



# Sustainable development report

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## Introduction

Sustainable Development seeks to bring together, in one approach, requirements that were long considered incompatible: long-term wealth creation, respect for human beings and environmental protection. These themes are the three pillars of sustainable development.

Since its creation, Air Liquide has had a long-term approach to its activities. One business, one name, steady growth, regular dividends, long-lasting relations with its major customers, and the loyalty of employees and individual shareholders demonstrate this commitment.

Air Liquide has therefore developed a sustainable development model that is specific to the Company, with four dimensions that were formalized in 2003 through a commitment signed by Benoît Potier, Chairman and CEO of the Group:

- **creating value** for shareholders by developing the Company's activity and performance over the long term and communicating this performance in a transparent manner;
- **developing the potential of the Company's men and women** in their commitment to common objectives;
- **preserving life and the environment** in the Group's operations and at its customers' sites;
- **innovating for tomorrow** to guarantee the growth of the Company and its customers.

At the same time, the Group created a Sustainable Development Department to define and implement this approach in the Company.

- **Shareholders:** The Group wished to integrate the shareholder relationship into its sustainable development approach. Air Liquide and its shareholders have maintained, for over a century, a relationship of trust and the Group places its shareholders at the heart of its strategy with one objective: increasing the value of their investments through a sustained and regular growth of earnings and dividends over the long term. The loyalty of shareholders in the long term is a source of continuity of Air Liquide's strategy.
- **Men and women:** 43,000 men and women, in over 75 countries, make up multicultural teams with a host of competencies. Air Liquide considers it vital to promote diversity, facilitate and accelerate knowledge transfer, motivate and involve its employees and encourage social and human commitment, especially through the creation of the Air Liquide Foundation and the announcement of the Air Liquide University creation in 2008.

- **Preserving life and the environment:** Safety and the environment are at the heart of the Company's industrial policy. More than 40 industrial gas applications preserve life and the environment for the Group's customers: these applications represent 33% of the Group's revenue.

- **Innovating:** Air Liquide was created in 1902 as a result of an innovation, a new liquefaction and air separation technology. Innovation continues to be an essential value for the Company. Air Liquide files about 250 patents a year. Innovation and sustainable development are inseparable. Some 60% of the Research and Development budget is directly related to the sustainable development question, mainly dedicated to energy efficiency at Air Liquide and its customers' sites, cleaner production, and use of new energies like hydrogen.

Air Liquide has gradually established a structured sustainable development approach that now has over 160 indicators, presented in the pages that follow, to measure the Group's performance in the four dimensions that define this approach. These sustainable development indicators are collected worldwide and are published each year with the financial indicators in the Reference Document.

In addition, the Group has defined eight objectives concerning the key performance indicators that are vital for sustainable development. These indicators notably concern long-term shareholder remuneration, the place of women in the Company, training, safety, the energy performance of production units and the filing of international patents.

Like the financial data, the extra-financial or sustainable development data has been reviewed each year since 2003 by Statutory Auditors. The reviews first of all evaluate the Group's procedures on the central level, then in the field in six Human Resources Departments of subsidiaries for human and social indicators, and in six large industrial sites for energy and environmental dimensions. The audit validates the consolidation of all this data with the various departments concerned and the Sustainable Development Department.

This review is not an obligation. It reflects Air Liquide's commitment to give more value to all these indicators provided to the Company's stakeholders and in particular, individual shareholders, investors, customers and employees.

## Reporting Methodology

### PROTOCOL AND DEFINITIONS

In the absence of a relevant and recognized benchmark for industrial gas activities, Air Liquide has created a protocol to define its reporting methods for Human Resources, safety and environmental indicators. This protocol includes in a single document 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 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.

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

- information on the impact of transportation (kilometers traveled by delivery truck, CO<sub>2</sub> emitted) covers the entire world. Figures are calculated on the basis of data collected in the main countries where the Group is established around the world;
- information on kilometers saved and CO<sub>2</sub> 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 and Services, and 98% of the Group's total revenue;
- production units are included in the reporting system as of their industrial service start-up;
- electricity consumption 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.

## REPORTING AND RESPONSIBILITY

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 dual responsibility of the Finance Department and the Human Resources Department;
- the indicator for the rollout of the Group's codes of conduct is tracked by the Sustainable Development Department and the Group Audit;
- safety indicators are based on the Group's accident reporting tool, which falls under the Safety and Industrial System Department;
- the energy consumption and carbon dioxide 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 data is carried out by the Safety and Industrial System Department using a dedicated intranet tool, and includes:
  - for the units mentioned above, other environmental indicators (atmospheric emissions, water consumption, discharge into water, etc.),
  - for the smaller units (acetylene, nitrous oxide, carbon dioxide units and hygiene and specialty chemical products units), the welding units and the Engineering and Construction units, the Research and Development centers and the technical centers all indicators (energy use, atmospheric emissions, water consumption, discharge into water, etc.);
- indicators on kilometers traveled are the responsibility of the Industrial Merchant business line;
- the estimate of the percentage of the Group's revenue where the IMS project is being rolled out are indicators under the responsibility of the Safety and Industrial System Department;
- finally, indicators for the "carbon content" of the Group's main products are established by the Energy Services Group Departement from energy and transportation indicators.

## 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 is incoherent or missing, an estimated value may be used by default. For the sixth year, and in the spirit of continuous improvement, Air Liquide has asked

the Environment and Sustainable Development Departments of its Statutory Auditors, Ernst & Young and Mazars, to review the Group's procedures for Human Resources (excluding employee shareholders), safety and environmental indicators, and to check certain sites or units on the data collection process. The review and its findings are presented below. This review process has also resulted in recommendations, communicated within the Group, which serve as a basis for improvement in the following year.

## 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 engineers and managers and social performance indicators;
- how representative the measurements taken and necessary estimates are, in particular, concerning indicators on avoided carbon dioxide emissions, water consumption, kilometers per on-site units and training indicators.

# Statutory Auditors' report

## about human resources, safety and environmental reporting procedures

At the request of and as Statutory Auditors of L'Air Liquide S.A. company, we reviewed reporting procedures on human resources, safety and environmental indicators published for the 2008 reporting period and presented in the tables on the following pages.

These indicators were prepared under the responsibility of Air Liquide's Executive Management in compliance with the Group's sustainable development reporting procedures applicable for the 2008 reporting period, summarized in the preceding pages. It is our responsibility to provide you with our findings following the procedures described below.

### Nature and scope of procedures

As agreed, we carried out the following procedures :

- We reviewed the reporting procedures and assessed their relevance, completeness and accuracy with regard to the Air Liquide Group's activities.
- We conducted interviews at corporate headquarters with the services in charge of the reporting systems (sustainable development, human resources, finance, safety and industrial system, Large Industries, Industrial Merchant) to review the consolidation and data control processes as well as their presentation in the Annual Report.
- We visited six entities and six production units in nine countries in Europe, North and South America and Africa: Vitalaire France, Lurgi GmbH in Germany, Air Liquide South Africa, Air Liquide Egypt, Air Liquide Canada and Air Liquide Argentina for the human resources reporting; the air separation units of Sarlux (Italy) and Cherepovets (Russia), the air separation unit and cogeneration of Geismar (United States), the hydrogen production unit of Longview (United States), and the acetylene production unit of Böhlen (Germany) for the safety and environmental reporting. In these areas, we selected the issues we considered as priorities: for human resources, employees, parity for women, training, performance review and rollout of codes of conduct throughout the Group; for safety and environment, work-related accidents, energies consumptions, carbon dioxide emissions and water consumption. For each of these topics, we assessed the adequate understanding and implementation of reporting procedures.

To conduct these procedures, we called on our teams specialized in sustainable development.

Such procedures do not include all the relevant controls for providing assurance in accordance with the international standard ISAE 3000 (International Standard on Assurance Engagements), but do allow us to describe findings.

Statutory Auditors' report

## Findings

Our procedures led us to the following findings:

- The Air Liquide Group presents the significant elements of its methodology on the preceding pages as well as notes and comments on the tables on the following pages.
- Compared to the preceding year, we noticed the following improvements:
  - for environment and safety, the Group has innovated while measuring the carbon content of the main gases produced. The implementation of reporting procedures related to water consumption has also been improved,
  - for human resources, the entities' awareness-raising operations were carried on and data consolidation controls were strengthened.
- Progress margins were also identified:
  - for the environment and safety reporting, the indicator related to energy consumption per volume of gas produced could better include minor sources of thermal energy,
  - for human resources reporting, the entities' implementation of reporting procedures concerning training as well as performance review (career interviews) remain perfectible.

Courbevoie, Paris-La Défense, March 23, 2009

The Statutory Auditors

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*This is a free translation into English of the original report issued in the French language and is provided solely for the convenience of English speaking readers.*

## → Shareholders

### A long-term relationship

Since its origin in 1902, Air Liquide has grown successfully because of its relationship of confidence with its individual shareholders and its institutional investors.

Becoming an Air Liquide shareholder also means backing a responsible actor that helps protect life and the environment and that shows it is committed in the human, social and societal areas.

Air Liquide has formalized its privileged and durable ties with its shareholders in the "Shareholders Charter", which is based on four commitments:

- consideration and respect for all shareholders;
- remuneration and increased value of their investments;
- listening to and informing shareholders;
- a dedicated shareholder service.

### Evolution of % of registered capital and % of capital eligible for loyalty bonus since 1999

Year	Registered capital	Capital eligible for loyalty bonus
1999	32%	29%
2000	30%	27%
2001	29%	26%
2002	27%	24%
2003	28%	24%
2004	30%	24%
2005	31%	25%
2006	32%	26%
2007	37%	26%
<b>2008</b>	<b>33%</b>	<b>26%</b>

In 2007, the share of capital owned by institutional investors holding direct registered shares increased due to one important institutional investor that sold its share in 2008. However, the share of registered capital owned by individual shareholders increased in 2008.

## Shareholders

## Evolution of share ownership

Individual shareholders have always been the largest group of Air Liquide shareholders. They now number 410,000 and hold 38% of the Group's capital. This is nearly four times more than the average of the other CAC 40 groups.

French and foreign institutional investors represent respectively 26% and 35% of the capital.

Among the individual shareholders, Air Liquide employees hold 1% of the capital.

In %	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Individual shareholders	50	45	42	40	40	39	38	38	37	38
French institutional investors	24	24	20	21	23	24	25	24	30	26
Foreign institutional investors	26	29	35	37	35	36	36	37	32	35
Treasury shares	-	2	3	2	2	1	1	1	1	1

## Air Liquide, a long-term investment

Since it was first listed on the French Stock Exchange, Air Liquide has always shown a profit.

A policy of sustained distribution and regular allocation of free shares has permitted the shareholder to see his or her initial investment increase.

Air Liquide creates value by developing its activities and optimizing its performance over the long run. Over the last

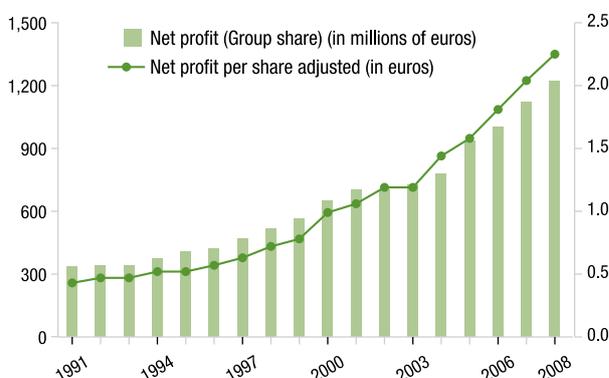
30 years, Air Liquide's revenue has shown an average annual growth of 8.6%. This growth has been profitable: the Group's earnings have followed a similar trend, with net profit per share of +9.0%.

During the last 10 years, nearly 50% of earnings have been distributed to shareholders. Over the same period, the dividend has had an average annual growth of +12.1%.

	1999	2000	2001	2002	2003	2004 IFRS	2005	2006	2007	2008
Net profit (Group share) (in millions of euros)	563	652	702	703	726	780	933	1,002	1,123	1,220
Net profit per share (in euros) <sup>(a)</sup>	2.06	2.39	2.61	2.64	2.75	2.97	3.56	3.79	4.26	4.70
Dividend per share (in euros) <sup>(a)</sup>	0.78	0.99	1.06	1.19	1.19	1.44	1.58	1.81	2.04	2.25

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

## Net profit and dividend



## OBJECTIVE

In the last 10 years, the growth in value of a portfolio of Air Liquide shares has been +8.1% a year, on average, including gross reinvested dividends, bonus shares and loyalty bonuses granted to registered shareholders. The Group's objective is to follow this long-term and transparent policy of comprehensive remuneration for shareholders in order to ensure regular growth in the value of their investment.

More information on Air Liquide and its shareholders is available in the Shareholder's Guide or in the Shareholders section at [www.airliquide.com](http://www.airliquide.com)

## Human Resources, social and societal

The Air Liquide Group has increasingly demonstrated its commitment in the human, social and societal areas. The annual publication of indicators on these themes is an integral part of

this approach. For the Group, it is a way to show and illustrate its commitment to social responsibility.

### THE GROUP'S MEN AND WOMEN

#### Diversity

Diversity is one of the pillars of Air Liquide's Human Resources policy. The Group is strongly committed to fighting all forms of discrimination (nationality, gender, age, experience, ethnic origin, training). The diversity of its employees makes it possible to better listen to and understand different viewpoints, update thought processes and broaden recruitment visions in order to attract the best talent. Air Liquide operates on diverse and complex markets. Diversity helps anticipate and adapt to these transformations. The fact that 22 different nationalities are represented among the Group's senior managers is a considerable asset from this viewpoint.

Air Liquide's objectives are to continue to increase diversity among its employees and to seek a better, more equitable division of responsibilities between men and women while placing more emphasis on the many cultures Air Liquide is composed of. For example, between 2003 and 2008, the percentage of women who were hired for managerial and engineering positions rose from 24% to 29%.

Air Liquide's general ambition is to have employees who are representative of the environment in which they work.

#### Training

Air Liquide stresses the need for regular training of its personnel. Training is an integral part of the Company's development. It allows employees to work more efficiently and in an increasingly safe environment while improving productivity and employability. The increase in the average number of training days per employee and per year is moreover one of the key objectives of Air Liquide's sustainable development approach. The recent announcement of the creation of the Air Liquide University that will offer, in the longer term, about 20 specific programs ranging from the integration of new employees to leadership, will strengthen the Group's capacity to train its people.

#### Remuneration

Employee remuneration is based on local market conditions, internal equity and applicable legislation. It is generally made up of a base salary plus complementary compensation elements. In 2008, 51% of the employees received an individual variable share in their remuneration. In addition, this remuneration can also include benefits such as profit-sharing and medical expenses. In 2008, 98% of the employees had a social coverage element through the Group.

#### The handicapped

For Air Liquide, diversity and equal opportunity also mean better insertion of handicapped employees into its teams but through subcontracting in companies in the adapted sector as well. In 2008, handicapped employees represented 1.2% of the Group's personnel.

The three agreements the Company signed in 2006 and 2007 with social partners in France were in line with this spirit.

Other actions have been implemented and are currently underway, in particular, to offer internships or on-the-job training program for handicapped people, to maintain employment of handicapped workers at Air Liquide, to increase cooperation with aid-through-work centers and raise awareness. This approach is coordinated for L'Air Liquide S.A. by the Handicap Air Liquide program.

## SOCIAL DIALOGUE

The European Works Council now has 28 employee representatives from 15 countries\*. 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 Executive Management. The main themes discussed during this meeting are: safety, the Group's current activities, the annual activity report and the Group's strategy. Today, 81% of Air Liquide's employees have access to representation, dialogue and a consultation structure.

\* Austria, Belgium, Denmark, France, Germany, Great Britain, Greece, Italy, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden.

## SUBCONTRACTING

The total amount of subcontracting of the Air Liquide Group was 1,368 million euros in 2008. Subcontracted activities are mainly those that are not core businesses of the Group; that require

specific resources and that can be called on to handle production overload.

## CORPORATE CITIZEN

### Principles of action and codes of conduct

In 2006, the Group formalized its principles of action in a document that explains its approach to all its key stakeholders (customers, personnel, suppliers, partners and local communities). Available in 16 languages, this document was distributed in 2007 to all the Group's units and can be consulted on the [www.airliquide.com](http://www.airliquide.com) Internet site in French and English.

Moreover, the Group's subsidiaries are encouraged to implement local codes of conduct. At the end of 2008, 57% of the Group's employees belonged to subsidiaries having a code of conduct. This decentralized approach combines the respect for local customs and regulations and the ethical commitment of the Group. It also permits the subsidiaries to thoroughly appropriate the Group's ethical principles by writing their own codes of conduct in their working language.

The implementation of these codes of conduct is backed by "Group Guidelines" based on 10 fundamental principles:

- respect for laws and regulations;
- respect for human beings: safety and hygienic conditions in the workplace, prevention of discriminatory actions, respect for third parties;
- respect for the environment;
- respect for regulations and competition law;
- respect for rules on insider trading;
- prevention of conflicts of interest: ties with a competitor, customer, supplier, respect for rules on corruption;

- protection of Air Liquide activities: protection of information, property and resources;
- transparency and integrity of information;
- internal controls and audits;
- implementation of codes of conduct.

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

In addition, in 2007, a Group ethics officer was appointed. He is responsible for providing advice and assistance to the entities in applying their codes of conduct. He also handles all the questions submitted by employees on implementing these codes of conduct. Furthermore, certain departments (procurement, sales, legal, Human Resources, etc.) have drawn up guides and codes detailing their operating principles in their specific field. For example, the code of conduct for the Group's procurement teams, translated into 13 languages, specifies that suppliers must be evaluated openly and fairly and that they are bound to respect Air Liquide's sustainable development commitments. This code particularly stresses the Group's commitment in the preservation of the environment, safety, working conditions, respect for human beings and the rejection of all forms of discrimination. In addition, apart from this buyers' code of conduct, a clause on responsible purchasing and environmental reporting elements is being introduced in certain purchasing framework contracts.

## Corporate philanthropy

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

The purpose of the Air Liquide Foundation, created in April 2008, is to encourage and develop these initiatives. It has a worldwide ambition with the desire to support projects in the 75 countries in which the Group operates.

The Foundation has three missions:

- in the environmental field, it supports scientific research on the preservation of our planet's atmosphere;
- in the health and respiration field, it supports scientific research on the human respiratory function;
- in the area of micro-initiatives, the Foundation encourages local proximity actions and anchoring in the regions of the world where the Group is present and in which it has expertise, for example, in education, training, etc. Each micro-initiative project is followed by a Air Liquide employee who

is a volunteer sponsor. The Group's employees who would like to get involved can sponsor a project to which they are geographically close and in which they have an interest.

With a budget of nearly 3 million euros over five years, the Air Liquide Foundation provides an intervention framework for philanthropic initiatives that are presented to it and that correspond to its missions. It provides them with financial, material and/or Human Resources.

The Foundation's Board of Directors is composed of nine members comprised of five members of the Air Liquide Group, an employee representative and three exterior experts in the three domains of the Foundation. The Board is chaired by Benoît Potier, Chairman and CEO of the Air Liquide Group. The Board of Directors is assisted in its functions by a Project Selection Committee that examines the projects submitted four times a year. The Committee is comprised of seven members including a representative of the Shareholders Communication Committee.

Projects may be submitted, on line, in French or English via the Foundation's site, [www.fondationairliquide.com](http://www.fondationairliquide.com).

### STOREBRAND

This Norwegian major investment fund has positioned Air Liquide among the best companies for its environmental and social performances.

### ETHIBEL SUSTAINABILITY INDEX

Since 2005, Air Liquide has been included in this indicator, which encompasses 280 companies worldwide leaders in sustainable development, and was selected by VIGEO, the European extra-financial rating agency.

### INDICATORS FOR THE GROUP AS A WHOLE

Employees <sup>(a)</sup>	2003	2004	2005	2006	2007	2008
Group employees	31,900	35,900	35,900	36,900	40,300	43,000
■ Women			8,310	8,670	9,630	10,300
			23%	23%	24%	24%
■ Men			27,590	28,230	30,670	32,700
			77%	77%	76%	76%
Joining the Group <sup>(b)</sup>						19.2%
Leaving the Group <sup>(c)</sup>						12.5%
% of employees having resigned during the year <sup>(d)</sup>		3.4%	3.7%	4.8%	5.0%	5.0%

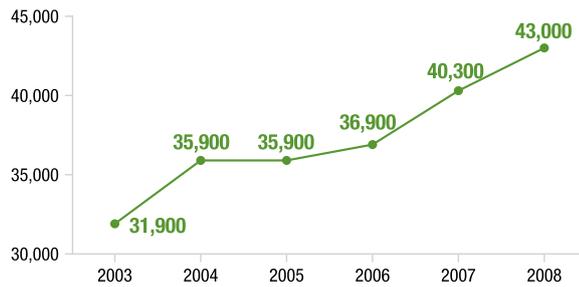
(a) Employees under contract, excluding temporary employees.

(b) Hiring or integration due to acquisitions. The percentage is calculated based on the number of employees at the end of 2007.

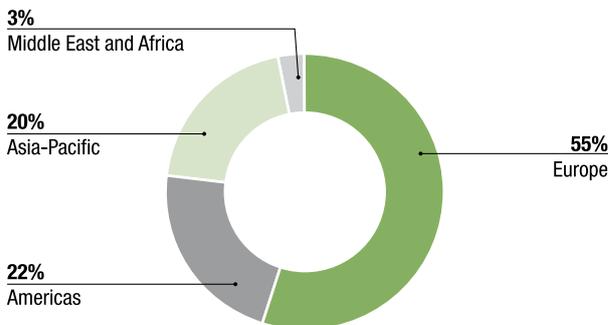
(c) Retirement, resignation, lay-offs, departure due to disposals... The percentage is calculated based on the number of employees at the end of 2007.

(d) Calculated based on the number of employees at the end of 2008.

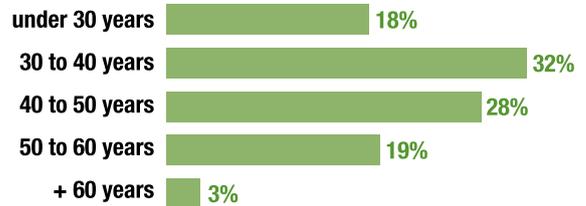
#### Group employees



#### Distribution of employees by geographic zone



#### Group employees by age



Parity and Diversity	2003	2004	2005	2006	2007	2008
<b>Women</b>						
% women among engineers and managers	14%	17%	17%	18%	19%	22%
% women among engineers and managers hired during the year	24%	31%	28%	29%	30%	29%
% women among employees considered high potential	20%	21%	24%	27%	32%	32%
<b>Number of nationalities</b>						
Among expatriates	36	36	36	40	40	48
Among senior managers	25	21	20	23	22	22
Among employees considered high potential	35	37	40	43	44	42

	2003	2004	2005	2006	2007	2008
<b>Training</b>						
% total payroll allocated to training (approximate)	3%	3%	3%	3%	3%	3%
Average number of days of training per employee and per year <sup>(a)</sup>	2.5 days	2.7 days	2.6 days	2.7 days	2.9 days	3.1 days
% employees who attended a training program at least once during the year		67%	67%	70%	68%	71%
<b>Remuneration</b>						
% employees with an individual variable share as part of their remuneration	36%	40%	41%	43%	49%	51%
<b>Performance review</b>						
% employees who have had a performance review meeting with their direct supervisor during the year	60%	70%	72%	70%	71%	68%
% of employees who have had a career development meeting during the year with the HR Department				13%	20%	16%
<b>Social performance</b>						
Average seniority in the Group			12 years	12 years	11 years	10 years
% of handicapped employees <sup>(b)</sup>			1.3%	1.3%	1.2%	1.2%
% of employees having access to organized representation/dialogue/consultation			74%	77%	83%	81%
% of employees belonging to a unit at which an internal satisfaction survey was conducted within the last three years <sup>(c)</sup>			56%	71%	64%	58% <sup>(d)</sup>
% of employees with benefits coverage through the Group <sup>(e)</sup>			98%	97%	98%	98%
<b>Employee shareholders</b>						
% capital held by Group employees	0.9%	0.9%	1.2%	1.1%	1.1%	1.0%
% Group employees that are shareholders of L'Air Liquide S.A. (approximate)		Over 40%	60%	50%	50%	Over 40%

(a) Calculated in average number of employees during the year.

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

(c) Indicator includes units with over 300 employees.

(d) Furthermore, in 2008, each unit conducted a study with its employees on the perception of the management and actions on safety in the Group.

(e) Includes retirement benefits.

Detailed Human Resources information for L'Air Liquide S.A. is in the "Social Report" on the Internet site [www.airliquide.com](http://www.airliquide.com) and is available on request.

Human Resources, social and societal

### Parity

#### OBJECTIVE

To strengthen the position of women in the Group, in particular through recruitment of engineers and managers. The Group's objective is to increase the hiring of women in this category, from nearly one out of three new hires to more than two out of five within five years (2005-2009).

#### MONITORING THE OBJECTIVE

In five years (2003 to 2008), the percentage of women engineers and managers hired in the Group went from 24% to 29%. In 2008, several countries had already passed the Group's objective of 40%. The percentage of women among employees considered high potential is now 32%. Nine women are now in a position of General Manager of subsidiaries in the Group. In the framework of Air Liquide's policy to encourage the hiring and promotion of women, and to strengthen their place and responsibilities in the company, awareness-raising and exchange days have been organized since 2007 with more than 400 managers.

### % of women among engineers and managers



### Training

#### OBJECTIVE

To increase training opportunities so that by 2009, all employees have the chance to enhance their skills and facilitate their advancement through, on average, at least three training days a year.

#### MONITORING THE OBJECTIVE

The number of training days per person continued to increase in 2008 (3.1 days) and the objective of three days by 2009 has already been exceeded. The recent announcement of the creation of the Air Liquide University that will offer, in the longer term, about 20 specific programs ranging from the integration of new employees to leadership is in line with the development of training in the Group.

### Average number of days of training per employee and per year



### Monitoring performance

#### OBJECTIVE

On every site, in every region, in every unit, the Group's objective is that 100% of employees meet their direct supervisor once a year for a performance evaluation interview and meet a manager from the Human Resources Department about every three years for a career development interview.

#### MONITORING THE OBJECTIVE

In 2008, the percentage of employees who had a meeting with their immediate supervisor was 68%. The percentage of employees who had a career meeting with their Human Resources Department was 16%. The Group's Human Resources Department continues to stress these meetings, which are the "keystone" of the company's human resources policy.

### % employees who have had a performance review meeting with their direct supervisor during the year



# ➔ Safety and the environment

## SAFETY INDICATORS FOR THE GROUP AS A WHOLE

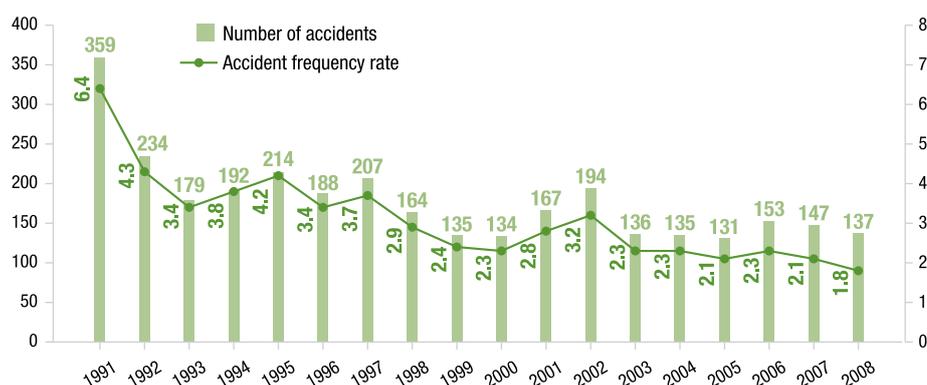
Security	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of accidents of Group employees <sup>(a)</sup>	359	234	179	192	214	188	207	164	135	134	167	194	136	135	131	153	147	137
Accident frequency of Group employees <sup>(b)</sup>	6.4	4.3	3.4	3.8	4.2	3.4	3.7	2.9	2.4	2.3	2.8	3.2	2.3	2.3	2.1	2.3	2.1	1.8
Number of accidents of subcontractors and temporary workers <sup>(c)</sup>																		154 <sup>(d)</sup>

(a) No fatal accidents in 2008, one in 2007, one in 2006, none in 2005 and one fatal traffic accident in 2004.

(b) Number of accidents involving lost time per million hours worked by Group employees. Accidents defined as recommended by the International Labor Office.

(c) 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.

(d) Including three fatal accidents (among them, two were traffic accidents).



### OBJECTIVE

The Group's objective is zero accident, on every site, in every region, in every unit.

## ENVIRONMENTAL INDICATORS FOR THE GROUP AS A WHOLE

Presented here are the environmental elements most representative of the Group's businesses:

- large air separation units;
- cogeneration units;

- hydrogen and carbon monoxide units;
- acetylene units;
- nitrous oxide units;
- carbon dioxide liquefaction units;

## Safety and the environment

- units in the hygiene and specialty chemical sectors;
- units for welding equipment and products;
- Engineering and Construction units;
- Research and Development centers and technical centers;
- transportation.

In 2008, the main characteristics regarding energy and environmental indicators for the Group were:

- **Electric energy consumption was stable**, primarily due to reduced activity at the end of the year in Large Industries' air separation units in North America.
- For the same reasons, **energy consumption per m<sup>3</sup> of air gas products increased** (cf. monitoring the objective on this subject in the specific paragraph on air separation units).

- **Thermal energy consumption, CO<sub>2</sub> emissions that are mainly linked to water consumption increased** due to the service start-up of a large cogeneration unit in the Netherlands and the growth of hydrogen production related to this product's increased sales. **The energy performance of hydrogen production units continued to improve.**

- Despite the development of cogeneration, **the CO<sub>2</sub> emissions avoided by this activity remained stable** because the content of the primary energies used in the countries where they are located is moving toward fuels that emit less CO<sub>2</sub>.

- For the same reasons as well as the stabilization of the Group's electric energy consumption (see above), **the Group's indirect CO<sub>2</sub> emissions were stable.**

#### MOST RELEVANT ENVIRONMENTAL INDICATORS FOR THE TOTAL OF THE 10 UNIT TYPES (461 SITES OR PRODUCTION UNITS) AND TRANSPORTATION INCLUDED IN THE WORLDWIDE SCOPE

	Scope	2003	2004	2005	2006	2007	2008
Total annual electricity consumption (GWh)	World		17,636	20,991	22,281	23,232	23,223
Total annual thermal energy consumption (LHV Terajoules)	World		128,357 <sup>(a)</sup>	143,082	155,725	160,033	177,395
<b>Evolution of energy consumption per m<sup>3</sup> of air gas produced</b>	<b>World</b>	<b>100.0</b>	<b>99.2</b>	<b>100.7</b>	<b>100.3</b>	<b>99.6</b>	<b>100.7</b>
<b>Evolution of energy consumption per m<sup>3</sup> of hydrogen produced <sup>(b)</sup></b>	<b>World</b>	<b>100.0</b>	<b>97.1</b>	<b>96.1</b>	<b>95.5</b>	<b>95.5</b>	<b>94.3</b>
<b>Evolution of efficiency of deliveries of liquefied gases (oxygen, nitrogen, argon, carbon dioxide) <sup>(c)</sup></b>	<b>World</b>	<b>100.0</b>	<b>96.1</b>	<b>98.0</b>	<b>96.3</b>	<b>95.1</b>	<b>95.9</b>
Total annual water consumption (in millions of m <sup>3</sup> )	World		44	49	55.6	57.4	59.7 <sup>(d)</sup>
Annual amount of CO <sub>2</sub> emissions avoided by cogeneration and on-site units (in thousands of tonnes)	World	-856	-647	-723	-757	-636	-638
Total direct CO <sub>2</sub> emissions into the atmosphere (in thousands of tonnes)	World		5,956 <sup>(e)</sup>	7,093	7,668	7,859	8,843 <sup>(e)(f)</sup>
Total indirect emissions of CO <sub>2</sub> generated by the production of electricity purchased externally consumed by the 9 types of production units presented (the cogeneration units are not taken into account because they produce electricity) <sup>(g)</sup> (in thousands of tonnes)	World				7,631	7,995	7,952

(a) Modified in 2008 to take into account new consolidation rules concerning hydrogen and carbon monoxide units.

(b) Also includes the quantities of carbon monoxide produced in these units. In 2008, the energy performances were recalculated for the previous years to take into account a greater precision regarding steam produced.

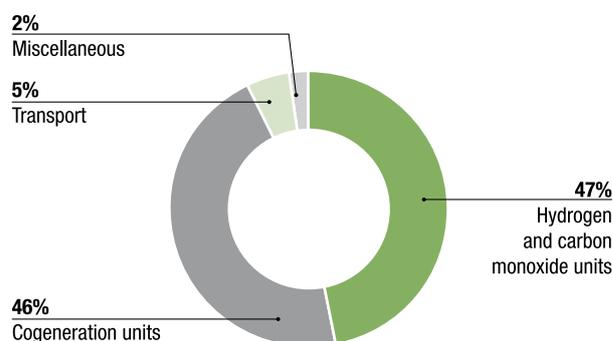
(c) In km per tonne delivered. Base 100 in 2003.

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

(e) Representing less than 1 one-thousandth of the CO<sub>2</sub> emissions in the countries under review.

(f) When adding nitrous oxide emissions, the total direct emissions of greenhouses gases (GHG) of the Group is 9,014 thousand tonnes of CO<sub>2</sub> equivalent.

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

**DISTRIBUTION OF TOTAL DIRECT EMISSIONS OF GREENHOUSE GASES (GHG)****Origin of electric energy used**

By taking into account the different types of primary energy in the countries where the Group is present, it is possible to present the global breakdown of the energy used:

**ORIGIN OF ELECTRIC ENERGY USED <sup>(a)</sup>**

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

**DETAILS ON INDICATORS FOR EACH OF THE 10 UNIT TYPES, TRANSPORTATION AND WASTE AND BY-PRODUCTS****1. Air separation units**

Worldwide, Air Liquide operates **257 large air separation units**. They produce oxygen, nitrogen and argon, with some sites producing rare gases. These **factories “without chimneys”** do not use any combustion process. Since they produce almost no

carbon dioxide (CO<sub>2</sub>), sulfur oxide (SO<sub>x</sub>) or nitrogen oxide (NO<sub>x</sub>) emissions, they are particularly environmentally friendly. They consume electricity almost exclusively: worldwide, they use about **2,500 MW** each instant, the equivalent of the production of two nuclear power plants. Their cooling systems require back-up water.

## Safety and the environment

Air separation units	Scope	2003	2004	2005	2006	2007	2008
Annual electricity consumption (GWh) <sup>(a)</sup>	World	16,134	16,931	20,179	21,379	22,296	22,235
<b>Evolution of energy consumption per m<sup>3</sup> of air gas produced <sup>(b)</sup></b>	<b>World</b>	<b>100.0</b>	<b>99.2</b>	<b>100.7</b>	<b>100.3</b>	<b>99.6</b>	100.7
Annual back-up water consumption (in millions of m <sup>3</sup> )	World		28	32	34.2	36.2	34.6
<b>Evolution of water consumption per m<sup>2</sup> of air gas produced <sup>(c)</sup></b>	<b>World</b>		<b>100.0</b>	<b>103.6</b>	<b>100.4</b>	<b>98.1</b>	<b>95.8</b>
Discharge to water: oxidizable matter (tonnes/year)	World		Below 2,000	Below 1,000	Below 500	Below 500	Below 250
Discharge to water: suspended solids (tonnes/year)	World		Below 2,000	Below 1,000	Below 500	Below 500	Below 250

(a) Including small volumes of purchased steam.

(b) Gases produced (oxygen, nitrogen, argon) calculated in m<sup>3</sup> of equivalent gaseous oxygen. Base 100 in 2003.

(c) Excluding the energy consumption of units with open cycle water cooling system. Base 100 in 2004. The scope of this indicator was specified in 2008 and the data of previous years was consequently recalculated.

### Evolution of energy consumption per m<sup>3</sup> of gas produced in the air separation units.

#### OBJECTIVE

To reduce, within five years (2005 to 2009, the Group's annual world consumption of electrical energy by air separation unit, at constant scope, by at least 400 GWh, or the annual domestic consumption of electricity of a city of 180,000 people and which leads to the emission reduction of 140,000 tonnes of CO<sub>2</sub> per year.

#### MONITORING THE OBJECTIVE

In 2005, the Group did not progress in this area (evolution of -168 GWh) due to problems in the United States related to hurricanes. In 2006 and 2007, the Group progressed by 79 GWh and 209 GWh respectively, for a net reduction of 120 GWh for the three years, 2005-2007.

Through the first three quarters of 2008, the Group was improving efficiency at a rate that would have resulted in a decrease in energy consumption of 186 GWh for the year. This would have led to a reduction of 306 GWh for the first four years of the five-year program. However, the fourth quarter of 2008 was difficult: the significant downturn in the economy and in industrial production forced the Group to operate plants below their economically optimal conditions to supply customers that were operating at reduced capacities. The effect was profound, not only erasing the gains from the previous three quarters of 2008, but also the gains from the previous three years and cumulatively presented a decline of 167 GWh compared to 2004 going back to the level of 2005.

In spite of this setback, the Group remains dedicated to reducing the environmental footprint from its operations by reducing the energy needed to produce its products and it continues to invest in energy efficiency programs.



## 2. Cogeneration units

Worldwide, Air Liquide operates **18 cogeneration units**. They produce steam and electricity simultaneously much more efficiently – 15 to 30% – than units that generate steam and electricity separately, which results in major savings in fossil fuels. They consume natural gas and water, most of which is converted into steam for the customers. Most of the steam is 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 gives off carbon dioxide (CO<sub>2</sub>) and produces some nitrogen oxide (NOx) emissions, but practically no sulfur oxide (SOx) emissions.

These units replace steam and electricity production units that would have produced more CO<sub>2</sub> emissions. Cogeneration units therefore help reduce CO<sub>2</sub> emissions in the industrial basins they supply. In 2008, the Group's cogeneration units **avoided 575,000 tonnes of carbon dioxide emissions being discharged into the atmosphere.**

The year 2008 was marked by the service start-up of a large new unit in the Netherlands for a customer in the Rotterdam industrial basin, which explains the growth in thermal energy and water consumption. This unit replaces former customers plants and contributes to reducing the emissions of this industrial basin.

Despite this development, the CO<sub>2</sub> emissions avoided by the cogeneration units have remained stable because the content of primary energies used in the countries where they are located is moving toward fuels that emit less carbon.

Cogeneration units	Scope	2003	2004	2005	2006	2007	2008
Annual natural gas consumption (or thermal energy) (LHV Terajoules)	World	71,464	74,065	67,474	68,584	64,685	74,168
Annual quantities of CO <sub>2</sub> atmospheric emissions prevented through cogeneration <sup>(a)</sup> (in thousands of tonnes)	World	-856	-647	-666	-693	-573	-575
Air emissions: CO <sub>2</sub> (carbon dioxide) (in thousands of tonnes)	World	3,930	4,155	3,785	3,848	3,629	4,161
Air emissions: NOx (nitrogen oxides) (in tonnes)	World	4,050	2,060	2,350	2,630	2,300	2,700
Air emissions: SOx (sulfur oxides) (in tonnes)	World	Below 100	Below 100	Below 100	Below 100	Below 50	Below 50
Annual water consumption (million m <sup>3</sup> )	World	10	7.9	7.9	8.7	7.9	11.5

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

### 3. Hydrogen and carbon monoxide production units

Worldwide, Air Liquide operates **38 large hydrogen and carbon monoxide production units**. They also produce steam for certain customers. Desulfurization of hydrocarbons to produce sulfur-free fuels is one of the main applications for hydrogen. In 2008, the hydrogen Air Liquide supplied to refineries throughout the world resulted in **savings of about 770,000 tonnes of sulfur oxide emissions discharged into the atmosphere**, which is greater than all the sulfur oxide emissions from a country like France. An important application for carbon monoxide is plastics manufacturing.

Natural gas is the main raw material used in these production units, along with certain amounts of "process" water. These units emit carbon dioxide (CO<sub>2</sub>) and lead to nitrogen oxides (NO<sub>x</sub>) emissions but produce practically no sulfur oxides (SO<sub>x</sub>). They also consume electricity and their cooling systems require back-up water.

**Growth in hydrogen production in 2008 is notably explained by the service start-up of a large unit in Antwerp, Belgium, incorporated into the hydrogen pipeline network in northern Europe.**

**Energy efficiency of these units per m<sup>3</sup> of gas produced has improved by about 5% over five years**

Hydrogen and carbon monoxide units	Scope	2003	2004	2005	2006	2007	2008
Annual thermal energy consumption (LHV Terajoules)	World		54,021 <sup>(a)</sup>	75,380	86,699	94,880	102,717
Annual electricity consumption (GWh)	World		375	435	507	512	518
<b>Evolution of energy consumption per m<sup>3</sup> of gas produced <sup>(b)</sup></b>	<b>World</b>	<b>100.0</b>	<b>97.1</b>	<b>96.1</b>	<b>95.5</b>	<b>95.5</b>	<b>94.3</b>
Air emissions: CO <sub>2</sub> (carbon dioxide) (in thousands of tonnes)	World		1,789 <sup>(a)</sup>	2,895	3,389	3,795	4,226
Air emissions: NOx (nitrogen oxides) (in tonnes)	World		Below 1,000	700	800	950	860
Air emissions: SOx (sulfur oxides) (in tonnes)	World		Below 500	Below 500	Below 500	Below 250	Below 250
Annual consumption of process and back-up water (in million m <sup>3</sup> )	World		5	5.3	9.6	9.8	10.6
Discharge to water: oxidizable matter (in tonnes)	World		Below 50	Below 100	Below 100	Below 100	Below 200
Discharge to water: suspended solids (in tonnes)	World		Below 500	Below 500	Below 500	Below 500	Below 1000

(a) Modified for the 2008 reporting to take into consideration the new consolidation rules adopted.

(b) Hydrogen and carbon monoxide. Base 100 in 2003. In 2008, the energy performances were recalculated for the previous years to take into account a greater precision in the evaluation of produced steam.

Safety and the environment

**EVOLUTION OF ENERGY CONSUMPTION PER M<sup>3</sup> OF GAS PRODUCED IN HYDROGEN AND CARBON MONOXIDE UNITS****4. Acetylene production units**

Worldwide, Air Liquide operates **50 acetylene production units** (a gas used mainly in welding and metal cutting). They produce

the gas through the decomposition of a solid - calcium carbide - using water. This process produces lime, which is generally recycled (at around 90%) in industrial and agricultural applications (cf. paragraph on waste).

Acetylene units	Scope	2004	2005	2006	2007	2008
Annual electricity consumption (GWh)	World			12	11	10
Annual water consumption (in million m <sup>3</sup> )	World	0.4	0.4	0.4	0.4	0.4
Annual calcium carbide consumption (in tonnes)	World	36,200	38,900	38,100	38,500	41,100
Air emissions of volatile organic compounds (VOC) (in tonnes) <sup>(a)</sup>	World				170	140

(a) Mainly loss of acetylene into the atmosphere.

**5. Nitrous oxide production units**

Worldwide, Air Liquide operates **12 nitrous oxide production units**. Nitrous oxide is used exclusively as an anesthetic gas

in medicine and as sweetening agent in the food industry. It is produced from ammonium nitrate in solid form or as a solution in water. The cooling circuits of these units require back-up water.

Nitrous oxide units	Scope	2004	2005	2006	2007	2008
Annual electricity consumption (GWh)	World	6	6	7	6	6
Annual water consumption (in million m <sup>3</sup> )	World	0.1	0.1	0.1	0.1	0.1
Annual ammonium nitrate consumption (in tonnes)	World	25,100	24,500	24,540	21,500	20,000
Estimate of loss of nitrous oxide into the atmosphere (in tonnes)	World	800 <sup>(a)</sup>	800 <sup>(a)</sup>	800 <sup>(a)</sup>	780	550 <sup>(b)</sup>

(a) Estimate for the years 2004 to 2006.

(b) Corresponding to the equivalent of 171,000 tonnes of CO<sub>2</sub>.

**6. Carbon dioxide liquefaction units**

Worldwide, Air Liquide operates **53 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 by-product 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 the process.

Carbon dioxide liquefaction units	Scope	2004	2005	2006	2007	2008
Annual electricity consumption (GWh)	World	306	353	320	340	375
Annual water consumption (million m <sup>3</sup> )	World	1.8	1.9	1	1.2	1.3
Discharge to water: oxidizable matter (in tonnes)	World	Below 100	Below 100	Below 50	Below 50	Below 50
Discharge to water: suspended solids (in tonnes)	World	Below 100	Below 100	Below 50	Below 50	Below 50

## 7. Hygiene and specialty chemical production units

**Hygiene and chemical specialty production units** are located at **eight sites** in France, Belgium, China and Germany. These units consume natural gas, electricity and water. Combustion of natural gas produces small quantities of carbon dioxide.

Hygiene and chemical specialty units	Scope	2003	2004	2005	2006	2007	2008
Annual electricity consumption (GWh)	World	17	18	18	18	20	22
Annual thermal energy consumption (LHV Terajoules) <sup>(a)</sup>	World	217	271	228	245	245	274
Air emissions: CO <sub>2</sub> (carbon dioxide) (in thousands of tonnes/year)	World	13	12	9	9	9	10
Air emissions of volatile organic compounds (VOC) (in tonnes)	World					320	250
Annual water consumption (million m <sup>3</sup> )	World	1	0.6	0.5	0.5	0.5	0.6
Discharge to water: oxidizable matters (in tonnes)	World	Below 1,000	Below 1,000	Below 1,000	Below 1,100	Below 1,000	Below 1,000
Discharge to water: suspended solids (in tonnes)	World	Below 100					

(a) Including thermal energy corresponding to steam purchases.

## 8. Welding equipment and products production units

The **welding equipment and products production units** are mainly located on **14 sites** in the world. They are welding equipment assembly (electric welding units, torches, regulators) or welding consumables (electrodes, welding wire and flux) production units.

Welding equipment and products production units	Scope	2006	2007	2008
Annual electricity consumption (GWh)	World	38	36	39
Annual thermal energy consumption (LHV Terajoules)	World	197	223	218
Air emissions: CO <sub>2</sub> (carbon dioxide) (thousands of tonnes)	World	11	13	12
Annual water consumption (million m <sup>3</sup> )	World	1.1	1.2	0.5
Annual consumption of raw materials (thousands of tonnes) <sup>(a)</sup>	World		150	170

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

Safety and the environment

## 9. Engineering and Construction units

The **Engineering and Construction units** are located on **six sites**, in France, China, Japan and India. They are mainly units for the construction of air separation columns and cryogenic tanks.

Engineering and Construction units	Scope	2007	2008
Annual electricity consumption (GWh)	World	11	10
Annual water consumption (million m <sup>3</sup> )	World	0.1	0.1
Annual consumption of raw materials (thousands of tonnes) <sup>(a)</sup>	World	7.2	7.7

(a) Mainly metals.

## 10. Principal Research and Development centers and technical centers

The **principal Research and Development centers and technical centers** are located on five **sites** in France, the USA and Japan.

Although these centers' environmental impact is very low compared to other Group entities, with a concern for exhaustiveness of the reporting and exemplarity, it was nevertheless decided to present their environmental impact.

Research and development centers and technical centers	Scope	2008
Annual electricity consumption (GWh)	World	8
Air emission: CO <sub>2</sub> (in thousands of tonnes)	World	1
Annual thermal energy consumption (LHV Terajoules)	World	18
Annual water consumption (in million m <sup>3</sup> )	World	0.02

## 11. Transportation

In 2008, trucks delivering Air Liquide liquid gases or gas cylinders traveled **395 million kilometers** throughout the world and emitted about **433,000 tonnes of carbon dioxide**. On-site nitrogen, oxygen and hydrogen units reduced truck deliveries, a source of carbon dioxide (CO<sub>2</sub>) emissions. These on-site units were able to **save the 58 million extra kilometers** traveled by trucks and therefore the emission of **63,000 tonnes** of carbon dioxide. **The efficiency of the deliveries** of liquefied gases (oxygen, nitrogen, argon, carbon dioxide) measured in

kilometers traveled per tonne **has been improved by nearly 4% since 2003**, corresponding to **a reduction in CO<sub>2</sub> emissions of about 18,000 tonnes a year**.

Supplying large customers via pipeline from the Group's production units also limits transportation. These pipeline systems, which are environmentally friendly and safe, total over **8,500 kilometers worldwide**. For air gases and hydrogen, which represent most of the volumes the Group delivers, **84% of deliveries are made via pipeline or through on-site units. As a result, only 16% of all air gases or hydrogen are delivered by trucks.**

	Scope	2003	2004	2005	2006	2007	2008
Kilometers traveled by all vehicles delivering gas in liquid or cylinder form (in millions of km)	World	303	325	369	375	377	395
Estimate of CO <sub>2</sub> emissions generated by these vehicles (in thousands of tonnes)	World			404	411	413	433
<b>Evolution of the efficiency of deliveries for liquefied gases (oxygen, nitrogen, argon, carbon dioxide) <sup>(a)</sup></b>	<b>World</b>	<b>100</b>	<b>96.1</b>	<b>98.0</b>	<b>96.3</b>	<b>95.1</b>	<b>95.9</b>
Estimate of truck transport kilometers avoided through on-site customer units (in millions of km)	World	-55	-54	-56	-60	-59	-58
Estimate of CO <sub>2</sub> emissions avoided by these on-site units (in thousands of tonnes)	World			-57	-64	-63	-63
Percentage of deliveries of air gases and hydrogen via pipeline or on-site	World			84% <sup>(b)</sup>	85%	84%	84%

(a) In km per tonne delivered. Base 100 in 2003.

(b) In 2005, this percentage only applied to air gases.

**EVOLUTION OF THE EFFICIENCY OF DELIVERIES LIQUEFIED GASES OVER THE PAST SIX YEARS (IN KM PER TONNE DELIVERED. BASE 100 IN 2003)****12. Waste and by-products**

The main waste and by-products produced by the Group's production units are lime from the acetylene production units, metal waste, oils, paints and solvents.

Although the quantity of waste and by-products produced is small, with a concern for exhaustiveness of the reporting and exemplarity, it has nonetheless been decided for the first time to publish the following figures.

Waste and by-products (in tonnes)	Scope	2008
■ Annual quantity of lime produced (extracted dry equivalent) by the acetylene production units <sup>(a)</sup>	World	47,000
Recycling rate	World	Over 90%
■ Metal waste <sup>(a)</sup>	World	9,400
Recycling rate	World	Over 99%
■ Oils	World	660
Recycling rate	World	88%
■ Paints and solvents	World	210
Recycling rate	World	8% <sup>(b)</sup>

(a) Non dangerous metal waste.

(b) In addition, 71% are incinerated.

**“CARBON CONTENT” OF AIR LIQUIDE'S MAIN PRODUCTS IN 2008**

Taking into account the characteristics of supplying factories with electricity and natural gas, Air Liquide has built a model <sup>(a)</sup> calculating the “carbon content” of the Group's main products in certain countries in which it has a strong presence. This therefore concerns oxygen, nitrogen, and hydrogen delivered via pipeline, oxygen and nitrogen delivered in liquefied form and oxygen delivered in pressurized cylinders. These figures include both direct and indirect emissions (electricity), those connected to production, filling and also transportation.

The figures on the next page show a large variation from one country to another because of the major differences in the type of energy used in each country, notably to produce electricity. For example, in France, electricity production units use very little coal (which emits a great deal of CO<sub>2</sub>), unlike in Germany, the USA and Japan.

Safety and the environment

**"CARBON CONTENT" OF AIR LIQUIDE'S MAIN PRODUCTS IN 2008 (gCO<sub>2</sub>/Nm<sup>3</sup> <sup>(b)</sup>)**

		France	USA	Germany	Japan
Oxygen	Oxygen via pipeline <sup>(c)</sup>	63	225	260	307
	Liquid oxygen	133	412	468	556
	Oxygen in cylinders <sup>(d)</sup>	452	612	771	<sup>(e)</sup>
Nitrogen	Nitrogen via pipeline <sup>(c)</sup>	21	74	86	101
	Liquid nitrogen	94	274	309	368
Hydrogen		Belgium	USA		
	Hydrogen via pipeline <sup>(f)</sup>	617	670		

(a) The methodology and calculations for the model of these figures were validated by Ecofys, a consulting firm specialized in sustainable development. These calculations take into account the different energy sources that Belgium, France, Germany and Japan use to produce electricity (source: International Energy Agency). In the USA, the calculation of indirect emissions takes into account the data from the main electricity production units that supply Air Liquide.

(b) Nm<sup>3</sup> = m<sup>3</sup> of gas at atmospheric pressure at 0 °C.

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

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

(e) Not available.

(f) At 100 bar, pressure standard for these pipelines.

## INDUSTRIAL MANAGEMENT SYSTEM (IMS) AND QUALITY AND ENVIRONMENTAL CERTIFICATION INDICATORS

In 2004, the Group launched a new industrial management system (IMS) to strengthen safety, reliability, the preservation of the environment and risk management. **The system is now implemented in nearly all the Group's operations (over 99% of the Group's revenue).** At the start of 2007, a new indicator was established to track the percentage of revenue covered by the Group's IMS internal audits. In 2007 and 2008, 36 entities were audited, i.e., **81%** of the Group's activities in terms of revenue.

The Group has taken several other quality initiatives, especially in the implementation of good production practices (Common Good Manufacturing Practices) and ISO certification. ISO 9001 quality certifications cover about 75% of the Group's revenue. The Group has also undertaken a proactive approach to preserving the environment by obtaining ISO 14001 certifications, an international benchmark in the environment. **These ISO 14001 certifications now cover about 24% of the Group's revenue.**

In %	Scope	2004	2005	2006	2007	2008
Estimate of the Group subsidiary revenue concerning the effective implementation of IMS in the field	World				46%	81%
Estimate of Group subsidiary revenue covered by an ISO 9001 quality certification	World	65%	67%	73%	73%	75%
Estimate of Group subsidiary revenue covered by an ISO 14001 environmental certification	World	14%	15%	22%	24%	24%

## PRINCIPAL EUROPEAN DIRECTIVES AND REGULATIONS APPLICABLE TO AIR LIQUIDE IN THE ENVIRONMENTAL AND SAFETY FIELDS

### 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, 93 “low threshold” and 23 “high threshold” Air Liquide sites are involved. Seveso regulations apply only to Europe but if the Seveso “high threshold” criteria were applied worldwide, 17 other Group sites could be included.

### CO<sub>2</sub> DIRECTIVE IN EUROPE

The objective of the European directive, which establishes a quota system for greenhouse gas emissions in Europe is to decrease these emissions like the Kyoto Protocol. Implementation for CO<sub>2</sub> in the industrial sector began on January 1, 2005. As air separation units emit practically no carbon dioxide, this directive only applies, for the 2005-2007 period, to Air Liquide's five cogeneration sites and two hydrogen production sites in France, the Netherlands and Spain. Air Liquide's quotas (about 1.2 million tonnes of CO<sub>2</sub> per year) for the 2005-2007 period covered the emissions observed.

For the second period (2008 to 2012), the directive will only apply to seven cogeneration sites in France, Germany, the Netherlands and Spain and a single hydrogen production site in Belgium. Air Liquide's quotas (about 2.9 million tonnes of CO<sub>2</sub> per year) should cover the anticipated emissions.

For the third period (2013-2020), in addition to the sites mentioned, the directive will propose to encompass the Group's other large hydrogen production sites in Europe. The specific quota allocation methods for CO<sub>2</sub> emissions are currently being drawn up by the European Union on the basis of the revision of the ETS (Emissions Trading Scheme) directive voted on December 17, 2008.

### EUROPEAN REACH REGULATIONS

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a set of European Union regulations (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.

These regulations went into effect June 1, 2007, but the registration and evaluation procedures will be spread out over about 12 years.

Air Liquide's main products such as oxygen, nitrogen, rare gases, CO<sub>2</sub>, hydrogen and helium are excluded from the scope of REACH.

Carbon monoxide, acetylene and a few specialty gases in electronics fall, however, under these regulations. In addition, one quarter of the revenue of the specialty chemicals business is concerned by REACH.

**In total, only less than 10% of the Group's revenue is concerned by REACH.**

Innovation

## Innovation

Innovation is an integral part of the Air Liquide culture and is one of the fundamental components of its sustainable development approach.

Certain patented innovations make a major contribution to the Group's growth. Each year, Air Liquide singles out the inventors of patents that have been successfully commercialized.

Each year on November 8<sup>th</sup>, the anniversary date of the Group's foundation in 1902, the Group's units celebrate an Innovation Day during which the main innovations developed during the year are exhibited.

**60% of the Group's R&D budget is devoted to work on life, the environment and sustainable development (energy efficiency, cleaner production processes and new energies).**

### INDICATORS FOR THE GROUP AS A WHOLE

Innovation	2008
Budget	224 million euros
Number of researchers	1,000 researchers with more than 25 nationalities
Number of research centers	8
Industrial partnerships	Over 100
Academic collaborations	Over 120 with universities and research institutes
Number of inventions patented	2,640

Patents	2003	2004	2005	2006	2007	2008
New inventions patented during the year	236	225	236	267	263	257
Patents filed directly in the Group's four main zones of operations <sup>(a)</sup>	105	109	103	108	152	129

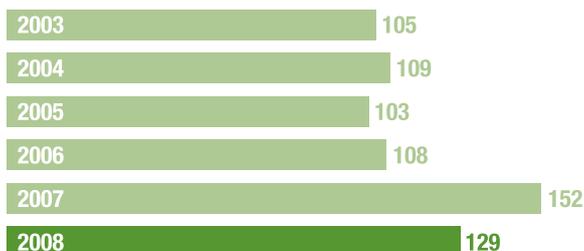
### Number of patents <sup>(a)</sup> filed in the Group's four main presence zones (Europe, the United States, Japan and China)

#### OBJECTIVE

To disseminate innovations within the Group and recognize innovators. Within five years (2005-2009), and in the largest number of areas, to file over 500 new patents, valid directly in the Group's four main zones of operations: Europe, the United States, Japan and China <sup>(a)</sup>.

#### MONITORING THE OBJECTIVE

In 2005, 2006, 2007 and 2008 with respectively 103, 108, 152 and 129 patents filed in these four zones, the Group is definitely in line with its objective in this area.



(a) According to the definition of the Group's Intellectual Property Department.