Press Release
On 17th January 2022

HyPSTER project prepares the construction phase

Currently under development on the French site of Etrez (located between Geneva and Lyon), HyPSTER is the first green hydrogen storage demonstrator in a salt cavern, supported by the Clean Hydrogen Partnership – the successor of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU). With a total budget of 13 million euros, it aims to better identify the position of storage in the hydrogen value chain, and in the long term, to support the development of the hydrogen sector in Europe.

The implementation of this project launched in January 2021 is continuing with the finalisation and validation of the engineering studies. These studies will enable the construction phase to begin, including the surface hydrogen production platform and the conversion of the salt cavern into hydrogen storage. Moreover, the contracting of the equipment required for the surface and underground works has been signed with the different partners, both French and international companies.

Industrial and R&D aspects validated by engineering studies

On the industrial side, the design of the new facilities to be built has been completed in order to define the layout of the piping, instrumentation, electrical and civil engineering facilities. At the same time, this phase allows the follow-up of the administrative requests that will enable the construction permit to be obtained.

In terms of Research & Development, the test protocol has been defined and will provide 100 cycles over 3 months. The aim is to simulate the injection and withdrawal of hydrogen to manage the consumers' needs for low carbon hydrogen, in the future.

Contracted surface and underground equipment

Several partners took part of the project by supplying the equipment necessary for the construction phase: a 1MW PEM electrolyser (Elogen), a compressor for the production platform and dispensing solutions (Howden), completion elements (Schlumberger), tubes for transporting the hydrogen between surface and the salt cavern. A memorandum of understanding with TechnipFMC has recently been signed for the development of an Hydrogen wellhead in the framework of a technological partnership.

In addition, Schneider Electric will provide its expertise in electricity, instrumentation, automation solutions for an optimised asset management system, thanks to a strategic partnership.

Installation of the electrolysis unit and conversion of the storage facilities

The equipment for the electrolysis units, designed to separate the water molecule into hydrogen and oxygen, are under construction by the different manufacturers. Storengy aims to start construction of the platform in the first half of the year. It will be followed by the conversion of the salt cavern, which until now has been used for R&D projects for natural gas underground storage.

The first hydrogen bubbles will be produced when the surface installations start up, which should take place in March 2023, with an experimentation phase in real conditions: the cycling tests will take place one month later in the cavern.

<u>Focus on HyPSTER project, an essential link in the development of the green hydrogen sector</u>

This **pilot** for the **underground storage of green hydrogen** paves the way for **the creation of a green hydrogen sector at industrial scale** and its **technical and economic replicability on other locations in Europe.** It marks a new step towards **flexible supply at large scale of renewable and low carbon energies**. Moreover, it is in line with the French government's will to further support the development of the hydrogen sector, which has benefited from an additional €1.9 billion under the France 2030 Investment Plan.

The project stakeholders and their roles

- **Storengy (FR)**: Project coordinator for all partners, manages and operates the storage site and the salt cavern used for testing.
- **Armines-Ecole Polytechnique (FR):** Different academic studies which are part of the HyPSTER project.
- **INOVYN (UK)**: Definition of the ideal salt cavern utilisation cycle (hydrogen input/output for consumption).
- **ESK (DE)**: Validation of engineering design and transfer of existing cycling models (from natural gas storage) for hydrogen storage.
- **Element Energy (UK)**: Validation of the techno-economic approach of the demonstrator and assessment of potential for replicability to other sites/countries.
- **Ineris (FR)**: Risks and environmental impacts management for the demonstrator. Analysis of the regulatory and normative framework for a safe development of this sector in Europe.
- **Axelera (FR)** : Operational result monitoring and sharing with all partners and the scientific community. Communication, dissemination, strategic intelligence and networking with

stakeholders, in order to facilitate the use and replication of HyPSTER's solutions beyond the project.

More information about HyPSTER's project
https://hypster-project.eu/

The project timeline

- **2020**: Definition of the regulatory framework for the project. Reception of financing by the European Union (FCH-JU), signature of the consortium agreement by all partners
- **2021**: Start of the engineering studies.
- **2022**: Construction of the electrolysis unit for on-site green hydrogen production and equipment of the cavern well for storage.
- **2023**: Experimentation of hydrogen storage in a salt cavern and hydrogen production.

About Storengy:
Storengy, an ENGIE subsidiary, is one of the world leaders in underground natural gas storage. Drawing on 70 years of experience, Storengy designs, develops and operates storage facilities and offers its customers innovative products. The company owns 21 natural gas storage sites with a total capacity of 136 TWh in France, Germany and the United Kingdom. Storengy is also a key player in renewable gases (biomethane, hydrogen, syngas) and geothermal energy (power generation and heat/cold production). In the hydrogen sector, Storengy is a member of France Hydrogène (formerly AFHYPAC), as well as the association Hydrogen Europe. www.storengy.com

About Armines-Ecole Polytechnique:
Armines is the largest French research structure oriented towards businesses, with 48 joint training centres (Ecoles-Armines), including Ecole Polytechnique. Ecole Polytechnique is the leading French institution combining top-level research, academics, and innovation at the cutting-edge of science and technology. With its 23 laboratories, the Ecole Polytechnique Research Center explores the frontiers of interdisciplinary knowledge to provide major contributions to science, technology, and society. www.armines.net www.polytechnique.edu

About INOVYN:
Formed on 1 July 2015 and part of INEOS, INOVYN is a vinyls producer that ranks among the top three worldwide. With a turnover above €3.5 billion, INOVYN has more than 4,300 employees and manufacturing, sales and marketing operations in ten countries across Europe. INOVYN's portfolio consists of an extensive range of class-leading products arranged across Organic Chlorine Derivatives; Chlor Alkali; General Purpose Vinyls; Specialty Vinyls; Sulphur Chemicals; Salt; and Electrochemical and Vinyls Technologies. Annual production volumes are more than 40 million tonnes. www.inovyn.com

About ESK:
As a renowned engineering company for energy storage and energy system services, ESK GmbH has been successfully managing both national and international projects for many years. Our highly qualified team, mainly consisting of engineers and geoscientists, has many years of experience and extensive know-how, especially in the fields of porous rock and cavern storage technology. ESK employs a total of 80 people at the Holzwickede and Freiberg locations and in offices in Leipzig and Staßfurt, Germany. www.esk-projects.com

About Element Energy:
Element Energy is a low carbon, sustainability and consumer behaviour consultancy and engineering practice providing strategic advice, computational modelling, software development and engineering consultancy across the buildings, transport and power sectors for a broad range of clients.
Element Energy was recently acquired by ERM, a global sustainability consultancy practice with over 5,500 employees in 40 countries. ERM is the world's largest pure-play sustainability advisory firm, a specialist energy consultancy that works with organizations to implement integrated low-carbon technology solutions that help solve their net zero and decarbonization challenges. www.element-energy.co.uk

About Ineris:
Ineris (National Institute for the Industrial Environment and Risks) is an industrial and commercial public Institute under the aegis of the Ministry of the Ecological Transition managing industrial and environmental risks. The institute carries out research activities requested by industrial operators and / or public

authorities in the field of risk assessment, prevention and protection in connection with industrial activities, in particular in underground environments. It has developed over the years a solid expertise in the field of environmental risk assessment related to underground storage activities. Ineris has also large scale laboratories for H2 experiments and testing. This expertise is based on both experimental skills (particularly in situ), numerical modelling and risk assessment methods for health and the environment. https://www.ineris.fr/fr

***About AXELERA Auvergne-Rhône-Alpes**:*
Axelera Auvergne-Rhône-Alpes is a French cluster at the crossroads of the chemical and environmental sectors. Axelera aims to help mature green hydrogen projects with its members from ideas to marketable products and processes as part of its more global commitment to developing sustainable, efficient, circular and clean solutions for industry. Axelera's public-private network of 367 members gathers expertise in: • Materials, chemicals, equipment and system manufacturing and integration • Process engineering, industrial energy and resource efficiency, and regulatory compliance • Circular economy • Water, air, and soil depollution • Renewable raw materials • Digitalization of the process industries. www.axelera.org.

About the Clean Hydrogen Partnership
The Clean Hydrogen Partnership – the successor of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) – aims to strengthen and integrate European Union research and innovation capacity to accelerate the development and improvement of advanced clean hydrogen applications ready for market, across energy, transport, building and industrial end-uses, while strengthening competitiveness of the Union clean hydrogen value chain. The three members of the partnership are the European Commission, fuel cell and hydrogen industries represented by Hydrogen Europe and the research community represented by Hydrogen Europe Research.
Homepage (europa.eu)

Media contacts:
Monet + Associés from Storengy
@ : monet-storengy@monet-rp.com / Tél : 01 45 63 12 43

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