Lhyfe announces that Sealhyfe, the world's first offshore hydrogen production pilot, produces its first kilos of green hydrogen in the Atlantic Ocean!

- After an initial phase of trials at quay, the Sealhyfe platform joined Centrale Nantes' SEM-REV offshore testing site, off Le Croisic, France (Atlantic Ocean).
- Sealhyfe is now connected to the subsea hub which is already connected with a floating wind turbine, and has entered the second trial phase which consists of producing hydrogen offshore, under the toughest conditions.
- Sealhyfe represents a historic step towards this new clean and sovereign energy model which the whole world hopes that the large-scale production of green H2 will achieve.
- Lhyfe's projects – on land and at sea – are already benefiting from the first learnings from this exceptional pilot project.

Nantes (France), 27 June 2023, 6:00 am CET – **Lhyfe (EURONEXT: LHYFE), one of the world's pioneers in green and renewable hydrogen production, has announced that its offshore hydrogen production pilot, known as Sealhyfe, was successfully towed 20 kilometres out into the Atlantic and connected with the SEM-REV power hub. As of 20 June 2023, the platform began producing its first kilos of offshore hydrogen, marking a decisive milestone for the future of the sector. The progress of the Sealhyfe trial once again demonstrates Lhyfe's ability to bring about concrete advances in the hydrogen industry and at great strides.**

***Caption**: on the right : Sealhyfe offshore hydrogen production pilot (Lhyfe), on WAVEGEM platform (GEPS Techno), On the left : FLOATGEN floating turbine (BW Ideol). On the SEM-REV offshore testing site (Centrale Nantes / OPEN-C) ©Lhyfe*

Sealhyfe: Designed to meet unprecedented challenges

In launching the world's first offshore hydrogen production pilot, Lhyfe wanted to prove the technical feasibility of such a project and acquire the operational experience needed to quickly scale up.

The company therefore voluntarily chose to confront Sealhyfe with the toughest conditions. It will be tested under real conditions, on a floating platform, which has been re-engineered to stabilise the production unit at sea (the WAVEGEM platform, engineered by GEPS Techno), and connected to Central Nantes' SEM-REV offshore testing hub operated by the OPEN-C Foundation, which is already linked with a floating wind turbine (FLOATGEN, engineered and operated by BW Ideol).

For this, Lhyfe and its partners designed, built and assembled all of the technology necessary for producing hydrogen offshore, including the 1 MW electrolyser supplied by Plug, in just 16 months. The Sealhyfe platform, which is less than 200 sq. metres in area, is capable of producing up to 400 kilograms of hydrogen a day.

Eight months of trials at quay to "derisk" this world first

From September 2022 to May 2023, Sealhyfe was moored at the Quai des Frégates, in the Port of Saint-Nazaire. Lhyfe and its partners have thus been able to draw knowledge from a series of start-up tests in order to approach the second phase of the project with confidence, and get the most out of the trials. Tests included:

- **Benchmarking tests**: Hundreds of tests were carried out at quay recording the precise behaviour and performance of the platform, so that they can be compared with the Phase 2 trial results via the thousands of sensors installed on the platform.
- **Technology and system optimisation**: All of the technology has been adapted to operate offshore in extreme conditions and designed to minimise the number of maintenance interventions required at sea. The tests performed at quay allowed Lhyfe to further optimise and approve the technology's behaviour.
- **Development of key solutions**: Lhyfe also developed the software and algorithm building blocks necessary to manage the site remotely. It will operate fully autonomously, more than 20 kilometres off the coast and in connection with the SEM-REV testing site's subsea hub.

Following this first phase, Lhyfe has already updated its specifications for all its sites – on and offshore – so that they can apply this valuable expertise. All Lhyfe units will therefore benefit from the state-of-the-art operating optimisations trialled under this experiment.

Start of offshore production: Millions of data to collect

Sealhyfe was towed this 19 May to the SEM-REV offshore testing site, 20 kilometres off the coast of Le Croisic (France). It was then connected to the site's subsea hub via a dedicated umbilical cable that was specially designed for the hydrogen application. The system was restarted and on stream in just 48 hours.

Lhyfe will now reproduce all of the tests carried out at quay several times in order to have a strict comparison of results and will then tackle additional offshore-specific tests.

In achieving the reliable offshore production of hydrogen in an isolated environment, the company will develop a unique operating capability which involves managing the platform's movement and environmental stresses, and validating green and renewable hydrogen production software and algorithms.

Kick-off for offshore hydrogen production: Next steps

As a logical follow-up to this first stage, Lhyfe just announced that the HOPE project, which it is coordinating as part of a consortium of nine partners, has been selected by the European Commission under the European Clean Hydrogen Partnership and is being awarded a €20 million grant. With HOPE, Lhyfe and its partners are moving up a gear and aiming for commercialisation. This unprecedentedly large-scale project (10 MW) will be able to produce up to four tonnes a day of green hydrogen at sea, which will be exported ashore by pipeline, and then compressed and delivered to customers.

Through these two pioneering projects in offshore hydrogen production, Lhyfe aims to validate industrial solutions which it will submit in response to future calls for projects from various governments, to help achieve the target set by the European Commission as part of the REPowerEU plan of 10 million tonnes of clean hydrogen produced in the European Union by 2030.

To achieve this, Lhyfe has already signed partnership agreements with wind turbine developers and offshore power specialists, such as EDPR, Centrica and Capital Energy.

Matthieu Guesné, Founder and CEO of Lhyfe said: "*Our team – supported brilliantly by our partners – has achieved a genuine feat of technology in successfully designing this first floating green hydrogen production site. We are extremely proud to be the first in the world to produce hydrogen at sea. This has been our wish since the launch of the company and we continue to move very quickly on offshore, which for us represents a tremendous development opportunity for mass producing hydrogen and decarbonising industry and transport. We are continuing to build on the successes we have had so far, firstly to prove to the world that transition is possible today, and of course to accelerate it.*"

For an interview with the persons quoted above, please contact the press department.
Click to access the Lhyfe Media Kit (press kit and visuals)

About Lhyfe

Lhyfe is a European group devoted to energy transition, and a producer and supplier of green and renewable hydrogen. Its production sites and portfolio of projects intend to provide access to green and renewable hydrogen in industrial quantities, and enable the creation of a virtuous energy model capable of decarbonising entire sectors of industry and transport.

In 2021, Lhyfe inaugurated the first industrial-scale green hydrogen production plant in the world to be interconnected with a wind farm. In 2022, Lhyfe inaugurated the first offshore green hydrogen production pilot platform in the world.

Lhyfe is represented in 11 European countries and had 149 staff at the end of 2022. The company is listed on the Euronext market in Paris (ISIN: FR0014009YQ1 – LHYFE). Lhyfe.com

About Plug

Plug is building an end-to-end green hydrogen ecosystem (production, storage, delivery) to help its customers achieve their business goals and decarbonize the economy. In creating the first commercially viable market for hydrogen fuel cell technology, the company has deployed more than 60,000 fuel cell systems and more than 165 fuelling stations, which is more than anyone else in the world. Plug is also the largest buyer of liquid hydrogen. With ambitions to build and operate a green hydrogen highway across North America and Europe, Plug is building a state-of-the-art Gigafactory to produce electrolysers and fuel cells, as well as several green hydrogen production plants that will produce 500 tonnes of liquid green hydrogen per day by 2025. Plug will provide its green hydrogen solutions directly to its customers and through joint venture partners across multiple industries, including handling, e-mobility, energy production and industrial applications. For more information visit www.plugpower.com

About Chantiers de l'Atlantique

Thanks to the expertise of its staff and its network of sub-contractors, combined with first-rate industrial facilities, Chantiers de l'Atlantique is a key player in the fields of design, integration, testing and turnkey delivery of cruise ships, military ships and electrical substations for offshore wind farms, and fleet services. The company is addressing tomorrow's challenges head on, offering ships with proven high energy efficiency, which go beyond the most drastic environmental regulations, as well as offshore wind systems that make it a major player in energy transition.
www.chantiers-atlantique.com

About GEPS Techno

The blue economy Innovation Lab, GEPS Techno, is an incubator for new isolated offshore applications. The company draws on the results of its research on autonomous solutions, its teams of experts and its test platforms to support customers from the expression of their needs right through to commercialisation.
Since 2011, the systems developed by GEPS Techno have accumulated more than 250,000 hours at sea, across the globe. Its design office and operational

department, staffed by experts in their field, offer a complete solution for the successful completion of offshore projects. The company caters for the needs of a wide range of markets, including offshore wind energy, oil & gas, defence, submarine cables and ocean science. www.geps-techno.com

About Centrale Nantes

Centrale Nantes is a French engineering school founded in 1919. It ranks among the best French engineering schools (Le Figaro, L'Etudiant) and in the top 250 worldwide (Times Higher Education). It also came No. 1 in the Les Echos Start and Change Now ranking of schools changing the world. Its graduates engineers, masters and doctoral students that have completed academic courses involving very high level scientific and technological development work. It is an international school with 43% international students, representing over 87 nationalities. Agreements have been signed with 178 universities in 48 countries and two-thirds of students follow a dual degree course. Research and training at Centrale Nantes are organized around three major growth and innovation challenges: sustainable development, digital transition and health. With research platforms ranging from digital simulation to experimentation on prototypes, some of which real sized, and an incubator with 20 years of experience, the school has excellent tools for innovation and collaborations with the business world. As part of a proactive research policy that integrates research labs with industry, Centrale Nantes has 15 industrial chairs and joint laboratories with leading economic players.
For more information: www.ec-nantes.fr. Media library: https://phototheque.ec-nantes.fr / @CentraleNantes

About the OPEN-C Foundation

The OPEN-C Foundation, created in March 2023, is Europe's largest offshore testing centre for marine renewable energy. It brings together all the French offshore testing resources for floating offshore wind, tidal power, wave energy, offshore hydrogen and floating photovoltaics. Over the next three years, the OPEN-C Foundation will undertake key innovation work, such as the testing of new prototypes of second-generation floating wind turbines. The OPEN-C Foundation is a high impact project which contributes to a more rapid energy transition and to enhancing France's position on these strategic issues. www.fondation-open-c.org

About Nantes Saint-Nazaire Port

As an industrial base for economic development and a regional developer, Nantes Saint-Nazaire Port works in partnership with the Region's public and private players to enhance the economic and environmental value of the Loire estuary. It provides a strategic interface between land and sea, serving an entire Region and its economy. As an international industrial and logistical platform, it welcomes nearly 3,000 ship calls a year. The port's activities generate 28,500 jobs within about 730 entities, forming an industrial port complex (source: 2022 Insee study based on 2018 data). It owns 2,722 hectares of land, including a 1,545 ha developed area including port, logistics and industrial zones, and 1,177 ha of natural space.
Nantes Saint-Nazaire Port is committed to energy and ecological transition, and supports the development of complementary alternatives to fossil fuels. It supports and facilitates the acceleration of projects promoting the production of renewable energy at its sites.
More information at nantes.port.fr

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