

# ON AIR

New  
format

June 2019

The magazine for everyone  
interested in Air Liquide



**Federica Bellingeri,**  
Healthcare Project  
Manager,  
Paris, France

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# Conversation



On Air magazine is reinventing itself: lighter content, more regular and more digital to answer the new needs of its readers. This ability to adapt has been Air Liquide's greatest strength since its creation and a major advantage in a world that is changing at an ever-quickening pace. Benoît Potier discusses the opportunities presented by the profound changes underway.

## The world continues to accelerate. What does that mean? And what does that imply for Air Liquide?

► **B. Potier:** With the digital revolution, we are seeing a permanent and unprecedented acceleration in usages and technological breakthroughs. And this is exponential! This rapid revolution offers major potential in several fields: mobility, education, healthcare, energy, and more. At the same time, it brings new challenges for companies, which must now foresee future usages, in a 6G or 7G environment, to be able to adapt their products and services to this new technological order. The challenge for Air Liquide is even greater as we are present in almost all economic sectors. This unique position requires permanent innovation to anticipate the needs of our customers and develop solutions that

meet their needs, including increasing efficiency, improving the user experience, and reducing their carbon footprint.

## New methods of consumption, environmental concerns, an aging population – these changes, among others, impact all of us. How can we help our customers adjust?

► **B. Potier:** All of these changes are opportunities, providing we seize them in time and know how to respond to them. Our main priority is to focus on our customers' satisfaction and listen to them to better understand their needs. This makes us committed to striving for continuous improvement to provide them with high-quality, competitive products and faultless service. At the same time, we must be capable of identifying trends and pinpointing the technologies that will allow them to stay one step ahead of the game. And we cannot achieve this alone: we must work in close collaboration with start-ups, universities, academic and industrial partners. This is why we have recently renewed our approach to innovation with a global network of open and connected Innovation Campuses.

## The announcement of our Climate objectives represents our ability to adapt and meet the challenges of the future. What does this commitment mean for the Group?

► **B. Potier:** By committing to reducing our carbon intensity by 30% by 2025, based on our 2015 emissions levels, we have set ourselves the most ambitious objective in our sector! This strategy requires taking measures with regard to our own assets and in partnership with our customers for a cleaner industry. It also means inventing solutions for a low-carbon society. This is what we are doing by contributing to the development of hydrogen, which is generating increased interest among a range of markets and audiences. This strategy has a promising outlook in both economic and environmental terms, in line with our profitable, steady and responsible growth model. It is up to us to combine our human, technological and economic strengths to invent the world of the future!



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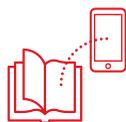


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# 8,000

## SQUARE METERS DEDICATED TO INNOVATION IN JAPAN!

 The Tokyo Innovation Campus was inaugurated in March 2019 and is another illustration of our open innovation approach, which focuses on energy transition & environment, healthcare, and digital transformation. This new state-of-the-art site houses 200 employees who work closely with customers, start-ups and academic partners to accelerate innovation, in particularly for the electronics market.



- **8** laboratories
- **€ 50M** investment
- **6** pilot platforms
- **5** Innovation Campuses in the world: Paris, Frankfurt, Delaware, Shanghai and Tokyo

# Our achievements over the past six months



## World

### ACCELERATING IN HYDROGEN ENERGY



**Pioneer in the hydrogen market, Air Liquide is convinced that this molecule has a fundamental role to play in facing the climate challenge. Therefore, the Group is contributing to its development as a source of energy. In addition to the roll out of new hydrogen stations, particularly in France, Japan and South Korea, the Group has led several projects in recent months all over the world. A brief overview:**

**IN CHINA** ▶ Air Liquide has created a joint venture with Chinese company Houpu<sup>(1)</sup> to develop the country's hydrogen distribution infrastructure.

**IN CANADA** ▶ The Group will build a new carbon-free hydrogen production unit located in Becancour, Quebec, to supply the Canadian and U.S. industry as well as the rapidly growing local hydrogen-mobility market.

**IN FRANCE** ▶ The Group partnered with Idex, specialized in energy efficiency services, Société du Taxi Électrique Parisien (STEP) and Toyota to create HysetCo and support the launch of a fleet of 600 hydrogen taxis by the end of 2020 in the Paris region.

(1) Company specialized in supplying clean energy refilling equipment.

## North America

### STRENGTHENING POSITIONS IN THE UNITED STATES

Air Liquide has stepped up its presence in the largest industrial gases market in the world through the acquisition of TechAir, an independent distributor of industrial gases and welding materials.

The Group has also extended its offering with major customers from the chemical and refining industry, among which is LyondellBasell, for the supply of a new petrochemicals facility currently being built in Channelview, Texas.

~ 20,000

AIR LIQUIDE EMPLOYEES  
IN THE UNITED STATES

France

## INNOVATING WITH DEEPTECH START-UPS

At its new Paris Innovation Campus, Air Liquide has just inaugurated Accelair, its entity dedicated exclusively to deeptech start-ups<sup>(2)</sup>. In addition to accommodation and access to experimental spaces, selected start-ups will benefit from a support program with Air Liquide experts to accelerate the time-to-market of their offer. Accelair will host approximately twenty start-ups developing breakthrough technologies in areas related to energy and environmental transition, industry 4.0, aerospace, agribusiness, and healthcare.

**For further information:**  
[accelair.airliquide.com](http://accelair.airliquide.com)

Spain

## OFFERING MORE SERVICES TO PATIENTS WITH DIABETES

Because each patient with diabetes is different and requires personalized care, Air Liquide acquired DiaLibre last April, a Spanish start-up offering personalized therapeutic support programs and medical follow-up for patients using digital technologies.



This acquisition allows us to complete our service offer to patients with diabetes and provide them with better support throughout their continuum of care. It also allows us to introduce a new complementary care model and opens up new development perspectives for the home healthcare business in Europe.



**PHILIPPE OGÉ,**  
 VICE-PRESIDENT HOME HEALTHCARE EUROPE

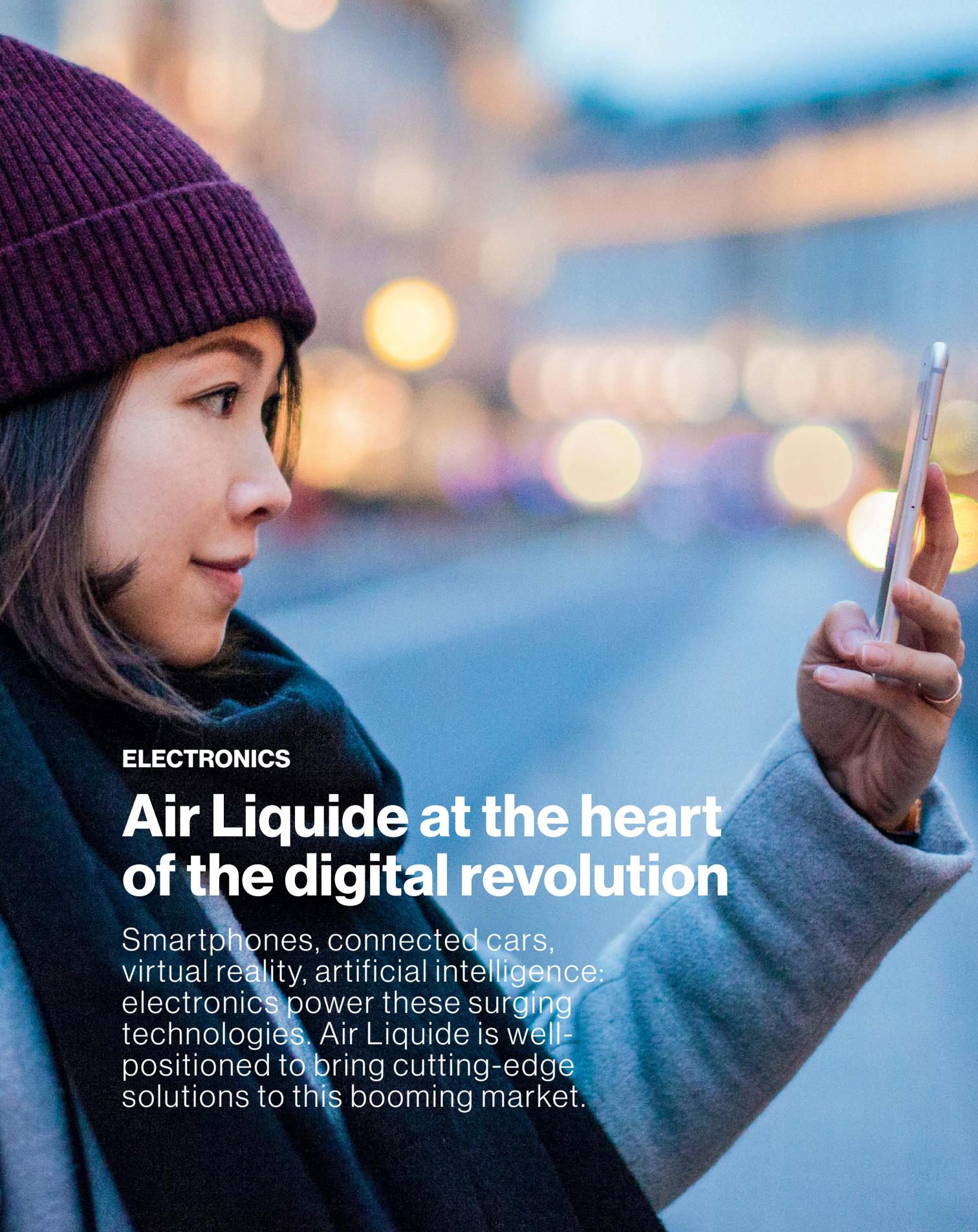
France

## VIVATECH: URBAN FARMING IN THE SPOTLIGHT!

Between May 16 and 18, Air Liquide was present at VivaTech, the global event for innovation, alongside four of its start-up partners specialized in new technologies for a variety of applications: Immersive Factory (virtual reality), Dietsensor (health), RampUp (coaching) and MyFood (urban farming). Among the collaborative projects presented, MyFood's smart urban greenhouse was a huge success. This start-up is collaborating with Air Liquide on a fertilization process using CO<sub>2</sub> to improve the quality and yield of vegetables grown in the greenhouse – a promising market!



<sup>(2)</sup> Start-ups that aim to break new technological ground using cutting-edge technologies to create scientific breakthroughs.



**ELECTRONICS**

# **Air Liquide at the heart of the digital revolution**

Smartphones, connected cars, virtual reality, artificial intelligence: electronics power these surging technologies. Air Liquide is well-positioned to bring cutting-edge solutions to this booming market.



# +10%

**AIR LIQUIDE'S 2018  
GROWTH IN  
ELECTRONICS ACTIVITY**

The booming electronics industry is driven by Asia - the largest market - and by the significant investments being made in Europe. As one of the main gas and services suppliers for this industry, Air Liquide serves several markets worth 600 billion dollars<sup>(1)</sup>. The Group has a key role to play in supporting its customers as they face multiple challenges.

### **Pushing technological boundaries**

In their continuous quest to improve technological performance, electronics companies face a major challenge: fitting more functionality in ever smaller and increasingly powerful chips. From providing ultra-pure gases that ensure the cleanliness and stability required in electronics manufacturing to the development of advanced materials, the Group helps them push the boundaries of what

is possible. For example, Air Liquide's advanced materials have contributed to reducing the size of silicon transistors from 65 to 14 nanometers in the past few years. At this nano-scale, flawless quality, product stability, safety, and reliability are critical. This is why, alongside ultra-pure gases and innovative materials, Air Liquide offers the equipment and services needed to ensure their optimum delivery.

### **An ongoing open innovation approach**

To help its customers keep pace with fast-evolving consumer trends, Air Liquide relies on a unique open innovation approach supported by its global network of Innovation Campuses. The Group is therefore well-positioned to capture the opportunities offered by this dynamic market. In 2018, its Electronics activity grew by more than 10%.

### **ACCELERATE INNOVATION WITH STMICROELECTRONICS**

The recent initiative between Air Liquide and STMicroelectronics, a world leader of semi-conductor solutions, aims to accelerate the development of digital solutions for industrial applications, such as asset tracking and management, predictive maintenance and the cybersecurity of industrial assets. This is a win-win cooperation that will extend the long-standing business relationship between the two companies.

(1) The integrated circuit, flat panel and photovoltaics markets. Source: Air Liquide Electronics, May 2019.

**Reducing the industry's environmental footprint**

Like other industries, electronics companies are striving to develop more efficient products that result in less greenhouse gas emissions. Assisting them in this ambition, Air Liquide has developed enScribe™, a new family of advanced etching materials that allows for the creation of chips at nano-dimensions while reducing their impact on the environment. For example, the

sole use of the enScribe™ molecule by a major semi-conductor customer contributed to reducing CO<sub>2</sub> emissions by 1% in this sector.

**DID YOU KNOW?**

**In 2018, Air Liquide supplied almost US\$2bn worth of gases and materials to electronics customers.**

The potential of this market is huge, as illustrated by the single example of smartphones: every year, 1.5 billion smartphones<sup>(1)</sup> are sold in the world, and each of them contains chips that are made with about US\$2 worth of gases and advanced materials.

(1) Source: [www.statista.com/statistics/263437/global-smartphone-sales-to-end-users-since-2007/](http://www.statista.com/statistics/263437/global-smartphone-sales-to-end-users-since-2007/)



**EUROPE: SUPPORTING PROGRESS IN NANO-ELECTRONICS**

In 2018, France launched the Nano 2022 initiative within the framework of an ambitious Europe-wide project that aims to develop a European sector of excellence in nanotechnology. Over five years, €5 billion (from French national and local governments, the E.U., and private partners) will be invested in French R&D and industrial projects to develop electronic components such as smart sensors and semi-conductors for applications in the automobile, aerospace, defense, and artificial intelligence sectors.

(2) Source: "What happens in an Internet minute in 2018?" study available at [www.visualcapitalist.com/internet-minute-2018](http://www.visualcapitalist.com/internet-minute-2018)

## MOLECULES AT THE HEART OF NEW TECHNOLOGIES

Air Liquide designs, produces and provides the high purity gases and advanced materials required to manufacture the latest-generation electronics components. They are used to inert the manufacturing environment, or as deposition and etching materials for the manufacturing of chips and flat panels.

Discover a few of these applications here.



### Connected cars

All of today's cars include Air Liquide materials. They can be found in their microprocessors, memory cards, sensors and screens.

- ▶ In 2025, 10% of new cars will have autonomous features (vs. 0.50% in 2017)<sup>(1)</sup>.



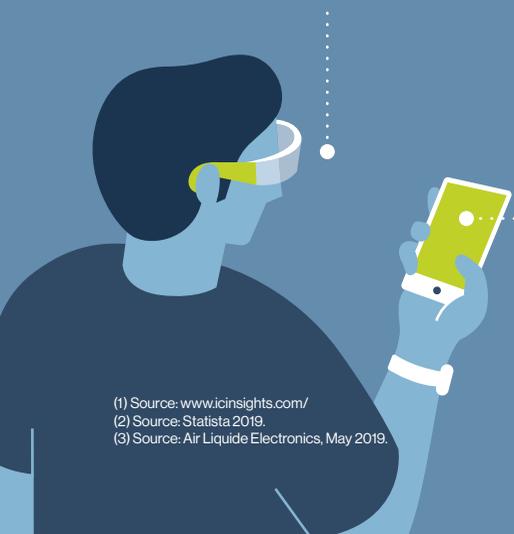
# US\$600 BN

WORTH OF TOTAL ELECTRONICS MARKETS ADDRESSED BY AIR LIQUIDE<sup>(3)</sup>

### Virtual and augmented reality

Air Liquide supports the leaders in the virtual and augmented reality sector and provides them with the necessary high purity gases for their manufacturing processes.

- ▶ The global virtual and augmented reality market is expected to expand drastically to reach US\$ 160bn in 2023 (vs. US\$ 16.8bn in 2019)<sup>(2)</sup>.



### Flat panels

Air Liquide supplies flat panel manufacturers with the ultra-pure carrier gases required to manufacture advanced semi-conductors.

- ▶ 200,000 Nm<sup>3</sup>/hour of nitrogen supplied to the flat panel industry each year.



### Smartphones

100% of the latest-generation smartphones have components, chips, and memory, which are manufactured using Air Liquide advanced materials. The Group's gases and materials also contribute to the development of the new generation of energy-efficient, flexible and ultra-high definition screens.

(1) Source: www.icinsights.com/

(2) Source: Statista 2019.

(3) Source: Air Liquide Electronics, May 2019.

## NEW GENERATION

# Why they've chosen Air Liquide

These four young employees recently joined Air Liquide. They highlight what drove their choice!



**Armelle Levieux**

VP Group Human Resources,  
Air Liquide

“Young people entering the job market today are searching for meaning. Some call them impatient, demanding, unreliable... Their demanding nature is unconventional to us, pushing us to adapt our working and management methods in response to their entrepreneurial drive. At Air Liquide, we offer a wide range of careers. We are guided by a spirit of innovation, and concrete projects are implemented to meet the challenges of our society. Therefore, it is up to us to prove to the new generation that our company is a place where we can contribute to inventing tomorrow's world. We can show them why they will want to commit to us for the long-term!”

“In charge of developing a new generation of oxygen cylinders intended for the medical sector, I'm proud to contribute to supporting healthcare professionals caring for patients.”

**Federica Bellingeri,**

Healthcare  
Project Manager,  
Paris, France



“I am proud to contribute to the business development of a forward-thinking and innovative company, whose products and services are necessary for customers and consumers on a daily basis.”

**David Amoah,**

Business Analyst  
for the Entrepreneurs  
and Professionals  
Market Unit,  
Birmingham,  
United Kingdom



"My studies abroad gave me the appetite for other cultures and diversity, which I enjoy at Air Liquide. During my job interview, I was told: 'You are joining Air Liquide Japan, but the door in front of you is global'. This word was decisive."

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**Tomohiro Shimizu,**  
Data Analyst,  
Tokyo, Japan

"I oversee the delivery of gases in bulk quantities for our customers in Brazil, which involves working with a wide range of stakeholders. I'm lucky to work with passionate teams and experience different challenges every day! I don't know what routine is!"

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**Karla Mendonca,**  
Sr. Operations Manager,  
São Paulo, Brazil



# The floor is yours!

**ON AIR** is the magazine for everyone interested in Air Liquide. Your opinion matters to us! Is there a subject you would like to share for the next editions?

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