Performing for what matters

Annual Report 2023

Air Liquide

Access the digital version

About us

Strategic Report

Governance & Financials

Cover: Kerwin, employee working at Air Liquide in South Africa.

There are many global societal challenges that call for immediate – and collective – responses. At Air Liquide, we are ready.

Climate, health, energy, mobility, sovereignty, the digital revolution... There are many global societal challenges that call for immediate – and collective – responses.

At Air Liquide, we are ready. **Ready to deploy our solutions wherever they are needed**, and ready to accelerate whenever the situation requires it. Whether it is supporting our customers on their decarbonization journey, working alongside caregivers and patients faced with an evolving healthcare sector, deploying hydrogen to make mobility more sustainable, or contributing to the growth of digital technologies, we offer concrete solutions to help society move forward.

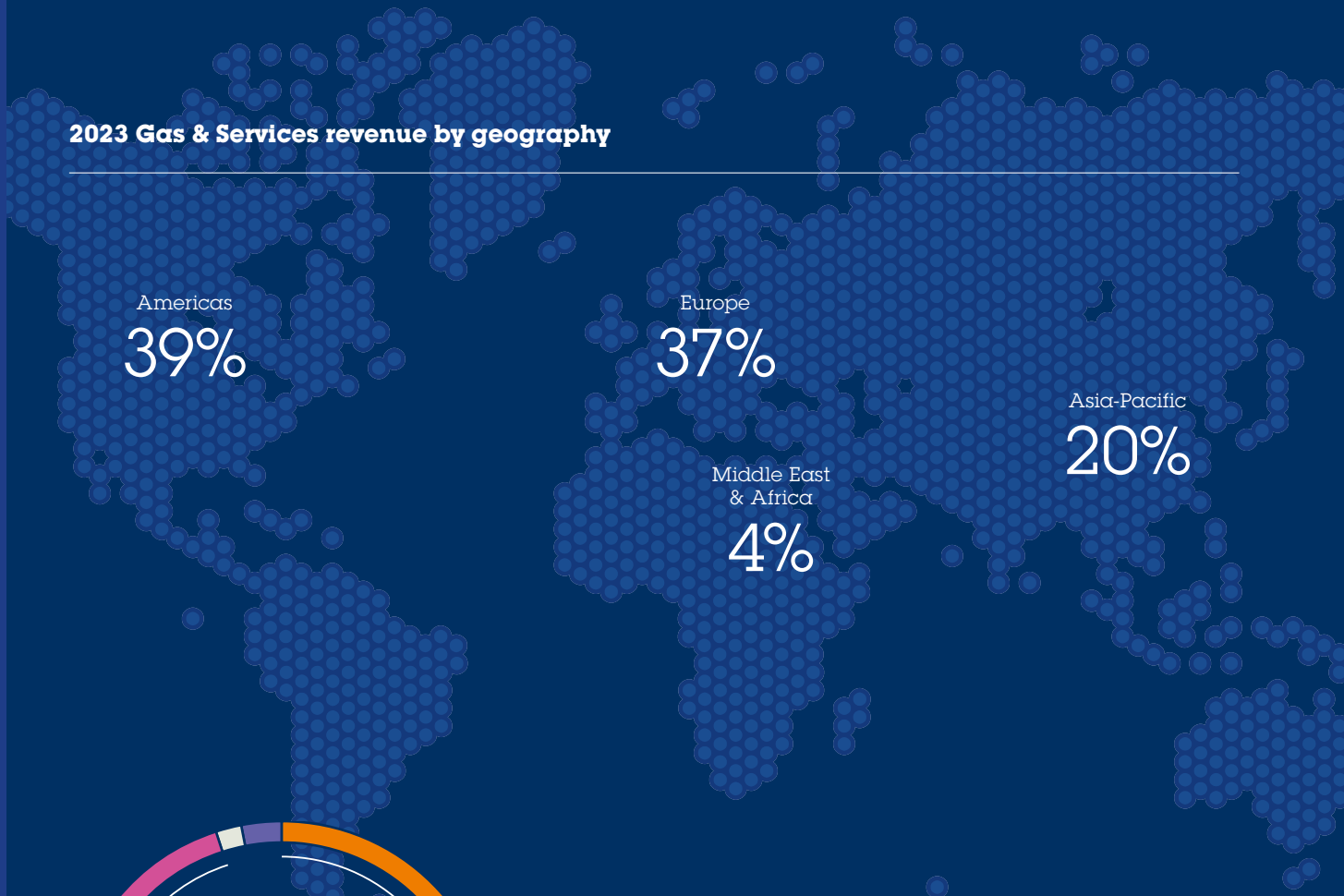
Our quest to provide ever more useful solutions for the world is made possible by the **ingenuity of our employees**, our **technological expertise**, and the infinite potential of our **essential small molecules**. It is by putting these strengths to work for society that our Group contributes, in its own way, to human, social, and environmental **progress**.

It is with this vision, with the commitment of our teams and the confidence of our stakeholders, that we are moving forward and taking action to **create a more sustainable future today**.

Air Liquide is a world leader in gases, technologies and services for Industry and Health.

72 countries	67,800 employees
4M customers and patients	~800,000 individual shareholders
€27.6bn Group revenue	€3.1bn Net profit (Group share)

2023 Gas & Services revenue by geography



Gas & Services

Large Industries	Industrial Merchant	Healthcare	Electronics
28%	43%	15%	9%

Engineering & Construction	Global Markets & Technologies
2%	3%

> "The future will bring unprecedented opportunities. I firmly believe that our Group will seize these opportunities with determination and boldness."

In a world facing multiple crises, our Group has once again demonstrated exceptional resilience. This has enabled it to distinguish itself through remarkable performance and social commitment. This resilience is built on the many qualities of our business model. It relies above all on the people who make up Air Liquide. I would like to express my immense pride to each and every one of them.

The individual and collective contributions of our employees are all the more admirable given the simultaneous challenges facing our environment, and thus the Group, such as climate change, geopolitical tensions, inflation and rising energy prices. Their commitment has helped us move forward and, thanks to unique innovation capacities, lead the way in many areas, from the energy transition – particularly in the fields of hydrogen and carbon capture – to creating value in healthcare with more personalized solutions, and bolstering our leadership in electronics.

At the same time, we have continued to support progress in a wide range of industrial sectors, such as chemicals, glass and food, where our low-carbon solutions are making a difference. We have also paved the way for new markets, such as metal 3D printing or electric batteries.

Another reason for our satisfaction is the efficient and fully operational collaboration between the Board of Directors and the Executive Committee since our new governance structure was introduced in 2022. The partial replacement of the Board of Directors through the appointment of new independent directors strengthened our Group's positive momentum. With the wide-ranging expertise of its members, the collegial nature of its deliberations, and the diverse views and opinions it represents, the Board provides the Group's executive management and Executive Committee with an enlightened and informed view of the economy, the world and its prospects.

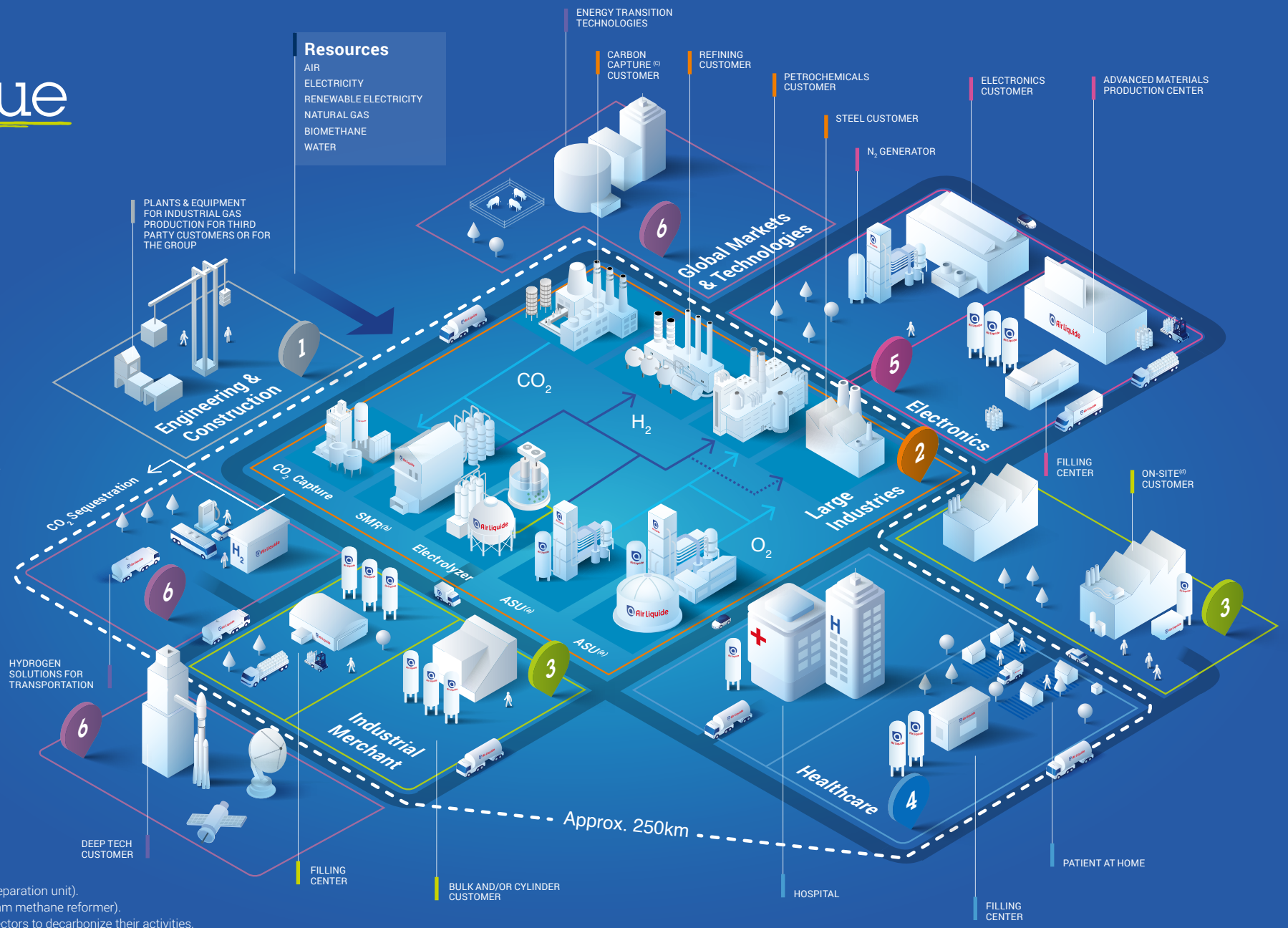
The future will undoubtedly be full of challenges as well as unprecedented opportunities. I firmly believe that our Group will seize these opportunities with determination and boldness. Our ability to plan for the future, the commitment of our teams around the world, our close relationship with our customers and patients, and the full confidence of our shareholders make me more confident than ever. The Board of Directors and I have faith in the Group's ability to grow and progress every day, thanks to the commitment of each and every employee, as we continue to invent the future.

Benoit Potier
Chairman of the Board of Directors
of Air Liquide

A unique model

One of Air Liquide's great strengths is the resilience of its model, which relies notably on the diversity of its activities serving almost all sectors of the economy. The strong integration of the various activities allows the Group to create synergies that are not limited to the industrial aspect, but also include technological expertise and human resources as well as financial management.

The specificity of Air Liquide's business model is a pillar on which the Group relies to pursue its long-term responsible growth dynamic.



(a) ASU: air gases production unit (air separation unit).
(b) SMR: hydrogen production unit (steam methane reformer).
(c) Carbon Capture: for hard-to-abate sectors to decarbonize their activities.
(d) On-site: small gas generator on the customer site.

1

Engineering & Construction

Engineering & Construction of industrial gas production units for the Air Liquide group or third party customers who do not wish to outsource their gas supply.

2

Large Industries

- Supply of gas in large quantities via pipeline networks or on-site units in industrial basins identified for their growth and mutualization potential.
- Signature of long-term contracts.
- Mutualization of production assets to strengthen the guarantee of supply and optimize operational costs.

6

Global Markets & Technologies

Worldwide activity for technologies (extreme cryogenics, membranes, etc.) for deep tech applications (aeronautics, space, quantum) and for the energy transition (biomethane, H_2 energy, liquefaction, etc.)

Liquefaction and conditioning of gases

from Large Industries to supply the other "gas" activities and distribute them in a given geographical area (around 250km maximum from the production site). Mutualization of distribution assets (trucks, storage, cylinders).

3

Industrial Merchant

- Wide variety of customers and applications.
- Accelerated development through acquisitions of local distributors to increase geographical coverage.
- Continuous innovation.

4

Healthcare

- Supply of medical gases to hospitals.
- In Home healthcare, extension of the oxygen respiratory therapy treatment to other chronic diseases (sleep apnea, diabetes, Alzheimer's, etc.) to increase density and ensure better quality of service and contribute to the sustainability of healthcare systems.

5

Electronics

Combination of several activities across the sector's production chain:

- carrier gases (by pipeline or on-site production).
- specialty materials.
- advanced materials (patented molecules with very high added value).

Performing for what matters

When it comes to fighting climate change, helping the industry to transform or advancing patient care, Air Liquide can make a real difference. In a world that is increasingly uncertain on many fronts, the Group's goal is clear: to have a **positive impact**.

As such, **performing for what matters** typically demands acting now to accelerate the pace of the energy transition. And, in this field, success will only come from a focused collective will to work together with customers and stakeholders, and to deliver concrete solutions with determination and speed.

Performing for what matters also means improving the quality of life of our patients and building efficient, sustainable healthcare systems.

Air Liquide's essential small molecules and technologies have always contributed to advancing industry and society. With the commitment of its 67,800 employees, the Group will continue to **advance further towards a sustainable future**.

“What all our developments have in common is their impact and their contribution to society. That’s what our innovative approach, which we are constantly developing, is all about.”

Q&A with *François Jackow*
Chief Executive Officer of Air Liquide

Air Liquide is half-way through its strategic plan ADVANCE. How would you describe the Group's performance?

2023 was another year of solid performance for Air Liquide! Once again, this reflects the resilience and quality of our business model, along with our teams' remarkable dedication. Despite the continued complexity of the global environment, all indicators are positive: sales growth increased by +3.7%(1), revenue reached 27.61 billion euros, our operating margin increased to reach 18.4%, recurring net profit(2) rose by +13.3%(3) and investment decisions reached their highest level, amounting to 4.3 billion euros in 2023.

This gives us confidence in our ADVANCE strategy to such an extent that we have decided to go further by doubling our initial ambition for improving the Group's operating margin. In two years, we have almost achieved our initial ambition, which was an increase in operating margin of +160 basis points. Consequently, we are going to double our ambition for the duration of the plan to reach +320 basis points (that is 3.20%) in four years. We are also maintaining our other financial objectives for sales growth(1) and return on capital employed, along with our target in terms of investment decisions.

Likewise, from an extra-financial standpoint, thanks to our numerous decarbonization initiatives, we are confident in our ability to combine growth in our business with a reduction in our CO_2 emissions in absolute value from 2025.

In short, I would say that the Group's performance in 2023 confirms the relevance of our ADVANCE strategic plan and our teams' ability to provide our customers with specific solutions with high added value to address their challenges, both now and in the future.

The decarbonization of industry is a hot topic right now and you have announced a number of related projects. How would you assess the Group's action in this area?

Decarbonization, both ours and that of our customers, is at the heart of our strategy. I strongly believe that the Group can be a driving force in the creation of a low-carbon industry. This challenge is now a global priority and we are having a tangible impact, thanks to our portfolio of technological solutions and services. Our partnerships with industry giants in Europe, where projects are rapidly gaining momentum, are proof of this.

For instance, our agreement with TotalEnergies to provide their Gonfreville refinery in Normandy with renewable and low-carbon hydrogen is an example of the development of a sustainable hydrogen industry to decarbonize the entire industrial basin in Normandy. The renewable hydrogen that will be supplied will be produced by our PEM(4) electrolyzer, Air Liquide Normand'Hy, the largest electrolyzer ever built, and will feature latest-generation equipment manufactured by our Berlin gigafactory, a joint venture with Siemens Energy. In the Netherlands, we are involved in major electrolyzer projects that are supported by the government and we are also going to develop a large-scale CO_2 capture unit on our hydrogen plant in Rotterdam. These developments will make a significant contribution to the decarbonization of industry in the Netherlands and neighboring countries.

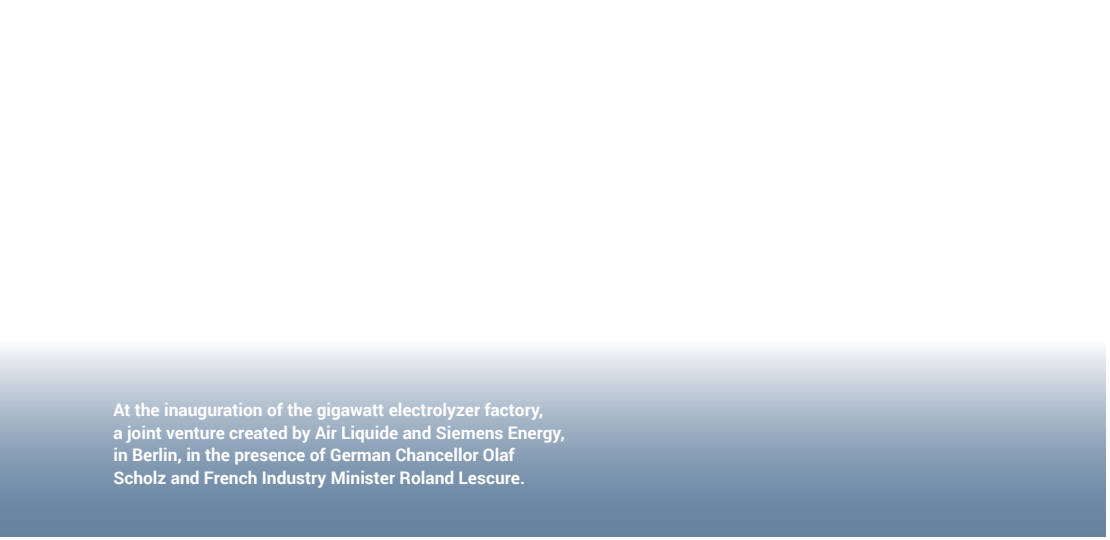
Things are also gathering pace in the United States. We are thrilled to have been chosen by the American Department of Energy as a strategic partner of six out of seven regional hydrogen hubs. Our solutions are making a difference in Asia as well. In Japan, our autothermal reforming technology has been chosen for a pilot project for the large-scale production of low-carbon hydrogen and ammonia.

We are also working with ENEOS, Japan's leading energy company, to develop the low-carbon hydrogen market; this partnership will cover the entire hydrogen value chain.

Although these projects underline hydrogen's key role in decarbonizing the industry, the solution will lie in a combination of different options. As such, we use other technologies to help our customers on their decarbonization journeys, including oxy-combustion, biomethane and carbon capture with our Cryocap™ solution. Indeed, Holcim has chosen this technology; we are going to work with the company to decarbonize their new cement plant in Belgium.

We owe this major and tangible progress to the efficiency of our technologies, our ability to devise and provide innovative solutions for our customers and our ability to bring together key players for large-scale, forward-looking projects. Because today, it's clear that we must work with industry as a whole and with the support of government authorities to collectively develop integrated ecosystems to accelerate the energy transition.

(1) Change excluding the currency, energy (natural gas and electricity) and significant scope impacts.
(2) Recurring net profit excluding exceptional and significant transactions that do not impact operating income recurring.
(3) Excluding the impact of foreign exchange rates.
(4) Proton Exchange Membrane.



At the inauguration of the gigawatt electrolyzer factory, a joint venture created by Air Liquide and Siemens Energy, in Berlin, in the presence of German Chancellor Olaf Scholz and French Industry Minister Roland Lescure.

> “Industry’s decarbonization is at the heart of our strategy. I am particularly proud of the Group’s role as a driving force and the progress we have made toward a low-carbon industry.”

Innovation is at the heart of the ADVANCE program. What progress has been made in this field?

Innovation has always been part of our DNA, from technology to the way we act and serve our customers. In practice, this has led to significant progress in growth markets this year, including semiconductors, with investments in new manufacturing centers for advanced materials in Taiwan and South Korea. These new production capacities will support the acceleration in the manufacture of high-tech chips. These chips are vital for next-generation electronics applications in artificial intelligence, the automotive industry and cloud computing(5).

2023 also saw many innovations in terms of mobility. For instance, we launched new joint ventures with Groupe ADP and with TotalEnergies that will help accelerate the development of hydrogen, from airport infrastructure to heavy vehicles. But I am also thinking of our industrial customers, be they traditional or positioned in new markets, such as the food, glass and metal industries. We supply them with innovative solutions with a reduced carbon footprint that enable them to reduce their CO_2 emissions.

Lastly, I would like to mention the healthcare sector, in which we continue to develop our solutions to improve the day-to-day lives of healthcare professionals. We have launched a new service so that hospitals no longer need to manage their supply of medical gases. The aim is to enable staff to focus more on patient care. This approach was inspired by the personalized care pathways for patients treated at home that was launched in 2021 and that we are continuing to develop.

What all these developments have in common is their impact and their contribution to society. That is what our innovative approach, which we are constantly developing, is all about.

In a few months, France will welcome the world for the Olympic and Paralympic Games Paris 2024. Air Liquide is an Official Supporter of this event for hydrogen. What is the reasoning behind this partnership?

In addition to the similarities between our values and those of Paris 2024, this is a particularly significant partnership because we can draw on our expertise to provide the event with decarbonized mobility solutions. We are going to provide hydrogen of renewable origin to power several hundred Toyota Mirai cars that will make up part of the Games’ official fleet. This is a real source of pride for me and our teams because these cars will contribute to a reduction in carbon emissions during this major sporting event. I firmly believe that this real-world use of hydrogen for mobility at an event of this magnitude will be a powerful force for accelerating the sustainable decarbonization of transport, creating long-term infrastructure and uses beyond Paris 2024. Acting as a champion of climate solutions means providing support for the ambitious environmental objectives of major events like the Olympic and Paralympic Games Paris 2024. I would like to commend the work of our teams, who are committed to ensuring that this partnership is a collective victory!

Lastly, this partnership is about more than just climate – it is also about embodying the values of diversity and inclusion that are so important to us. As such, the Group is supporting at least 6 athletes and para-athletes in their bid to qualify for the Olympic and Paralympic Games Paris 2024. We are very proud to support them and their endeavors and we wish them every success!

(5) Cloud computing involves transferring computer data to remote servers.

What is your outlook for 2024?

The world faces many challenges. From sovereignty to security, from climate change to energy independence and demographic shifts, we must contend with this new, uncertain world, just as our customers are doing. As is the case with any challenge, there are opportunities. Indeed, there have never been so many opportunities and we must seize them. We must work together to perform better and ensure we have the means to respond effectively to the major challenges of the energy transition, changing healthcare systems and global competition in high-tech development. As the Group's expertise has never been more pertinent to address global challenges, this is also a unique opportunity to improve existing services and offerings and develop new ones, as we always have, so we can provide the world with tangible and practical solutions. Although the short-term future will undoubtedly have its share of surprises, I feel confident and energized because I know that I can count on truly extraordinary teams. They and I are more committed than ever to serve our customers and patients and, in so doing, provide useful and tangible solutions to create a more sustainable world.

Official Hydrogen Supporter of Paris 2024

500 hydrogen-powered Toyota Mirai will be driven during the Olympic and Paralympic Games Paris 2024. Part of the official fleet, these cars will transport officials throughout the event.

As part of its partnership with Paris 2024, Air Liquide will supply these cars with hydrogen from renewable sources, produced from water electrolysis or biomethane with guarantees of origin.

Reflecting its ambition to organize "more sustainable Games", these hydrogen-powered cars will contribute to Paris 2024's objective of reducing this edition's carbon emissions in comparison to previous Games.

Given that transport accounts for a quarter(1) of global CO_2 emissions, the climate emergency requires a range of solutions, including hydrogen. It offers real advantages, including range and minimal charging times, for intensive transport such as the vehicles in Paris 2024's official fleet that will be in continuous use.

For Air Liquide, the real-world use of hydrogen for mobility at an event of this magnitude will be a powerful force for accelerating hydrogen for mobility, creating long-term infrastructure and uses beyond the Paris 2024 Games.

(1) Source: Data lab, French Ministry of Ecological Transition.

ADVANCE, our strategic plan towards a comprehensive performance

For Air Liquide, building the future means delivering strong financial performance which prepares the future, acting as a leader in the decarbonization of industry, unlocking progress through technological innovation and acting for all.

With this vision in mind, the Group launched in 2022, ADVANCE its strategic plan for 2025, which intricately links financial and extra-financial performance. This plan firmly positions the Group on the path toward comprehensive performance.

Faced with the numerous and complex challenges of the world, Air Liquide is acting today while preparing the future.

With its proven resilient business model, its innovation capacity and its technological expertise, the Group is ideally positioned at the heart of the markets of the future to continue its growth dynamic by working to meet the major challenges facing our world, driven by the desire to make a positive impact.

ADVANCE is built around these four pillars where Air Liquide's action is more relevant than ever.

Delivering strong financial performance

With ADVANCE, Air Liquide is taking action today while preparing the future. The Group is rising up to an ambitious challenge: maintaining its growth dynamic and improving its profitability while meeting its commitments to reduce CO_2 emissions and investing in the markets of the future.

Unlocking progress via technology

Innovation and technology are two of Air Liquide's major strengths that have always enabled the Group to play a pioneering role. Today, these strengths make it possible for the Group to contribute to the development of key sectors of the future, where it intends to strengthen its positions through the ADVANCE plan.

Decarbonizing industry

ADVANCE will enable Air Liquide to consolidate its leading role in the decarbonization of industry and the advent of a low-carbon society in which hydrogen notably plays a decisive role.

Acting for all

As a civic-minded company, Air Liquide strives to ensure that everything it does is in the interests of its stakeholders and, beyond that, of society as a whole.

Delivering strong financial performance

Air Liquide is taking action today and preparing the future to rise up to an ambitious challenge: delivering strong financial performance, by maintaining its growth dynamic and improving its profitability while promoting a greener industry, by meeting its commitments to reduce CO_2 emissions and investing in the markets of the future.

To achieve these goals, the Group is acting on several levers: a dynamic pricing policy, regular efficiency gains and active management of its business portfolio.

In order to continue inventing the future, Air Liquide is raising its investments to a record level. This momentum is strong in the fields of energy transition, particularly in the carbon capture and hydrogen technologies, and electronics. Furthermore, these promising markets require a high degree of investment selectivity. The need to reduce CO_2 emissions is now an integral part of any investment decision.

Our 2025 objectives and ambitions

Our results

Our 2025 objectives and ambitions	Our results
+5% to +6% Average annual sales growth(1)	+4% in 2023 +7% in 2022 Annual sales growth(2)
>10% Return on capital employed (ROCE) from 2023	10.6% Recurring ROCE(3)
Reduction of CO_2 emissions(4) in absolute value from 2025	On track
€16bn Investment decisions over the 2022-2025 period(5)	€8.3bn Industrial investment decisions over 2022-2023
>+160bps Increase of operating margin between 2022 and 2025(6)	+150bps Increase of operating margin over the 2022-2023 period(6)

New: Having practically reached our margin target halfway through ADVANCE we now aim for a **+320 bps** increase, over the duration of the plan.

(1) Compound Annual Growth Rate (CAGR) of sales on a comparable basis over the 2021-2025 period.
(2) Comparable growth vs previous year. Change excluding the currency, energy (natural gas and electricity) and significant scope impacts.
(3) Based on the recurring net profit.
(4) Scopes 1 and 2.
(5) Cumulated industrial and financial investments decisions over 4 years 2022-2025.
(6) Sum of annual operating margin improvements in basis points, excluding energy passthrough impact.

Investing in the energy transition, **investing in the future**

Vision

The Group's consistent financial performance provides the resources it needs to finance large-scale projects and realize its long-term vision. This vision includes the transition to low-carbon industry, both in terms of its own activities and in terms of support for its industrial customers.

Industry, particularly heavy industry, is a major emitter of carbon dioxide, accounting for around 20% of global CO_2 emissions. To achieve carbon neutrality, there must therefore be a drastic and rapid reduction of these emissions. To contribute to this vital decarbonization, Air Liquide allocates nearly half of its investment decisions to key projects that will contribute to the fight against global warming. And because it strongly believes in the power of collaboration, Air Liquide is establishing various partnerships in a wide range of sectors, particularly those with the highest emissions and that are hardest to abate. Working alongside its customers, the Group is investing significant resources to accelerate the transition to a low-carbon industry.

19

major projects that will support the energy transition are being developed by the Group in Europe

Action

As part of its ADVANCE strategic plan, Air Liquide is committed to supporting its industrial customers in decarbonizing their activities through a portfolio of technological solutions. 2023 saw a significant increase in this dynamic with strategic investments and key partnerships. For instance, the Group signed an agreement to decarbonize the Belgian plant of the Swiss company Holcim, one of the world's leading cement manufacturers, using its proprietary technology, Cryocap™. Developed by Air Liquide, the Cryocap™ process captures CO_2 by liquefying it through cryogenics. This technology will enable the cement plant to reduce its CO_2 emissions by 1.1 million tonnes every year.

Using the same technology, Air Liquide will help transform one of EQIOM's cement plants in France into Europe's first carbon-neutral cement plant by 2028. The project, known as K6, has received funding of 150 million euros from the European Innovation Fund and aims to capture nearly 8 million tonnes of CO_2 during the first 10 years of operation.

This Cryocap™ technology was used for the first time in 2015 in Port-Jérôme in Normandy, on the Group's largest hydrogen production site in France.

"We are proactively stepping up our efforts to develop a more sustainable industry. Our technologies, particularly our proprietary carbon-capture solution Cryocap™ and our electrolyzers for low-carbon hydrogen production, as well as our many collaborations and partnerships with customers position us as a leading player when it comes to the major challenge of the energy transition."

Chris Clark

Vice President of Large Industries at Air Liquide

Close to this site and with the support of the French government, Air Liquide is now building a world-scale PEM (proton exchange membrane) electrolyzer, with a capacity of 200 megawatts, as part of the Normand'Hy project. The objective is to produce up to 28,000 tonnes of decarbonized hydrogen per year, beginning in 2026. This unique facility will be equipped with the latest-generation PEM electrolysis modules, produced by the new gigafactory operated by Air Liquide and Siemens Energy in Berlin, Germany (see page 24).

Half of the hydrogen produced by this electrolyzer will be used by the TotalEnergies refinery located in the same industrial basin. At the same time, TotalEnergies will provide renewable electricity to cover half the energy needs of Air Liquide's Normand'Hy. This is an ambitious project: in addition to avoiding annual emissions of 250,000 tonnes of CO_2, this will be the first low-carbon hydrogen supply chain in Europe. Many other projects like this are also being developed by the Group, particularly in Europe. This extensive portfolio makes Air Liquide a pioneer and a leader in the energy transition.

When it comes to large-scale decarbonized hydrogen, Air Liquide has already demonstrated its industrial capabilities in operating electrolyzers for the last 3 years in Bécancour, Canada. With a capacity of 20 megawatts to produce 8 tonnes of hydrogen every day, this is enough to power 2,000 cars, 16,000 forklift trucks, 275 buses or 230 large trucks!

This electrolyzer is at the heart of a new low-carbon gas production platform that is being developed by Air Liquide in Quebec to produce renewable hydrogen, oxygen, nitrogen and argon. In addition to the existing electrolyzer, the investment project of more than 140 million euros will include a new renewable oxygen and nitrogen production unit and significant liquid storage capacity, connected by a pipeline network to better serve local customers. This new infrastructure is part of a wider process to decarbonize Bécancour's industrial zone and port, making it a unique place to produce renewable industrial gases and thereby develop offerings with high added value for our customers who are committed to the energy transition.

Air Liquide's plans for hydrogen on the other side of the Atlantic do not stop there! The Group is now a partner of six regional hydrogen hubs created in 2023 to develop low-carbon hydrogen on a large scale in the United States (see page 25).

In addition to these investments in projects for carbon capture and hydrogen production through electrolysis, the Group is pursuing several other strategies to accelerate the energy transition. For instance, it is working with KBR, the world leader in ammonia technology, to provide solutions to produce low-carbon ammonia by using the autothermal reforming (ATR) process developed by Air Liquide. This technology, in which the Group is a world leader, is one of the most promising solutions for the large-scale production of low-carbon hydrogen; it is then combined with nitrogen to produce low-carbon ammonia. The solutions provided in collaboration with KBR will also contribute to the development of a global low-carbon hydrogen market because hydrogen, when transformed into ammonia, can easily be transported over long distances (see page 23).

Lastly, the Group is supporting sustainable mobility by contributing to the development of hydrogen ecosystems with major players including TotalEnergies, Lotte, Eneos and Trillium Energy Solutions (see page 34). The aim is to accelerate the adoption of hydrogen, particularly for heavy mobility.

All these strategic investments underline Air Liquide's proactive approach to the creation of a low-carbon society.

Strengthening our position **in Electronics**

Vision

The rapid development of digital technologies has never had so much momentum. Artificial intelligence, 5G and smart devices (Internet of Things) are revolutionizing science, industry and our everyday lives. Semiconductors are at the heart of this revolution; their shortage during the Covid-19 pandemic almost paralyzed several industrial sectors. Their large-scale and secure supply has therefore become a global and geostrategic issue. In response, manufacturers are investing the equivalent of 100 billion dollars every year(1) in this sector. The market is estimated to be worth 1,000 billion dollars by 2030(2), double the current market valuation. This growth is being driven by the introduction of major government plans that are specifically focused on semiconductors, such as the Chips Acts in the United States and Europe. Air Liquide is contributing to this powerful dynamic by providing the largest semiconductor manufacturers with support for their development, both technological and geographic, with the ultimate goal of consolidating its leadership position.

Action

To strengthen its position in the global market of molecules and services for the electronics industry, Air Liquide has increased its investments in Asia, where it has been the leading supplier of industrial gases for the electronics industry for 30 years. Hundreds of millions of dollars were invested in the construction of two advanced materials production centers to support the development of Taiwanese and South Korean semiconductor giants. By establishing these production centers in the immediate vicinity of its customers' plants, Air Liquide is improving competitiveness and the collaborative development and production of new cutting-edge molecules that are vital to the manufacture of more complex, more compact and more powerful semiconductors.

35%
of projects in investment backlog are in the Electronics sector

(1) SEMI.
(2) SEMI FORECAST, Semicon Japan December 2023.

"Our investments confirm our leadership in the semiconductor sector. This leading position reflects our ability to understand the requirements of the sector's major players and the quality of the service we provide. These investments are also proof of our ability to provide innovative solutions with a lower environmental impact that meet the highest standards of purity and reliability."

Guillaume Cottet

Vice President of Electronics at Air Liquide

This approach ensures continuity of supply while fostering innovation through constant communication. At the same time, the Group and its customers are reducing the environmental impact of their plants by limiting the number of kilometers covered during transport. This approach is welcomed by our customers, who are no longer dependent on global supply chains.

In addition to its investments in Taiwan and South Korea, Air Liquide has recently opened a new plant in Japan that supplies ultra-pure nitrogen to guarantee the impurity-free environment that is required for semiconductor manufacturing. This plant will prevent annual emissions of 20,000 tonnes of CO_2, which is equivalent to the carbon dioxide emitted by the electricity consumption of 6,000 Japanese households. The Group has also signed a long-term contract with the Chinese company BOE Technology Group. It specializes in the manufacture of LCD flat-screens and Air Liquide has supplied the company with industrial gases for 20 years. This new contract underlines this customer's trust in the Group's expertise.

Air Liquide is also collaborating with some of the largest semiconductor manufacturers in the world. The Group recently signed a contract extension with one of its long-standing partners, Globalfoundries, for sites in the United States (Malta, New York) and Singapore; Air Liquide currently supplies these sites with ultra-pure nitrogen for semiconductor manufacturing. The Air Liquide plants in Malta will be modernized and a new production unit will be constructed in Singapore. The goal is to increase the energy efficiency of these facilities. For example, the Singapore unit will save energy equivalent to the total energy consumption of more than 3,650 Singaporean households.

By strengthening its presence in all major semiconductor production centers, Air Liquide is positioning itself as a global strategic partner in the development of ultra-high-tech semiconductors. These semiconductors are vital for the development of increasingly sophisticated electronic devices in a wide range of fields, from artificial intelligence and electric vehicles to cloud computing(3) and connected solutions for smart cities!

(3) Cloud computing involves transferring computer data to remote servers.

Decarbonizing industry

Reducing CO_2 emissions has become a major challenge for key players in industry and heavy mobility. Air Liquide has a comprehensive portfolio of technology and service solutions to support its customers' decarbonization efforts around the world, from the supply of low-carbon industrial gases to CO_2 capture and industrial process transformation.

Air Liquide thus provides its industrial customers with tailor-made solutions to support their decarbonization efforts and relies notably on a strategy centered on industrial basins to develop operational synergies.

And with ADVANCE, the Group is thus committed to decarbonizing its own operations; the objective being to start reducing its CO_2 emissions in absolute terms around 2025.

Our objectives and ambitions

Our progress

-33%

Reduction in absolute terms of the Group's Scope 1 and 2 CO_2 emissions by 2035 compared to 2020 baseline

On track

~50%

of industrial investment decisions will be dedicated to the energy transition(1)

On track

75%

of the Group's 50 largest customers committed to carbon neutrality (scope 3 commitment) by 2025

74%

of the Group's 50 largest customers stated a carbon neutrality commitment

Carbon neutrality

By 2050, reaching carbon neutrality across the entire value chain

(1) Industrial investment decisions above €5 million over the 2022-2025 period.

Renewable electricity: **boosting power supply**

"Many players are looking to source renewable electricity, making the PPA(1) market very tight. Our long-term commitments and solid business model make Air Liquide a preferred customer for renewable energy suppliers."

Raphaëlle Imbault
Director of Energy Management at Air Liquide

2,600 GWh
per year of renewable electricity secured in 2023

Vision

Using renewable electricity to produce low-carbon industrial and medical gases is part of Air Liquide's commitment to achieving carbon neutrality by 2050. While the production of oxygen and nitrogen generates no CO_2 emissions, it does require large quantities of electricity, which needs to be decarbonized. The challenge is to secure long-term supply from renewable energy suppliers. Air Liquide relies on Power Purchase Agreements (PPAs) – contracts which can run for up to 25 years – providing the Group with long-term renewable electricity. 2023 saw considerable development in this area, with Air Liquide nearly doubling its supply reaching 2,600 GWh of renewable electricity per year for the coming years in many different countries, 60% of which is secured through PPAs.

Action

In South Africa, where the Group operates the world's largest oxygen production site at Secunda, Air Liquide has teamed up with its customer, Sasol, a leading global chemicals group, to source renewable electricity. Several PPAs were signed since 2022 with various local energy suppliers, now representing 580 MW of renewable electricity. This newly installed capacity will contribute to Air Liquide's objective of reducing CO_2 emissions linked to oxygen production at Secunda by 30 to 40% by 2031.

In Europe, where Air Liquide is stepping up plans to decarbonize its production units, the Group has once again signed a PPA with Vattenfall, one of Europe's leading electricity producers and distributors, for an installed capacity of 115 MW. This second PPA in Benelux significantly strengthens Air Liquide's supply of renewable electricity in the region. Concluded for a 15-year period starting in 2026, it will bring Air Liquide's total installed renewable electricity generation capacity in Benelux to around 270 MW. This represents over 70% of the Group's current electricity consumption in the region.

In China, the Group signed its first long term PPA for the supply of renewable electricity from solar farms with a total capacity of 200 MW. This amount secured by Air Liquide for the production of industrial and medical gases in China is equivalent to the electricity consumption of 300,000 Chinese households.

These new PPAs mark an important step in Air Liquide's drive to secure renewable energy. The Group will be able to offer low-carbon molecules and solutions to its customers, supporting them in their decarbonization efforts.

(1) Power Purchase Agreements.

Cutting-edge technologies for **low-carbon production**

"I firmly believe that technology will play a key role in the decarbonization of industry and mobility. That's why we keep developing solutions that address our customers' environmental challenges as well as our own climate objectives. Not only do we have the right technologies, but our teams have the skills and the execution capabilities to deliver them."

Philippe Merino

Group Vice President supervising Engineering & Construction at Air Liquide

Vision

Air Liquide is firmly committed to decarbonizing its own production methods, with the aim of significantly lowering its CO_2 emissions by 2025 and reducing them by a third by 2035. The Group is therefore developing solutions to improve the industrial and energy efficiency of its Air Separation Units (ASUs) and its low-carbon hydrogen production processes.

Action

More efficient Air Separation Units

In the Tianjin basin in China, Air Liquide has operated four ASUs supplying industrial gases to the healthcare and industrial sectors for more than 20 years. In 2023, the Group invested 60 million euros in a transformation project to reduce the carbon footprint of two of these ASUs, as part of a long-term contract with Tianjin Bohua Yongli Chemical Industry Co., Ltd. The aim is to adapt these plants to run on electricity instead of steam, thereby reducing annual CO_2 emissions by 370,000 tonnes. This is equivalent to the electricity-related emissions of more than one million Chinese households.

Toward very large-scale, low-carbon hydrogen production

Air Liquide has also established itself as a leader in autothermal reforming (ATR) technology, an efficient large-scale solution to produce low-carbon hydrogen, with 70 years of experience. When ATR is combined with carbon capture technology, it can achieve higher energy efficiency with lower investments and a simplified production process to facilitate the capture of up to 99% of CO_2 emissions in highly integrated industrial facilities. The Group will use this technology as part of a pilot project with INPEX Corporation, a Japanese energy company, to produce low-carbon hydrogen and ammonia.

At the same time, Air Liquide is working with KBR to develop technological solutions integrating the ATR process to produce low-carbon ammonia and low-carbon hydrogen. The solutions provided will contribute to the development of a global low-carbon hydrogen market as hydrogen, when transformed into ammonia, can be easily transported over long distances.

In addition, the Group is building an ammonia cracking pilot unit in Antwerp in Belgium, using innovative technology to transform ammonia into hydrogen with a reduced environmental impact. This initiative will make it easier to transport hydrogen and contribute to the development of hydrogen as a key enabler of the energy transition.

Renewable hydrogen: **a gigafactory of electrolyzers** to scale up

Vision

A hydrogen future depends on competitive, large-scale production of low-carbon hydrogen – and, therefore, a mass supply of electrolyzers: a production technology that uses electricity to separate purified water molecules (H_2O) in order to separate the hydrogen from the oxygen.

Air Liquide is playing a leading role in the entirely new industrial and economic ecosystem needed to drive the future of hydrogen. We are partnering with major industrial and technology enterprises, including a joint venture with Siemens Energy. And these are not merely plans: 2023 ended with the inauguration of a world-first hydrogen gigafactory to produce large-scale PEM(1) electrolyzers.

20%
share of hydrogen in the world energy mix by 2050(2)

"This gigafactory is a decisive step forward in offering large volumes of renewable hydrogen to the industrial and mobility sectors. Production units equipped with PEM electrolyzers will contribute to decarbonizing these markets. The gigafactory also gives Air Liquide and Siemens Energy a significant advantage by ensuring privileged access to crucial equipment for successfully scaling up the production of renewable hydrogen."

Marie-Khuny Khy
Director of Electrolysis Product Line at Air Liquide

Action

On November 8, 2023, production began at the new Air Liquide Siemens Energy Joint Venture gigafactory in Berlin. The cutting-edge 2,000 m² plant, highly automated with robotics, is producing electrolysis stacks that use proton exchange membrane (PEM) technology.

Initial manufacturing capacity is 1 GW per year, with ramp-up plans targeting at least 3 GW per year of output by 2025. In terms of hydrogen production capacity, this would translate into 1,200 tonnes per day more of hydrogen.

The project also builds on real-world knowledge from our operations to continuously hone and optimize the potential of mass-scale electrolyzers.

This strategic joint venture will equip a portfolio of current hydrogen projects, including notably:

- Our 20 MW hydrogen production unit in Oberhausen, Germany, contributing to accelerate the decarbonization of the Rhine-Ruhr industrial basin.
- The Normand'Hy project in Port-Jérôme, France, with a capacity of 200 MW – the largest PEM electrolyzer under construction, which will integrate equipment produced in the framework of the joint venture. It will avoid the emission of 250,000 tonnes of CO_2 each year.
- In the Netherlands, two other large-scale electrolyzer facilities will provide low-carbon hydrogen to various industrial and mobility market customers. With individual capacities of 200 MW, these projects are set to collectively produce approximately 30,000 tonnes of low-carbon hydrogen annually, without generating CO_2 emissions.

(1) Proton Exchange Membrane.
(2) Hydrogen Council.

Low-carbon hydrogen **made in USA**

Vision

Many countries are initiating efforts to accelerate the establishment of a solid hydrogen market. In the United States, the hydrogen hubs program was created within the Bipartisan Infrastructure Law and further enabled by the Inflation Reduction Act, creating a total of 8 billion dollars in incentives. This massive investment plan aims at supporting the transition to a system based on low-carbon energy, including the creation of a solid hydrogen network. The U.S. Department of Energy has chosen Air Liquide as the partner for a record six out of seven regional *Clean Hydrogen Hubs*. Indeed, hydrogen represents a major opportunity for the country to decarbonize its economy and reinforce its energy sovereignty.

25M

metric tonnes of CO_2 emissions avoided annually in the United States thanks to these hydrogen hubs[(1)]

"With programs like these hydrogen hubs, the United States is well-positioned to drive innovation in hydrogen. As many sectors of the industry tackle the challenge of decarbonization head-on, we are ready to work with our partners to develop these hubs and support the emergence of a mature domestic hydrogen market."

Adam Peters

CEO of Air Liquide North America

Action

These *Clean Hydrogen Hubs* are located in 16 states across the American territory, from the Appalachians to California, including Texas and the Midwest. They will enable the production of 3 million tonnes of low-carbon hydrogen per year, reaching nearly a third of the 2030 U.S. production target while abating 25 million tonnes of CO_2 per year – the equivalent of 5.5 million gasoline-powered automobiles – and creating thousands of jobs[(1)].

As one of the main industrial sponsors of the HyVelocity Hub located on the Texas Gulf Coast, Air Liquide will collaborate with its partners to optimize existing local energy assets and develop hydrogen projects that will benefit Texas, Louisiana, and the surrounding regions.

In the PNWH2 Hub on the Pacific Northwest coast, the ARCH2 Hub in the Appalachians, and the MACHH2 Hub in the Midwest, the Group is committed to advancing the energy transition and establishing the necessary production, transportation, and distribution infrastructure to facilitate access to hydrogen. Additionally, Air Liquide is also a partner in the ARCHES network (Alliance for Renewable Clean Hydrogen Energy Systems in California) and in the MACH2™ (Mid-Atlantic Clean Hydrogen Hub).

The Group will thus leverage its expertise of over 60 years across the entire hydrogen value chain to implement the necessary infrastructure for hydrogen production, transportation, and distribution that are essential elements for the growth and sustainability of the local low-carbon hydrogen market.

(1) Source: U.S. Department of Energy.

Capturing CO_2, an essential solution for **decarbonizing industry**

Vision

More than 20% of the world's CO_2 emissions come from industry. Today, the challenge is to rapidly deploy concrete solutions that will significantly reduce these emissions. Among the technologies already available, carbon capture and sequestration (CCS) is a key solution for decarbonizing the industries with the highest emissions and those most difficult to decarbonize, such as cement, metallurgy, refining, and chemicals. These are also the sectors where this technology will have the greatest impact, as CO_2 concentrations are the highest. The principle consists in capturing CO_2 emissions at the source, treating and purifying them, and then recycling or sequestering them in permanent geological storage.

Large-scale CCS projects are being developed around the world, particularly in Europe and the United States, which together account for over 70% of global projects. Air Liquide is one of the leaders in this field, with its proprietary Cryocap™ technology, which captures, purifies, and liquefies CO_2 before it is transported to the sequestration site.

Action

Air Liquide is involved in a number of large-scale CCS projects, particularly in Europe.

In the Netherlands, where the government has set the ambitious target of reducing the country's greenhouse gas emissions by 95% by 2050, the Group is involved in the Porthos project, the Netherlands' largest CO_2 emissions reduction program. For Air Liquide, it consists in decarbonizing its own facilities by installing a Cryocap™ unit at its hydrogen production site in Rozenburg, near Rotterdam. The project also includes the construction of a pipeline which, from 2026, will transport the CO_2 emitted by several local plants through the port of Rotterdam to the North Sea, 20 km off the coast, where it will be sequestered at a depth of 3,000 meters in a depleted natural gas field.

In all, the Porthos project will contribute to reducing the emissions by 2.5 million tonnes of CO_2 per year, which represents about 10% of the CO_2 emitted by industrial activities in Rotterdam.

12

CCS projects in which Air Liquide is involved in Europe

Air Liquide is also involved in the K6 project, a partnership with cement manufacturer EQIOM. The aim is to make the Lumbres factory in northern France the first carbon-neutral cement plant in Europe, by capturing almost 8 million tonnes of CO_2 in the first 10 years of operation, thanks in particular to the Cryocap™ technology. In the same spirit, Air Liquide will also contribute to decarbonizing the Lhoist lime production plant in Réty, in the north of France.

Finally, as part of the D'Artagnan project, the CO_2 captured at the two plants will be transported to a temporary storage platform at the port of Dunkirk, from where it will be shipped to be then sequestered between 1,000 and 2,000 meters below the North Sea. By 2027-2028, the D'Artagnan project will contribute to the reduction of emissions by 1.5 million tonnes of CO_2 per year.

The Group also participates in many other initiatives of the kind in Europe, such as the Kairos@C, Antwerp@C, ECO_2 Normandie and Callisto projects. These large projects show Air Liquide's expertise and commitment to providing solutions to decarbonize both its own and its customers' assets.

According to the IPCC, the intergovernmental panel on climate change, no single technology is a miracle solution, but CCS is an essential technology for limiting global warming to 1.5°C or 2°C by 2100.

Up to
98%
of CO_2 captured thanks to the Cryocap™ technology

"To best meet our customers' needs, we draw on our more than 15 years of experience in this field. As a result, we can offer a portfolio of innovative technologies guaranteeing very high capture rates while optimizing the energy efficiency of installations."

Florian Gautier

Director of Energy Transition for Large Industries activity at Air Liquide

ECO ORIGIN™, **certified low-carbon molecules**

ECO ORIGIN™ gases produced from **100%** renewable energy sources

Vision

Be it in terms of industrial performance or environmental footprint, Air Liquide always innovates to support its customers. Many industries use gases such as oxygen, nitrogen, argon and carbon dioxide (CO_2) in their manufacturing processes, which can have an impact on their carbon footprint. That is why Air Liquide is now developing ECO ORIGIN™, a range of certified low-carbon gases, thus committing to supporting its customers' decarbonization efforts.

"ECO ORIGIN™ is winning over more and more of our customers, especially those close to end consumers, as it reduces their Scope 3 emissions, both upstream and downstream, covering the purchase of raw materials and the end use of products, as well as Scope 1 emissions corresponding to the CO_2 emitted during production."

Christel Champinot
Climate Program Manager for Air Liquide's Industrial Merchant activity

Action

Produced from 100% renewable energy sources, these gases offer traceable emissions from production to delivery, with their low-carbon footprint certified by an independent body in compliance with ISO standards.

Following oxygen, argon, and nitrogen, Air Liquide is extending its ECO ORIGIN™ low-carbon gas range by offering its customers biogenic CO_2 – ideal for use in the food industry, where CO_2 is used for deep-freezing and preservation. It is also essential for the carbonation of soft drinks. In response to the sector's environmental needs, the Group offers biogenic CO_2, naturally produced by biological processes (generated by renewable sources such as organic waste, fermentation, or plant respiration).

Among the first companies to be convinced by this offering are both SMEs and major players in the food industry. For example, Danone has chosen to source ECO ORIGIN™ CO_2 to reduce the carbon footprint of its sparkling water production. Les French Bulles also uses ECO ORIGIN™ in the refill canisters for its home soft drinks machines. ECO ORIGIN™ CO_2 was a natural fit for this French SME and its commitment to sustainable, local production. It is also the choice of Vidya Europe, specialized in the development and production of natural ingredients for different markets such as human and animal nutrition and cosmetics, which uses it for the extraction of active compounds from plants. Air Liquide is thus helping Vidya Europe to significantly reduce the carbon footprint of its products. It does the same with many other players in the sector.

Biomethane: **a promising energy source**

Vision

According to the International Energy Agency, biogas production is set to quadruple by 2030. Naturally emitted by the decomposition of organic waste, biogas is composed of biogenic CO_2 and biomethane. This biomethane can be used as a substitute for natural gas in industrial processes such as hydrogen production, or as an energy source or renewable raw material for industries such as chemicals, thereby reducing CO_2 emissions by up to 80%[1]. Air Liquide, which first entered this market with its cryogenic purification and liquefaction technologies, has been a part of the massive growth of the global biomethane industry for more than 10 years. Convinced that this energy will play a key role in decarbonizing heavy mobility and industry, we are investing in new production units as part of our virtuous circular economy model.

"Initially used as energy for transport, biomethane is now an effective solution for the decarbonization of industry. It's a key alternative to fossil-based natural gas for producing heat, as well as a raw material for producing renewable hydrogen and biogenic carbon monoxide that are essential molecules for our petrochemicals customers."

Jérémie Lallemand

Director of Sales at Air Liquide Biogas Solutions

211,000
tonnes of CO_2 avoided in 2023 thanks to the 1.8 TWh of biomethane produced by the Group

Action

Present in Europe, and in particular in France, Italy, the United Kingdom, and the Nordic countries, Air Liquide continues to develop its biomethane business. In Italy, for example, the Group is enhancing its offering by equipping its new production unit at Covo, near Milan, with a biogenic CO_2 purification and liquefaction system to serve its industrial customers (greenhouse agriculture, metal fabrication, chemicals) in the region. In China, Air Liquide has launched its first production unit, with a capacity of 75 GWh per year, to produce biomethane to supply homes via the city gas network. It will also be used to generate electricity for the production unit and the local power grid. Air Liquide is also expanding its biomethane production capacity in the United States, where a new unit in Rockford, Illinois, is about to come on line. With a capacity of 380 GWh per year, it will be the Group's largest biomethane unit. With five production units already in operation, Air Liquide is becoming a significant player in biomethane production in the country, a position the Group has strengthened with the recent start of construction of two new units in Pennsylvania and Michigan. By increasing its biomethane production, the Group is pursuing its ambition to support the energy transition of its transportation and industrial customers.

With 26 operational units worldwide, a capacity of 1.8 TWh per year, and its mastery of the entire value chain, Air Liquide is contributing to the growth of biomethane as a renewable energy source and thus to the development of a low-carbon society.

(1) Source: Carbone 4.

Unlocking progress via technology

Innovation and technology are at the heart of Air Liquide's DNA. They have always enabled it to play a pioneering role. Today, these strengths make it possible for the Group to take part in the development of key sectors of the future, such as Healthcare, where its solutions contribute to improving the quality of life of patients. These also include industry and fundamental research where its small molecules are essential to develop the cutting-edge technologies needed to help build a more sustainable society.

That is why, as part of its ADVANCE strategic plan, the Group spends more than 300 million euros per year on research and innovation, with more than half dedicated to the crucial sectors of energy transition and digital technologies.

Our objectives and ambitions

50%

of innovation spending dedicated to the energy transition and to digital technology

Improving the quality of life of patients

at home with chronic diseases in mature economies

Our results

€309M

innovation spending in 2023 of which

51%

dedicated to the energy transition and to digital technology

More than **2M** patients worldwide

55%

of patients benefited of personalized care plans in 2023

A true partner is **Always There**

Vision

All essential products and services need to be founded on quality and timeliness, but none present a greater need for reliability and urgency than healthcare. Patient outcomes, and indeed lives, are at stake.

For decades, Air Liquide has been a major player in the healthcare sector, providing medical gases and related services to 20,000 hospitals and clinics in the world. In addition to the medical gases themselves, we address storage capacities and cylinder management in departments; piping required for bedside gases, and in operating rooms; and monitoring of all parameters related to medical gases thanks to digital solutions.

Today, the Group takes its commitment further, by being a partner of choice for the healthcare professionals working in hospitals and care facilities. This led Air Liquide to create "Always There", a completely new value proposition to provide facilities with unparalleled medical gas supply reliability and seamless onsite gas management, in a sustainable way. At its heart: the ability to free up caregivers to allow them to focus their energy on advancing patient care.

Action

The "Always There" value proposition is the result of a survey of more than 100 healthcare professionals, ranging from front-line doctors and nursing teams to technical experts, administrators and procurers. We drew respondents from across the sector, including emergency, surgical, intensive care and respiratory care units around the world.

"Always There" is founded on three pillars:

- **Guaranteeing supply**, to bring healthcare professionals peace of mind, by making medical gases available in times of calm and crisis, and by strengthening supply chains.
- **Simplifying gas management**, combining the best of technology, expertise and highly committed teams to deliver complete medical gas management, freeing hospital staff for patient care.
- **Reducing carbon footprint**, by providing medical gases produced from renewable sources while reducing waste.

Ramping up simplicity

Across our portfolio, we aim to simplify the management and use of gases by stepping up products and services for the benefit of caregivers and patient safety. The Group provides hospitals with medical gases and advanced medical devices that are combined to treat respiratory failure, from intensive care units to patients' beds. Beyond the therapy offer, Air Liquide provides dedicated services with training and 24/7 support for technical and clinical assistance. Dr Marcial Rey, Director of Anaesthesiology and Resuscitation at Hospital Povisa Vigo, Spain, explains: "The gas administration system provided by Air Liquide Healthcare eases the healthcare professionals to start the treatment. Another aspect is the support of Air Liquide teams in training healthcare professionals responsible for assembling the system, handling it and delivering of the treatment itself."

In a sector that highly depends on reliability, Air Liquide is thus a trusted partner relying on a "rational use of technology and innovation to improve patient health and support professionals in implementing these improvements".

Reducing the carbon emissions of hospitals

Sustainability being a key part of "Always There", the Group also supports the healthcare sector in their objective to reduce their carbon footprint. For instance, in 2023, the Ikazia Hospital in Rotterdam (The Netherlands) chose liquid oxygen with the ECO ORIGIN™ solution supplied by Air Liquide Healthcare. This offer guarantees that the oxygen supplied was produced using 100% renewable energy. This helped reduce the carbon footprint for these gases by 86%(1).

Matthijs de Vroed, Sustainability Leader of the Ikazia Hospital, comments: "This reduction in our emissions means a reduction of 16,000 kg of CO_2 annually. A great step towards reaching the objective of the Dutch Healthcare Green Deal that targets to reduce the carbon footprint of healthcare organizations in the country by 30% by 2026."

How to *deliver* medical gases consistently and adequately?

Our robust supply chain, based on local plants and backup plans, ensures continuous medical gas availability. Telemetry and technical assistance further assist healthcare providers to manage supplies more easily. We provide healthcare facilities with an all-in-one solution tailored to their needs, aiming to guarantee medical gas availability during crisis. This solution includes equipment reservations, on-site installations upgrades, and provision of emergency kits and protocols.

How to *simplify* the daily work of caregivers?

Combining digital technology, expertise and dedicated teams, Air Liquide Healthcare can handle the comprehensive management of medical gases on-site. Our solutions feature ergonomic, compact and user-friendly oxygen mobility cylinders for safe patient transfers and personalized gas management through Air Liquide Healthcare experts to cover any customer demand. Additionally, our digital platform ensures simplified management of data, assets, and services, enhancing customer overall experience.

How to reach *carbon neutrality* for medical gases?

At Air Liquide, we aim to reduce the CO_2 emissions of gas supply. For our transportation, we will progressively transition to more environment-friendly energy solutions as we have already done for our production. By transitioning to air separation units powered with renewable electricity, Air Liquide allows its customers using the ECO ORIGIN™ offer to reduce CO_2 emissions by 70 to 95% for a given product, depending on their geographies.

(1) Certified to an international ISO standard by an independent certification body.

Joining forces to **accelerate hydrogen mobility**

100
hydrogen stations to be built in the coming decade in Europe

Vision

Transportation is essential to our daily life but it comes at an environmental price. Around 15% of the world's total CO_2 emissions originate on its roads, with heavy duty vehicles accounting for a major share. Society at large is pushing for alternatives to decarbonize transportation. Air Liquide is contributing to intensify the use of hydrogen as a decisive low-carbon solution for mobility. To actively participate in this crucial momentum, the Group is forming partnerships with major local players to establish a low-carbon and viable hydrogen ecosystem in Europe, Asia and the U.S.

Action

Joint initiative to power heavy-duty transport in Europe

In 2023, Air Liquide and TotalEnergies created TEAL Mobility, aiming to establish over 100 hydrogen refueling stations on Europe's main road corridors over the next decade, creating the first transnational European network for trucks. This joint venture, equally held, combines Air Liquide's expertise on the hydrogen value chain with TotalEnergies' long experience in operating and managing station networks. Aligned with the European Union's decarbonization goals, TEAL Mobility's objective is to reach early on a minimum viable network for heavy duty truck operators to develop and deploy hydrogen vehicles with confidence, thus contributing to the widespread adoption of hydrogen for heavy duty mobility.

Fostering the rise of the hydrogen economy in Asia

In Asia, hydrogen momentum is not lagging behind. For instance, South Korea targets a 35% reduction of its greenhouse gas emissions by 2030, aiming for carbon neutrality by 2050. Hydrogen is pivotal, leading Air Liquide to collaborate with Lotte Chemical and investing in advanced hydrogen filling centers. Air Liquide provides expertise, Lotte Chemical access to substantial hydrogen. With a strong commitment to the 'Hydrogen Economy Roadmap,' South Korea leads the transition to a hydrogen economy and cleaner mobility.

Similarly, Japan, aiming for a low-carbon society by 2040, prioritizes sustainable mobility with hydrogen. Air Liquide partners with ENEOS Corporation to accelerate the development of low-carbon hydrogen, leveraging ENEOS's infrastructure and market presence, and Air Liquide's 60 years of expertise in hydrogen, including Carbon Capture, Utilization, and Storage (CCUS).

Bolstering the hydrogen mobility market in the U.S.

Air Liquide and Trillium Energy Solutions have signed in 2023 a Memorandum of Understanding to pursue the development of the heavy-duty hydrogen fueling market in the U.S. This significant collaboration marks a pivotal milestone in accelerating the decarbonization of the transportation sector while bolstering the hydrogen mobility market. The ambition through this partnership is to initially support the development of 150 tons per day of hydrogen production and the refueling infrastructure capable of supplying more than 2,000 heavy-duty vehicles.

These partnerships demonstrate Air Liquide's expertise and its contribution to the development of low-carbon ecosystems for a more sustainable mobility.

3D printing, a multi-layered **success story**

Vision

The process of metal additive manufacturing – also known as 3D printing – is an industrial technique that consists in building metal parts layer by layer, using digital models. Due to the design freedom and customization it allows, metal additive manufacturing is a rapidly growing technology with a wide range of applications and significant potential for innovation. Applications range from the medical field, to aerospace and automotive, industrial tooling, and even the energy sector. Industrial gases play a significant role in metal additive manufacturing processes, impacting quality, efficiency and safety. Air Liquide provides solutions all along the value chain: from gas atomization for metal powder production to the additive manufacturing process itself, to post treatments and parts cleaning.

+20%

Industrial gas demand growth by 2027 in the additive manufacturing sector(1)

"Additive manufacturing is still an emerging market of global manufacturing: it targets high value added applications like lighter parts for aeronautics contributing to reduce their carbon footprint. It is displacing traditional manufacturing processes and it is a great addition to the portfolio of technologies. So, at Air Liquide, we are proud to play a part in its development."

Fabien Januard

Industrial Merchant Experts Global Network Manager at Air Liquide

Action

When it comes to metal parts, a leading technique is powder bed fusion, where thin layers of metal powders are melted and layered. It is an industrial gas-intensive process leading to a significant growth demand: projections point to 20% more gas being needed by 2027(1).

Among the Group's customers in the sector, ArcelorMittal holds a special place as the global steelmaker is developing a new business focusing on steel powders for additive manufacturing, with its AdamIQ™ range. One example of application for the automotive industry consists in coating layers on brake discs to help prolong their life and reduce braking particulates' emissions. Directly linked to the Euro 7 regulation set by the European Union, it aims at lowering air pollutant emissions from road transport.

Air Liquide also collaborates with ArcelorMittal on gas atomization, a crucial phase for producing metal powders that meet additive manufacturing standards, especially for aerospace, automotive, and medical applications as those require high-quality spherical powders. This process uses significant amounts of argon and nitrogen, as gas is blown onto liquid metal streams to create the powders. ECO ORIGIN™ gases are perfectly aligned with ArcelorMittal's XCarb™ strategy for a sustainable metal manufacturing. In addition to gas supply, Air Liquide leverages its expertise in molecules and its research and knowledge in metal additive manufacturing to optimize processes. Through this fruitful partnership with ArcelorMittal, Air Liquide collaborates on defining technical specifications, sharing innovation projects, and aligning on market opportunities and business visions.

(1) Additive Manufacturing power report.

SHINE a light on fundamental research

Vision

Unlocking progress via technology also means expanding scientific knowledge that can have a positive impact. That is the purpose of Big Science, i.e. large-scale scientific research projects aiming for breakthrough findings. And Big Science requires big expertise in cryogenics: Air Liquide's speciality. Thanks to its mastery of ultra-low temperatures for decades, the Group is always ready to support major scientific projects with its competencies in mechanical cold production, gas liquefaction, storage and distribution of cryogenic fluids at extremely low temperatures. Major projects include amongst others the LHC (Large Hadron Collider), the CERN's particle accelerator, ITER, the experimental fusion reactor and the SHINE project.

"We have been honored to partner with ShanghaiTech University since 2005, and our collaboration on the SHINE project strengthens our long-standing relationship. This partnership acknowledges our expertise in extreme cryogenics, and we are proud thereby to contribute to advancements in fundamental research."

Przemyslaw Brozyna

Managing Director,
Gas & Cryogenics Business Unit,
Air Liquide Advanced Technologies

Action

Since 2018, Air Liquide has supported ShanghaiTech University by participating in its SHINE project: Shanghai HIgh repetition rate XFEL aNd Extreme light facility. Built in a 3.2 km- long tunnel located 29 m underground, this particle accelerator will generate high-intensity X-ray flashes that can go through relatively thick objects without being absorbed or diffused. The ultra rapid, high-resolution images thus created will be used in a range of applications, from developing new drugs to designing new materials for electronics and clean energy technologies.

Simply summarized, Air Liquide's participation in the SHINE project consists in building China's biggest-ever cryogenic refrigeration system achieving temperatures close to the 'absolute zero': -273.15°C.

Every partner has to bring proven, world-class experience and technological resources to a project of this scale and ambition. Air Liquide draws on a wealth of experience, gained over more than 60 years of pioneering work in cryogenics, and in particular extreme cryogenics, one of the Group's core areas of expertise.

SHINE is due to come into service in 2025 and Air Liquide will keep accompanying the project beyond that date through operations support and predictive maintenance activities.

-271°C
is the temperature required for the SHINE project

Using AI with **intelligence**

"At Air Liquide, our main challenge is to make sure that digital tools always remain business enablers that are ultimately used for the benefit of our customers and patients as well as our teams."

Baladji Soussilane
Vice President,
Digital & IT at Air Liquide

500+
Air Liquide projects have already used data and AI

Vision

As the world wakes up to the possibilities presented by this new technology, Artificial Intelligence (AI) has become a key resource to aid thinking, planning and actions. Thanks to high-quality and well-structured data combined with human intelligence, AI helps us make predictions, recommendations and enlightened decisions based on very large amounts of data. It is a valuable resource that not only enhances Air Liquide's operational efficiency and eases employees' work but also enables the development of innovative solutions, ultimately leading to better services for our customers and patients.

Action

Enhancing our operations and solutions

Every day, 3.5 billion data points are collected from Air Liquide's 500 plants, 20 million gas cylinders, and 9,900 trucks. Their analysis allows a better management of the industrial assets and drives optimization efforts. Our teams have implemented various AI-powered solutions to enhance the reliability of production units while optimizing their energy consumption and assisting dispatchers and drivers in planning gas delivery and sourcing.

A valuable resource for healthcare

AI also supports our Value-Based Healthcare approach which puts people with chronic diseases at the heart of the care pathway to improve their quality of life at the best cost for the healthcare system.

Data and AI enable us to monitor sleep apnea patients, using an algorithm that predicts the risk of non-adherence of treatment among those equipped with a connected device. Our teams can thus set up the most appropriate personalized care plan for the patient.

In 2023, 22,000 patients suffering from sleep apnea, have started benefiting from personalized support based on the monitoring of outcomes thanks to the digital tools developed by Air Liquide, particularly in Europe, South Korea, Brazil and Australia.

Next step for our AI-powered tools: predictive alerting, which will help our healthcare teams identify in advance patients who may not be able to keep up with their treatments.

In addition, with the objective to provide a better quality of life for patients, this approach combining human and digital resources also contributes to the efficiency of the healthcare system, ultimately leading to its resilience.

Acting for all

As a civic-minded company, Air Liquide strives to ensure that everything it does is in the interests of its stakeholders and, beyond that, of society as a whole.

Firstly, for its employees, the Group promotes a culture based on dialogue and continuous learning in a safe, inclusive and collaborative working environment.

To better serve our customers and patients, Air Liquide pursues its initiatives to understand their new expectations, simplifying and enhancing interactions and increasing agility by empowering our teams to work as closely as possible with them.

For our shareholders, the Group has a proactive shareholder policy that gives individual shareholders an important role.

Mindful of the changing world, Air Liquide understands how to act in the public interest, where its contribution can make a positive impact. The Group is involved in long-term community projects in the countries in which it operates.

Our objectives

Our results

Our objectives	Our results
35% of engineers and professionals will be women by 2025	32% of women among engineers and professionals within the Group in 2023
100% of our employees will benefit from a common basis of care coverage by 2025	78% of our employees benefited from the common basis of care coverage in 2023
100% of our employees will have the opportunity to engage in local initiatives to support communities as part of the Citizen at Work program by 2025	73% of our employees can have access to the Citizen at Work program in 2023

Two Air Liquide ways of **caring about people**

Vision

At Air Liquide, performance means first developing our employees' ability to engage and go the extra mile for our customers, our patients and for society as a whole. That's why our aim is to offer our 67,800 employees the right support, wherever they are and whatever may be happening in their lives, by creating a safer work environment and providing social protections, so that they can unlock their full potential.

Action

Safety, our licence to operate

Safety is a fundamental value for the Group with a strong ambition: "zero accidents, on every site, in every region, in every entity". As a responsible industry player, Air Liquide is therefore committed to efficiently and under all circumstances reducing the exposure of its employees, subcontractors, customers, patients and suppliers to professional and industrial risks.

That is why the Life-Saving Rules which apply to everyone and cover Individual, Road and Process safety were edicted. They are enforced first through trainings in safety and risk prevention for both employees and partners, as well as through regular exchanges of experience and on site visits to make sure that the facilities comply with our high standards. In 2023, the Group focused particularly on road safety for our drivers and subcontractors. In addition to training and constant reminders of the basic principles of safe driving, 60% of our heavy vehicles fleet is now equipped with digital technology to assist or protect drivers.

"Going into the field of our operations is a way to keep connected with our people and field realities. Sharing with them helps understanding daily challenges, and learning about safety good practices we may replicate in other places."

Alexandre Morainville

HSEQ & Risk Management Director for Healthcare in North & Central Europe at Air Liquide

A common basis of care coverage for all employees

Protecting our teams also means offering them peace of mind. Present in 72 countries with diverse cultures, Air Liquide historically faces very different situations in care coverage for employees. As a social responsible employer, the Group is committed to providing a common basis of care coverage to all of our 67,800 employees so that they can rely on:

- A one-year insurance plan to provide income and support in case of an accident or disease, notably if they cannot work
- Health insurance cover to pay for inpatient and outpatient treatment
- A minimum of 14 weeks' paid maternity leave

Today, 78% of our teams benefit from the Common Care Coverage policy, and the goal is to reach 100% by 2025.

1.0

lost-time accident frequency rate(1)

20-year

best performance in lost-time frequency rate

78%

of employees benefited from the common basis of care coverage in 2023, with a target of 100% coverage by 2025

(1) Lost-time frequency rate for Group employees and temporary workers. Number of accidents with at least one day's absence from work per million hours worked.

More diversity in STEM

Vision

From Marie Curie, the pioneer of radioactivity, to Dr Katalin Kariko, who co-devised the technology behind the Covid-19 vaccines, women have a long history of extraordinary achievements in Science, Technology, Engineering and Mathematics (STEM).

Women in STEM bring diverse perspectives, innovative problem-solving, and a unique blend of skills that enhance creativity and drive progress in science and technology. That is why, at Air Liquide, we are committed to harness the talents of many more women in senior roles. The Group has thus set for itself the objective of reaching 35% of women in management & professional positions by the end of 2025. This requires an environment where women will be as likely to join and to stay with the company as their male colleagues. Air Liquide is thus actively recruiting and empowering women.

Action

A significant initiative is Women in TCL (Technical Community Leaders), which allows female employees in technical areas to gain more expertise and visibility. A cornerstone of this initiative is the establishment of a robust mentoring program that facilitates knowledge exchange and skill development between mentees and their mentors.

Another program is MORE, aiming at supporting gender diversity within the Group's Innovation and Development Division. The program, launched in 2023, is based on three main actions: ensure that as many women as men are recruited, a referral program to encourage employees to recommend external female profiles to the Group and a set of initiatives to support women at early stages of their career in their professional development including to facilitate access to their first management position.

Globally, the Group actively recruits female talents through various initiatives. For instance, we collaborate with universities to reach out to women, challenge stereotypes, highlight opportunities, and cultivate a diverse pipeline of future applicants.

32%
of women in management and professional roles in 2023 with a target of 35% by 2025

In Europe, we launched a campaign in Poland to combat gender biases and promote an inclusive culture for women in STEM. Similarly, in Germany, a recruitment campaign using gender-neutral language and innovative channels resulted in a 15% rise in female applications, an initiative that will be replicated within the Group.

Worldwide, the message is the same: women in STEM are valued, respected and will find an inspiring platform for their talents at Air Liquide.

Recognizing technical expertise

Air Liquide celebrated in 2023 the 20th anniversary of its TCL program. Since its creation, its members, who are now more than 4,500, have consistently driven innovation, enabling the Group to offer new solutions, tailored to customers' needs. This dynamic network continues to grow each year, highlighting our employees' career development in technical fields.

"The most important message is not: you are standing here because you are a woman. But you are standing here because you are excellent in what you are doing."

Justyna Łysoń
Process Manager at Air Liquide, TCL International Expert

Improving the quality of life of patients

"It is really important that the patient's voice is being properly listened to. As patients, we are the experts!"

Sofia Segersson,
Patient Community Manager,
an Air Liquide partner

Vision

In home healthcare, we aim at providing everyday personalized support for people living with chronic diseases, with the objective to make it easier for them to achieve their therapy goals and improve their quality of life. We believe in the combination of the most suitable treatment and the most adapted support, both are key components in supporting chronic diseases. At Air Liquide, we are convinced that we can contribute to better outcomes through a focus on personalization of care.

Action

Listening to patients to implement services that matter to them

"If you take 100 people with Type 1 diabetes, you're looking at 100 different variations of the disease." Those are the words of Sofia Segersson, who is a patient community manager working with Air Liquide, and who also lives with the condition herself. She is leading a Patient Advisory Board, a new forum for 54 patients living in Sweden, with ages ranging from 17 to 30, all of whom have Type 1 diabetes. It was initiated by Sofia Segersson and Daniel Stjern, Diabetes Business Development & Innovation Manager at Air Liquide, following a common vision to incorporate a deep understanding of patients' needs into the development of Air Liquide's diabetes services.

In recent years, technology has made giant strides in helping to manage the condition with more advanced connected devices. Such technologies, together with the appropriate training and support, help improve patients' clinical results and outcomes. While this is good news and often liberating for them, an aspect may be going largely untreated: their emotional wellbeing.

Sofia Segersson comments: "A patient may meet a physician perhaps once or twice a year. But what we need is not just 'how are you?' but more "how are you, really?" This need can be particularly acute when a young adult leaves paediatric care and, possibly, the daily support of parents. To transition from child to adult in the healthcare system can be a lonely experience."

Listening, then acting to empower

Our Patient Advisory Boards give the time and space to delve into how patients actually are, and to talk beyond their clinical data related to glucose rate for instance. They can explore what their pain points are and together suggest a solution to fix them based on experiences, expectations, disease expertise and data because it is created jointly by both data outputs and expert humans.

Sofia Segersson concludes: "It is really important that the patient's voice is being properly listened to. As patients, we are the experts!"

120
initiatives focused on patients since 2021

Making oxygen **more accessible**

Vision

Oxygen saves lives – yet half of the world's population has no access to medical oxygen. As a major player in the healthcare sector worldwide for 60 years, Air Liquide has leveraged on its long-term expertise in medical oxygen supply to create a social impact program – Access Oxygen™ – to make medical oxygen available in rural areas in low- and middle income countries. Since the launch of the program, 2 million people in Senegal, South Africa and Kenya have gained access to oxygen. And the work continues: our ultimate goal is to develop access to oxygen in more countries in Africa but also in Asia and Latin America.

>2M

people in Africa have been facilitated with access to oxygen since the launch of the program

Action

Q&A: Dr Bernard Olayo, founder of Centre for Public Health and Development (CPHD), Kenya

Doctor, what is CPHD?

Our mission is to address the main health challenges that can be fatal for women and children. We bring innovative solutions to the public health system in the Eastern African region.

Can you give us an example of when medical oxygen is saving lives?

A particularly dangerous illness is childhood pneumonia. Each year it kills around 800,000 children under the age of five worldwide(1). Most deaths are concentrated in countries where incomes are low. That includes Kenya, where tragically we lose up to 6,000 children each year, mainly because of a lack of oxygen. Even when seriously ill children receive hospital treatment and the necessary antibiotics, half of them will still die if oxygen is not available.

How has Access Oxygen™ made a difference?

While other programs serve larger hospitals, Access Oxygen™ fills a vital gap because it is tailored to the needs of primary care – for example, the clinics serving small and often remote communities.

Once these smaller facilities have oxygen, they can administer life-saving treatment to a sick child more quickly, without losing vital time travelling to a bigger facility.

Concretely, what does the support of Access Oxygen™ look like?

We are equipping the small primary care facilities with a complete solution comprising oxygen cylinders, concentrators, pulse oximeters and regulators. And as importantly, Access Oxygen™ provides training for the caregivers, and supports the equipment with maintenance to ensure accuracy and reliability.

Why did you choose Access Oxygen™?

We have partnered with Access Oxygen™ teams because of their work done in Senegal. They bring real-world experience of providing this support in other places. With their track record, we can approach potential funders with a high degree of credibility. Thanks to their experience, we were able to make the solution in Kenya a reality.

(1) WHO Mother-Child Epidemiology Estimate (WHO-MCEE) 2018.

Our people are **Citizen at Work**

Vision

Air Liquide's success relies on the dedication and expertise of its 67,800 employees worldwide. This represents a remarkable reservoir of talent, energy and willingness to give back to communities. We are actively leveraging this shared commitment to empower our people to volunteer through a structured and engaging program called Citizen at Work. Our target: by 2025, to empower 100% of our employees to dedicate a portion of their working hours to lend a helping hand to their local communities.

Citizen at Work was launched in 2022 and, already, 73% of our people have access to the program. It focuses on areas that are in line with the company's sustainability objectives and the teams' expertise, with a particular emphasis on healthcare, safety, the environment, professional development and education: an initiative that not only contributes to the development of local communities but also enhances employees' sense of purpose in their daily lives.

73%

of our people can already access Citizen at Work with a target of 100% by 2025

Action

At Airgas, an Air Liquide's subsidiary in the U.S., looking after people is clearly in the DNA and employees are always thrilled to give back to communities. When the Citizen at Work program was launched, employees seized the opportunity to get more involved. A major project is the Airgas High School Welding Education Initiative launched five years ago to prepare students for careers in welding as the industry faces a shortage in skilled labour. According to projections from the American Welding Society forecasts, 336,000 new welding professionals will be needed by 2026, a challenge that Airgas contributes to address.

Since 2018, the Airgas High School Welding Education Initiative has assisted 117 schools, 8,178 welding students and nearly 560 instructors across the country. In addition, 1,071 students obtained jobs directly after graduating. In 2023, with the help of the Citizen at work program, Airgas expanded the initiative, supporting 56 schools from 23 states thanks to the involvement of 113 employees.

Air Liquide Foundation: **15 years of actions**

Vision

Air Liquide is committed to supporting local communities in the countries it operates in. Since its creation in 2008, the Air Liquide Foundation has taken action in three areas: environmental and medical research, access to employment and solidarity. This action is driven by the ambition to make a positive impact by providing on-the-ground support and leveraging the skills and commitment of the Group's teams to support local projects.

The very origin of the Air Liquide Foundation is based on the direct involvement of the Group's employees. This is still one of its distinctive characteristics today. Each and every project is initiated by an employee and is followed by a colleague based locally, close to the project.

500
projects in **50** countries
in **15** years

"I recommended to the Air Liquide Foundation an association in which my husband does volunteer work. I believe that it is important to bring something personal to my community, in particular to children, thanks to my company's support."

Lina Feudi

Air Liquide Italy employee, sponsor of the Dynamo Camp's project

Action

2023 was particular as the Foundation celebrated 15 years of impactful initiatives, supporting over 500 projects across 50 countries since its creation. Notable actions supported last year included:

- **In France: Research into the respiratory system with Institut Pasteur**
  A fundamental of life – the ability to breathe naturally and easily – is not a given to everyone. This project led by a team from Institut Pasteur in Paris, is researching the treatment of pulmonary bacterial infections that affect patients with cystic fibrosis, and more generally patients with antibiotic-resistant infections.

- **In Spain: Access to employment through the Fundación Tomillo**
  This project supported young people from disadvantaged backgrounds to embark on comprehensive training in warehouse management and, as importantly, courses and mentoring in interpersonal skills in the business environment. Additionally, they could join a two-month internship at Air Liquide or one of five partner companies. The program has clear goals, and 100% of the participants qualified for certification at the end of the course.

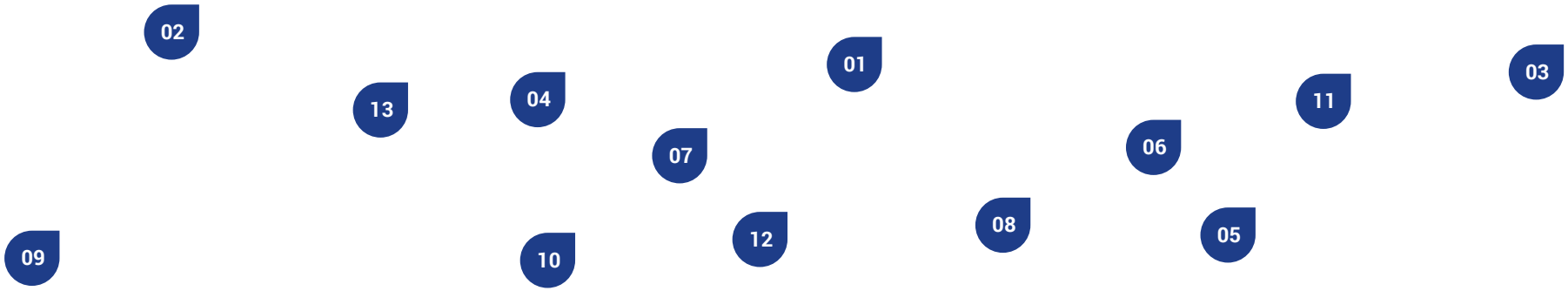
- **In Asia and Africa: Solidarity**
  Giving access to education and training is part of its solidarity action. This year, the Foundation supports projects worldwide in order to offer young people from particularly disadvantaged backgrounds access to education in the Philippines, in Burkina Faso, in Mali and many other countries.

Governance

The primary decision-making bodies of Air Liquide are the Board of Directors and the Executive Committee. Discover their respective compositions.

Executive Committee as of 01.01.24

The Executive Committee coordinates Air Liquide's various programs and activities. It implements the strategy defined by the Board of Directors and oversees operations, the management of transformation projects and business development. It also carries out strategic reviews and monitors the Group's safety and operational performance.



01 François Jackow
Chief Executive Officer
Born in 1969 – French

02 François Abrial
Senior Vice President, Group General Secretary overseeing General Control & Compliance, Legal, Public & International Affairs and Digital & IT
Born in 1962 – French

03 Ronnie Chalmers
CEO of the Asia Pacific Hub
Born in 1968 – British

04 Marcelo Fioranelli
CEO of Airgas
Born in 1968 – Brazilian

05 Matthieu Giard
CEO of the Americas Hub
Born in 1974 – French

06 Michael J. Graff
Executive Vice-President overseeing the Engineering & Construction activity, and chairing the Boards of Directors of Group holdings in the Americas
Born in 1955 – American

07 Amelia Irion
Vice President of Human Resources
Born in 1970 – American and French

08 Armelle Levieux
Vice President of Innovation, overseeing the Hydrogen Energy and Electronics World Business Lines as well as the Global Markets & Technologies division
Born in 1973 – French

09 Emilie Mouren-Renouard
CEO of the Europe Industries Hub
Born in 1979 – French

10 Jérôme Pelletan
Chief Financial Officer overseeing the Shareholder Services Department
Born in 1970 – French

11 Diana Schillag
CEO of Europe Healthcare overseeing the Healthcare World Business Line as well as the Sustainable Development and the Group's Procurement functions
Born in 1971 – German

12 François Venet
Senior Vice President overseeing the Large Industries World Business Line and the Group's Strategy function
Born in 1962 – French

13 Pascal Vinet
Executive Vice-President overseeing the Europe Industries Hub and the Africa/Middle East/India Hub, the Group's Safety and Industrial System function as well as the Industrial Merchant World Business Line
Born in 1962 – French

Read more
about the members of the Executive Committee on airliquide.com

Board of Directors as of 12.31.23

The composition of the Board of Directors offers a complementarity of experiences, nationalities and cultures and reflects the Group's diversity policy.

Benoît Potier
Chairman of the Board of Directors
Born in 1957 – French

Philippe Dubrulle
Director representing the employees
Member of the Environment and Society Committee
Born in 1972 – French

Bertrand Dumazy
Independent Director
Member of the Appointments and Governance Committee, Member of the Audit and Accounts Committee
Born in 1971 – French

Aiman Ezzat
Independent Director
Member of the Audit and Accounts Committee
Born in 1961 – French

Catherine Guillouard
Independent Director
Chairwoman of the Audit and Accounts Committee
Born in 1965 – French

Xavier Huillard
Independent Director – Lead Director
Chairman of the Remuneration Committee, Chairman of the Appointments and Governance Committee
Born in 1954 – French

François Jackow
Director & Chief Executive Officer
Born in 1969 – French

Christina Law
Independent Director
Born in 1967 – Chinese (Hong Kong)

Kim Ann Mink
Independent Director
Member of the Remuneration Committee
Born in 1959 – American

Alexis Perakis-Valat
Independent Director
Born in 1971 – French and Greek

Michael H. Thaman
Independent Director
Born in 1964 – American

Fatima Tighlaline
Director representing the employees
Member of the Remuneration Committee
Born in 1979 – French

Monica de Virgiliis
Independent Director
Member of the Environment and Society Committee
Born in 1967 – Italian and French

Annette Winkler
Independent Director
Chairwoman of the Environment and Society Committee, Member of the Appointments and Governance Committee
Born in 1959 – German

Read more about the Board of Directors on airliquide.com

The Board of Directors and its specialized committees

The Board of Directors determines the orientations of the Company's activities and ensures their implementation, in accordance with its corporate interest, taking into account the social and environmental stakes of its activity. In this regard, it examines and approves the main points of the Group's strategy, including the multi-annual points of strategy concerning corporate social responsibility. The Board relies on four specialized committees.

Audit and Accounts Committee

Composition

The Committee is composed of between three and five members of the Board of Directors, including at least 2/3 "independent" members. Members must have financial or accounting skills.

Some of the Committee's missions:

- Review of the financial statements and accounting methods used;
- Check of existence and functioning of control organizations and control procedures adapted to the Group, making it possible to identify and manage the risks incurred, including social and environmental risks;
- Selection of the Statutory Auditors;
- Review of the procedures relating to the preparation and processing of the extra-financial information.

Appointments and Governance Committee

Composition

This Committee is composed of three to five members of the Board of Directors and the majority are independent.

Some of the Committee's missions:

- Periodic assessment of the structure, size and composition of the Board of Directors, and recommendations for any changes;
- Selection of future independent directors and studies of potential candidates as part of the procedure organized by the Committee;
- Review of the succession plan for executive directors and the renewal of the terms of office of the Chairman of the Board of Directors and the Chief Executive Officer;
- Ensure the proper functioning of the governance bodies.

Remuneration Committee

Composition

This Committee is composed of three to five members of the Board of Directors, with the majority being independent.

Some of the Committee's missions:

- Examination of the performance and all the components of remuneration for the Corporate Officers;
- Review of the remuneration and retirement policy applied to Executive Management (in particular to the Executive Committee);
- Examination of the proposals by the Executive Management concerning the granting of stock options, performance shares, and other incentive systems related to the share price;
- Proposal to the Board relating to the allocation of the fixed annual sum awarded to the Directors by the General Meeting.

Environment and Society Committee

Composition

This Committee is composed of three to four members of the Board of Directors.

Some of the Committee's missions:

- Examination of the Group's strategy and commitments in the field of sustainable development;
- Monitoring of the Group's environmental actions and societal actions and their deployment, as well as the actions engaged by the Foundation;
- Examination of the environmental and societal risks in liaison with the Audit Committee and the impact of environmental and societal issues in terms of investment, performance and image;
- Form a reasonable judgment about the extra-financial information.

Financial statements

As of December 31, 2023

Consolidated income statement (summarized)

(in millions of euros)	2022	2023
Revenue	**29,934**	**27,608**
Operating costs	-22,606	-20,058
Operating profit before depreciation	**7,328**	**7,550**
Depreciation and amortization	-2,466	-2,482
Operating income recurring	**4,862**	**5,068**
Other non-recurring operating income & expenses	-571	-496
Operating income	**4,291**	**4,572**
Net financial costs and other net financial expenses	-386	-416
Income taxes	-1,002	-972
Share of profit of associates	1	4
Profit for the period	**2,904**	**3,188**
– Minority interests	145	110
– Net profit (Group share)	**2,759**	**3,078**
Basic earnings per share (in €)	5.28	5.90

Consolidated Balance Sheet (summarized)

Assets (in millions of euros)	12/31/2022	12/31/2023
Goodwill	14,587	14,194
Fixed assets	25,458	25,283
Other non-current assets*	1,235	1,137
Total non-current assets	**41,280**	**40,614**
Inventories & work in-progress	1,961	2,028
Trade receivables & other current assets*	4,324	3,970
Cash and cash equivalents	1,911	1,625
Total current assets	**8,196**	**7,623**
Assets held for sale	42	95
Total assets	**49,518**	**48,332**

Equity and Liabilities (in millions of euros)	12/31/2022	12/31/2023
Shareholders' equity	23,736	24,321
Minority interests	836	722
Total equity	**24,572**	**25,043**
Provisions	1,991	2,005
Non-current borrowings	10,169	8,560
Non-current lease liabilities	1,052	1,046
Other non-current liabilities*	2,838	2,832
Total equity and non current liabilities	**40,622**	**39,486**
Provisions	282	364
Trade payables & other current liabilities*	6,367	5,933
Current lease liabilities	228	220
Current borrowings	2,004	2,285
Total current liabilities	**8,881**	**8,802**
Liabilities held for sale	15	44
Total equity and liabilities	**49,518**	**48,332**

* Including fair value of derivative.

Consolidated cash flow statement (summarized)

(in millions of euros)	2022	2023
Funds provided by operations	**6,255**	**6,357**
Changes in working capital	-397	-154
Other cash items	-48	60
Net cash from operating activities	**5,810**	**6,263**
Purchases of property, plant and equipment, and intangible assets	-3,273	-3,393
Purchases of financial assets and the impact of changes in scope	-136	-103
Proceeds from sale of subsidiaries, property, plant and equipment, and intangible and financial assets	167	417
Net cash in investing activities	**-3,242**	**-3,079**
Distribution	-1,487	-1,667
Increase in capital stock	38	129
Purchase of treasury shares	-192	-82
Transactions with minority shareholders	-4	-142
Change in borrowings and lease liabilities (including net interests)	-1,136	-1,718
Impact of exchange rate changes and net debt of newly consolidated companies and others	-165	-62
Change in net cash and cash equivalents	**-378**	**-357**
Net cash and cash equivalents at the beginning of the period	**2,139**	**1,761**
Net cash and cash equivalents at the end of the period	**1,761**	**1,404**

Complimentary copy. Published by the Communications department of the Air Liquide Group, 75 quai d'Orsay, 75007 Paris, France.

Publication Director: François Jackow. Editor: Domitille Fafin. Date of publication and legal deposit: April 2024. ISSN: 2803-6220. Photo credits: in order of appearance, p. 1: Ben Bergh/Capa Pictures, p. 2: Adrien Daste, p.5: Julien Lutt/Capa Pictures, p. 8: Thomas Laisné/La Company, p. 10: Thomas Laisné/La Company – All Rights Reserved, p. 11: Dmitrydesign/Shutterstock, p. 13: Gorodenkoff/Getty Images – Wayne Eastep/Getty Images – Sinology/Getty Images – Betsie Van Der Meer/Getty Images, p. 14: Adrien Daste, p. 15: Oliver Bellendir Photography, p. 16: Carlos Ayesta/Capa Pictures, p. 17: Carlos Ayesta/Capa Pictures – Air Liquide, p.18: Adrien Daste, p. 19: Adrien Daste – All Rights Reserved, p. 20: Antonio Hugo/Getty Images, p. 21: Adrien Daste, p. 22: Daniel Bosma/Getty Images –All Rights Reserved, p. 23: Air Liquide – All Rights Reserved, p. 24: Oliver Bellendir Photography – All Rights Reserved, p. 25: Gauge Theory Creative – Terry Halsey, p. 26: All Rights Reserved, p. 27: Adrien Daste – All Rights Reserved, p. 28: lisegagne/Getty Images – Mokrani Mourad photo, p. 29 : Andrea Campagnolo – All Rights Reserved, p. 30: Adrien Daste, p. 31: Carlos Ayesta/Capa Pictures, p. 32 : Adrien Daste, p. 33: Adrien Daste, p. 34: Matthieu de Valence, p. 35: Monty Rakusen/Getty Images – Nicolas Gouhier, p. 36: Monty Rakusen/Getty Images – All Rights Reserved, p. 37: Sophie Loubaton – Julien Lutt/Capa Pictures, p. 38: Evgeny Atamanenko/iStock, p. 39: Alexis Toureau/Capa Pictures, p. 40: Bryan Meltz – All Rights Reserved, p. 41: Adrien Daste, p. 42: Adrien Daste – All Rights Reserved, p. 43: N.Thomas/Capa Pictures, p. 44: Adam Hendrick, p. 45: Christel Sasso/Capa Pictures, p. 47: Thomas Laisné/La Company, p. 48: Julien Lutt/Capa Pictures – Olga Kolleeny/Capa Pictures – Thomas Cecchelani – All Rights Reserved – Airbus SAS – L'Oréal. Ref.: ALRA023. Printed by Handi'Print.

This document is printed on FSC-certified paper sourced from sustainably managed forests by an Imprim'Vert-certified printer.

L'Air Liquide – S.A. company established for the study and application of processes developed by Georges Claude with issued capital of 2,884,842,279.00 euros.

Designed and produced by emperor

Air Liquide

A world leader in gases, technologies and services for Industry and Health, Air Liquide is present in 72 countries with approximately 67,800 employees and serves more than 4 million customers and patients. Oxygen, nitrogen and hydrogen are essential small molecules for life, matter and energy. They embody Air Liquide's scientific territory and have been at the core of the company's activities since its creation in 1902.

airliquide.com

YouTube
@AirLiquideGroup

LinkedIn
linkedin.com/company/airliquide

Instagram
@air_liquide_group

X
@AirLiquideGroup