

Press Release

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Offshore green hydrogen production: the partnership between Lhyfe and Centrale Nantes on track for a world first.

The conditions are ripe for this very ambitious challenge to succeed. The world's first offshore hydrogen production facility, developed by Lhyfe and powered by electricity from a floating wind turbine, will be operational in 2022, off the coast of Le Croisic, at SEM-REV, Centrale Nantes' offshore test site.

Lhyfe and Centrale Nantes share an ambitious goal: to make offshore renewable hydrogen a reality, by demonstrating the reliability of an offshore electrolyser. This represents a world first at a time when initiatives for offshore hydrogen production are emerging across Europe. The world's first offshore hydrogen production site, set up by Lhyfe in collaboration with Chantiers de l'Atlantique, will be operational on the SEM-REV site, from 2022. The offshore test site meets all the criteria (MRE presence, harsh environmental conditions) to validate offshore hydrogen production technology before moving towards large-scale industrial deployment in 2024. This project, which will foster the development of a major hydrogen production industrial sector, is already supported by the Pays de la Loire Region, the Sea innovation cluster Pôle Mer Bretagne Atlantique and the Maritime Industry's Strategic Committee.

The electrolyser will be installed on GEPS Techno's floating platform and connected to the various sources of Marine Renewable Energy (MRE) available on the offshore test site, including the Floatgen floating wind turbine. This unique production process only emits oxygen, no CO₂. Centrale Nantes is also making its research facilities available and providing support for the various regulatory, experimental and logistical phases to ensure a successful outcome.

Matthieu Guesné, CEO and founder of Lhyfe: *"We are convinced that offshore production of renewable hydrogen is a perfectly suitable solution for the massive deployment of hydrogen that is on the horizon. Through this partnership and the bringing together of the most advanced expertise in the field, we are making great strides forward in our development and are determined to be the first in the world to deploy a solution for offshore renewable hydrogen production."*

Green hydrogen from offshore wind power

Wind power - and in particular offshore wind - is a particularly relevant energy source for hydrogen production. Its availability (capacity factor over 50%) and its development potential (with 130GW installed by 2040 and a technical potential over 18 times higher than the demand for electricity across Europe) make it all the more relevant. Moreover, the water needed for the electrolysis process is available in unlimited quantities offshore, and floating wind farms could even operate without being connected to the grid.

Offshore wind thus offers the greatest potential for sustainable hydrogen production because of the cost effectiveness that can be achieved through scalability and technological innovation. Offshore

renewable hydrogen provides a unique opportunity to move towards a 100% renewable energy world.

Testing on the SEM-REV site will allow Lhyfe to showcase the expertise of a consortium of national and local players in the development and deployment of a renewable hydrogen production solution in France and abroad.

Making renewable hydrogen a reality

This is exactly what Lhyfe is already proving in Bouin, the first site in Europe directly connected to onshore wind turbines set to produce its first kilograms this summer. This site also has an R&D site for offshore hydrogen production. The production of hydrogen from seawater and directly connected to wind turbines will be tested and validated from July 2021.

Lhyfe and the Chantiers de l'Atlantique have been working closely since 2020 on the detailed design of an offshore hydrogen production platform that can be built in Saint Nazaire, ranging from ten MW to several hundred MW. The aim is to deploy these concepts as early as 2024.

New development projects for Marine Renewable Energies

Centrale Nantes's concept of creating an offshore test site in 2007 became reality when the site was connected to the power grid in 2012. Since then, SEM-REV has hosted 2 prototypes: FLOATGEN from 2018 and WAVEGEM from 2019. It is thus fulfilling its primary role of meeting the R&D needs of developing Marine Renewable Energy technologies. To build on this momentum, the SEM-REV site is set to host a new 5 MW floating wind turbine developed by EOLINK in 2022. Major upgrades to the test site's electrical network get underway soon, to continue to accommodate new MRE development projects.

Jean-Baptiste Avrillier, Director of Centrale Nantes: *"The collaboration between Lhyfe and SEM-REV associates Centrale Nantes with a meaningful ambition, that of developing industry with a positive impact on the environment. The production of green hydrogen offshore in the Pays de la Loire region, which is a world first, is a great source of pride for the school, which is already actively involved in the deployment of marine renewable energies."*

About Lhyfe

Lhyfe was founded in Nantes in 2017 and is a producer and supplier of green and renewable hydrogen for transport and industry. Its production sites provide access to renewable hydrogen in industrial quantities, and give rise to a virtuous energy model geared towards environmental benefits. Lhyfe will soon have around 40 employees and is a member of France Hydrogène and Hydrogen Europe. It raised €20 million in financing between 2019 and 2020 and laid the foundation stone for its first green hydrogen production site on 26 September 2020.

About Centrale Nantes

Founded in 1919, Centrale Nantes is a French engineering school and member of the Ecoles Centrale Group. The school boasts excellent rankings: top ten for academic excellence (Le Figaro), 4th engineering school in France in 2021 (L'Etudiant), and top 200 worldwide for engineering (Times Higher Education). Its undergraduate, Master and PhD programmes are based on the latest scientific and technological developments and the best management practices. With strong international outreach, 43% of its student body are international students, representing more than 87 nationalities. Partnership agreements are in place with 178 universities in 48 countries and two-thirds of students follow a double degree programme abroad. At Centrale Nantes, research and training are organised into three key areas for growth and innovation: manufacturing, energy transition and healthcare. With research platforms ranging from digital simulation to prototyping with full-scale models, and a joint incubator which has 20 years of experience in supporting start-up projects, the school has two major tools for innovation and creation, working hand-in-hand with industry. Through a proactive approach of collaborative research

between laboratories and industry, Centrale Nantes is developing initiatives for the creation of international chairs, of which there are 15 to date.

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