

Circular economy : Air Liquide and TotalEnergies innovate to produce renewable and low-carbon hydrogen at the Grandpuits Zero Crude Platform

Air Liquide and TotalEnergies are innovating, in the context of the conversion to a biorefinery of the TotalEnergies' Grandpuits site, to produce and valorize renewable and low-carbon hydrogen. Under a long-term contract, committing TotalEnergies to purchase the hydrogen produced for the needs of its platform, Air Liquide will invest over 130 million euros in the construction and operation of a new unit producing hydrogen. This unit will partly use biogas from the biorefinery built by TotalEnergies, and will be delivered with Air Liquide's carbon capture technology, Cryocap™. These innovations will prevent emissions amounting to 150,000 tonnes of CO₂ a year compared to current processes. TotalEnergies' biorefinery will use the unit's hydrogen to produce sustainable aviation fuel.

In line with the two companies' shared ambition to reach carbon neutrality by 2050, this project is based on an innovative sustainable and circular approach:

- Air Liquide will build and operate at the Grandpuits site **a new hydrogen production unit** with an annual capacity of more than 20,000 tonnes. By recycling, in part, residual biogases from Grandpuits' biorefinery as a substitute for the natural gas traditionally used, the hydrogen produced by this unit will be partly renewable.
- In addition, this unit will include, from its start-up, an **Air Liquide Cryocap™ H₂ carbon capture unit**. This will enable to capture, for reuse in agri-food and industrial applications, over 110,000 tonnes of CO₂ per year contributing to reducing the site's carbon footprint.
- Most of the renewable and low-carbon hydrogen produced will be used by the biorefinery to **produce sustainable aviation fuel**. This hydrogen could also be used to support **sustainable mobility in the Ile-de-France region**.

Pascal Vinet, Senior Vice President and a member of Air Liquide's Executive Committee, supervising notably Europe Industries activities, said : **"This innovative project is characterized by the combination of several solutions in order to produce renewable and low-carbon hydrogen, and contribute to the decarbonization of TotalEnergies' Grandpuits site. It also provides the opportunity to recycle CO₂ as part of a circular economy approach while securing its supply for agri-food applications. This project illustrates Air Liquide's expertise in working with its customers on customized solutions to help them reduce their carbon footprint and actively participate in the fight against global warming. It provides yet another example of the key role that hydrogen will play to succeed in the energy transition"**.

"By recycling the biogas produced by the biorefinery into renewable hydrogen, this innovative project makes full use of the conversion of the Grandpuits refinery into a zero crude platform harnessing the potential of biomass, especially in the production of sustainable aviation fuel," said **Bernard Pinatel**, President, Refining & Chemicals, TotalEnergies. **"Combined with the production of low carbon hydrogen and the capture of CO₂, this project contributes to TotalEnergies' ambition to decarbonize all of the hydrogen used by its European refineries by 2030."**

Air Liquide et l'hydrogène

In line with the 2015 Paris Agreements and to address the urgency of climate change, Air Liquide is committed to achieving carbon neutrality in its activities by 2050. As a pioneer in hydrogen, the Group is convinced that this molecule has an essential role to play to succeed in the energy transition. Over the last 60 years, the Group has developed unique expertise in hydrogen, which positions it today as a leader in the production and distribution of low-carbon and renewable hydrogen and a world reference in liquid hydrogen. The Group currently initiates, pilots and develops some of the largest projects to decarbonize industry and road, air and sea transport. Air Liquide has taken several commitments to accelerate the development of hydrogen for the energy transition: the Group plans to invest 8 billion euros in the low-carbon hydrogen value chain by 2035 and to develop a total electrolysis capacity of 3 GW by 2030.

About Grandpuits site of TotalEnergies

Commissioned in 1966, Total's Grandpuits-Bailly-Carrois refinery was for a long time the only refinery in the Paris region. In September 2020, TotalEnergies launched a project to convert the site, in line with its strategy to become carbon neutral by 2050. This zero-crude project, with a total investment of more than 500 million euros, is based on the development of several future-oriented activities in the field of biomass, renewable energies, and circular economy: chemical recycling of plastic waste, production of biosourced and biodegradable bioplastics, production of sustainable aviation fuels, construction of a solar farm and electricity storage by batteries. The start-up of these new units will begin in 2022, and they should all be operational by 2025.

CONTACTS

Corporate Communications
media@airliquide.com

Investor Relations
IRTeam@airliquide.com

About Air Liquide

A world leader in gases, technologies and services for Industry and Health, Air Liquide is present in 75 countries with approximately 66,400 employees and serves more than 3.8 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.

Taking action today while preparing the future is at the heart of Air Liquide's strategy. With ADVANCE, its strategic plan for 2025, Air Liquide is targeting a global performance, combining financial and extra-financial dimensions. Positioned on new markets, the Group benefits from major assets such as its business model combining resilience and strength, its ability to innovate and its technological expertise. The Group develops solutions contributing to climate and the energy transition—particularly with hydrogen—and takes action to progress in areas of healthcare, digital and high technologies.

Air Liquide's revenue amounted to more than 23 billion euros in 2021. Air Liquide is listed on the Euronext Paris stock exchange (compartment A) and belongs to the CAC 40, CAC 40 ESG, EURO STOXX 50 and FTSE4Good indexes.

About TotalEnergies

TotalEnergies is a global multi-energy company that produces and markets energies: oil and biofuels, natural gas and green gases, renewables and electricity. Our more than 100,000 employees are committed to energy that is ever more affordable, cleaner, more reliable and accessible to as many people as possible. Active in more than 130 countries, TotalEnergies puts sustainable development in all its dimensions at the heart of its projects and operations to contribute to the well-being of people.

TotalEnergies Contacts

Media Relations: +33 (0)1 47 44 46 99 | presse@totalenergies.com | [@TotalEnergiesPR](https://twitter.com/TotalEnergiesPR)
Investor Relations: +33 (0)1 47 44 46 46 | ir@totalenergies.com