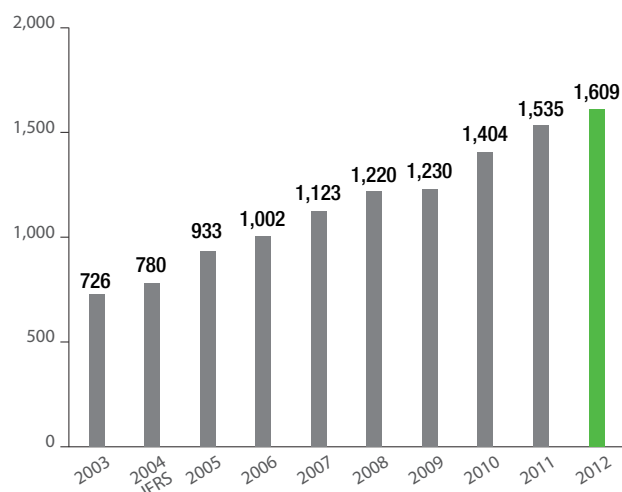
Evolution in the stock market price (in euros)



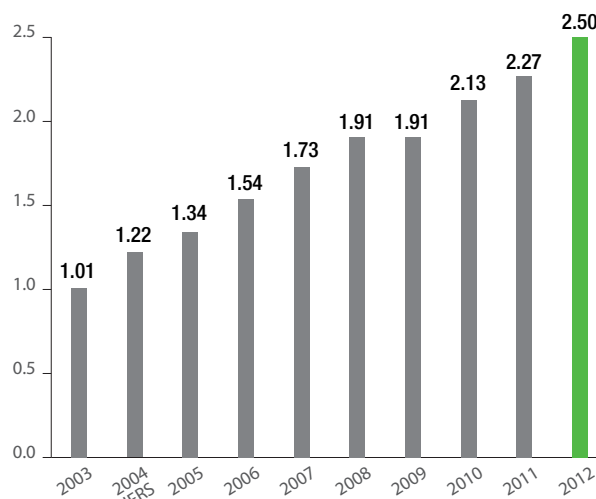
Since it was first listed on the French Stock Market in 1913, Air Liquide has always shown a profit. The Group creates value by developing its activities and optimizing its performances over the long run. Over the last 20 years, Air Liquide's revenue has shown an average annual growth of +6.2%. This growth has been profitable: the Group's earnings have followed a similar trend, with an average annual growth of the net profit per share of +7.9%. Over the same period, the dividend has had an average annual growth of +9.6%.

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

Net profit – Group share (in millions of euros)



Adjusted dividend per share (in euros/share)



Shareholders

RETURN ON AN INVESTMENT IN AIR LIQUIDE SHARES FOR THE SHAREHOLDER

To further increase the investment value of Air Liquide shares, subscribing to registered shares permits shareholders who choose this option to benefit from a privileged relationship with Air Liquide and a loyalty bonus: +10% on the amount of the dividends received and +10% on the number of free shares granted. This loyalty bonus is granted to shareholders who have

held direct registered or intermediary registered shares for two calendar years and who still hold them on the date of dividend payment and the attribution of free shares.

Total Shareholder Return (TSR) is an annualized rate of return for shareholders who purchased a share at the beginning of the period and sold it at the end of the period, including the contribution from both the share price performance and dividends paid (including loyalty bonus), assuming that the dividend is immediately reinvested in shares, as well as free share attributions.

Average annual growth of the portfolio as of December 31, 2012

FOR A CAPITAL INVESTED	Air Liquide – Registered shareholder ^(a)	Air Liquide – Bearer shareholder ^(a)	CAC 40 index – reinvested ^(b)
■ over 5 years (December 31, 2007)	+7.1%	+6.7%	-4.4%
■ over 10 years (December 31, 2002)	+13.9%	+13.4%	+5.4%
■ over 20 years (December 31, 1992)	+11.4%	+10.7%	+6.6%

(a) The TSR on shares for the registered shareholder is higher than the TSR on shares for the bearer shareholder because the registered shareholder benefits from loyalty bonuses.

(b) CAC 40 index with gross dividends reinvested.

During the last 10 years, the return rate for an Air Liquide shareholder has been on average +13.9% per year, with gross dividends reinvested in shares, attributions of free shares and loyalty bonuses to registered shareholders.

	2003	2004 IFRS	2005	2006	2007	2008	2009	2010	2011	2012
Net profit per share (in euros) ^(a)	2.33	2.52	3.03	3.22	3.62	3.99	3.99	4.53	4.92	5.17
Dividend per share (in euros) ^(a)	1.01	1.22	1.34	1.54	1.73	1.91	1.91	2.13	2.27	2.50 ^(b)

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

(b) Subject to the approval of the May 7, 2013 Shareholders' Meeting.

The Air Liquide value codes

Air Liquide shares are divided into four categories, called "value codes" (or ISIN codes), according to when they were recorded as registered shares. There are two permanent value codes (FR0000120073, which is also Air Liquide's stock market ISIN negotiation code, and FR0000053951, which corresponds to shares already benefiting from the loyalty bonus) and two intermediate value codes (FR0011147412 and FR0011336254, which identify the share that will benefit from the loyalty bonus, respectively in 2014 and 2015).

Listening to and informing shareholders

LISTENING AND PROXIMITY

Shareholder Services is specific to Air Liquide. Directly attached to Executive Management, this team manages the accounts of nearly 80,000 shareholders with direct registered shares and accompanies them in their steps by offering them, without any intermediaries, a broad range of personalized services. It is also dedicated to listening to and informing all the 390,000 individual shareholders who receive information all year long through different communication supports. In addition, many events and meetings that are highlights between Air Liquide and its shareholders are organized as for example the Shareholders' Meeting, regional meetings and fairs dedicated to share ownership in France and Europe.

The **Shareholders' Communication Committee**, composed of 12 Air Liquide shareholders, is regularly consulted to improve the quality of information and services provided to shareholders. Apart from plenary meetings with the Chairman and CEO, the Committee is involved through the year in working groups on subjects that are essential to the shareholders' concerns. A Committee member is part of the Air Liquide Foundation's Project Selection Committee.

The Chairman and CEO, after the Shareholders' Meeting, continues his exchanges with **shareholders in the regions**


by traveling to several cities in France to present the results, the Group's prospects and answer their questions. Finally, to strengthen this dialogue, the Director of Shareholder Services regularly meets shareholders during meetings and fairs (about 10 events a year) held in France and Europe (Germany, Belgium, Denmark, Finland, Switzerland). In 2012, 8,000 shareholders were met.

The **Investors Relations** Department, attached to the Financial Department, specifically answers the questions of institutional investors and financial analysts of brokerage companies. The four annual announcements of revenue or profits are of course privileged moments of exchange, but throughout the year, this dedicated team meets investors, either at its offices at corporate headquarters in Paris, or during travel to the world's major stock markets. Air Liquide does not hesitate to organize road shows or take part in conferences to go before international investors and present them with the solidity of its business model, the dynamism of its growth levers and the soundness of its strategy. On average, the Investors Relations Department meets over 300 institutions each year. It also regularly organizes Investor Days, bringing together the international financial community and Air Liquide's management for targeted strategic discussions whose theme varies according to economic issues and current events.

Contacts

Shareholder Services:

Air Liquide – 75, quai d'Orsay 75007 Paris, France

 N° Vert 0 800 166 179 (free number from a French landline), or +33 (0)1 57 05 02 26 from outside France

FREE FROM A FRENCH LANDLINE

<http://contact.shareholders.airliquide.com>

Investors Relations:

Air Liquide – 75, quai d'Orsay 75007 Paris, France

+33 (0)1 40 62 51 50

<http://contact.investors.airliquide.com>

Shareholders

TRANSPARENT INFORMATION

Air Liquide provides for its individual and institutional shareholders through various communication supports, transparent information on the Group's activities, strategy, performances and perspectives.

Pedagogy is one of the major concerns that takes priority in the design of information supports like the Annual Report, the Shareholder's Guide and the Invitation to the Shareholders' Meeting. The latter document didactically presents the resolutions submitted to the shareholders' vote and is sent to all the shareholders who hold at least one share. Air Liquide also publishes, in the month after the event, a report of its Shareholders' Meeting, presenting in a detailed manner all the participations and discussions. These publications are available in French and English. The minutes of the Shareholders' Meeting are established during the two months following the Meeting.

Moreover, Shareholder Services has designed an educational and entertaining **learning module** to better understand the stock market. The first module, "The stock market today", available on the Company's Internet site in the Shareholders section, sheds

light on the role and history of the stock market, its different players and Air Liquide's history in the Paris Stock Market. Shareholder Services also makes available a free **Air Liquide Shareholder application** for iPhone and Android to follow stock market prices, use simulators and to stay informed about the Group at every moment.

In addition, Air Liquide welcomes its shareholders in a dedicated venue, the **Shareholders Lounge**, at the Group's head office in Paris, so that they can obtain complete information on the Company's activities, the life of the share, and for those who hold direct registered shares, how to carry out operations on their accounts.

Since 2011, the Shareholders Lounge has also been proposing simple, didactic and interactive temporary exhibitions: an additional occasion for shareholders who wish to find out more about the Group's activities and initiatives and to strengthen the link of proximity. In 2012, Shareholder Services organized two online conferences, live from the Shareholders Lounge, about "How free shares are allocated" and "Registered shares made easy".

For information

More information on Air Liquide and its share ownership is available in the **Shareholder's Guide**, available online on the Internet site www.airliquide.com, Shareholders section.

Specific services for registered shareholders

Specifically organized to provide answers to shareholders with direct registered shares, the Shareholder Services, composed of 26 people, offers its expertise in share account management: how to open an account, how to place orders on the stock market, how to determine taxation of securities and how to transmit a portfolio. Throughout the year, Air Liquide advisors answer the shareholders' questions *via* the toll-free number mentioned previously (also accessible from outside France) or directly at the Shareholders Lounge.

Air Liquide directly manages the accounts of its shareholders with direct registered shares. They pay no handling fees, and broker fees are reduced to 0.18% excluding tax of the gross amount of the transaction. Air Liquide endeavors to regularly communicate to its shareholders on all the benefits of holding registered shares

(privileged relationships with Air Liquide, loyalty bonus). Every year, an information campaign is organized for shareholders who have bearer shares: presentation of the registered share on all the communication supports aimed at shareholders and a booth dedicated to registered shares during the Actionaria fair held every year in November in Paris.

Direct registered shareholders have access to a personal secure space on the Internet so that they can consult their share portfolio, modify their personal information or consult documents useful for managing their account. They can also place buy and sell orders on the stock market online and view, in real time, the operations conducted on their account and the amounts received (payment of the dividend, sale of shares, etc.).

> CUSTOMERS AND PATIENTS

Commitment

Deliver added value to customers and patients through safe, reliable and cost-effective solutions; proactively dialogue with customers and patients.

2015 objective

Increase customer satisfaction and loyalty and patient satisfaction. By 2015, customer and patient interviews and the related action plans will cover entities representing 85% of the Group's sales.

Key Responsibility Indicator

Percentage of the Group's sales concerning the units where a customer or patient satisfaction survey has been conducted over the last two or three years, according to the business line concerned ^(a).

In 2012, the percentage of Group sales related to units where a customer or patient satisfaction survey has been conducted was 66%.

A responsible company: from listening to action

Air Liquide's relationship with industrial customers of very diverse sizes and sectors as well as with healthcare professionals, patients and associations in the Healthcare activities are at the heart of the concerns of the Group's teams and guide the Company's development. The quality of this relationship engages each unit and employee. It is based on the definition of precise commitments that its teams endeavor to respect in their daily activities, in a spirit of professionalism, with a sense of service and innovation.

Customer and patient satisfaction is a priority for Air Liquide.

In a context of increased competition, a change in its customers and patients' expectations and a growing diversity of its customers and patients, reaching the growth objectives that the Group has set itself requires:

- creating loyalty and satisfaction in customers;
- understanding patient expectations;
- conquering new ones through the relevance and attractiveness of Air Liquide's offerings.

This strategy requires that the Group's employees focus more on customers and patients to better understand their priorities, current and future needs and their satisfaction level. In the framework of the ALMA strategic corporate program and its initiative "Improving our customer approach", a project called "Action surveys" has been launched. It presents three steps:

- Listen: to better understand the customers and patients' expectations, this takes the form of interviews conducted by specialized companies. After these interviews, the managers of the units concerned meet certain unsatisfied customers. In 2012, over 15,000 interviews were conducted and a large number of visits made in 26 units in China, the Benelux countries, the United States and France.
- Build: This listening phase helps identify improvement tracks and define related action plans. To mobilize the organization transversally, workshops to raise awareness of employees on the customer experience have been rolled out. These workshops can bring together employees in the Purchasing, Sales, Production and Human Resources Departments and have already been organized in subsidiaries in Tunisia, Spain, Portugal, India and France.
- Act: The action plans chosen are communicated to all the subsidiary's employees. Managers are responsible for implementing the action plans and measuring their progress. Certain action plans are shared with customers.

These surveys are gradually being extended to all the subsidiaries.

To include this approach in a continuous improvement process and measure progress in terms of satisfaction and loyalty, these surveys will be conducted every two or three years, depending on the business line concerned.

(a) Three years for the Large Industries business line, two for other business lines.

Customers and patients

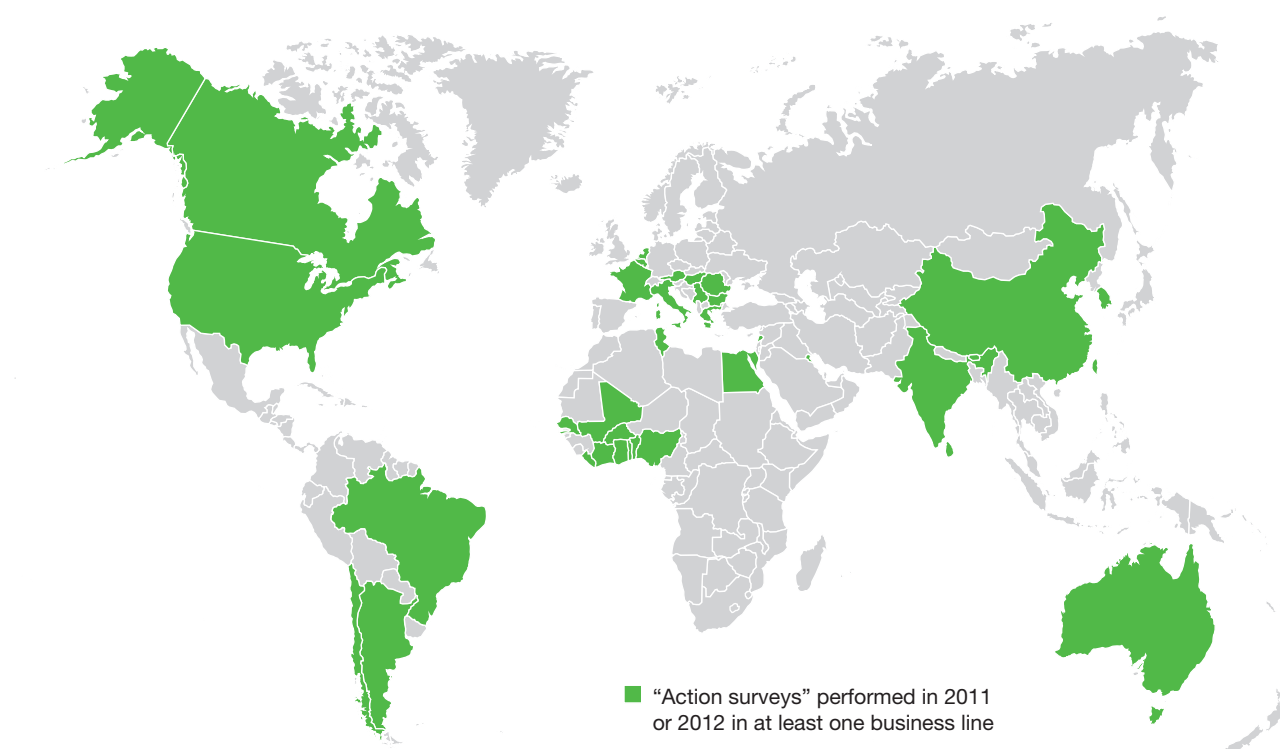
In 2012, the percentage of the Group's revenue concerning the units where customer satisfaction surveys and action plans were carried out was about 66%. This percentage,

which is the Key Responsibility Indicator of this stakeholder, is now followed up annually. It takes into account the satisfaction surveys rolled out over the last two or three years.

Percentage of the Group's revenue concerning the units where customer satisfaction surveys were carried out

Year	2011	2012	2013	2014	2015 objective
Percentage of the Group's revenue concerning the units where customer satisfaction surveys were carried out	39%	66%			85%

"Action surveys" rollout since 2011



Air Liquide and its customers: proximity and expertise

Air Liquide serves a **great diversity of industrial customers, estimated at over a million** and in sectors ranging from the steel to the food industry as well as electronics, pharmaceuticals and craftsmen. Their expectations are extremely varied, constantly changing and their requirements are ever greater. In each market segment, Air Liquide has set an objective of accompanying its customers by acquiring the deepest understanding possible of their business. In this way the Group can **offer its customers innovative services and solutions**.

The Group's decentralized structure enables each unit, in each geographic area, to meet the specific expectations of local

customers, instituting a **close relationship of confidence** with each of them. More than just a product, customers demand **flexibility, rapidity, service, availability and a real partnership over the long run**.

A CUSTOMER COMMITMENT

After the rollout of the first "Action surveys", the results were generally positive with most customers satisfied or very satisfied. Product and service quality, strict respect for safety rules, the teams' behavior in contact with the customers and their efficiency, notably in emergency situations, were particularly appreciated.

These surveys also brought out concerns and incidents encountered by the customers in their relations with the Group. Priority action plans are being created to respond to these dissatisfactions.

For example, after the “Action surveys” rolled out by Air Liquide in China, a business line decided to regionalize its organization to better meet a demand for proximity from a large customer segment. In addition, the Australian subsidiary defined action plans involving all its organization’s functions. To steer these plans and maintain team mobilization, it appointed a manager in charge of customer satisfaction.

Air Liquide and its patients

A GROUP ATTENTIVE TO HOSPITALS AND HOME HEALTHCARE PATIENTS’ NEEDS

The Group’s determination to improve its listening capacities for its stakeholders also concerns the Healthcare World Business Line. Air Liquide is particularly attentive to its patients’ needs to guarantee irreplaceable service.

The first “Action surveys” adapted to this activity were rolled out in 2012. The subsidiaries that produce and distribute medical gases to hospitals conducted these surveys with the technical and purchasing departments of the customer hospitals as well as with doctors who use these gases.

In the Home Healthcare activity, patients benefiting from Air Liquide’s services as well as the doctors prescribing the treatments, but also the pharmacists distributing these products and the healthcare coverage authorities directly responded to these satisfaction surveys.

Italy was the pilot country for this initiative’s launch. Over 500 surveys were done at hospitals and other healthcare service providers by telephone or e-mail. For each hospital, five people representing the main services (purchasing, technicians, pharmacists, biologists and doctors) were queried. The results on satisfaction and loyalty were generally positive. Site visits as well as action plans were done for each customer indicating dissatisfaction points. A second survey campaign is planned for 2013 to measure this initiative’s benefits. As for Homecare, nearly 1,650 patients, prescribers, pharmacists and regional healthcare authorities were queried.

A DIALOGUE WITH CUSTOMERS ON THE RESPONSIBILITY AND SUSTAINABLE DEVELOPMENT APPROACH

Air Liquide also answers its customers’ growing requests on its own responsibility and sustainable development. The Group can in this way contribute to its customers’ own responsibility and sustainable development approach. Over the last three years, about 50 customers queried the Group on this subject, notably through detailed questionnaires. The Group’s Sustainable Development Department contributed its support to local units to respond to this new type of request from its customers. The data on the carbon content of Air Liquide products in the principal countries presented in the Environment part of this Report specifically meets customer expectations on this issue.

MEDICAL GAS PRODUCTION AND DISTRIBUTION FOR HOSPITALS

Air Liquide, a major player in medical gases for hospitals

Air Liquide is one of the world leaders in medical gas production and distribution and related services for hospitals. The Group supplies oxygen for operating rooms, intensive care units and patients’ rooms, as well as therapeutic gases for anesthesia, pulmonary arterial hypertension or pain relief. Air Liquide also offers a range of hygiene products used for disinfection and the fight against nosocomial illnesses. The Group currently supplies 7,500 hospitals and clinics worldwide.

A confirmed commitment for the safety of patients under anesthesia

Air Liquide places the safety of patients and healthcare professionals at the heart of its concerns. The **quality and safety of medical gases and devices** as well as related services shows Air Liquide’s commitment to the patient’s safety. In this framework, Air Liquide is one of the leading healthcare manufacturers to have signed the “Helsinki Declaration for the safety of patients under anesthesia” during the 2011 congress of the European Society of Anesthesiology in Amsterdam. This declaration plans to reduce complications follow anesthesia during major surgery by recalling good clinical practices, the anesthesiologist’s key role in treatment safety and the importance of cooperation between healthcare manufacturers and the medical community.

Customers and patients

THE HUMAN AND SOCIAL DIMENSION OF AIR LIQUIDE'S HOME HEALTHCARE ACTIVITY

Attention to the person, proximity and human relations are particularly important with the growing presence of Healthcare teams at patients' homes. Compared to the Group's activities in the hospital milieu, this Home Healthcare activity has greatly developed due to the strong prevalence of chronic illnesses, the increase in life span and budget constraints related to the healthcare expenditures of economically advanced countries. The development of healthcare systems in certain economies with strong growth is also contributing to this increase in the Home Healthcare activity.

Air Liquide's Home Healthcare activity now concerns over **1,000,000 patients worldwide**. It has a very strong human dimension because it focuses on having patients and their families accept a treatment that is sometimes long term and accompanied by constraints. Air Liquide's employees accompany and support at home patients suffering from chronic pathologies (respiratory insufficiency, sleep apnea, diabetes, Parkinson's disease, etc.). Innovative education and support programs aim at improving the patients' quality of life by helping reinforce treatment follow-up and increasing their autonomy.

The Home Healthcare activity is at the heart of the healthcare system. Air Liquide has therefore become a link between the patient, hospital, doctors, nurses, medical insurance organizations and pharmacists. The Group supplies products and medical equipment necessary to start treatment at the patient's home following the medical prescription, and trains the patients

and their families in the proper use of devices (oxygen therapy, ventilator, insulin pump, etc.). Air Liquide therefore makes a major contribution to the care chain by ensuring the patients' follow-up at home over the long run. It is an activity that demands a high level of quality of service on a daily basis and that is clearly long term, with all the caregivers who want to improve the patient's quality of life at home.

The Group's Home Healthcare activity is an integral part of Air Liquide's **Responsibility and Sustainable Development approach**, in line with its preoccupations with the protection of vulnerable lives, improvements in the quality of life, proximity, the deeply human dimension of this service, relationships built over time and a strong involvement in the social fabric.

ACQUISITION OF LVL MÉDICAL AND GASMEDI, TWO MAJOR PLAYERS IN HOME HEALTHCARE IN FRANCE AND SPAIN

In 2012, Air Liquide acquired two new companies: LVL Médical, a French homecare player (respiratory assistance, perfusion/nutrition, etc.) and Gasmedi, the third largest homecare player in Spain. These two acquisitions have brought the Group 175,000 new patients and 1,500 additional employees. The combination of the performance of the two companies, the know-how of their teams, along with Air Liquide's innovation capacity, will permit the Group to continue to develop its activities for all its patients. The details of these acquisitions are provided in the 2012 Highlights section on page 30.

An acquisition financed by raising socially responsible bonds

In 2012, Air Liquide issued its first SRI-labeled bonds ^(a) under its Euro Medium Term Notes (EMTN) program, for a total amount of 500 million euros. This operation, issued at a very competitive rate, allowed the acquisition of Gasmedi and LVL Médical to be financed for a total amount of about 650 million euros. This bond was mostly placed with investors having SRI management mandates and permitted the Group to diversify its financing sources. After public authorities and supranational issuers, **Air Liquide became the first company to issue bonds meeting the criteria of SRI investors.**

Obtaining a rating from the extra-financial rating agency Vigeo about the Home Healthcare activity led to this issue being given a SRI label. This evaluation is based on the social, environment and governance criteria of the Home Healthcare activity that concerns one million patients worldwide.



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

Indicators concerning the Home Healthcare activity

In the framework of this SRI bond issue, Air Liquide made a commitment to publishing during the life of these bonds, *i.e.*, nine years, indicators specific to the Home Healthcare activity in the area of the environment, safety and employee diversity.

Number of patients treated	2010	2011	2012
Total number of patients treated by the Air Liquide Home Healthcare Division	600,000	700,000	1,000,000
Employees			
Home Healthcare activity employees ^(a)	4,893	5,494	7,303
Safety			
Number of lost-time accidents of at least one day among employees	29 ^(b)	28 ^(b)	42 ^{(b) (c)}
Number of accidents of subcontractors and temporary workers ^(d)	15 ^(b)	7 ^(b)	10 ^(b)
Parity			
% of women among Managers and Professionals (MP)	53%	55%	55%
% of women among the MPs hired during the year	62%	62%	40%
Training			
Average number of training days per employee per year	2	2.1	1.6 ^{(e) (f)}
Kilometers driven and CO₂ emissions related to transportation			
Kilometers driven per patient followed per year			155
CO ₂ emissions related to transportation per patient (kgCO ₂ /patient) per year			39

(a) Employees under contract.

(b) No fatal work accidents.

(c) Of which 11 accidents in the framework of the LVL Médical and Gasmedi activity, after the acquisition of these subsidiaries on October 1, 2012. Only the accidents of the last quarter of these subsidiaries are noted.

(d) Personnel working in the framework of a contract with Air Liquide, on an Air Liquide site, or on a customer site, or as a delivery driver.

(e) Or 12 hours a year following the calculation in hours (base: 1 day = 7.5 hours).

(f) Impact of the recently acquired companies, LVL Médical and Gasmedi.

PARTNERSHIP WITH THE EUROPEAN FEDERATION OF ALLERGY AND AIRWAY DISEASES PATIENTS ASSOCIATIONS

The European leader of Homecare, Air Liquide is in charge some 800,000 patients in Europe suffering from sleep apnea or insufficient respiration, notably those with severe chronic obstructive pulmonary disease (COPD), under long-term oxygen therapy.

Since 2011, the Group's Worldwide Healthcare Activity Branch has been developing a partnership with the EFA (European

Federation of Allergy and Airways Diseases Patients Associations). This Brussels-based organization brings together the national associations of patients (22 countries represented) with respiratory ailments. In the framework of this partnership, Air Liquide supports the actions on information and raising awareness initiated by the EFA in public opinion and the European authorities. COPD is an under-diagnosed pathology and a major public health issue. The World Health Organization forecast that in 2015, COPD would go from being the fourth to the third cause of mortality in the world and estimates the total cost of COPD in Europe at 45 billion euros.

> EMPLOYEES

Commitment

Be a great place to develop one's potential providing employees with a safe, performing and respectful work environment.

2015 objective

Continue to improve the safety of employees with a goal of reducing each year the frequency rate of lost-time accidents.

Ensure the employee development, diversity and engagement by raising the "Our Talents" Index from 100 in 2010 to 115 in 2015.

Key Responsibility Indicator

Frequency rate of lost-time accidents of the Group's employees.

In 2012, the frequency rate of lost-time accidents of the Group's employees was 1.5.

The "Our Talents" Index measures the progress of the development, diversity and engagement of the Group's employees. With a base of 100 in 2010, its value was 100 in 2012.

49,500 men and women in 80 countries compose multicultural teams with a host of skills. Air Liquide is involved in promoting diversity, facilitating and accelerating knowledge transfer, motivating and involving its employees and encouraging a social and human commitment, notably through the Air Liquide Foundation. Safety remains a top priority for the Group's management and employees.

Safety: the first priority

Continuously and durably improving the health and safety in the workplace of its employees and subcontractors is one of Air Liquide's major challenges, which is expressed by the keyword "zero accidents" on each site, in each region, in each unit. Employees are mobilized through active communication on this objective. In addition, safety objectives are part of the variable remuneration of the Group's Senior Managers. In particular, the variable share of the remuneration of the executive officers is notably linked to safety objectives (see page 140).

Prevention, protection, early detection and rapid reaction are at the heart of the Group's concerns. Air Liquide rolled out its Industrial Management System (IMS)^(a) in 2005 and it has deeply changed work methods and improved processes involving safety management, reliability, preservation of the environment and industrial risk management.

The Group has set up procedures, training sessions and an appropriate follow-up to encourage each employee to work responsibly and in total safety, respecting the laws and regulations in force. A central team of experts pilots networks of specialists

in the field to see to the proper implementation of the IMS. Together, they provide local managers in the Group's different units with technical and methodological support and participate in managing industrial risks.

In 2012, the frequency rate of lost-time accidents was 1.5, which is the lowest level the Group has ever had. These results show the teams' capacity to mobilize around safety. The seriousness rate, equal to the average number of days of lost time per thousand hours worked for Air Liquide employees, excluding fatalities, was below 0.1 in 2012.

The Group's focuses for safety in 2012 stressed the understanding and prevention of major risks linked to its activities. So Air Liquide launched an awareness-raising program for all the employees on technical risks that can have serious consequences. This program increases safety in everyone's daily life. It permits each field manager to start the discussion with his or her team to share the best rules, practices and daily experience in this area. This campaign will be continued in 2013.

(a) More information on the IMS is presented in the Governance section – page 103.

Safety indicators for the Group as a whole

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of lost-time accidents of at least one day of Group employees ^(a)	136	135	131	153	147	137	131	153	144	138 ^(b)
Accident frequency of Group employees ^(c)	2.3	2.3	2.1	2.3	2.1	1.8	1.7	1.9	1.7	1.5* ^(b)
Accident seriousness rate ^(d)									<0.1	<0.1
Number of accidents of subcontractors and temporary workers ^{(e) (f)}						154	148	155	118	142

(a) Fatal accidents since 2008: one in 2012, one in 2011, one in 2010.

(b) Except LVL and Gasmedi subsidiaries, integrated on October 1, 2012. Including the accidents of the last quarter 2012 of these subsidiaries, this number reaches 149.

(c) Number of accidents involving lost time, of at least 1 day, per million hours worked by Group employees. Accidents defined as recommended by the International Labor Office.

(d) Average number of days of lost time per thousand hours worked. Accidents defined as recommended by the International Labor Office.

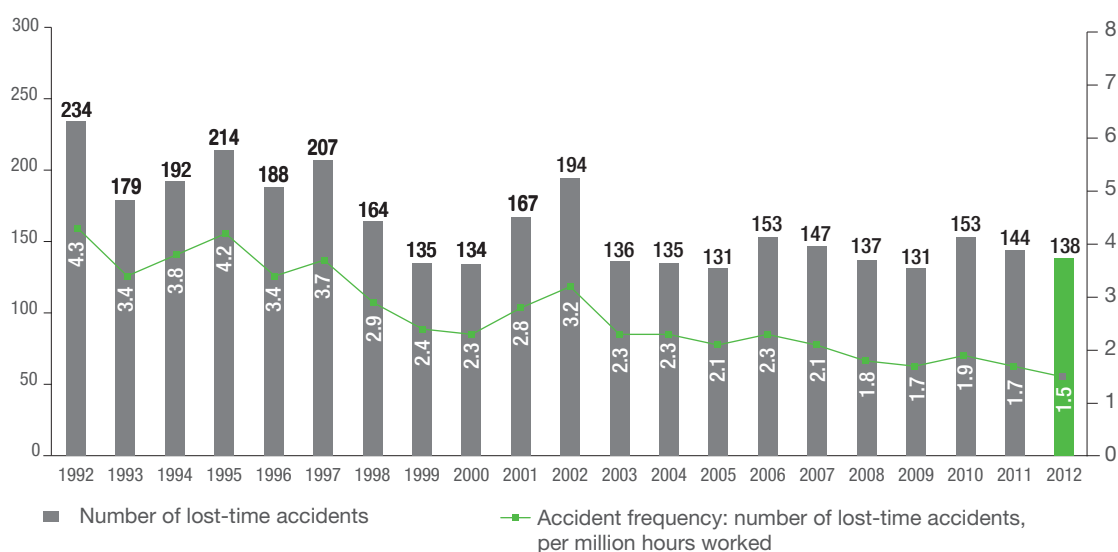
(e) Personnel working in the framework of a contract with Air Liquide or on a Group site, or on a customer site or as a delivery vehicle driver.

(f) Fatal accidents since 2008: three in 2012, four in 2011, one in 2010, four in 2009, three in 2008. Among them eight are traffic accidents.

* Indicator verified by the Statutory Auditors.

The indicators presented above are calculated on a worldwide scale. The percentages of those entering and leaving the Group notably include hires and layoffs.

Number of lost-time accidents and accident frequency since 1992



A committed enterprise



Air Liquide, winner of the Human Capital Trophy in 2012 for the coherence of its actions facilitating personal, social and economic well-being. This trophy awarded each year in France jointly by the Michael Page recruitment firm and the newspaper *Le Monde* distinguishes the prizewinning company for the good management of its human resources.

Since its creation in 1902, Air Liquide has always considered that the competence, performance and motivation of its employees are key differentiation factors and a **major feature of the Company's DNA, from the top to the bottom of the hierarchy**. Thanks to a long-term vision of the development of technologies, geographies and expertise, the Group has continued its growth while providing its employees with an attractive and diversified work environment. The Human Resources Departments are closely associated with Air Liquide's strategy. At Group level and in the countries, this function is always composed of mixed teams of Human Resources professionals and managers coming from the operations. Finally, the Group's Human Resources Vice President is a member of the Executive Committee and reports directly to the Chairman and CEO.

"OUR TALENTS" INDEX

Starting in 2012, Air Liquide publishes annually a Key Responsibility Index called **"Our Talents"** reflecting the Group's efforts and results in the development, diversity and engagement

of its employees. The objective is to encourage the organization to set up progress actions in these areas. It is calculated by integrating the indicators presented in this section, weighed as follows: a third for development, a third for diversity and a third for employee engagement.

Development	■ Percentage of employees who benefited from at least one training session during the year
	■ Percentage of employees who had an annual evaluation interview with their immediate supervisor during the year
Diversity	■ Percentage of women among Managers and Professionals hired during the year
	■ Number of nationalities among the Senior Managers/Number of countries where the Group is present
Engagement	■ Percentage of employees belonging to a unit where an internal satisfaction survey was conducted over the last three years
	■ Percentage of employees holding Air Liquide shares
	■ Loyalty rate of Managers and Professionals

The value of the "Our Talents" Index in 2012 was **100**. It was calculated from a reference value of 100 in 2010. Air Liquide's objective is to reach 115 in 2015.

	2010	2011	2012	2015 objective
"Our Talents" Index	100	102	100	115

Even if certain indicators have progressed, notably the one on the number of internal satisfaction surveys, the value of the "Our Talents" index declined slightly in 2012, compared to 2011, mainly for two reasons:

- a decrease in the proportion of Group employee shareholders in the Company because there has been no capital increase reserved for employees over the last two years;
- the integration at the end of 2012 of over 2,000 employees from companies that have not yet reached the Group's standards in the Human Resources area.

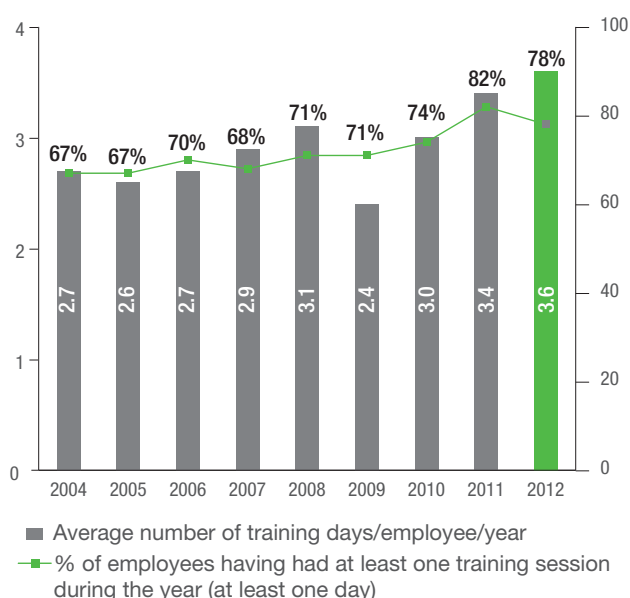
In addition, this index, also calculated for the preceding years, shows a strong increase, having gone from 86 in 2008 to 100 in 2012.

DEVELOPMENT

Training

Air Liquide takes particular care to develop the competencies and expertise of its employees. Training is an integral part of this development. It allows employees to work safely as well as to improve their performance, contribution and employability. In 2012, 78% of the Group's employees had at least one training session during the year. The average number of training days per employee and per year reached more than 3.6 days in 2012, which is the largest number of days ever attained by the Group. This represents an amount of more than 1,272,000 training hours in 2012.

Average number of training sessions per employee and per year/percentage of employees having had at least one training session during the year



The Group has invested in better professional qualifications and training programs for young people to facilitate their integration into the business world. As a result, more than 400 young people have benefited from work-study contracts in France, combining theoretical learning in their university or school and a practical internship at Air Liquide.

Through its **Corporate University**, created in 2009, Air Liquide has developed its training programs to meet the needs of employees while including the Group's values. Based on a decentralized model that permits a very large number of employees to be trained, with modern pedagogic techniques like e-learning, it has a dual objective:

- formalizing and rolling out the training processes and disseminating good practices that go hand in hand with the Group's training dynamic;
- proposing about 20 specific programs, ranging from integrating new employees to developing leadership capacities, as well as "business" training programs given by the different business lines. The Group's values, Principles of action and key challenges are systematically included in the different modules. In 2012, the programs expanded to offer training sessions to Senior Managers and were enriched notably with the launch of sessions "of finance for non-financiers", called "Cash".

The e-learning platform provides employees with a support for their training. In line with preceding years, the on-line training offering has been enriched by many themes such as safety, ethics and office automation. An on-line language course will also be offered in the near future. The e-learning module, "Discover", rolled out in 2011, presents new arrivals with the Group's history and key messages, safety, Principles of action and core businesses. It is available this year in six languages (French, English, Spanish, Italian, Russian and Portuguese). Over 3,600 people were already trained through this module since its launch in the different countries where Air Liquide is present.

Training in ethics and in particular in anti-corruption was also continued in 2012. This module is planned first for sales, procurement and legal teams as well as for the Executive Committees and Senior Managers in the Group's units. Nearly 1,000 employees have already been trained in the Group's different geographies, mostly in Asia (China, India, South Korea, etc.), Europe (Russia, Ukraine, Greece, Bulgaria, etc.), the Middle East and Africa (United Arab Emirates, North Africa, South Africa) and South America (Brazil, Argentina, etc.). It was reinforced in 2012 by the creation of e-learning modules on employee Codes of Conduct and the Anti-corruption Code.

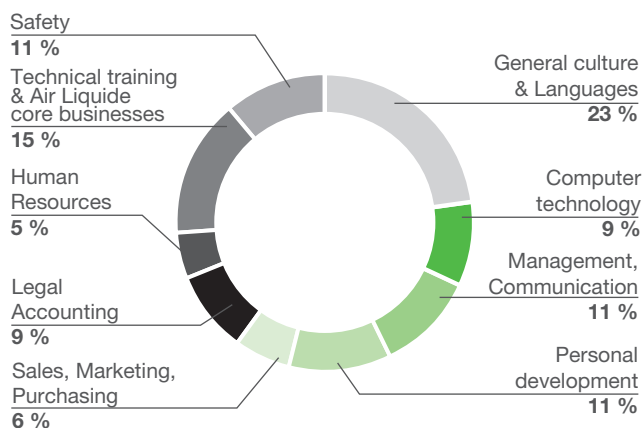
In 2012, Air Liquide innovated by organizing two encounter and training campuses in Paris and Houston (Texas). The goal was to bring employees together around a range of training programs and to promote contacts and meetings through networking.

Since its creation in 2009, the Air Liquide University has already trained nearly 7,000 employees.

Employees

Training themes (a)

The range of training themes offered to employees is quite broad. Among the nine themes offered, the largest share goes to safety and foreign languages.

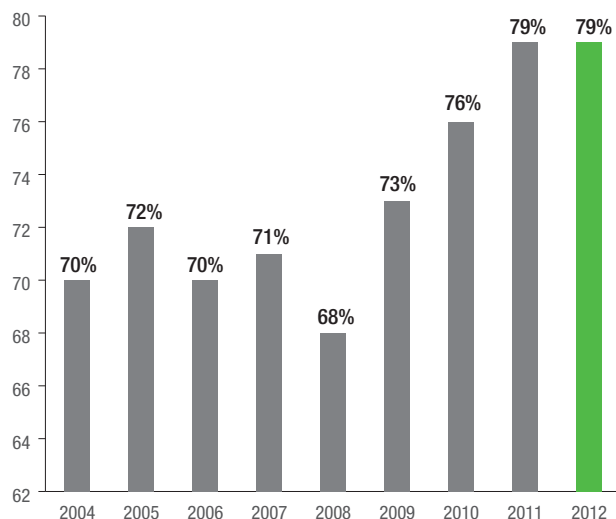


Follow-up of employee performance

It is through the commitment and contribution of its employees that Air Liquide gives more value to its customers and shareholders. This performance is followed and measured during interviews that each employee has every year with his or her immediate supervisor but also during career development interviews that permit each employee to talk about more long-term prospects with the local Human Resources Department. The Group's Human Resources Division particularly encourages these meetings as they are one of the cornerstones of the Company's Human Resources policy.

In 2012, 79% of the employees had a performance evaluation interview with their immediate supervisor, which is the highest rate in the last nine years. In addition, 17% of the employees had a career interview with their unit's Human Resources Department.

Percentage of employees having had an annual interview with their immediate superior during the year



(a) Breakdown of training sessions, estimated in days, in France.

DIVERSITY

Diversity/Parity

Air Liquide is strongly committed to **fighting all forms of discrimination**. Diversity is a priority of the Air Liquide's Human Resources policy. The Group considers it is a source of dynamism, creativity and performance and has always desired to broaden hiring and attract the best talent. Air Liquide's markets are varied and complex. The diversity of its employees should notably reflect its customers' geographic diversity.

The Group's objectives are to continue to increase this diversity among its employees by notably seeking a better division of responsibilities between men and women while promoting the many cultures represented at Air Liquide. The five poles of the Group's Human Resources policy concerning diversity are: diversity of nationality, gender, educational background, age and disability. The international character of the Group's Senior Managers – 29 different nationalities represented in 2012 – is a considerable asset from this viewpoint and continues to be a strong growth track. A team in the Corporate Human Resources Department is in charge of steering the diversity projects.

Equality between men and women is an essential point in the expression of this diversity. For the last several years, Air Liquide has had a global action plan. For example, between 2003 and 2012, the percentage of women who were hired for Manager and Professional positions rose from 14% to 26%. This latter percentage for women Managers and Professionals in the Group corresponds to the global percentage of women in the Group (26%) and illustrates the good representation of women in Air Liquide's management. In addition, women now represent 41% of employees considered high potential. 17 executive management positions in the subsidiaries are held by women in the Group; the number of women in this type of position has increased six-fold since 2007. Moreover, three women are now members of the Group's Board of Directors.

Percentage of women among Managers and Professionals



These results are the fruit of a concrete, rigorous and global Human Resources strategy based on four focuses:

1. Recruiting:

Strengthening the place of women in the Group, in particular through hires of Managers and Professionals.

2. Developing careers and increasing responsibilities for women in the Company:

- for every management position that becomes available, Human Resources examines the application of at least one woman among the applicants;
- regular Human Resources reviews dedicated to women with high potential are conducted by the Group's Executive Committee;
- a meeting before and after maternity leave has been organized in a certain number of units in France.

3. Communicating with and involving all the managers:

In the framework of Air Liquide's policy on promoting parity, the hiring and career development of women and strengthening their place and responsibilities in the Company, a program on awareness-raising and exchanges on "men/women" differences and the benefits that parity induces has been organized in the Group since 2007, aimed at managers. More than 700 managers in the Group have followed this program, in Europe and Asia. The objective is to continue rolling out these awareness programs at all the Group's subsidiaries. A communication support kit, containing a video message from the Group's Chairman and CEO, was deployed by the Human Resources teams for the different Air Liquide units to implement these actions locally with their teams.

In addition to these many local initiatives, each year, Air Liquide joins forces with the International **Women's Day celebrated on March 8**.

Moreover, this year, Air Liquide took part in two seminars on diversity, one on the initiative of Shell, a historic customer of international dimension, and the other on the initiative of BNP Paribas, one of the main French banking groups.

4. Better balancing professional and private life:

The **CESU** (Universal Service Employment Check), whose aim is to facilitate childcare in the home, has been implemented for certain units in France since 2007 for men and women in the Group who have young children.

The **Diversity Charter** that Air Liquide signed in France is available on this organization's website and is an illustration of the Group's commitment to diversity.

Other information on the actions Air Liquide has undertaken on balancing professional and private life can be consulted in the **"Well-being"** paragraph presented on page 76.

Disability

For Air Liquide, diversity and equal opportunity also mean better insertion of disabled employees into its teams, but also through subcontracting to firms in the protected sector ^(a), particularly in France.

In 2012, disabled employees represented 1.3% of the Group's personnel.

In France, the general Human Resources policy on disability took concrete form through the signature of three agreements with social partners and a complementary agreement on local hiring initiatives. At the end of 2012, the percentage of disabled workers for all the French subsidiaries was 4.3%. Through these company agreements, Air Liquide has an employment policy with objectives in recruitment, integration into the Company, training, job maintenance, awareness-raising and subcontracting from the Protected Sector.

To carry out these operations favoring the disabled in the field, Air Liquide's *Mission Handicap* calls on employees who are "disability advisors" divided among the main French subsidiaries. They are accompanied by multidisciplinary working groups that meet three times a year to work on different subjects connected to disabilities.

Among the new operations implemented in 2012 was the **signing of a partnership with a company specialized in hiring disabled people** to further integrate the disabled into the Group, and a survey conducted by a sociologist on three sites in France on employment, daily work and relations with the managers and colleagues of disabled people. This study revealed that disability in a company is a subject that identifies the strengths and weaknesses of each individual and that makes a team more aware of its group dynamics.

In November 2012, as every year, *Mission Handicap*, renewed its "Disability Month" operation on the occasion of the national week for the employment of the disabled. For this event, Air Liquide mobilized all its employees through awareness-raising actions to develop a better knowledge of disabilities and to look at differences in another way. This year, Air Liquide focused on the theme of the Paralympic Games and organized a series of personal accounts and exhibitions on Paralympic sports (photo exhibitions, drawing contest for employees' children, etc.).

Lastly, in 2012, the Group's Human Resources Division held a seminar for all of the managers of disabled employees to promote their actions.

(a) Sector of the economic activity giving priority to employing disabled workers.

Employees

ENGAGEMENT/LOYALTY

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

The Group wants to have its employees worldwide more broadly participate in the capital of Air Liquide S.A. So, since 1986, 11 capital increase operations have been especially reserved for the Group's employees so that they can take advantage of preferential conditions.

At the end of 2012, the share of capital held by the Group's current and former employees was estimated at 2.1%, of which 1.5% (in the meaning of Article L. 225-102 of the French Code of Commerce) corresponded to the shares subscribed by the employees in the framework of capital increases that are reserved for them or that are held in the framework of collective management.

Remuneration

Employee remuneration is based on local market conditions, internal equity, applicable legislation and their performance. It is generally made up of a base salary plus complementary compensation elements. In 2012, 54% of the employees received an individual variable share in their remuneration. Most of the Managers and Professionals have a variable remuneration, which includes sustainable development objectives: they focus on subjects such as **safety** (number of accidents with lost time, number of "behavioral safety visits"), the **reliability of production facility operation energy efficiency** and **hiring diversity**.

In addition, remuneration can also include benefits such as provident insurance and medical expenses. In 2012, 98% of the employees benefited from some sort of social coverage through the Group.

HEALTH IN THE WORKPLACE

Air Liquide is particularly concerned with ensuring that its employees' working conditions do not present any health risks. This is notably demonstrated through preventive actions on the ergonomics of workstations and the implementation of specific safety rules in the Group's Industrial Management System (IMS). For example, in 2012, an action plan targeted on the handling and carrying of heavy loads was instituted in France on a CO₂ filling site. The risk of musculoskeletal disorders was reduced on the workstations concerned. In Indonesia, a training campaign was launched on noise-related risks. In this region, the local climate makes it difficult to install acoustic cladding for industrial equipment, which increases noise-related health risks. This training reinforced instructions on wearing hearing protection.

In France, a diagnosis undertaken in 2011 on difficult working conditions for employees (physical constraints, environment and work rhythm) established that a very small number of the Group's employees work in harsh conditions. In the units where this diagnosis was carried out, the results were systematically presented to the Hygiene, Safety and Working Conditions Committee (CHSCT) to collect opinions, and action plans were organized. In 2012, no specific agreement on safety and health was signed in France.

Air Liquide creates awareness-raising campaigns and training worldwide on safety, health and risk management especially at workstations. This year, a section of the different types of risks was rolled out in the form of posters and training to be organized by managers.

General information on health is also regularly distributed. For example, in France, an information article on "nutrition and cancer" was made available on the Group's intranet for its employees. In South Africa, local subsidiaries are continuing their awareness operations on the AIDS epidemic.

In addition, some of Air Liquide's activities concern hygiene and disinfection, through the Group's specialized subsidiaries Schülke and Anios, which make their products available to other units.

WELL-BEING

Continuing the measures carried out these last few years to increase well-being at work, in 2012, Air Liquide signed three agreements for France with external service providers to promote the personal/professional life balance of its employees, whatever their age or position.

First, an agreement was established with a French firm of inter-company crèches to reserve places for the employees of the subsidiaries concerned. The objective is to have 40 places in the next three years. At the end of 2012, 22 places had already been provided.

Next an e-portal was created so that employees can access practical, administrative and legal information from home or the office to facilitate daily life. It can be used by the employee and his or her family *via* a personal access code. Over 70% of the Group's employees in France now have access to this portal.

Lastly, an agreement with the Mondial Assistance company permits employees to call, from their office or home, experts (doctors, legal specialists, social workers, orientation counselors) who answer their questions with complete confidentiality on areas as varied as the family, housing, well-being and healthcare, unforeseen events, budget management, taxation and retirement. Air Liquide is a forerunner in this area as the Group is currently one of the only ones in France to offer its employees such a large range of services.

ABSENTEEISM

This year, Air Liquide is communicating its employees' absentee rate. The definitions of working time and absenteeism differ according to the subsidiaries and their locations. The Group's Human Resources Division is currently reflecting on how to harmonize the follow-up of absenteeism on a worldwide level. In 2012, the absentee rate reported concerned France. This reporting will be expanded to Europe, then the rest of the world in the years to come. The Group's absentee rate was established by counting the total number of days absent due to illness, whatever their duration and cause, including commuting and work accidents, compared to the number of days worked per year ^(a). In 2012, the absentee rate of the Air Liquide Group in France was 3.2%.

ORGANIZATION OF WORK TIME

In France, the general framework of work time organization was defined by all the agreements signed in 2000 and 2001 with the unions. Very few activities operate with shiftwork, which concerns fewer than 10 plants in France, mainly in the Large Industries business line. On the other hand, most of industrial activities, such as those in Healthcare, include on-call systems that are regularly discussed with the unions.

SOCIAL DIALOGUE

Air Liquide is particularly concerned about encouraging and respecting social dialogue and to this end 76% of the Group's employees have access to a representation, dialogue or consultation structure.

The European Works Council has 28 employee representatives from 15 countries ^(b). The composition of the Council evolves with the Group's acquisitions, the expansion of the European Union and according to the rules established by the Council's constitutional agreement. The Council meets once a year chaired by a member of the Executive Committee. The main themes discussed during this meeting are: safety, the Group's current activities, the annual financial statements and Air Liquide's strategy.

In France, an agreement was signed on paying a profit-sharing bonus, instituted by the law of July 28, 2011. In 2012, French employees benefited from this bonus. Three other agreements were created for 11 French subsidiaries on union representation, the Company's contribution to a group saving plan and the profit-sharing bonus. Over 30 agreements in total were signed in France with the representative unions on the subjects mentioned above, as well as on professional equality. This set of collective agreements will gradually be extended to the entire Group.

In Germany, the local subsidiaries are members of the chemical sector employers association (BAVC ^(c)). Negotiations are carried out directly between this association and the German unions. Several agreements were signed in May 2012 in this country. They cover a raise in wages applicable to all the professions represented, greater flexibility of the duration of the work week and an increase in employee social contributions to anticipate the effect of the demographic evolution, notable to offset the cost of implementing part-time contracts for employees over the age of 60.

In addition, in Italy, several agreements were signed between the local subsidiaries and the unions notably on flexible hours and the partial coverage of transportation, school and healthcare expenses.

EMPLOYEE AWARENESS-RAISING ON SUSTAINABLE DEVELOPMENT

Many initiatives are created at Air Liquide to raise employee awareness on sustainable development issues and encourage them to promote them in their daily activities. The "Better and Cleaner" initiative and the "Car-free Day" are a few examples.

The "Better and Cleaner" initiative, launched in France at the end of 2009 and expanded to all of the Group's R&D centers, continued in 2012. The objective of this program is to raise awareness in the Group's employees on their environmental impact by bringing them together around a common project whose goal is to reduce greenhouse gas emissions. These initiatives decrease the carbon footprint of each unit, while finding the best environmental practices developed by researchers worldwide. The best overall performances and local initiatives that are remarkable because of their contribution to a decrease in environmental impact, sustainable development or social benefits are rewarded.

At the Group's head office in Paris, "Better and Cleaner" is being launched on the initiative of employees who wish to get involved in sustainable development at Air Liquide on a daily basis. This year, a study quantified the environmental impact of an employee at the head office by establishing a carbon footprint assessment and identifying improvement tracks to define an action plan to be implemented.

In addition, each year, the Group rolls out, on "World Car-free Day" on September 22, an awareness campaign on the environmental impact of road transportation and highlights alternative means of transportation like carpooling. Many initiatives, in over 40 countries, show the employees' increasingly greater commitment to a more responsible approach in this area.

(a) 365 days minus weekends and legal holidays.

(b) Austria, Belgium, Denmark, France, Germany, Great Britain, Greece, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden.

(c) Bundesarbeitsgeberverband Chemie: Federal Association of Chemical Industry Employers.

Employees

Human resources indicators concerning the Group as a whole

Employees ^(a)	2008	2009	2010	2011	2012
Group employees	43,000	42,300	43,600	46,200	49,500*
■ Women	10,300	10,300	11,100	12,100	12,800
In %	24%	24%	25%	26%	26%
■ Men	32,700	32,000	32,500	34,100	36,700
In %	76%	76%	75%	74%	74%
Joining the Group ^(b)	19.2%	10.5%	15.1%	20.4%	19.9%
Leaving the Group ^(c)	12.5%	12.2%	11.9%	14.3%	12.7%
% of employees having resigned during the year ^(d)	5.0%	3.2%	4.0%	5.3%	4.6%

(a) Employees under contract, excluding temporary employees.

(b) Hiring or integration due to acquisitions. The percentage is based on the number of employees as of December 31 of the preceding year.

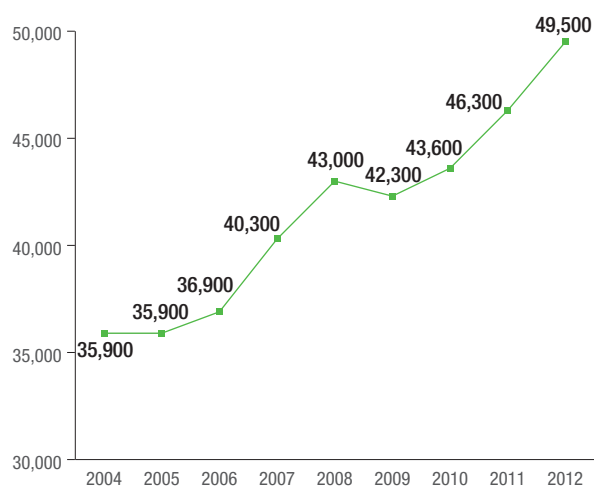
(c) Retirement, resignations, layoffs, departures due to disposals, etc. The percentage is calculated based on the number of employees as of December 31 of the preceding year.

(d) Since 2009, calculated on the number of employees as of December 31 of the preceding year.

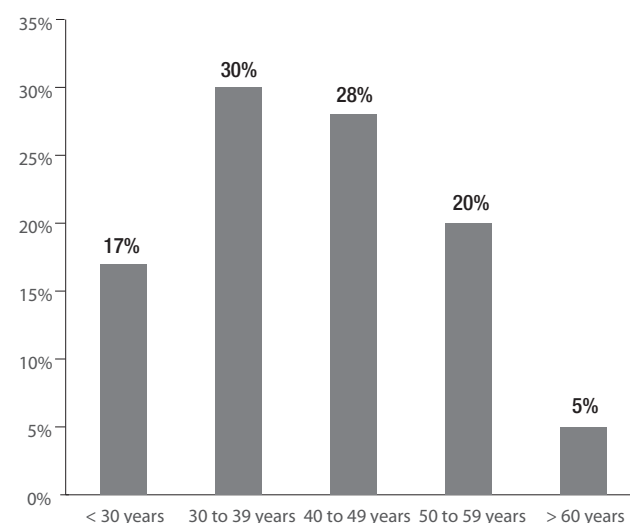
* Indicator verified by the Statutory Auditors.

The indicators presented above are calculated on a worldwide scale. The percentages of those entering and leaving the Group notably include hires and layoffs.

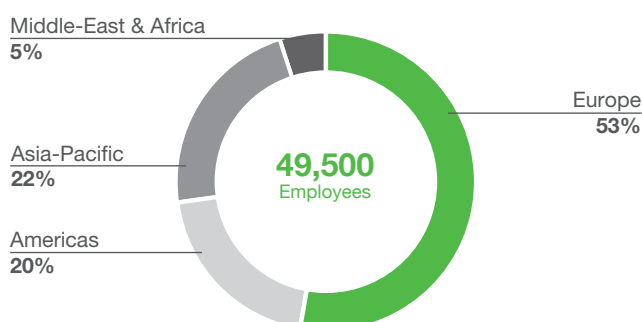
Employees



Distribution of employees by age bracket in 2012



2012 employees by zone



	2008	2009	2010	2011	2012
Parity and diversity					
Parity					
% women among Managers and Professionals	22%	24%	24%	26%	26%*
% women among Managers and Professionals hired during the year	29%	29%	29%	29%	28%*
% women among employees considered high potential	32%	36%	40%	39%	41%
Number of nationalities					
Among expatriates	48	46	53	48	44
Among Senior Managers	22	25	27	28	29
Among employees considered high potential	42	47	46	46	44
Number of nationalities among Senior Managers/Number of countries where the Group is present				35%	36%
Training					
% total payroll allocated to training	About 3%	About 2%	About 2%	About 2%	About 2%
Average number of days of training per employee and per year	3.1 days	2.4 days	3.0 days	3.4 days	3.6 days* ^(a)
% employees who attended a training program at least once during the year	71%	71%	74%	82%	78%*
Performance review					
% employees who have had a performance review meeting with their direct supervisor during the year ^(b)	68%	73%	76%	79%	79%*
% employees who have had a career development meeting with the HR Department during the year ^(b)	16%	14%	15%	18%	17%
Remuneration					
% employees with an individual variable share as part of their remuneration	51%	50%	51%	53%	54%
Absenteeism					
Absentee rate of Air Liquide employees ^(c)					3.2%
Ethics					
% employees belonging to a unit with a local Code of Conduct	55%	67%	71%	90%	91%
Employee loyalty					
Average seniority in the Group	10 years	11 years	10 years	10 years	10 years
Retention rate of Managers and Professionals over a year				94.5%	95.4%
Social performance					
% disabled employees ^(d)	1.2%	1.2%	1.2%	1.3%	1.3%
% employees having access to a representation/dialogue/consultation structure	81%	82%	79%	77%	76%
% employees belonging to a unit at which an internal satisfaction survey was conducted within the last three years ^(e)	58%	37%	43%	48%	55%
% employees with benefits coverage through the Group ^(f)	98%	97%	98%	98%	98%
Employee shareholders					
% capital held by Group employees ^(g)	1.0%	1.4%	1.6%	1.6%	1.5%
% Group employees that are shareholders of L'Air Liquide S.A.	>40%	>60%	>60%	>50%	About 50%

(a) 27 hours a year according to counting in hours (base: 1 day = 7.5 hr.).

(b) Since 2010, calculated on the basis of employees with "long-term contracts".

(c) Calculated in 2012 in France only.

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

(e) Indicator for units of over 300 employees until 2011. All units from 2012.

(f) Includes notably retirement benefits.

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

* Indicator verified by the Statutory Auditors.

> COMMUNITIES

Commitment

Act as a good citizen where the Group operates, by participating in the development of local economies, the protection of life and the environment and through a proactive dialogue with communities.

2015 objective

Put the expertise of the Group's teams at the service of communities by carrying out at least one philanthropic project per country.

In this framework, the Group commits to supporting, over the long term, the Air Liquide Foundation so that it can help reach this objective through the projects.

Key Responsibility Indicator

Number of countries having carried out at least one philanthropic project directly or through the Air Liquide Foundation from 2011 to 2015.

In 2012, Air Liquide supported projects in 19 countries through its subsidiaries and its Foundation, which brings the total number of countries in which a corporate philanthropy project was carried out since 2011 to 30.

Each Air Liquide unit is located in communities for which respect is at the heart of the concerns of the Group's employees. They are aware that each decision, each action commits them vis-à-vis customers and partners but also vis-à-vis those individuals or firms that are affected by the Group's activities. The consideration of these communities' needs is necessary to guarantee the sustainability of the environment where the Group carries out its action.

Relations with public authorities

In 2012, Air Liquide formalized a "Public Affairs" policy governing the Group's interactions with public authorities throughout the world. It deals with reducing risks related to regulatory changes, developing market opportunities and more generally bringing the Group into the public debate.

This policy specifies that Air Liquide works with the public authorities of each country in which it does business, in a transparent manner, following ethical rules and applying political neutrality. All the Group's actions respect the official lobbying regulations in force in the countries in which it is present. Air Liquide is thus registered in the "transparency register" of European institutions and has committed to following the rules enacted by this register's Code of Conduct.

Managers specialized in public affairs have been appointed in the principal countries, comprising a network coordinated on the Group level by the European and International Affairs Division.

The tasks of these managers is to follow public initiatives that may have an impact on the Group and to interact with the public authorities to defend Air Liquide's interests. These interactions can take place either directly or through the professional associations of which Air Liquide is a member. The Group is active in several federations and associations, for example, the European Roundtable of Industrialists, of which Benoît Potier, Chairman and CEO of Air Liquide, is vice president. The Group also calls on outside consultants in this area.

Public affairs cover all the Group's activities. In 2012, the priorities in this sphere were:

- energy transition and the environment with the boom in alternative energies (hydrogen energy, biogases, etc.), energy efficiency and intermittent energy management (photovoltaics, wind turbines, etc.);
- the carbon market with changes in European regulations and the development of regional markets in North America and Asia-Pacific;

- the defense of Air Liquide's shareholding model;
- on the European level, the space question notably concerning current discussions on the future European space launcher;
- the defense of intellectual property and the launch of the European patent;
- the competitiveness of companies on the worldwide level.

Relations with local communities

Air Liquide's teams are very committed to taking part in the local economic life near the Group's sites. This participation includes hiring employees in the area and developing close relations with training organizations and universities that can prepare people for the Group's core businesses.

In the industrial basins where over 1,000 of the Group's sites are located, the Company also wishes to develop subcontracting and local procurement to make a contribution to local economic life.

For example, the Association Air Liquide Maroc has supported a welding school in Casablanca for the last two years. Its aim is to train young adults from disadvantaged milieus in welding

techniques. Since the school's creation, about 30 young people have received a capacity certificate enabling them to more easily find a job. Likewise in India, the Cryolor Asia subsidiary has set up training in welding specifically for women from local communities.

In addition, the Group's activities as well as the means implemented to prevent and manage industrial risks are regularly presented to the populations near Air Liquide's sites. In France, the industrial sites participate in CLICs and CLIEs, local committees that provide information and regulatory consultations on the communes' initiative, with the aim of providing transparent information on their activities to representatives of the local populations.

Corporate philanthropy and the Air Liquide Foundation

Social and human commitment is an ongoing concern for Air Liquide. Since its very beginning, the Group has carried out philanthropic actions, especially in the preservation of life and the environment.

Whether they are directly carried out by the Group's subsidiaries or initiated by the Air Liquide Foundation, these corporate philanthropy actions represented nearly **2 million euros in 2012**.

Subsidiaries committed to communities

Throughout the world, Air Liquide's subsidiaries interact with their direct environment, supporting local corporate philanthropy initiatives. The success of these actions owes a great deal to the employees' involvement in them.

For example, in **Canada**, the subsidiary contributed 50,000 Canadian dollars (37,900 euros) to the creation of the Neonatal Intensive Care Unit at the Montreal Children's Hospital. Through this donation, Air Liquide Canada contributed to the community's development by investing in permanent medical infrastructures. In addition, the subsidiary is supporting, for an amount of 10,000 Canadian dollars (7,600 euros) the Reconnect program of the South Peace Community Resources Society whose aim is to reestablish links between young people and their families, school and community.

In the **United States**, the Group's subsidiaries and their employees have donated over 362,000 dollars (269,000 euros) to charitable

organizations working in the healthcare sector (American Heart Association, National Multiple Sclerosis Society) and education area (Partnership for the Advancement & Immersion of Refugees).

In the framework of celebrations of the 101st anniversary of SOXAL, an Air Liquide subsidiary in **Singapore**, a donation of 40,000 euros was made to the Garden City Fund, an environmental NGO whose purpose is to protect Singapore's biodiversity. This funding will make it possible to conduct a biodiversity study on the coral reefs in the waters around Singapore. In addition, over 250 employees got together on September 29, 2012 in Punggol Waterway Park to plant 101 trees in the framework of the Garden City Fund's Plant-A-Tree program.

Three missions for the Air Liquide Foundation

Created in 2008, the Air Liquide Foundation shows the Group's commitment to being a responsible enterprise. It has a worldwide scope and supports projects in the 80 countries where the Group operates. With a budget of nearly 3 million euros over five years, the Foundation has three missions:

- environment: support for scientific research on the preservation of our planet's atmosphere;
- healthcare: support for scientific research on improving the human respiratory function;

Communities

- Micro-Initiatives on local development: the Foundation supports proximity actions (education, access to treatment, energy and water, micro-entrepreneurship, disabilities, etc.) in the regions of the world where the Group is present.

Each Micro-Initiative is followed by an Air Liquide employee who is a volunteer. The Group's employees who wish to can evaluate and follow a project and get personally involved in the field. Today, over 160 Group employees are involved alongside the Foundation.

Headed by Benoît Potier and composed of Senior Managers of the Group, a personnel representative and outside experts, the Foundation's Board of Directors meets twice a year to determine corporate philanthropy focuses and to examine scientific research projects. It is assisted in its functions by a Project Selection Committee, which about four times a year studies the projects submitted to it. This Committee is composed of seven members including a representative of the Shareholders Communication Committee.

Projects can be submitted on line, in French or in English, on the Foundation's site, www.fondationairliquide.com.

In 2012, the Air Liquide Foundation supported 31 new projects, including two scientific research projects in the environment and 29 Micro-Initiatives. In 2012, these projects were located in 16 countries, four of which were new. Since its creation in 2008, the Foundation has supported 126 projects in 33 countries, among which **over 100 Micro-Initiatives**.



Among the environmental research projects, the Foundation has supported the University of Bern, in **Switzerland**, over the last two years for its Oldest Air program, a long-term scientific project whose purpose is to reconstitute climate changes over a period of 1.2 million years by means of the analysis of air bubbles trapped in the Antarctic ice.

In the framework of its Micro-Initiative support program, the Foundation favors actions whose goal is the development of local communities over the long term.

In **education and training**, the Foundation supports the fight against illiteracy and school dropouts and works to promote literacy training and the socio-professional reinsertion for adults. In 2012, the Foundation supported a dozen initiatives in this field for an amount of 85,000 euros. These funds permitted the renovation

and construction of schools in **Morocco** and **Indonesia**, the purchase of computer equipment for a women's training center in **Lebanon**, teacher training in **Mali** and, in **France**, awareness-raising for secondary school children in difficulty to prevent them from dropping out of school.

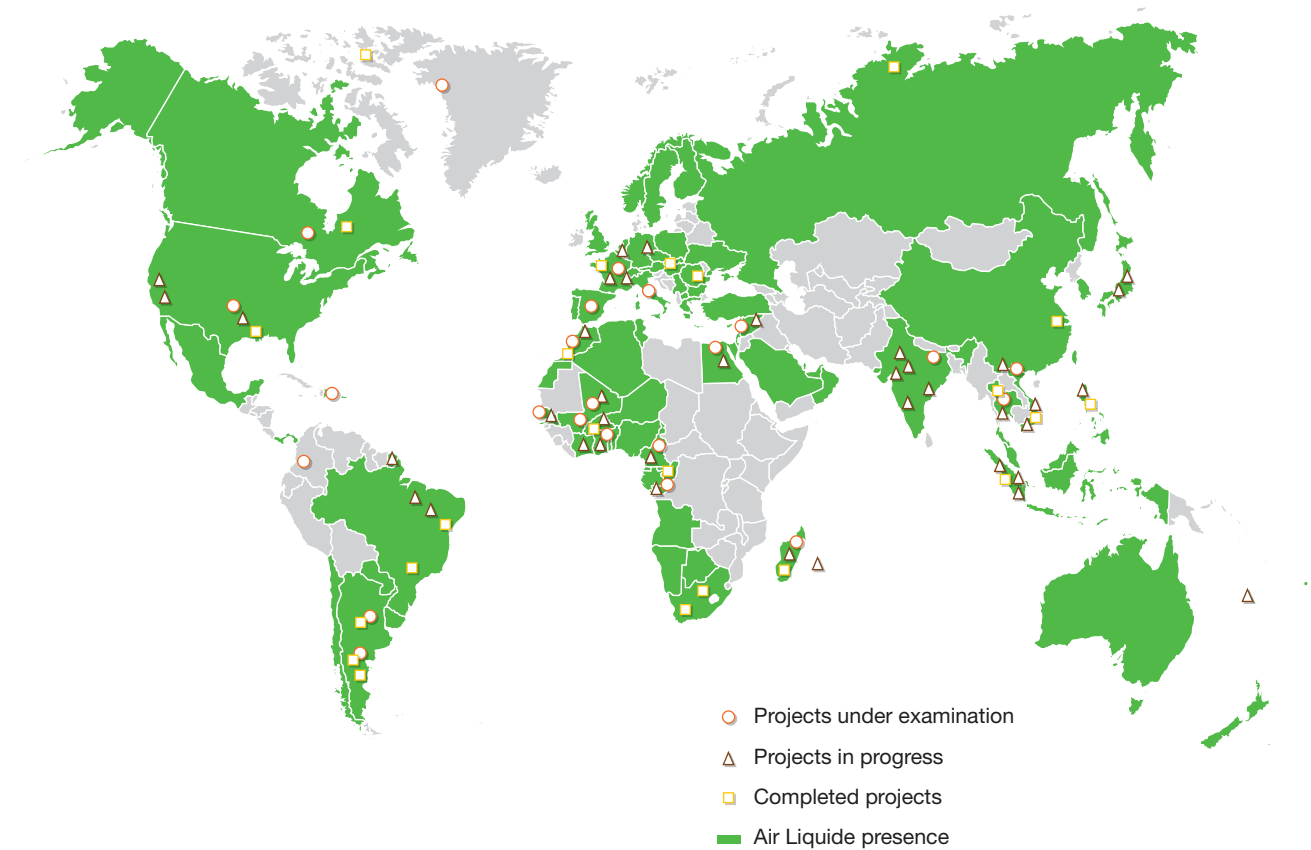
To complement the action of *Mission Handicap* conducted in France, the Foundation accompanies projects that contribute to the coverage and social autonomy of the disabled. In 2012, the Air Liquide Foundation helped six organizations whose aim is to assist these people by notably helping them to surpass themselves and to encourage their self-development. With 45,000 euros of subsidies granted, the Foundation made it possible to renovate reception and learning centers and to develop new therapeutic methods in **France and Belgium**.

In **micro-entrepreneurship**, the Foundation contributes its assistance to the start-up or development of Micro-Initiatives that help revitalize Air Liquide's local environment. In 2012, the Foundation supported, with a subsidy of 32,000 euros, four organizations whose purpose is to durably improve living conditions in local communities by giving them the capacities to generate income and become autonomous in the longer run. For example, it supported the training and equipping of peasant communities in Rio Grande do Norte in **Brazil** so that they could develop apiculture. In **Japan**, the Foundation supported the startup of oyster farming in Miyagi and Iwate, cities devastated by the tsunami in 2011. In **Mali**, it took part in rolling out the traditional construction technique called the "Nubian vault". The objective was to promote the access and dissemination of this ancestral know-how to masons and to create an autonomous local market.

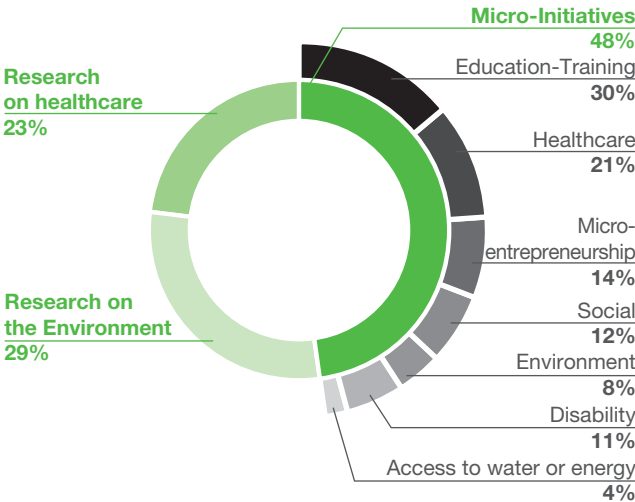
In **healthcare**, the Air Liquide Foundation supports the development of access to healthcare for the most disadvantaged populations, promotes medical skills transfer and helps organizations that respond to emergency situations. In 2012, the Foundation supported five organizations with subsidies of 55,000 euros. These funds were used to equip dispensaries in **Senegal** and **Burkina Faso**, and to accompany patients with chronic illnesses in **France**.

In the **social** sphere, the Foundation helps people to be reinserted socially and professionally. In 2012, it contributed its assistance to three organizations for an amount of 18,000 euros, notably to accompany people in an exclusion situation in **France** or to help communities that had become vulnerable after natural disasters, like **Japan** in 2011.

Air Liquide Foundation projects



The Air Liquide Foundation's actions per mission since its creation in 2008



Improve the environmental footprint

> IMPROVE THE ENVIRONMENTAL FOOTPRINT

Commitment

Continuously improve the environmental footprint of the Group's operations, products, customers, suppliers and communities.

2015 objective

Improve by at least 2% from 2011 to 2015 the energy efficiency of each of its activities: air separation units, hydrogen units and products delivery.

Key Responsibility Indicators

- Evolution of energy consumption for air separation units per m³ of gas produced: improved by 0.2% from 2011 to 2012.
- Evolution of energy consumption for hydrogen units per m³ of gas produced: improved by 0.1% from 2011 to 2012.
- Evolution of the distance traveled per ton of gas delivered (Industrial Merchant activity): worsened by 0.7% from 2011 to 2012.

Air Liquide made the strategic choice of allocating its resources, in particular its investments, to help reduce the direct CO₂ emissions of its activities on its operational scope as well as on its customers sites. This is notably achieved by offering customers solutions to enable them to reduce their own emissions and by steadily improving production and transportation operations.

Revenue linked to life and the environment

Over 40 applications of industrial and medical gases preserve life and the environment at the Group's customers: these applications represent **43% of revenue** ^(a).



In order for the Group to offer its customers solutions so that they can improve their environmental footprint, Air Liquide consolidated, starting in 2003, these "blue" ^(b) sales every other year. In 2010, the Group decided to communicate on this indicator every year. "Blue sales" are calculated **for each of the Group's World Business Lines: Large Industries, Industrial Merchant, Healthcare, Electronics and Engineering & Construction.**

A few examples of applications that preserve the environment:

- filling under modified atmosphere to protect foods and reduce chemical additives;
- inerting with nitrogen industrial installations;
- fusing glass by using pure oxygen, which considerably reduces emissions of nitrogen oxides, gases that cause acid rain;
- using special gases to produce photovoltaic panels;
- treating water in purification stations;
- using rare gases like krypton to improve the insulation of double-glazed windows;

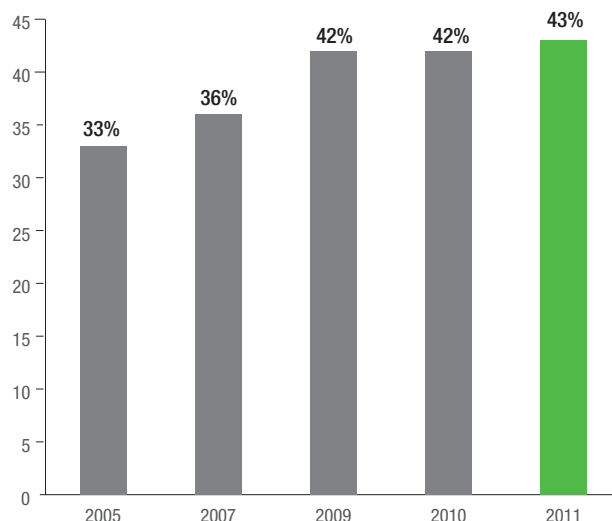
(a) Percentage calculated on the basis of the Group's 2011 revenue.

(b) Air Liquide describes this specific revenue as "blue" to evoke the color of the sky since air is the main raw material in the Group's production units and it is the blue of the atmosphere that we must preserve.

- using hydrogen in refineries to remove sulfur from hydrocarbons, reducing the emissions of sulfur oxide, which also contribute to acid rain;
- manufacturing adjuvants for vaccines;
- using oxygen in blast furnaces to reduce the consumption of coke whose production is very polluting.

The percentage of Air Liquide's "blue sales" noticeably increased between 2005 and 2011, going from 33% to 43% of the Group's total revenue. This growth illustrates the development of the applications linked to preserving life and the environment in Air Liquide's global revenue. In addition, **over 60% of the Group's Research & Development budget is earmarked for work on preserving life and the environment** and is a "blue sales" growth driver for the future.

Percentage of applications that preserve life and the environment in the Group's revenue



The environmental footprint of the Group

ENVIRONMENTAL INDICATORS CONCERNING THE GROUP AS A WHOLE

In its **production** activities, the main trends concerning environmental data in 2012 are the following:

- **the volumes of air gas** produced continued to **rise** compared to 2011. As a result, electrical energy consumption, which is mainly used in air separation units, increased, as did indirect CO₂ emissions, which are connected to it;
- **thermal energy consumption and direct CO₂ emissions** increased mainly due to a sustained rise in volumes of hydrogen production notably due to the startup of two new large units in the United States and China.

Presented here are the environmental elements most representative of the Group's businesses. They cover a total of **524** Air Liquide production units or sites and concern:

- large air separation units;

- hydrogen and carbon monoxide units;
- cogeneration units;
- acetylene units;
- nitrous oxide units;
- carbon dioxide liquefaction and purification units;
- units in the Hygiene and Specialty Ingredients activity;
- Engineering & Construction units;
- units for Welding equipment and products;
- Research & Development centers and technical centers.

The indicators concerning the environmental impact of the **transportation** of products of the Group's Industrial Merchant and Healthcare activities as well as those on water management and the main **waste and byproducts** are presented. Other indicators are also communicated.

Improve the environmental footprint

The most relevant environmental indicators for the total of the 10 types of production units (524 units) and transportation on a worldwide scope

	2008	2009	2010	2011	2012
Evolution of energy consumption per m³ of air gas produced ^{(a) (b)}	101.3	103.3	99.0	99.0	98.8*
Evolution of energy consumption per m³ of hydrogen produced ^{(a) (c)}	98.8	98.7	98.3	98.5	98.4*
Evolution of the distance traveled per ton of industrial gas delivered ^{(a) (d)}	99.2	97.4	96.3	97.1	97.8*
Annual electricity consumption <i>(in GWh)</i>	23,223	21,139	24,924	26,661	27,578*
Annual thermal energy consumption <i>(in LHV TeraJoules)</i> ^(e)	177,395	183,381	204,434	213,198	229,177* ^(f)
Annual water supply <i>(in millions of m³)</i>	59.7	59.9	66.1	67.2	66.4* ^(g)
Annual emissions of CO₂ avoided by cogeneration and on-site units <i>(in thousands of tons)</i>	-625	-819	-870	-1,051 ⁽ⁱ⁾	-987
Total direct greenhouse gas (GHG) emissions <i>(in thousands of tons CO₂ eq.)</i> ^(h)	9,014	9,386	10,181	10,549	11,272*
Total indirect GHG emissions <i>(in thousands of tons CO₂)</i> ⁽ⁱ⁾	7,952	7,447	9,294	10,606 ^(j)	10,853*
Total direct and indirect GHG emissions <i>(in thousands of tons CO₂ eq.)</i>	16,966	16,833	19,475	21,155 ^(j)	22,125*

(a) Calculated from base 100 in 2007.

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

(c) Hydrogen and carbon monoxide.

(d) In kilometers per ton delivered within the framework of the Industrial Merchant business line, for oxygen, nitrogen, argon and carbon dioxide.

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

(f) Or approximately 63,600 GWh LHV.

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

(h) Includes CO₂ emissions and nitrous oxide emissions.

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

(j) At the end of 2012, the International Energy Agency changed the methodology of calculation of the emissions factors related to energy production. 2012 indirect emissions take this referential change into account. 2011 indirect energy emissions have been recalculated according to these new factors so that indirect and total CO₂ emissions between 2011 and 2012 could be comparable. The values published in 2011 were, in thousands of tons of CO₂, 863 for the emissions avoided by cogeneration and on-site units, 9,994 for total indirect GHG emissions and 20,543 for total GHG emissions.

* Indicator verified by the Statutory Auditors.

DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS AND ORIGIN OF THE ELECTRICITY USED

Companies' direct and indirect greenhouse gas emissions are usually divided into three scopes depending on their origin:

■ Scope 1 includes direct emissions generated by all possible emission sources owned or controlled by the Group. This scope brings together the Group's production units as well

as the transportation of products and equipment to the customers;

■ Scope 2 is composed of all the indirect emissions related to the 10 types of production units;

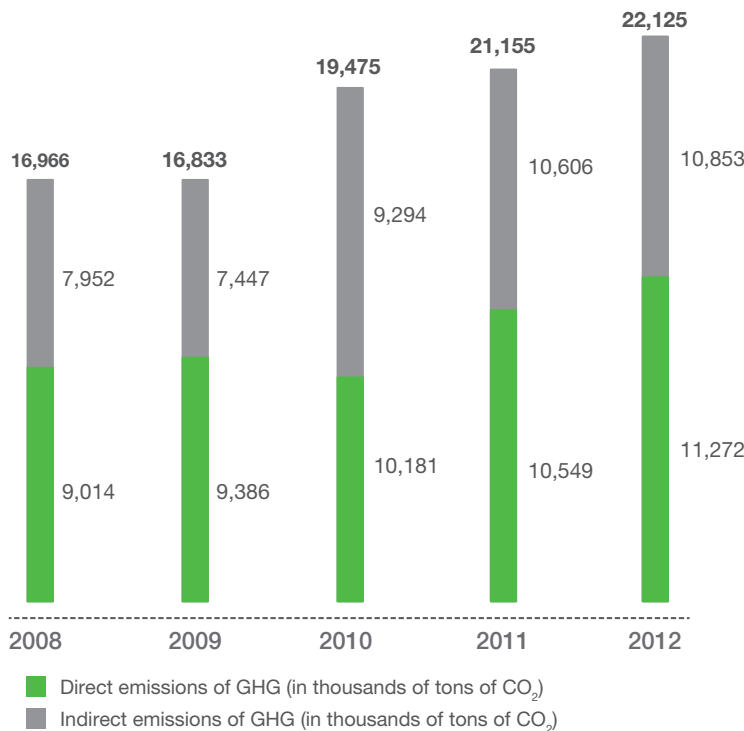
■ Scope 3 encompasses the other indirect emissions generated, for example, by professional travel and commuting or the treatment of products at end of life.

Direct and indirect emissions of Scopes 1 and 2

Direct and indirect emissions of Scopes 1 and 2 represented 99% of the Group's total emissions in 2012.

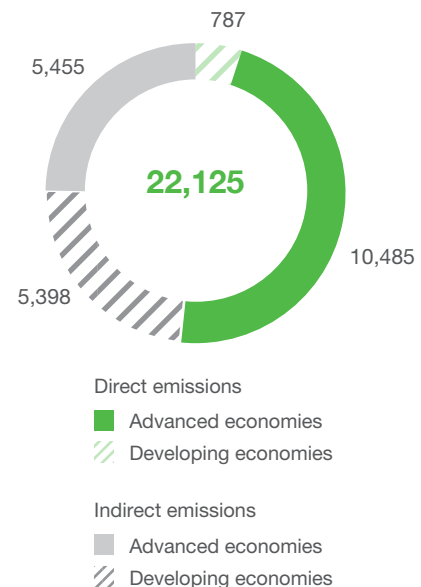
In order to distinguish the differentiated growth dynamics between advanced economies and developing economies, Air Liquide decided, in 2010, to segment its direct and indirect CO₂ emissions between these economies.

Direct and indirect greenhouse gas emissions



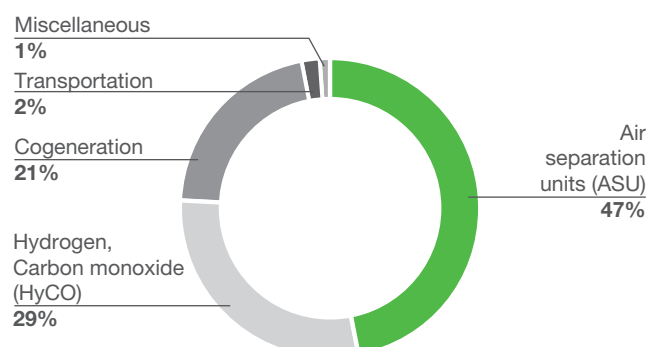
Breakdown of greenhouse gas emissions between advanced and developing economies

(in thousands of tons of CO₂)



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

Breakdown of direct and indirect greenhouse gas emissions



Improve the environmental footprint

Scope 3 emissions related to professional travel

Professional travel by car, train or plane is one of the main sources of Scope 3's CO₂ emissions. These were estimated at 50,000 tons of CO₂ in 2012 for all the subsidiaries, which represents less than 1% of the Group's total emissions. This estimate was done based on the European subsidiaries' emissions, representing 53% of the Group's employees. The total of Scope 3 emissions was then extrapolated by hypothesizing that emissions are homogeneous in all the countries where the Group is present.

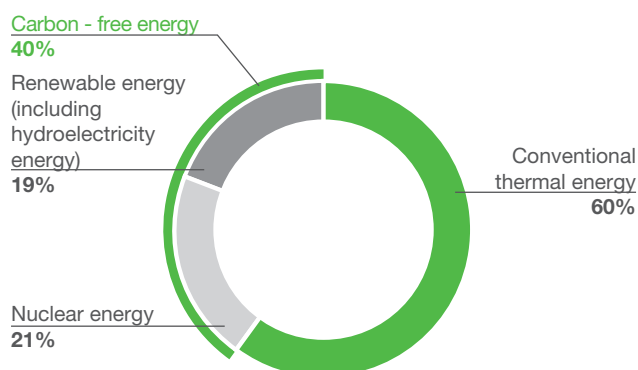
Air Liquide endeavors each year to reduce the greenhouse gas emissions generated by its subsidiaries' activities, notably those caused by professional travel. In France, Air Liquide's objective is to decrease the CO₂ emissions generated by the fleet of cars leased for personnel. To reduce this impact, the French subsidiaries decrease, each year, in their selection criteria for leased vehicles, the CO₂ emission per kilometer ceiling. Set at 147 grams per kilometer in 2008, this ceiling was 109 grams in 2012, with the goal of under 105 grams per kilometer in 2013. With over 3,300 vehicles each traveling on average 40,000 kilometers per year, this has made it possible to avoid the emission of about 14,000 tons of CO₂ between 2006 and 2012.

In addition, since the summer of 2012, 10 telepresence rooms have been operational worldwide: Paris and Champigny in France, Frankfurt in Germany, Houston in the United States, Krakow in Poland, Johannesburg in South Africa, Shanghai and Hangzhou in China, Hyderabad and New Delhi in India. These rooms enable remote meetings by guaranteeing each participant a presence similar to a physical meeting. Launched in the Engineering & Construction activity, Air Liquide has been gradually expanding the use of these rooms to other Group activities, as well as to interactions with customers, partners and investors. This technology reduces the CO₂ emissions generated by the employee's air transportation. Since their service start-up in 2012, the number of trips saved for the Engineering & Construction activity is estimated at 270 round-trips, or over 500 tons of CO₂ emissions avoided.

Origin of electricity used

Taking into account the different natures of primary energy of the countries where Air Liquide is present, it is possible to present the breakdown of the origin of the electricity used worldwide. The Blue Hydrogen® program is currently the main Group initiative on developing the use of renewable energy (see. Innovation section – page 105).

Origin of electricity used in 2012 ^(a)



ENERGY EFFICIENCY OF LARGE PRODUCTION UNITS

Created from an invention that considerably reduced the energy used to separate air gases, Air Liquide has always been involved in preserving the environment and natural resources. The Group has initiated an approach to steadily reduce the environmental footprint of its activities and contributes to improving that of its partners and customers. The objective of improving by at least 2% from 2011 to 2015 the energy efficiency of its air separation units, its hydrogen units and the efficiency of liquefied gas deliveries **corresponds to over 300,000 tons a year of direct and indirect CO₂ emissions avoided ^(b)**.

Through its Engineering & Construction activity, the Group designs its own production units: it can therefore adapt these units' concept to the customers' needs, technological evolutions and energy costs. It directly and rapidly profits from the improvement of these units' energy efficiency. Air Liquide has been operating air separation units and hydrogen units for many years. It therefore benefits from a virtuous circle of steady improvement through **its control of design and operating experience of these units**. Whenever circumstances permit, old units are replaced by new ones that are more energy efficient.

In addition, the Group builds **larger and larger units** that generally provide more efficient energy through economy of scale.

(a) The calculation takes into account the different natures of primary energy that each country uses to produce electricity (source: International Energy Agency).

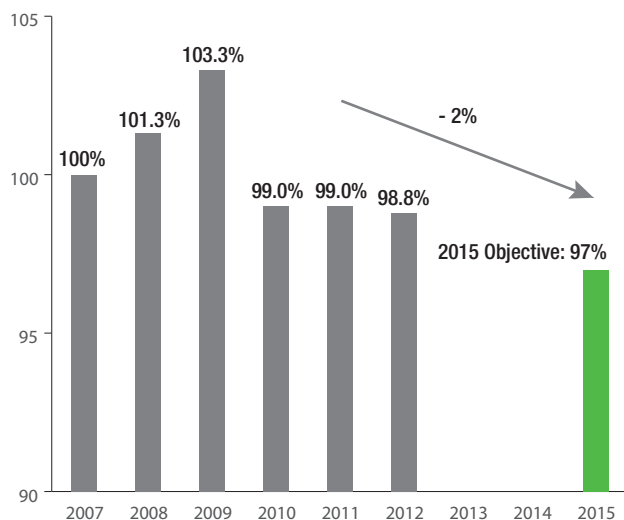
(b) Estimate on the basis of CO₂ emissions in 2012.

Air Liquide has also set up a program to **improve the reliability** of the units' operation that, in addition to providing better service to customers, has direct consequences on energy efficiency. Every shutdown and startup of these units creates an energy consumption sequence. Increasing reliability, *i.e.*, reducing the number of excessive shutdowns, results in better energy efficiency in production units.

Large units are often interconnected through a **pipeline system** supplying a customer industrial basin. This group of interlinked units creates a synergy of their operation both for production and energy consumption. The steady development of the Group's oxygen, nitrogen and hydrogen pipeline systems clearly helps improve its energy efficiency.

Lastly, more efficient **computer technology** is being rolled out to centrally monitor and run the Group's large units so that **production can be adjusted to the customers' needs**. This initiative leads to substantial savings in energy consumption.

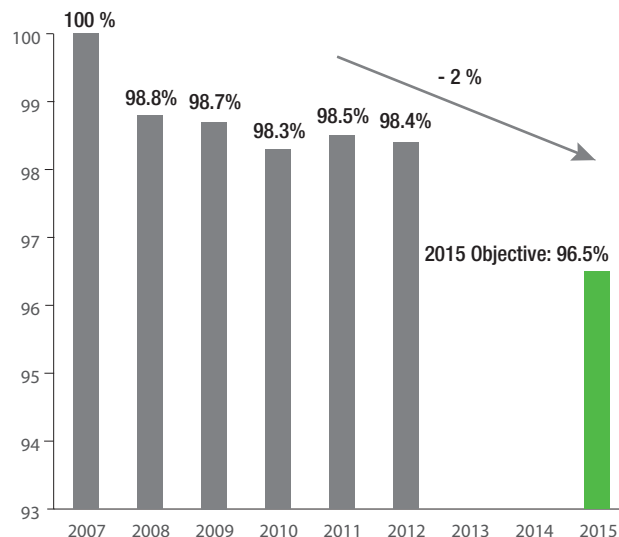
Evolution of energy consumption per m³ of gas produced for air separation units ^(a)



The energy consumption per m³ of air gas produced, *i.e.*, the **energy efficiency of these units, continued to improve in 2012** and is at its best level since 1998.

(a) Calculated from base 100 in 2007.

Evolution of energy consumption per m³ of gas produced for hydrogen and carbon monoxide units ^(a)



The energy efficiency of hydrogen units has slightly improved in 2012.

TRANSPORTATION

For Air Liquide, gas transportation is mainly achieved by pipelines. Supplying large customers *via* pipeline from the Group's production units also considerably limits truck transportation. These pipeline systems, which are environmentally friendly and safe, total over **9,000 kilometers worldwide**. For air gases and hydrogen, which represent most of the volumes the Group delivers, **86% of deliveries are made *via* pipeline or through on-site units**. As a result, only 14% of all air gases or hydrogen are delivered by trucks.

Industrial Merchant activity

In 2012, trucks delivering Air Liquide liquid gases or gas cylinders in the Industrial Merchant activity traveled **428 million kilometers** throughout the world and emitted about **471,000 tons of CO₂**. On-site nitrogen, oxygen and hydrogen units reduced truck deliveries, a source of CO₂ emissions. These on-site units were able to save the **68 million extra kilometers** traveled by trucks and therefore the emission of **68,000 tons of CO₂**.

Improve the environmental footprint

In addition, the Industrial Merchant activity has developed software that **optimizes truck deliveries** to reduce the number of kilometers traveled per ton of gas delivered. In particular, the levels of the customers' stock delivered in liquid form are automatically

measured and transmitted to Air Liquide's logistics teams. These data determine the optimal delivery frequencies and itineraries to resupply these customers.

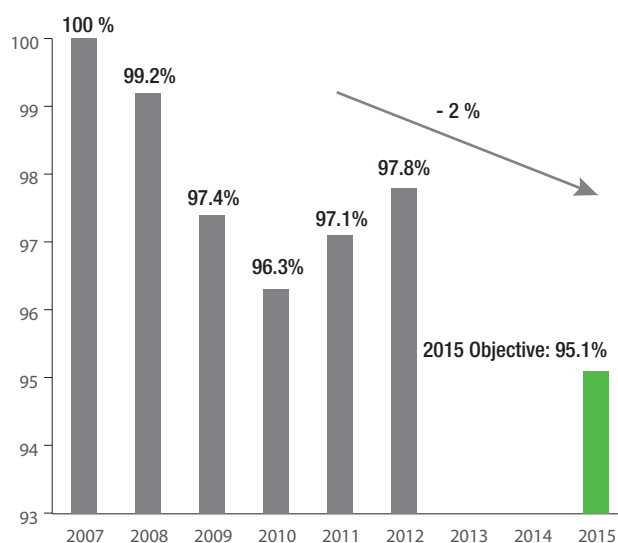
	2008	2009	2010	2011	2012
Kilometers traveled by all vehicles delivering gas in liquid or cylinder form (in millions of km)	395	363	361	428	428*
Estimate of CO ₂ emissions generated by these vehicles in the Industrial Merchant activity (in thousands of tons)	433	399	396	471	471*
Evolution of the distance traveled per ton of industrial gas delivered (oxygen, nitrogen, argon, carbon dioxide) ^{(a) (b)}	99.2	97.4	96.3	97.1	97.8*
Estimate of truck transport kilometers avoided through on-site customer units (in millions of km)	-58	-54	-61	-70	-68
Estimate of CO ₂ emissions avoided by these on-site units (in thousands of tons)	-63	-58	-66	-70	-68
Percentage of deliveries of air gases and hydrogen via pipeline or on-site	84%	85%	86%	86%	86%

(a) In kilometers per ton delivered for the Industrial Merchant activity.

(b) Calculated from base 100 in 2007.

* Indicator verified by the Statutory Auditors.

Evolution of the distance traveled per ton of industrial gas delivered (oxygen, nitrogen, argon, carbon dioxide)



In 2012, the increase of the distance traveled per ton of industrial gas delivered represented a decrease in the efficiency of truck delivery, **due to problems supplying liquid CO₂**, in particular in Europe and Australia where in-depth maintenance operations

were carried out on the main sources of this gas. Delivery vehicles traveled more kilometers to stock up and supply customers. Nevertheless, over the last 10 years, the energy efficiency of truck deliveries has improved by over **4%**.



Air Liquide innovates for cleaner and quieter refrigerated transportation with the Blueeze™ technology

In France, refrigerated transportation is handled by 66,000 refrigerated trucks including 34,000 trailer trucks. Each day, this fleet delivers thousands of tons of fresh and frozen products, a large part of which goes to metropolitan areas. Today's refrigerated trucks produce cold by means of a refrigerating unit run by a diesel engine. With Air Liquide's Blueeze™ technology, chilling inside the truck is done by the circulation of liquid nitrogen at -196°C, in a totally airtight exchanger that can be adjusted to within 1°C. This safe and innovative solution reduces greenhouse gas emissions since its carbon footprint is limited to the very small amount of waste generated by nitrogen production and also reduces noise pollution because this system is silent, unlike the traditional diesel engine system. This innovation by Air Liquide decreases the environmental impact of customers and improves the acoustic comfort of users and local residents and businesses..

Healthcare activity

In 2012, the total number of kilometers traveled for deliveries of gas cylinders for the Home Healthcare activity was **141 million kilometers**. The quantity of CO₂ emitted for these deliveries was **35,000 tons**^(a). The number of kilometers traveled for the delivery of medical gases to hospitals^(a) amounted to 20,000 million kilometers, which represented **17,000 tons of CO₂** in 2012.

	2012
Transportation Home Healthcare activity	
Kilometers traveled (in millions of km)	141
Associated CO ₂ emissions (in thousands of tons)	35
Transportation Medical Gases activity	
Kilometers traveled (in millions of km)	20
Associated CO ₂ emissions (in thousands of tons)	17
TOTAL KILOMETERS TRAVELED HEALTHCARE ACTIVITY (in millions of km)	161
TOTAL ASSOCIATED CO₂ EMISSIONS (in thousands of tons)	52

WATER MANAGEMENT

Fresh water used for human activities **represents less than 1%** of the water present on the earth. Its rational use is a subject of growing importance. According to the OECD^(b), the worldwide demand for water should rise more than 50% by 2050. This increasing demand generates tensions both between countries for the control of supply sources and between activity sectors (agriculture, industry and domestic use). The water stress indicator, as defined by the World Business Council for Sustainable Development (WBCSD), locally measures the quantity of renewable water available in m³ per person and per year. This data enables risk zones to be identified.

In 2012, among the 276 analyzed sites, 30 were located in a very high water stress zone (<500 m³ per person per year),

which represents about 5% of the annual water supply of Air Liquide's industrial sites. More generally, about 100 of the 276 main industrial sites analyzed are located in a high or moderate water stress zone^{(c) (d)}.

In 2012, Air Liquide used 66.4 million m³ of water broken down as follows:

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

(a) Extrapolated from the main countries of the Healthcare activity.

(b) Organisation for Economic Co-operation and Development.

(c) A zone is considered in a moderate water stress situation when this volume of renewable water is between 1,700 and 1,000 m³ per person and per year, and in a high water stress situation when this volume is below 1,000 m³.

(d) Study conducted by using the Global Water Tool developed by the World Business Council for Sustainable Development (WBCSD).

Improve the environmental footprint

Air Liquide assumes its responsibility as an industrialist, working on reducing the volumes used. Several notable action plans have been implemented recently in the world in the Group's different activities:

- in São Paulo in Brazil, a city wastewater recovery and treatment system was set up in partnership with 10 other local chemical companies to use this water in industrial processes and in this way totally replace the supplying of water from rivers;
- in Tunisia, work carried out on two air separation units improved the quality of the water discharged from the cooling towers and reduced the annual amount of water supplied by 21%;
- in South Africa, a recovery system for water used to cool acetylene cylinders during their filling reduced consumption at two production sites from 4,000 liters an hour to 4,000 liters a week, a saving of about 30,000 m³ per year.

These examples are disseminated via the Air Liquide internal information networks to help all the subsidiaries make progress in this area.

ENVIRONMENTAL INCIDENTS AND CONSIDERATION OF RISKS RELATED TO CLIMATE CHANGES

Reporting and classification procedures for environmental incidents depending on their seriousness included in the Group's IMS (Industrial Management System) have been rolled out in all the units. Every event reported at the Group level is systematically analyzed so that preventive actions can be created to avoid repetition of the incident. Environmental risks related to industrial processes and risks related to climate change are presented in the Risk factors section – page 26.

Environmental incidents in the industrial and medical gases activity, compared to the traditional chemicals industry, have a very low impact on the environment most of the time. For example, in air gas production, any possible leak of these gases presents absolutely no danger for the atmosphere. Likewise, the water used in Air Liquide's processes are primarily used in cooling and steam production. The risk of possible pollution of the water used is therefore also very low.

The amount of financial provision and guarantees earmarked for environmental risks is 15 million euros.

WASTE AND BYPRODUCTS

Although the quantity of waste and byproducts produced in the Group's industrial and medical gases activity is small, with a concern for the exhaustiveness of the reporting, Air Liquide nonetheless decided to publish the following estimated figures. The main waste and byproducts produced by the Group's production units are lime from the acetylene production units (byproduct), metal waste, oils, paints and solvents. The average recycling ratio of waste ^(a) is over 90%.

Waste and byproducts	2008	2009	2010	2011	2012
Waste and byproducts that are not dangerous					
■ Annual quantity of lime produced (extracted dry equivalent) by the acetylene production units (in tons)	47,000	39,400	36,900	36,800	30,400
% recycled	> 90%	> 90%	> 90%	> 90%	> 80%
■ Metal waste (in tons) ^(b)	9,500	6,000	9,200	8,200	9,200
% recycled	> 99%	99%	> 99%	> 99%	> 99%
■ Oils (in tons)	700	600	750	750	825
% recycled	88%	89%	90%	84%	91% ^(c)
TOTAL NON-DANGEROUS WASTE AND BYPRODUCTS (estimate in tons)	57,200	46,000	46,850	45,750	40,525
Dangerous waste					
■ Paints and solvents (in tons)	200	200	200	150	101
% recycled	8%	30%	45%	54%	43% ^(d)
TOTAL WASTE AND BYPRODUCTS (estimate in tons)	57,400	46,200	47,050	45,900	40,626

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

(b) Metal waste that is not dangerous.

(c) In addition, 9% is incinerated.

(d) In addition, 48% is incinerated.

SECONDARY ENVIRONMENTAL INDICATORS

As a complement of the main environmental indicators presented at the beginning of the environment chapter, there are other environmental indicators for the Group but that are of lesser importance and relevance for Air Liquide's business. Among them and with a concern for transparency and exhaustiveness in reporting, Air Liquide presents below the synthesis table of emissions into the atmosphere of nitrogen oxide (NOx), sulfur oxide (SOx), Volatile Organic Compounds (VOC) as well as discharge to water of oxidizable matter and suspended solids.

	2008	2009	2010	2011	2012
Total emissions into the air: NOx (nitrogen oxide) (in tons)	3,560	3,910	3,500	3,710	3,940
Total emissions into the air: SOx (sulfur oxide) (in tons)	< 300	< 300	< 300	< 300	< 300
Total volatile organic compounds (VOC) emitted into the atmosphere (estimate, in tons)	390	300	330	320	124
Total discharge to water: oxidizable matter (in tons)	< 1,500	< 1,400	< 1,600	< 1,700	< 1,700
Total discharge to water: suspended solids (in tons)	< 1,400	< 1,400	< 1,400	< 1,500	< 1,500

"CARBON CONTENT" OF AIR LIQUIDE'S MAIN PRODUCTS

Taking into account the characteristics of electricity supplied to Air Liquide, the Group has built a model ^(a) calculating the "carbon content" of its main products in certain countries where the Group is located ^(b). These figures include both direct and indirect ^(c) emissions, those connected to production, cylinder filling and also transportation. These data are increasingly requested by the Group's customers to integrate the carbon content of industrial gases into the global life-cycle analysis of their products.

"Carbon content" of Air Liquide's main products in 2012 (gCO₂/Nm³ ^(a))

		France	Germany	Italy	Spain	Sweden	United States ^(b)	Canada	Japan	China
Oxygen	Oxygen in pipelines ^(c)	62	293	252	222	16	375	133	307	454
	Liquid oxygen	136	524	469	411	72	670	259	562	796
	Oxygen in cylinders ^(d)	559	969	843	825	247	1,015	688	1,243	1,118
Nitrogen	Nitrogen In pipelines ^(c)	20	97	83	73	5	124	44	101	150
	Liquid nitrogen	98	345	315	276	62	440	177	375	518
	Nitrogen In cylinders ^(d)	519	781	681	683	236	775	603	1,046	827
Argon	Argon In cylinders ^(d)	650	1,400	1,215	1,152	271	1,569	884	1,696	1,789
CO₂	Liquid CO ₂ ^(e)	59	120	127	107	34	130	62	^(f)	^(f)

(a) Nm³ = m³ of gas at atmospheric pressure at 0°C.

(b) In 2012, the calculation of indirect emissions in the United States takes into account the emission factor provided by the International Energy Agency. In 2011, this calculation only took into account the electricity production units supplying Air Liquide. This change in base explains the increase between 2011 and 2012.

(c) At 40 bar, pressure standard for these pipelines.

(d) At 200 bar, pressure standard for cylinders.

(e) Exceptionally, the data on liquid CO₂ are expressed in gCO₂/kg.

(f) Product not distributed by Air Liquide in this country.

In 2012, the emissions generated by primary transportation, i.e., between cylinder filling sites and distribution platforms, were counted, unlike the preceding years. This change in the calculation method explains an increase of about 12% of the carbon content of gases in cylinders.

The average carbon content of the hydrogen supplied by the Group's units in Europe was 761 gCO₂/Nm³. With a concern for simplification, this calculation was made solely on the units producing hydrogen but not carbon monoxide (CO) or syngas, and the CO₂ emissions related to the steam production of these units were deducted by considering a factor of 176 tCO₂/kt.

(a) The methodology and calculations for the model of these figures were validated in 2008 by Ecofys, a consulting firm specialized in sustainable development. These calculations take into account in each country the different energy sources used to produce electricity (source: International Energy Agency).

(b) These nine countries represent about 80% of the Group's Gas revenue.

(c) Concerning the CO₂ emissions from electricity production consumed by Air Liquide.

Improve the environmental footprint

BIODIVERSITY

As for biodiversity, the impact of Air Liquide's activities is limited because the Group's production units are generally located on small sites in industrial zones.

Nevertheless, Air Liquide supports the preservation of terrestrial and marine biodiversity through its Foundation, which finances projects favoring this subject throughout the world.

In 2012, the Foundation supported the following projects:

- the WWF association to set up a pilot site of the REDD ^(a) program in the Tesso Nilo Park, in Sumatra in Indonesia. The object is to reduce deforestation in the park to decrease CO₂ emissions into the atmosphere;

- the CNRS ^(b) in French Guiana, which is conducting a study on chemical diversity in this area of the Amazon, to develop natural insecticides;

- in addition, the Foundation has continued to support biodiversity projects launched in 2010. The goal of one of them is to develop and structure apiculture activities to benefit 850 beekeepers of the Apodi community in the state of Rio Grande do Norte in Brazil, an arid region where the local vegetation, called "caatinga", makes up an ecosystem that is very vulnerable to desertification. This project is being conducted by the Agronomes et Vétérinaires Sans Frontières (AVSF) ^(c) association, which has worked since 1977 for the development of agriculture and livestock farming in peasant communities threatened by hunger and exclusion. Profitable very rapidly, apiculture enables the caatinga, a local natural resource, to be developed while preserving biodiversity through pollination by bees.

Details on indicators for each of the 10 unit types

1. AIR SEPARATION UNITS

Worldwide, Air Liquide operates 309 large air separation units. These units produce oxygen, nitrogen and argon, with some sites producing rare gases like krypton and xenon.

These factories "without chimneys" do not use any combustion processes. Since they discharge almost no CO₂, sulfur oxide (SOx) or nitrogen oxide (NOx) emissions, they are particularly environmentally friendly. They consume electricity almost exclusively: worldwide, they use about 3,000 MW each instant, the equivalent of the production of two nuclear power plant units. Their cooling systems require back-up water.

Air separation units	2008	2009	2010	2011	2012
Number of production units	257	265	287	298	309
Annual electricity consumption (in GWh) ^(a)	22,235	20,141	23,774	25,398	26,203
Evolution of energy consumption per m³ of gas produced ^{(b) (c)}	101.3	103.3	99.0	99.0	98.8*
Indirect GHG emissions (in thousands of tons of CO ₂)	7,612	7,105	8,893	10,158 ^(d)	10,364
Annual make-up water (in millions of m ³) ^(e)	34.6	33.2	36.7	37.7	37.9
Make-up water per m³ of gas produced ^(c)	97.6	104.1	102.0	97.2	96.8

(a) Also including small volumes of purchased steam.

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

(c) Calculated from base 100 in 2007.

(d) Value recalculated in 2012 taking into account the reference provided by the International Energy Agency. The reported value in 2011 was 9,568 thousand tons.

(e) Excluding the energy consumption of units with an open and closed cycle water cooling system.

* Indicator verified by the Statutory Auditors.

(a) The United Nations REDD (Reducing Emissions from Deforestation and Forest Degradation) program aims at encouraging the preservation of forests through financial incentives offered to developing economies that reduced their greenhouse gas emissions from wooded areas and that invest in carbon emission reduction projects.

(b) National Center for Scientific Research (France).

(c) Agronomists and Veterinarians without Borders.

2. HYDROGEN AND CARBON MONOXIDE PRODUCTION UNITS

Worldwide, Air Liquide operates **43 large hydrogen and carbon monoxide production units**. These units also produce steam for certain customers. They primarily use natural gas as a raw material and certain amounts of water required for the reaction that produces hydrogen. Carbon monoxide is an indispensable raw material in the chemical industry for producing plastic materials. The **desulfurization of hydrocarbons** to produce sulfur-free

fuels is one of the main applications for hydrogen. These units emit CO₂ and nitrogen oxides (NOx) but produce practically no sulfur oxide (SOx). They also consume electricity and their cooling systems require make-up water.

In 2012, the hydrogen Air Liquide supplied to refineries throughout the world resulted in **avoiding about 810,000 tons of sulfur oxide emissions being discharged into the atmosphere**, which is more than twice as much as all the sulfur oxide emissions from a country like France.

Hydrogen and carbon monoxide units	2008	2009	2010	2011	2012
Number of production units	38	36	39	41	43
Annual thermal energy consumption (in LHV Terajoules) ^(a)	102,717	95,306	119,205	128,075	146,525
Annual electricity consumption (in GWh)	518	478	620	700	823
Evolution of energy consumption per m³ of gas produced ^{(b) (c)}	98.8	98.7	98.3	98.5	98.4*
Emissions into the air: CO ₂ (in thousands of tons)	4,226	3,923	4,875	5,202	6,067
Annual process water consumption and water supply (in millions of m ³)	10.6	10.2	13	11.8	13.1
Emissions into the air: NOx (nitrogen oxide) (in tons)	860	750	850	800	870
Emissions into the air: SOx (sulfur oxide) (in tons)	< 250	< 250	< 250	< 250	< 250

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

(b) Hydrogen and carbon monoxide.

(c) Calculated from base 100 in 2007.

* Indicator verified by the Statutory Auditors.

3. COGENERATION UNITS

Worldwide, Air Liquide operates **17 cogeneration units**. These units produce steam and electricity simultaneously. They consume natural gas and water, most of which is converted into steam for customers. The steam can be condensed by these customers and then reused in the cogeneration unit. In most cases, the electricity produced is supplied to the local electricity distribution network. Combustion of natural gas produces CO₂ and leads to nitrogen oxide (NOx) emissions, but practically no sulfur oxide (SOx) emissions.

The cogeneration units are more energy efficient concerning CO₂ emissions than separate production units for electricity and steam. They therefore help reduce CO₂ emissions in the industrial basins they supply. In 2012, the Group's cogeneration units avoided **919,000 tons of CO₂ emissions being discharged into the atmosphere**, so they were about 16% more efficient than the separate production of electricity and steam.

Cogeneration units	2008	2009	2010	2011	2012
Number of production units worldwide	18	18	17	17	17
Annual natural gas consumption (or thermal energy) (in LHV Terajoules) ^(a)	74,168	87,642	84,763	84,654	82,308
Annual amount of CO₂ emissions into the atmosphere prevented through cogeneration units ^(b) (in thousands of tons)	-562	-761	-804	-981 ^(c)	-919
Emissions into the air: CO ₂ (in thousands of tons)	4,161	4,917	4,755	4,749	4,617
Annual water supply (in millions of m ³)	11.5	13.5	13.1	14.6	12.8
Emissions into the air: NOx (nitrogen oxide) (in tons)	2,700	3,160	2,650	2,910	3,070
Emissions into the air: SOx (sulfur oxide) (in tons)	< 50	< 50	< 50	< 50	< 50

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

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

(c) Values recalculated in 2012 taking into account the change in reference provided by the International Energy Agency. The value published in 2011 was 793,000 tons.

Improve the environmental footprint

4. ACETYLENE PRODUCTION UNITS

Worldwide, Air Liquide operates **53 acetylene production units** (a gas used mainly in welding and metal cutting). 51 of them produce this gas through the decomposition of a solid – calcium carbide – using water. Two units fill cylinders with this gas, which is supplied by another industrial company. This process produces lime, which is generally recycled (at over 90%) in industrial and agricultural applications (see paragraph on waste and byproducts).

Acetylene units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	10	10	10	11	11
Annual water consumption (in millions of m ³)	0.4	0.3	0.3	0.2	0.2
Annual calcium carbide consumption (in thousands of tons)	41	34	32	31	28 ^(b)
Estimate of emissions of volatile organic compounds (VOC) into the air (in tons) ^(a)	140	150	140	130	120

(a) Losses of acetylene and acetone into the atmosphere.

(b) The ratio between electricity consumption and calcium carbide consumption changed between 2011 and 2012 due to increased activity at two sites where acetylene is supplied by another manufacturer.

5. NITROUS OXIDE PRODUCTION UNITS

Worldwide, Air Liquide operates **eight nitrous oxide production units**. Nitrous oxide is used primarily as an anesthetic gas in the healthcare sector and as a sweetening agent in the food industry. It is produced from ammonium nitrate in solid form or as a solution in water. The Group's policy on reducing greenhouse gases emitted into the atmosphere has seen results, with a **decrease of almost 70% of these emissions in five years**.

Nitrogen oxide units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	6	5	6	6	6
Annual water consumption (in millions of m ³)	0.1	0.1	0.1	0.1	0.1
Annual ammonium nitrate consumption (in thousands of tons)	20	19	21	21	22
Emissions of nitrous oxide into the air (in tons)	550	410	430	340	160 ^(a)

(a) Which corresponds to the equivalent of 49,600 tons of CO₂.

6. CARBON DIOXIDE LIQUEFACTION AND PURIFICATION UNITS

Worldwide, Air Liquide operates **64 carbon dioxide liquefaction and purification units**. Carbon dioxide has many industrial applications but is used mainly in the food industry to deep-freeze foods or to produce carbonated beverages.

Carbon dioxide is most often a byproduct of chemical units operated by other manufacturers. In some cases, it is found naturally in underground deposits. It is purified and liquefied in Air Liquide units, which consume electricity and cooling water. In this way, carbon dioxide is reused for other industrial applications instead of being directly emitted into the atmosphere.

Carbon dioxide liquefaction and purification units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	375	411	420	450	450
Annual water consumption (in millions of m ³)	1.3	1.7	1.8	1.8	1.4

7. HYGIENE AND SPECIALTY INGREDIENTS PRODUCTION UNITS

Hygiene and specialty ingredients production units are located at **six sites** in France, Germany and China and belong to the subsidiaries Seppic (specialty ingredients) and Anios and Schülke (hygiene). Air Liquide experts work closely with hospitals to help them reduce the risk of nosocomial infection and contamination

through the products the Group has developed. After the sale at the end of 2011 of two of this activity's industrial sites in Lyon in France and Antwerp in Belgium, the environmental indicators notably dropped compared to 2011, in particular, the volatile organic compounds emissions, mainly generated by these two sites.

These units consume natural gas, electricity and water. Combustion of natural gas produces small amounts of CO₂.

Hygiene and specialty ingredients units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	22	21	22	24	19
Annual thermal energy consumption (in LHV Terajoules) ^{(a) (b)}	274	234	272	266	145
Air emissions: CO ₂ (in thousands of tons)	10	9	10	10	8
Air emissions of volatile organic compounds (VOC) (in tons)	250	150	190	190	4
Annual water consumption (in millions of m ³)	0.6	0.4	0.5	0.5	0.3
Discharge to water: oxidizable matter (in tons)	< 1,000	< 800	< 1,000	< 1,000	< 1,000
Discharge to water: suspended solids (in tons)	< 100	< 100	< 100	< 100	< 50

(a) Including thermal energy corresponding to steam purchases.

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

8. ENGINEERING & CONSTRUCTION UNITS

The **Engineering & Construction units** taken into account in this reporting are located at **five sites**, in France, China, Japan and India. They are mainly units for the construction of air separation

columns and cryogenic tanks. Lurgi, a Group subsidiary, has enabled the Group to have a portfolio of engineering technologies, in particular in production processes for hydrogen and syngas, biofuels (bioethanol, biodiesel) and methanol. In addition, Lurgi is one of the world leaders in sulfur recovery processes.

Engineering & Construction units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	10	11	11	10	8
Annual water consumption (in millions of m ³)	0.1	0.1	0.1	0.1	0.1
Annual consumption of raw materials (in thousands of tons) ^(a)	7.7	4.5	4.5	4	4.6

(a) Mainly metals.

9. WELDING EQUIPMENT AND PRODUCTS PRODUCTION UNITS

The **Welding equipment and products production units** are mainly located on **13 sites** in the world. They are welding equipment assembly (electric welding units, torches, regulators) or welding consumables (electrodes, solid and flux-cored welding wire) production units.

Welding equipment and products production units	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	68	49	52	54	49
Annual thermal energy consumption (in LHV Terajoules) ^(a)	218	166	160	177	165
Emissions of CO ₂ into the air (in thousands of tons)	12	9	9	10	9
Annual water consumption (in millions of m ³)	0.5	0.4	0.5	0.4	0.5
Annual consumption of raw materials (in thousands of tons) ^(b)	170	116	130	136	127

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

(b) Metals and materials for the production of welding products.

Improve the environmental footprint

10. PRINCIPAL RESEARCH & DEVELOPMENT CENTERS AND TECHNICAL CENTERS

The **principal Research & Development centers and technical centers** ^(a) are located at **six sites** in France, Germany, the United States and Japan. Although these centers' environmental impact

is very low compared to other Group units, it was nevertheless decided to present their environmental impact.

Over **60% of the Research & Development budget** is directly earmarked for **protecting life and environmental issues**: saving energy, producing in a cleaner way, developing energies of the future.

Research & Development centers and technical centers	2008	2009	2010	2011	2012
Annual electricity consumption (in GWh)	8	13	9	8	9
Annual thermal energy consumption (in LHV Terajoules) ^(a)	18	33	34	26	34
Emissions of CO ₂ into the air (in thousands of tons)	1	2	2	2	2
Annual water consumption (in millions of m ³)	0.02	0.02	0.01	0.01	< 0.01

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

Product stewardship

Air Liquide has set up procedures to decrease its products' impact on the environment, health and safety, in particular for substances like oxygen, hydrogen and the gases used in Electronics. Product stewardship is concretely carried out by:

- the identification of physical and chemical, toxicological or ecological dangers related to certain products;
- the evaluation of risks during different phases of production, transportation and storage from raw materials to finished products;
- the implementation of systems guaranteeing customers and patients' safety during the handling of products and their incorporation into the customers' industrial processes.

EUROPEAN REACH REGULATION

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a European Union regulation (therefore directly applicable in the Union's member states) that governs the registration, evaluation and authorization of chemical products produced in or imported to the Union. Any chemical substance imported to or manufactured in Europe of over one ton a year must be registered with the European agency ECHA. Each manufacturer or importer must have its own registration. The rule is part of the responsible product management approach developed by the chemicals industry.

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

Air Liquide's main products such as oxygen, nitrogen, rare gases, CO₂, hydrogen and helium are excluded from the scope of REACH. Until now, four products (carbon monoxide, acetylene, methanol ^(a) and lime ^(b)) have been registered in compliance with the schedule established by this regulation. Nitrous oxide and a few specialty gases in the Electronics business such as nitrogen trifluoride and silane must be registered by June 1, 2013 for annual quantities between 100 and 999 tons.

In addition, the Specialty Ingredients activity falls under the REACH regulation for about 35% of its revenue. Depending on the annual tonnage imported or manufactured, these products must be declared in compliance with the regulation at the latest on June 30, 2018.

Air Liquide must also make sure that the raw materials it uses are in compliance with the REACH regulation.

In 2012, Gas revenue concerned by REACH represented less than 6% of the Group's revenue.

CUSTOMER SAFETY IN PRODUCT USE

Air Liquide makes sure that its customers, patients and subcontractors know how to correctly use its products and equipment and are aware of the related risks, especially through specific training programs.

(a) Apart from the research centers of the Hygiene and Specialty Ingredients activity, which are included in paragraph 7.

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

(c) Lime is a byproduct of the acetylene activity (see paragraph of the Report on the acetylene units).

In addition, the Group constantly updates safety information on its products through product safety data sheets and also fulfills the requirements of national and international directives (REACH) – registration, evaluation and authorization of chemical substances; GHS – Globally Harmonized System of Classification

and Labelling of Chemicals). This information is available in the Air Liquide Gases Encyclopedia, accessible on the Group's Internet site at the following address:

<http://www.airliquide.com/our-offer.html>

A specific example of responsible product management: the Specialty Ingredients activity

SEPPIC, an Air Liquide subsidiary in the Healthcare activity, develops and markets a broad range of **specialty ingredients in the health sector** – excipients and active ingredients – for the cosmetic and pharmaceutical markets and vaccines, whose raw materials partially come from plants. SEPPIC's strategy is based on a "green" innovation and the constant concern for minimizing its activities' environmental impact. To meet these goals, SEPPIC has created innovative tools: eco-design, life-cycle analysis (LCA) and the global Carbon Assessment.

- Eco-design is an analytical method for creating new products with a low impact on the environment during their entire life cycle, but also for improving the manufacturing of existing products. The method SEPPIC has chosen consists in evaluating projects using a grid of 12 environmental criteria based on "green chemistry" principles like the use of plant-based raw materials, solvent-free processes and the reduction of energy consumption. Eco-design enables safer production for both the user and the environment.
- In 2012, SEPPIC carried out, for the first time, a life-cycle analysis on a "green" emulsifier ^(a) used in cosmetics and pharmaceuticals. This methodology, certified by the international standard ISO 10444 specific to the LCA methodology, consists of a detailed analysis of a product's environmental impacts from raw material extraction to its end use by the consumer. The life-cycle analysis goes beyond the greenhouse gas emissions assessment because it takes other environment impacts into account like the consumption or acidification of water resources that can intervene during certain product treatment stages. This first study conducted in 2012 on a product range shows SEPPIC's desire to develop expertise in this area. These LCAs will be done in the future on an increasing share of the product range.
- Last year, SEPPIC carried out a global Carbon Assessment on all its activities, from obtaining its raw materials to making its products available to its customers worldwide. This assessment will be used as the basis of a long-term plan to further reduce greenhouse gas emissions.

Moreover, quality, safety and the environment are continuously the focus of the management of SEPPIC's industrial sites, totally certified by the international standards ISO 9001, ISO 14001 and OHSAS 18001 ^(b).

PRINCIPAL EUROPEAN DIRECTIVES AND REGULATIONS APPLICABLE TO AIR LIQUIDE IN THE ENVIRONMENTAL FIELD

Seveso 2 directive

This European directive focuses on preventing major industrial risks. It applies to any facility where dangerous substances exceed certain quantities. These facilities are divided into two categories according to this quantity: Seveso 2 "high threshold" and "low threshold". In Europe, mainly because of their stocks of oxygen, 90 "low threshold" and 26 "high threshold" Air Liquide sites are involved principally due to stockage of oxygen.

Seveso regulations apply only to Europe but if the Seveso "high threshold" criteria were applied worldwide, 21 other Group sites could be included.

CO₂ emissions quotas

The objective of the European directive ETS (Emission Trading Scheme), which establishes a quota system for greenhouse gas emissions in the European Union, is to decrease these emissions, respecting the Kyoto Protocol. Implementation for CO₂ in the industrial sector began on January 1, 2005. The first phase (2005-2007) only concerned Air Liquide's five cogeneration sites and two hydrogen production sites and the allocated quotas (about 1.2 million tons of CO₂ per year) for this period covered the emissions observed.

(a) Molecule that stabilizes an emulsion between an aqueous phase and a phase composed of lipids.

(b) International standards of quality (ISO 9001), environment (ISO 14001) and safety (OHSAS 18001) management.

Improve the environmental footprint

For the second period (2008 to 2012), the directive concerned seven cogeneration sites in France, Germany, the Netherlands and Spain and a single hydrogen production site in Belgium. Air Liquide's quotas (about 3.3 million tons of CO₂ per year) covered the anticipated emissions ^(a).

The third period (2013-2020), defined during the revision of the ETS Directive, voted by the European Council in December 2008, broadened the scope of industrial facilities subject to the ETS. For Air Liquide, the application of this directive's measures adds to the sites previously concerned, the Group's large hydrogen product sites in Europe.

Concerning hydrogen production units, the CO₂ emission quotas are mostly allocated for free. Only the emissions that exceed a ceiling calculated on the basis of the most efficient European facilities must be purchased. The detailed calculation of the quotas allocated for free is being finalized by the European Union.

As of January 1, 2013, Air Liquide was required to obtain CO₂ quotas from the market or its customers for emissions from hydrogen production sites not covered by the free allocations as well as for all the emissions from the cogeneration sites.

In California, the AB32 (Assembly Bill 32) directive establishes a CO₂ quota system for industrialists, with the obligation to comply with a cap-and-trade program as of January 2013 and sets emission reduction objectives of 2% per year until 2020. The volume of allocated quotas will be reduced by half as of 2018. This new regulation concerns two hydrogen production sites in this state.

In addition, Australia and the European Union want to make their quota systems compatible by 2018.

New greenhouse gas emissions regulation in France

The application of article 75 of the French law of July 12, 2010, called "Grenelle 2", makes it mandatory for companies with at least 500 employees to establish a greenhouse gas emissions assessment. This assessment, transmitted to the French authorities and published at the end of 2012, concerns emissions in 2011. An action plan explaining the measures planned to reduce these emissions was also included in this assessment. Seven French subsidiaries were concerned in 2012: Air Liquide France Industrie, L'Air Liquide S.A., Air Liquide Engineering, SEPPIC, Air Liquide Welding France, Pharmadom/Orkyn and Vitalaire. The assessment takes into account all the direct and indirect emissions related to each subsidiary's activity, including emissions at service sites. Electricity, natural gas and other energies used for heating buildings and lighting are also counted in the assessment in the same way as all the production-related emissions. In 2012, the seven subsidiaries concerned emitted 1.6 million tons of CO₂ eq.



(a) The amount of the allocated quotas is calculated following the same consolidation rules as the environment and energy indicator reporting.

> ENHANCE BUSINESS PRACTICES AND GOVERNANCE

Commitment

Maintain a well-designed organization and effective decision processes, committed to ethical behavior, appropriate risk management and proactive compliance with internal and external rules and regulations.

2015 objective

- Maintain, on an operational level in the Group, the risk management process.
- Incorporate ethics and/or respect for competition law into training sessions for those whose activity justifies it.

Key Responsibility Indicators will be established to measure progress on this subject.

The Group endeavors to take into account the interests of its different stakeholders through its decision-making processes as well as in carrying out each of its actions. This approach, inspired by the Group's executive management, guides the action of each unit and employee to ensure the Company's responsible growth.

A corporate citizen

PRINCIPLES OF ACTION

In 2006, the Group formalized its Principles of action, driving the Group strategy and development, in a document that explains its approach to all its key stakeholders. Available in 16 languages, this document was distributed to all the Group's units and can be consulted on the website www.airliquide.com in the section The Group/Ethics, in French and English.

SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

Social and Environmental Responsibility Policy

As a complement to the Principles of action, the Group's policies were completed and regrouped in 2009 in a global reference guide called the BLUEBOOK. This reference guide is accessible to all the Group's employees and concerns the internal information systems that they usually use. These policies are in the form of Procedures, Codes and Reference Guides.

In the BLUEBOOK, the Social and Environmental Responsibility Policy defines the commitments made by the Group in the

framework of its activities to promote the respect for and safety of men and women, the protection of the environment, ethics and participation in the economic and social development of the regions in which it operates.

This Social and Environmental Responsibility Policy has implemented a coherent Responsibility and Sustainable Development approach on every level of the Company and defines the orientations on this subject for the subsidiaries and departments. It is available on the website www.airliquide.com in the section The Group/Ethics, in French and English.

Commitment to Human Rights

This policy specifies that Air Liquide respects human rights and the dignity of its employees, subcontractors, temporary workers and suppliers. In this framework, the Group's units notably exclude any form of discrimination, harassment, the use of forced labor or child labor and any undermining of the freedom of association. Air Liquide's policy aims at respecting labor law in all the countries in which it operates, and is therefore considering taking into account the fundamental agreements of the International Labour Office (ILO) on this subject.

EMPLOYEE CODES OF CONDUCT

The Group's subsidiaries are encouraged to implement a local Code of Conduct. This decentralized approach combines respect for local customs and regulations and Air Liquide's ethical commitment. It also helps the subsidiaries to embrace the Group's ethical principles by writing their own Codes of Conduct themselves in their working language. As a result, in 2012, **91 %** of the Group's employees belonged to subsidiaries that have a local Code of Conduct. Today, these Codes of Conduct are available in 23 languages.

The implementation of these Codes of Conduct is supported by the Group Guidelines, which are a reference guide to Air Liquide's Social and Environmental Responsibility Policy. These Group Guidelines are based on 10 fundamental principles:

- respect for laws and regulations;
- respect for human beings: health and safety conditions in the workplace, prevention of discriminatory actions, respect for third parties;
- respect for the environment;
- respect for competition law;
- respect for rules on insider trading;
- prevention of conflicts of interest: ties with a competitor, customer or supplier, respect for rules on corruption;
- protection of Air Liquide's activities: protection of information, property and resources;
- transparency and integrity of information;
- internal controls and audits;
- implementation of Codes of Conduct.

Details on these 10 fundamental principles are available on the Group's Internet site.

These Codes of Conduct demonstrate the Group's commitment to respect the regulations concerning its economic activity but also ethical principles such as social rights and the fight against discrimination and harassment.

In addition, since 2007, a Group Ethics Officer has been responsible for providing advice and assistance to the units in applying their Codes of Conduct. He also handles all the questions submitted by employees on implementing these Codes of Conduct.

RESPECT FOR COMPETITION LAW

Instructions and codes at the Group level were established as to proper behavior concerning respect for competition law, especially in Europe and the United States. The most important rules on competition law are also included in the employees' local Codes of Conduct. For some of the Group's activities, Healthcare in particular, specific Codes of Conduct have been developed on competition law as well.

Audits are jointly conducted on a regular basis by the Group's internal audit departments and an external attorney. They carry out tests and interviews to identify practices at risk in this area or deviations.

Finally, awareness-raising meetings on compliance with competition law are regularly held throughout the Group.

FIGHT AGAINST CORRUPTION

In 2009, the Group formalized an anti-corruption Code of Conduct that was made available to all the subsidiaries. This code, which is linked to the Social and Environmental Responsibility Policy of the BLUEBOOK, provides a reminder of the laws on the fight against corruption and deals with relations with intermediaries, particular cases such as mergers, acquisitions and partnerships, types of payments requiring particular attention, as well as administrative and accounting traceability requirements.

To strengthen the rollout of this anti-corruption Code of Conduct throughout the Group, Air Liquide launched a training program in 2010 dedicated to disseminating knowledge of the anti-corruption Code of Conduct and its good practices to the Group's employees. This training course is now an integral part of the Air Liquide University program and is specifically aimed at sales and procurement teams as well as managers. It has been gradually rolled out throughout the Group.

Once detected, the most significant cases of fraud and deviations are transmitted to the Audit Committee of the Board of Directors, as well as the investigative and treatment measures taken for these situations.

Responsible procurement in the Group

Air Liquide's responsible procurement approach is an integral part of the Group's Responsibility and Sustainable Development approach.

The Group's **Responsible Procurement Policy** makes use of several tools:

- First, the **buyers' Code of Conduct**, which is a code that is part of the Group's procurement policy, spells out the ethical principles of sustainable development on which procurement is based. Translated into 13 languages, this code specifies that suppliers must be transparently and fairly evaluated and that they are bound to respect Air Liquide's Responsibility and Sustainable Development Commitments.
- In addition, sustainable development clauses are being gradually included in new Group **framework contracts**. These clauses allow for the possibility of conducting external audits at the suppliers and subcontractors concerned. They also include compulsory reporting elements from the supplier, in particular on safety and energy and water consumption.
- Since 2009, the Responsible Procurement Policy has been strengthened by the distribution of a **sustainable development questionnaire**, now accessible to all the Group's buyers who are systematically required to present it to new major suppliers. Certain answers are considered eliminatory: for instance, the absence of a commitment on health and safety, of regular inspections of high-risk tools, of respect for local legislation on minimum wage and of the measurement of energy consumption.

Air Liquide is developing, with all its subsidiaries, this evaluation approach concerning its suppliers, with the support of a partner specialized in responsible procurement. A new campaign was carried out in 2012 with 150 suppliers. The evaluation includes the following themes: the Environment, Social issues, the Ethics of Business and these suppliers' own procurement policy. **This supplier evaluation policy** was formalized in the BLUEBOOK.

Risk mapping on procurement has been carried out and followed up since 2010 to target critical suppliers and determine specific actions to be carried out at these suppliers.

Apart from respect for **human rights** by Air Liquide's employees, the Group considers it important to monitor these rights at its suppliers. To prevent these risks, the Group conducts CSR (Corporate Social Responsibility) analysis with its main critical suppliers. The methodology of these analyses is described in an internal procedure that every Group employee can consult in the BLUEBOOK. These analyses primarily concern environmental and social questions, notably on monitoring human rights, including excluding child labor and all forms of forced labor, discrimination, working conditions and freedom of association.

Training sessions on responsible procurement for the Group's buyers continue to be offered as in the preceding years.

In addition, in July 2012, Air Liquide organized in Asia, in partnership with international companies and customers of the Group, an information session with 10 suppliers considered at risk. Tailored action plans were proposed according to these suppliers' level of maturity on social, ethical and environmental risks.

A worldwide campaign was also launched at the end of 2012 to reevaluate suppliers identified as being at risk.

The total amount of **subcontracting** for the Air Liquide Group was 1,486 million euros in 2012. Subcontracted activities are mainly those that are not core businesses of the Group, such as haulage, that require specific resources or that can be called on to handle production overload. The total amount of Group purchases in 2012 was 6.1 billion euros, most of which is related to energy.

Since 2008, Air Liquide has published the number of accidents of its subcontractors and temporary workers. In 2012, there were 142 lost-time accidents of this type, including three fatalities.

Industrial Management System and certifications

In 2004, the Group launched a new Industrial Management System (IMS) to strengthen safety, reliability, the preservation of the environment and industrial risk management. **This system is now rolled out in nearly all the Group's operations (over 99% of the Group's revenue)**. An indicator makes it possible

to track the percentage of revenue covered by the Group's IMS internal audits. **Between 2008 and 2012, 97 units were audited, representing 93% of the Group's activities** in terms of revenue. In five years, almost the entire Group was audited for the implementation of its Industrial Management System (IMS).

Enhance business practices and governance

The Group considers that the IMS industrial management system that it specifically created is the best adapted to its activity. Nevertheless, notably to meet the requests of certain customers, other initiatives in the Group are a matter of a quality approach such as the ISO certifications.

The **ISO 9001** quality certifications cover about **76%** of the Group's revenue. Likewise, the **ISO 14001** certifications, an international reference in environmental management, **cover about 29% of the Group's revenue.**

A few years ago, the Group undertook a certification approach concerning healthcare and safety in the workplace called "**OHSAS 18001** certification", which now covers **18%** of the Group's revenue.

Likewise, **environmental incidents**, like **accidents involving personnel safety**, are reported by Air Liquide subsidiaries worldwide. They are analyzed in depth depending on their nature so that prevention measures can be strengthened.

The worldwide "**Responsible Care**" Charter is an initiative of the International Council of Chemical Associations. It formalizes the commitment of the signatories to improve the global performances of the chemical industry in health, safety and protection of the environment. Many Air Liquide subsidiaries had already signed this charter locally. L'Air Liquide S.A. signed it in 2010 on the Group level, confirming many principles that the Company already very largely follows.

	Scope	2008	2009	2010	2011	2012
Estimate of the Group's units revenue covered by an ISO 9001 quality certification	World	75%	74%	71%	76%	76%
Estimate of the Group's units' revenue covered by an ISO 14001 environmental certification	World	24%	25%	25%	27%	29%
Estimate of the Group's units' revenue covered by an OHSAS 18001 occupational health and safety management system	World		14%	12%	15%	18%

A recognized Responsibility and Sustainable Development approach

Ethibel Sustainability Index

Forum Ethibel, an independent European certification agency for socially responsible investment (SRI), reconfirmed Air Liquide as a component of its Ethibel Sustainability Index® (ESI) Excellence Europe, for the ninth year in a row. The selection, based on the analyses provided by Vigeo, indicates that Air Liquide is one of the most high-performance groups in its sector in terms of social and environmental responsibility.

"Environment Social Governance" (ESG) Vigeo index

In 2012, Air Liquide was included in the **ESG Europe 120** index awarded by the **Vigeo** extra-financial rating agency. It selects the most high-performance companies in their region and activity sector in terms of developing human resources, respecting human right in the workplace and society, protecting the environment, complying with the requirements of ethical business practices, and on the basis of transparency and efficiency in corporate governance and a commitment to the economic and social development of the areas where they do business.

> INNOVATE RELENTLESSLY

Commitment

Innovate relentlessly in order to bring sustainable and cost-effective solutions to the stakeholders, leveraging partnerships with customers, suppliers, academics and communities.

An objective and a related Key Responsibility Indicator reflecting the vitality of the Group's innovation with its customers is currently being developed.

Air Liquide was founded in 1902 on an innovation, a new technology for liquefying and separating air gases, particularly efficient in terms of energy performance. The molecules Air Liquide produces (oxygen, nitrogen, hydrogen, rare gases, etc.) have not changed since the Group's creation. It is innovation that has made the difference and that is responsible for new applications.

Innovating enables Air Liquide to open new markets, expand its business by creating new solutions for its customers and fully play its role *vis-à-vis* society. Anticipating its markets' challenges and innovating permit the Group to progress and ensure competitiveness, in a way that increasingly respects life and the environment.

Innovation remains an essential value for the Company and is an integral part of Air Liquide's culture. It is one of the fundamental components of the Group's Responsibility and Sustainable Development approach.

Recognition of the spirit of innovation

Air Liquide files about 300 patents a year. Certain patented innovations significantly contribute to the Group's development. The Inventors Recognition Program rewards inventors who are responsible for successfully marketing patents. The recognition of technical expertise in the Group is also shown through the Technical Career Ladder (TCL), which has designated 2,000 experts since it was launched in 2003. In 2012, the TCL appointed 100 new international experts. Technical expertise, the spirit of innovation and the creative talent of Air Liquide's men and women are key factors in the Company's growth.

In a world where innovation is rapidly accelerating, where scientific knowledge is more and more widely disseminated, the response to major global issues (healthcare, the environment, resource availability, mobility, urbanization, etc.) is found by pooling the efforts of all the actors in the innovation ecosystem.

More than ever, the dynamic management of interactions with this innovation ecosystem – called “open innovation” – has become an essential component of innovation. Through the development of new collaborations with academic partners, young innovative firms and operational units in contact with customers, this “open innovation” makes it possible to explore new technological opportunities by following the evolution of markets. In 2012, 60% of our Research and Development projects were carried out in cooperation with public-private partnerships.

Innovation and sustainable development

The traditional fossil resources like coal, oil and natural gas are gradually being exhausted while energy needs are constantly increasing. It is therefore indispensable to use energy more efficiently and to develop cleaner and renewable alternative

energies. Moreover, greenhouse gas emissions damage our environment and have a harmful impact on climate change. **Air Liquide develops, with its partners, solutions that help limit these emissions and produce the energies of tomorrow.**

Innovate relentlessly

In 2012, over 60% of the Group's Research & Development budget was earmarked for work connected to life, the environment and sustainable development, focused on the following tracks:

■ **Environment:**

- energy efficiency;
- hydrogen, clean energy carrier;
- use of industrial gases in the photovoltaic industry;
- development of biogas;
- CO₂ capture and storage;
- second-generation biofuels.

■ **Healthcare and hygiene:**

- new medical gases to relieve pain and for anesthesia;
- products and lotions to avoid nosocomial illnesses;
- homecare for patients suffering from chronic ailments.

The Group's different innovation tracks on energy, the environment and healthcare are more specifically developed and illustrated below.

HYDROGEN, CLEAN ENERGY CARRIER

Air Liquide is capitalizing on the Group's technologies and know-how to develop and roll out competitive solutions for the markets of hydrogen, a clean energy carrier.

Used in a fuel cell, hydrogen combines with the oxygen in air to **produce electricity, rejecting nothing but water**. It can be produced from various energy sources, notably natural gas, but also from renewable energies. **Hydrogen therefore has a strong clean energy production potential.**

In this field, **Air Liquide is already marketing solutions** such as:

- supplying stationary silent energy with zero emissions at the point of use for facilities far from the electricity distribution network, like mobile phone relay antennas;
- supplying captive fleets with their hydrogen filling infrastructure to increase productivity while decreasing emissions at the point of use. The main applications are for fleets of logistics warehouse forklifts, baggage transport vehicle fleets in airports and buses.

These different experiences in hydrogen energy and fuel cell applications confirm this technology's development potential and its competitiveness.

The Horizon Hydrogène Énergie (H2E) program

The *Horizon Hydrogène Énergie* (H2E) program, initiated, and coordinated by Air Liquide, was launched in 2008. Its aim is to build a durable and competitive hydrogen energy activity by developing a complete offering from production to distribution. This seven-year program is currently at the halfway point. Since the startup of the H2E program, over a hundred experimental rollouts have been undertaken, enabling 19 industrial partners to capitalize on the feedback and deepen their knowledge of the markets. In addition, a new generation of products was developed from work carried out since 2009 in hydrogen production, storage and distribution, providing a first technological breakthrough. The H2E program also has helped to establish an adapted regulatory framework and included a program of pedagogic demonstrations and actions so that a broad public can become familiar with this new clean energy carrier.

Hydrogen for supplying stationary energy

The Group already markets solutions for supplying stationary silent energy with zero emissions at the point of use and has already rolled out hydrogen fuel cells at over 76 telecom sites around the world, corresponding to 120 MWh delivered over the last three years. These systems have demonstrated excellent availability and have avoided the emission of 700 tons of CO₂ a year.

Hydrogen for vehicles

Hydrogen, as a clean energy carrier, is one of the solutions to the challenges of sustainable mobility: reduction of greenhouse gases, local pollution in cities, noise and dependence on fossil fuel.

Air Liquide has made a major commitment to developing technologies to contribute solutions to our society's major issues like that of hydrogen energy. The Group has in-depth knowledge of this sector, which **is very actively developing:** from production to distribution as well as pressurized storage, fuel cells and hydrogen distribution stations.

To develop and roll out a competitive offering for the first hydrogen markets, **Air Liquide has created a specific hydrogen energy organization, based on three of the Group's subsidiaries:** **Air Liquide Hydrogen Energy** proposes innovative solutions for the implementation and marketing of hydrogen energy. **Axane** and its subsidiary **Hypulsion**, a joint venture with Plug Power, are developing fuel cells for hydrogen applications for electricity production in isolated sites and for forklift trucks. Finally, a division of the Air Liquide Technology branch (AL-AT) develops, installs and runs hydrogen distribution centers for buses, cars and forklift trucks.

After celebrating in February 2012 the opening of the facility to supply forklift trucks with hydrogen for Coca-Cola in California, Air Liquide also inaugurated facilities to supply hydrogen-powered buses in Brugg in Switzerland and Oslo in Norway, in the framework of the European CHIC ^(a) project. The first Air Liquide hydrogen distribution station accessible to the general public was officially opened in September in Dusseldorf in Germany. 10 new hydrogen distribution stations will now be designed, built and rolled out over the next three years, in the framework of a large-scale demonstration project conducted by the German government. By 2015, Germany will have a supply network of at least 50 public hydrogen distribution stations. The Japanese government is also planning the rollout of an infrastructure composed of 100 of these stations by 2015. In this context, Air Liquide plans to create about 20 stations to add to the three already established. One of them, producing hydrogen from wood shavings, is in line with the objectives the Group set with its **Blue Hydrogen®** initiative.

The Blue Hydrogen® initiative

Currently, 95% of the hydrogen the Group produces is made from natural gas. Air Liquide plans, by 2020, to gradually increase the share of hydrogen produced from carbon-free energy sources, *i.e.*, without any CO₂ emissions. The Group's objective is to produce, within this time frame, at least 50% of the hydrogen needed for hydrogen energy applications from carbon-free energy sources by combining:

- the use of renewable energies, water electrolysis and biogas reforming;
- the use of capture and storage techniques for the CO₂ emitted during hydrogen production based on natural gas.



BIOGAS DEVELOPMENT

Air Liquide works on global solutions for the development of biogas with the aim of extracting it from methane that can, for example, be used as a fuel.

Biogas is a renewable energy produced during the anaerobic digestion of the biomass or household waste. It is mostly composed of methane and CO₂. Air Liquide is implementing a process that extracts the methane from biogas by using gas separation membranes that the Group has designed and developed. The biogas produced in this way can be injected into the natural gas network.

Air Liquide proposes development solutions that cover all its customers' needs: purification, injection, cryodistillation and liquefaction of methane. The modular biogas treatment systems the Group has designed and developed to meet this demand cover flows of 100 to several thousand m³ per hour.

In 2012, Air Liquide installed and started up, on the Methavalor site in Forbach in eastern France, its first biogas purification and injection unit in the natural gas network and, in Lidköping in Sweden, one of the first biomethane liquefaction units in the world. In the United States, the Group also acquired a biogas development site in Conley, Georgia. The Group has to date sold 23 biogas development facilities worldwide.

PHOTOVOLTAICS AND ELECTRONICS

Air Liquide, a leader in gases for the photovoltaics industry

If the solar energy market is in constant growth – about 10% a year –, notably sustained by the demand of China and other Asian countries, the worldwide photovoltaic industry is currently in a consolidation phase. The acquisition or regrouping of firms in this sector by leading companies, mainly based in Asia, has resulted in economies of scale and has considerably reduced the production costs of photovoltaic panels over the last few years. Due to this decrease in costs, in certain cases, photovoltaics have become a competitive energy compared to fossil fuels or nuclear energy. In this industrial consolidation context, Air Liquide, as a recognized supplier for this industry, is interested in proposing innovative solutions to its customers to help them to reduce their own production costs.

Industrial gases are used at every stage of the manufacturing process for photovoltaic cells. Present in over 20 countries with 3,500 dedicated employees, Air Liquide Electronics World Business Line's offering covers all the gas needs of its customers in the photovoltaics industry. The historic partner of this industry, the Group has worked with its customers both on their technological development contributing to research and development by broadening its product offering, but also by investing in production and filling centers in China, Taiwan, Southeast Asia and the Middle East.

Air Liquide has therefore become the **world leader** in this rapidly expanding sector:

- **50% of solar cell manufacturers in the world** are Air Liquide customers;
- most of Air Liquide's sales in this activity are to the **20 leading companies in the sector**.

(a) Clean Hydrogen in European Cities.

Innovate relentlessly

Many Research and Development programs are focused on adapting the Air Liquide offering to changes in photovoltaic technologies. In September 2012, Air Liquide inaugurated an experimental solar cell production line at its main research center near Paris in France. The Group is the first in its sector to acquire this production line equipped with crystalline silicon. This technology now represents 88% of the solar industry market. This line can test new molecules and processes adapted to each customer's needs. This research will also increase the cells' performance and reduce their per-watt production cost, in this way helping to strengthen solar energy's competitiveness.

Electronics: launch of an innovative offering that respects the environment

The demand in fluorine cleaning gases, used in high-tech equipment manufacturing processes, for example, for flat screens or solar panels, has strongly increased. Since May 2012, the Group has been offering its customers the possibility of equipping their sites with units that produce gaseous fluorine, required to clean these technologies' production equipment.

This solution was developed with the Solvay group, in a joint venture with global aims that will invest, build and operate the next generation of on-site fluorine production units. A first unit will be installed in 2013 in South Korea.

Fluorine gas will be proposed to these industrialists as an alternative to trifluoride nitrogen, now widely used for these applications. This gas has a global heating power 17,000 higher than that of CO₂, and for this reason was added to the list of regulated products in the framework of the second engagement period of the Kyoto Protocol (2013-2020). Unlike this product, gaseous fluorine has no impact on global warming.

CARBON CAPTURE AND STORAGE OR CCS

The Group's teams are taking part in developing CO₂ storage and capture processes. This means creating technologies, in particular, oxycombustion, to easily capture CO₂ to store it in the subsoil. Oxycombustion enables the CO₂ in fumes from combustion to be highly concentrated and therefore to make its capture, purification and then underground storage by specialized companies much less expensive. Two projects are notably underway, one in Lacq in France and the other in Queensland in Australia, in partnership with the Callide Oxyfuel Services company.

Air Liquide is also building in Port-Jérôme in France a new "Cryocap H2" unit for CO₂ capture and liquefaction on its hydrogen production site.

INNOVATION IN HEALTHCARE

Air Liquide is also innovating in the homecare field. In 2012, this activity launched the rollout of two new products, Nowox™ and Nowapi™, developed to facilitate treatment follow-up at the home of patients with respiratory ailments like chronic obstructive pulmonary disease (COPD). Nowapi™ is a teleobservation system that remotely informs the family doctor about the proper use by the patient of his or her PAP^(a) breathing device. Nowox™ is a device that continuously measures the flow of oxygen for patients undergoing oxygen therapy as well as their movements. These data are recorded and a detailed report is automatically transmitted to the doctor through the healthcare service provider. These solutions enrich the Group's range of services dedicated to improving its patients' quality of life.

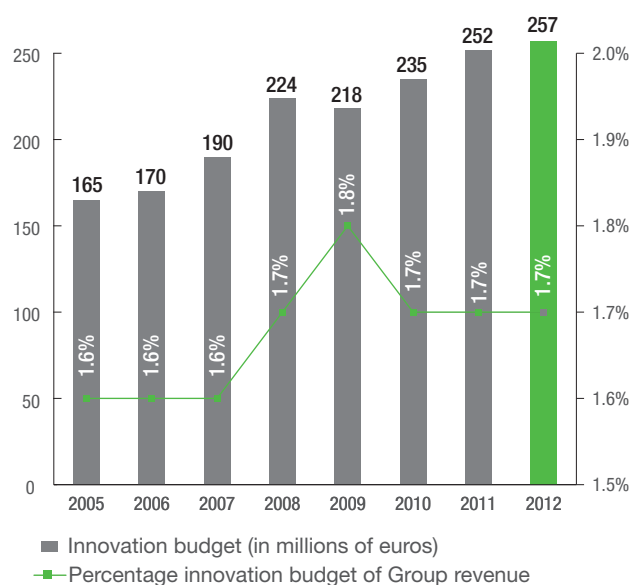
(a) Positive Airway Pressure.

INDICATORS CONCERNING THE GROUP AS A WHOLE

	2012
Number of researchers	1,000 researchers of 35 nationalities
Number of research centers	8
Industrial partnerships	Over 100
Academic collaborations with universities and research institutes	Over 120

	2008	2009	2010	2011	2012
Innovation budget (in millions of euros)	224	218	235	252	257
Revenue of the Group (in millions of euros)	13,103	11,976	13,488	14,457	15,326
% innovation budget of revenue	1.7%	1.8%	1.7%	1.7%	1.7%

Innovation budget



Patents	2008	2009	2010	2011	2012
Number of inventions patented	2,640	2,508	2,830	3,109	3,215
New inventions patented during the year	257	280	301	332	316
Patents filed directly in the Group's four main zones of operation ^(a)	129	156	145	144	160

(a) Europe, United States, Japan, China.

> REPORTING METHODOLOGY

Protocol and definitions

In the absence of a relevant and recognized benchmark for industrial gas activities, Air Liquide has created its own protocol to define its reporting methods for human resources, safety and environmental indicators. This protocol includes all the definitions, measurement procedures and collection methods for this information. In line with the Group's commitment to continuous improvement, Air Liquide is gradually making adjustments to its responsible and sustainable development indicators protocol to reflect changes in the Group.

This protocol is based on the general principles defined by the Group with regard to scope, responsibilities, controls and limits, and establishes definitions, responsibilities, tools and data-tracing methods for each indicator. This document is regularly updated. Moreover, this protocol takes into account all the Group's formalized procedures in the framework of the IMS (Industrial Management System).

Scope and consolidation methods

Human resources and environmental indicators are consolidated worldwide for all companies globally and proportionally integrated within the financial consolidation scope pro rata according to the integration percentage.

Safety indicators are consolidated worldwide for all companies in which Air Liquide has operational control or is responsible for safety management.

Apart from these general rules, there are certain specific ones:

- information on the impact of transportation (kilometers traveled by delivery truck, CO₂ emitted) is calculated on the basis of data collected in the main countries where the Group is established around the world;
- information on kilometers saved and CO₂ emissions avoided through on-site air gas production units concerns the subsidiaries globally integrated within the financial consolidation scope;
- environmental and energy indicators for the main types of production units operated by the Group cover about 99% of the Group's revenue in Gas & Services, and 98% of the Group's total revenue;
- production units, concerning environmental and energy indicators, are included in the reporting system as of their industrial service start-up;
- electricity consumption, and the indirect CO₂ emissions related to it, is only taken into account when Air Liquide pays for this electricity. Energy consumption of on-site units, as well as water consumption specific to the sale of treated water (which is not part of the Group's core business) are excluded from the data consolidation scope;
- the segmentation between advanced economies and developing economies for direct and indirect greenhouse gas emissions is established by the Finance Division.

Reporting and responsibilities

The human resources, safety and environmental indicators are produced by several data-collection systems in the Group, each under the responsibility of a specific department:

- human resources indicators included in the Group's general accounting consolidation tool are under the responsibility of the Human Resources Department;
- the energy consumption and CO₂ emissions indicators from the main air separation units, cogeneration, hydrogen and carbon monoxide units are tracked by the Large Industries business line using a dedicated intranet tool;
- as a complement, the collection of environmental and safety data is carried out by the Safety and Industrial Management System Department using a dedicated intranet tool, and includes accident reporting:
 - for all units the data of the Group's accident reporting,

- for the units mentioned above, other environmental indicators (atmospheric emissions, water consumption, discharge to water, etc.),
- for the smaller units (acetylene, nitrous oxide, carbon dioxide units and Hygiene and Specialty Ingredients units), the Welding units and the Engineering & Construction units, the Research & Development centers and the technical centers all indicators (energy use, atmospheric emissions, water consumption, discharge to water, etc.);
- indicators on Industrial Merchant transportation are the responsibility of this business line;
- indicators on the transportation of Medical Gases and Home Healthcare are the responsibility of the Healthcare business line;

- the estimate of the percentage of the Group's revenue where the Industrial Management System (IMS), the ISO standards 9001 and 14001 and the OHSAS 18001 are being rolled out are indicators under the responsibility of the Safety and Industrial System Department;
- indicators for the “carbon content” of the Group's main products are established by the Industrial Merchant Division from energy and transportation indicators. The carbon content of hydrogen is calculated by the Large Industries business line.

Among the subjects covered by the French “Grenelle 2” law, ground plans and the consideration of noise pollution are not relevant for the industrial gases activity given the size of the Group's sites and the noise levels generated. They are therefore not mentioned in this Report.

Controls

Each department in charge of collecting data is responsible for the indicators provided. Control occurs at the time of consolidation (review of changes, intersite comparisons).

Safety and energy indicators are tracked monthly. In addition, audits of environmental data are carried out by the Safety and

Industrial System Department on a sample of sites representative of the various types of units monitored. Where the data reported are incoherent or missing, an estimated value may be used by default.

Methodological limits

The methodologies used for certain human resources, safety and environmental indicators can have certain limits:

- the absence of nationally or internationally recognized definitions, in particular for indicators on Managers and Professionals and social performance indicators;

- how representative the measurements taken and necessary estimates are, in particular, concerning indicators on CO₂ emissions avoided, water consumption, kilometers avoided per on-site units and training.

> INDEPENDENT VERIFIER'S ATTESTATION AND ASSURANCE REPORT ON SOCIAL, ENVIRONMENTAL AND SOCIETAL INFORMATION

To the General Management,

Pursuant to your request and in our capacity as independent verifier of L'Air Liquide, we hereby report to you on the consolidated social, environmental and societal information presented in the management report in the section «2012 Corporate Social Responsibility and Sustainable Development Report» issued for the year ending December 31, 2012 in accordance with the requirements of Article L. 225-102-1 of the French Commercial Code (*Code de commerce*).

MANAGEMENT'S RESPONSIBILITY

The Board of Directors is responsible for the preparation of the management report including the consolidated social, environmental and societal information (the «Information») in accordance with the requirements of Article R. 225-105-1 of the French Commercial Code (*Code de commerce*), presented as required by the entity's internal reporting standards (the «Guidelines») and a summary of which can be provided upon request.

OUR INDEPENDENCE AND QUALITY CONTROL

Our independence is defined by regulatory requirements, the Code of Ethics of our profession (*Code de déontologie*) and Article L. 822-11 of the French Commercial Code (*Code de commerce*). In addition, we maintain a comprehensive system of quality control including documented policies and procedures to ensure compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

INDEPENDENT VERIFIER'S RESPONSIBILITY

It is our role, on the basis of our work:

- to attest whether the required Information is presented in the management report or, if not presented, whether an appropriate explanation is given in accordance with the third paragraph of Article R. 225-105 of the French Commercial Code (*Code de commerce*) and Decree no. 2012-557 dated April 2012 (Attestation of presentation);
- to provide limited assurance on whether the Information is fairly presented, in all material aspects, in accordance with the Guidelines (Limited assurance).

We called upon our Corporate Social Responsibility experts to assist us in the performance of our work.

1. Attestation of presence

Our engagement was performed in accordance with professional standards applicable in France:

- We compared the Information presented in the management report with the list provided in Article R. 225-105-1 of the French Commercial Code (*Code de commerce*).
- We verified that the Information covers the consolidated perimeter, namely the entity and its subsidiaries within the meaning of Article L. 233-1 and the controlled entities within the meaning of Article L. 233-3 of the French Commercial Code (*Code de commerce*) and within the limits specified in the «Reporting Methodology» section of the «2012 Corporate Social Responsibility and Sustainable Development Report».
- In the event of the omission of some consolidated Information, we verified that an appropriate explanation was given in accordance with Decree no. 2012-557 dated April 24, 2012.

On the basis of our work, we attest that the required Information is presented in the management report.

2. Assurance report

NATURE AND SCOPE OF THE WORK

We conducted our engagement in accordance with ISAE 3000 (International Standard on Assurance Engagements) and French professional guidance. We performed the following procedures to obtain limited assurance that nothing has come to our attention that causes us to believe that the Information is not fairly presented, in all material aspects, in accordance with the Guidelines. A higher level of assurance would have required more extensive work.

Our work consisted in the following:

- We assessed the appropriateness of the Guidelines regarding their relevance, completeness, neutrality, clarity and reliability, taking into consideration, where applicable, the good practices in the sector.
- We verified that the Group had set up a process for the collection, compilation, processing and control of the Information to ensure its completeness and consistency. We examined the internal control and risk management procedures relating to the preparation of the Information. We conducted interviews with those responsible for social and environmental reporting.
- We selected the consolidated Information to be tested and determined the nature and scope of the tests, taking into consideration their importance with respect to the social and environmental consequences related to the Group's business and characteristics, as well as its societal commitments. This information is:

Subject	Group indicator
Environment	Annual electricity consumption
	Annual thermal energy consumption
	Evolution of energy consumption per m ³ of air gas produced
	Evolution of energy consumption per m ³ of hydrogen produced
	Evolution of the distance traveled per ton of industrial gas delivered
	Kilometers traveled by all vehicles delivering gas in liquid or cylinder form
	Estimate of CO ₂ emissions generated by these vehicles in the Industrial Merchant activity
	Total direct greenhouse gas (GHG) emissions
	Total indirect GHG emissions
Safety	Annual water supply
	Accident frequency of Group employees
Social	Headcount end of period
	% women among Managers and Professionals
	% women among Managers and Professionals hired during the year
	Number of hours of training per employee
	% employees having attended a training during the year
	% performance appraisals performed by managers
	% of employees belonging to a subsidiary in which an employee satisfaction survey was conducted in the last 3 years
	Retention rate of Managers and Professionals over a year

Concerning the quantitative consolidated information that we deemed to be the most important:

- at the consolidating entity level and the controlled entities level, we implemented analytical procedures and, based on sampling, verified the calculations and the consolidation of this information;

Independent verifier's attestation and assurance report on social, environmental and societal information

- at sites level that we selected^(a) based on their activity, their contribution to the consolidated indicators, their location and a risk analysis:
- we conducted interviews to verify that the procedures were correctly applied,
- we performed tests of detail based on sampling, consisting in verifying the calculations made and reconciling the data with the supporting documents.

The sample thus selected represents on average 16% of the consolidated value of Environment Indicators^(b), 17% of the consolidated value of Human Resources Indicators^(c) and 21% of the consolidated worked hours upon which Safety Indicators are calculated.

- As regards the other consolidated information published and presented in the sections "Employees", « Communities », « Improve the environmental footprint » and « Enhance business practices and governance^(d), we assessed its fairness and consistency according to our knowledge of the company and, where applicable, with interviews or the consultation of documentary sources.
- Finally, we assessed the relevance of the explanations given in the event of the absence of certain information.

COMMENTS ON THE INFORMATION

We wish to make the following comments on the verified Information (limited assurance) above-cited:

- For the "Frequency rate of Group employees", the definition of "worked hours" should be clarified to ensure a more consistent implementation between business units, in particular integrating more frequently overtime and removal of leave of absence and the realization of a reconciliation with Human Resources data.
- For the « Annual water supply», the reporting methodology could be reminded and internal controls strengthened, in particular at site level, to ensure the consistency and reliability of the reported data.
- For Human Resources Indicators, the controls undertaken by business units which consolidate multiple subsidiaries should be strengthened, to ensure the consistency, reliability and completeness of the reported data.
- The census methodology regarding the following indicators should be clarified to ensure consistent application of the guidelines within the Group: the "number of employees having attended a training during the year", the "number of annual performance appraisals completed".

CONCLUSION

Based on our work described in this report, nothing has come to our attention that causes us to believe that the Information is not fairly presented, in all material aspects, in accordance with the Guidelines.

Courbevoie and Paris-La Défense, February 20, 2013

The Statutory Auditors
French original signed by:

Mazars	Ernst & Young et Autres
Lionel Gotlib	Daniel Escudeiro
	Jean-Yves Jégourel
	Emmanuelle Mossé

(a) For Environment Indicators: The air gases networks of Germany, the air separation units of Sarlux 1&2 (Italy), Fos Tonkin (France) and Fos Audience (France), the hydrogen production units of Yeochon (Korea), Rodeo (USA) and J10 Hermes (Singapore), the cogeneration units of Scottford (Canada) and Bayport (USA) and the filling centers of Villaverde (Spain) and Oberhausen (Germany). For Safety Indicators: Air Liquide France Industrie-Large Industrie (France), Air Liquide Spain (Spain), Air Liquide Korea (Korea), Air Liquide Italy (Italy), Air Liquide Industrial US LP (USA), Air Liquide Canada (Canada), Japan Air Gas (Japan), Air Liquide Brazil (Brazil) and Air Liquide Germany (Germany).

For Social Indicators: JAG (Japan), AL Sanita Italy (Italy), Air Liquide France Industrie (France), AL Brazil (Brazil), AL Germany (Germany), Carbagas (Switzerland), SOAEO, Aqualung and AL Egypt (Egypt).

(b) On average 10% of the produced air volumes from the air separation units (ASU), 16% of the produced volumes from hydrogen production units (HyCO), 12% of water consumption, 9% of electricity consumption, 25% of thermal energy consumption, 27% of direct CO₂ emissions and 13% of the travelled kilometers by Industrial Merchant.

(c) On average 17% of headcount, 14% of women among managers and professionals, 11% of women among managers and professionals hired during the year, 14% of training hours, 15% of employees having attended a training during the year, 19% of employees who had an annual performance review with their supervisor, 6% of resignations among managers and professionals.

(d) Except information related to respect for competition law.

> APPENDIX

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

Air Liquide indicators	GRI indicators
Human Resources	
Group employees	LA1
Distribution of employees by geographic zone	LA1
Turnover of employees (leaving the Group)	LA2
Retention rate of Managers and Professionals	LA2
% of women	LA13
% of women among Managers and Professionals	LA13
Average number of days of training per employee and per year	LA10
% of employees who have had a performance review meeting with their direct supervisor during the year	LA12
Diversity (number of nationalities)	LA13
% employees with benefits coverage through the Group	LA3
Safety	
Number of lost-time accidents of Group employees	LA7
Accident frequency of Group employees	LA7
Number of lost-time accidents of subcontractors and temporary workers	LA7
Energy and environment	
Total annual electricity consumption	EN3/EN4
Total annual thermal energy consumption	EN3/EN4
Evolution of energy consumption per m ³ of air gas produced (ASU)	EN6
Evolution of energy consumption per m ³ of hydrogen produced (HyCO)	EN6
Evolution of the distance traveled per ton of gas delivered	EN6
Total annual water consumption	EN8
Total direct greenhouse gas emissions	EN16
Total indirect greenhouse gas emissions	EN16
Total direct and indirect greenhouse gas emissions	EN16
Consumption of materials (calcium carbide, ammonium nitrate, materials for Welding)	EN1
Emissions into the atmosphere (NO _x)	EN20
Emissions into the atmosphere (SO _x)	EN20
Emissions into the atmosphere (VOC)	EN20
Discharge to water (oxidizable matter, suspended solids)	EN21
Total mass of waste by type and waste treatment	EN22
Transportation	
Estimate of CO ₂ emissions by truck delivery	EN29
Estimate of CO ₂ emissions avoided through on-site units	EN29
Social	
% employees belonging to a unit with a local Code of Conduct	SO3
Responsibility	
% of the Group sales concerning the units where a customer or patient satisfaction survey has been conducted	PR5

(a) Global Reporting Initiative (GRI): network-based organization that sets out principles and indicators that can be used to measure and report economic, environmental and social performances.