



Press Release

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Hydrogen storage in salt caverns HypSTER reaches a new milestone with the successful completion of cycling tests

Launched at the end of 2024 for a period of four months, the cycling tests for the HypSTER (Hydrogen Pilot STORAGE for large Ecosystem Replication) project have now been completed. They provided an assessment of the salt cavern and the stored hydrogen while facing different pressure cycles, and validated the ability to commercially operate hydrogen storage in salt caverns.

HypSTER is the first salt cavern hydrogen storage demonstrator which has been subsidised by the European Union (Clean Hydrogen Partnership). It aims at testing and validating the role of hydrogen storage in the hydrogen value chain, with the perspective to eventually replicate it on a larger scale and support the development of the hydrogen industry in Europe.

The project has just reached an essential stage in its deployment with the success of the cycling tests.

These consisted of carrying out around a hundred cycles of variations in hydrogen pressure inside the cavern. This allowed a proper study of the cavern and hydrogen's response to different cycle profiles (slow/fast; low/high pressure variations), reflecting the variety of cycles which would be encountered in commercial operations.

The results are positive and validate the feasibility of commercial exploitation of hydrogen storage in salt caverns.

Zoom on the HypSTER project, an essential link in the development of the renewable hydrogen sector:

This demonstrator studying the underground storage of renewable hydrogen sets the stage for the creation of an industrial-scale hydrogen sector and its technical and commercial reproducibility at other sites in Europe. It is a further step towards flexible and large-scale supply of renewable, low-carbon energy.

About the project:

<https://hypster-project.eu/>

"This project benefits from financing through the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under the grant agreement no. 101006751. This Public-Private Partnership has received the support of the Horizon H2020 research and innovation programme by the European Union, Hydrogen Europe and Hydrogen Europe Research."



About the partners

Storengy

Storengy, an ENGIE subsidiary, is one of the world leaders in underground natural gas storage. The company has 21 sites in France, Germany and the United Kingdom. With 70 years of experience in operating underground assets, the company progressively adapts its storage facilities to accommodate 100% renewable gases and further mobilises its expertise to develop hydrogen storage infrastructures. Its local roots enable Storengy to take concrete action on environmental, economic and social issues, for the benefit of local communities. In addition, Storengy provides technical services to its customers on industrial and energy storage projects in France and abroad. www.storengy.com

Armines-École Polytechnique

Armines is the largest private contractual research structure in France. Under the supervision of the Ministry of Industry, it is supported by 48 research centres, including the École polytechnique, for which it is a federating operator. The École polytechnique is France's number-one institution associating research, education and innovation at the highest scientific and technological level. With its 23 laboratories, the École Polytechnique's Research Centre works at the frontiers of knowledge on major interdisciplinary scientific, technological and societal issues. www.armines.net www.polytechnique.edu

INOVYN

Founded on 1st July 2015 as a part of INEOS, INOVYN is one of the three world leaders in vinyl manufacturing. With a turnover of more than 3.5 billion euros, INOVYN has more than 4,300 employees with manufacturing, sales and marketing activities in ten European countries. INOVYN's portfolio includes a wide range of advanced products such as organic chlorine derivatives, chlor-alkali, general purpose vinyl, specialty vinyl, sulfur chemicals, salt, and electrochemical and vinyl technologies. The annual production volume amounts to more than 40 million tonnes. www.inovyn.com

ESK

ESK GmbH is a renowned engineering company for energy storage and systems services and has successfully completed national and international projects for many years. Its team of highly qualified engineers and geoscientists has extensive experience and know-how in the fields of aquifer and salt cavern storage technologies. In total, ESK has 80 employees in Holzwickede and Freiberg, as well as in its Leipzig and Stassfurt offices, in Germany. www.esk-projects.com

ERM

ERM is the business of sustainability.

As the largest global pure play sustainability consultancy, ERM partners with the world's leading organizations, creating innovative solutions to sustainability challenges and unlocking commercial opportunities that meet the needs of today while preserving opportunities for future generations.

ERM's diverse team of 8,000+ world-class experts in over 150 offices in 40 countries and territories supports clients across the breadth of their organizations to operationalize sustainability. Through ERM's deep technical expertise, clients are well-positioned to address their environmental, health, safety, risk, and social issues. ERM calls this capability its "boots to boardroom" approach - a comprehensive service model that allows ERM to develop strategic and technical solutions that advance objectives on the ground or at the executive level. <https://www.erm.com/>

Ineris

Ineris (Institut national de l'environnement industriel et des risques) is a public industrial and commercial establishment under the supervision of the Ministry of Ecological Transition. This institute conducts research activities on behalf of public authorities, industrial operators and public bodies in the fields of assessment,



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prevention and control of risks linked to industrial activities, particularly in underground environments. Over the years, Ineris has developed solid expertise in the field of environmental risk assessment related to underground storage activities. The institute has large-scale laboratories for tests involving hydrogen. Their expertise is based on experimental skills (especially in situ) in the fields of digital modelling and risk assessment methods in health, safety and the environment. <https://www.ineris.fr/fr>

AXELERA Auvergne-Rhône-Alpes

AXELERA is the reference cluster of the chemical and environmental sectors in the French region Auvergne-Rhône-Alpes. In France and internationally, it supports the development and innovation of actors involved in the controlled management of environmental materials and resources, for a sustainable development of territories. The cluster is committed to developing chemical solutions for the industry and territories, competitive and eco-efficient processes, technologies to preserve and restore natural resources, circular management of different materials, water, air, soil and energy. www.axelera.org.

Brouard Consulting

Brouard Consulting is an engineering firm specialising in underground storage founded in 1999 and operating worldwide. This company is providing expertise to the HyPSTER project by performing digital calculations to accurately simulate the thermodynamic behaviour of salt caverns and control the mechanical stability of the surrounding rock. <http://www.brouard-consulting.com>

Equinor

Equinor is an international energy company committed to long-term value creation in a low-carbon future. Our purpose is to turn natural resources into energy for people and progress for society. Equinor's portfolio of projects encompasses oil and gas, renewables and low-carbon solutions, with an ambition of becoming a net-zero energy company by 2050. Equinor is the leading operator on the Norwegian continental shelf. We are present in around 30 countries worldwide. www.equinor.com



EUROPEAN PARTNERSHIP



Co-funded by
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Clean Hydrogen Partnership

Clean Hydrogen Partnership succeeds to the Fuel Cells and Hydrogen Joint Undertaking (FCH JU). Its aim is to strengthen and integrate the European Union's research and innovation capacities in order to accelerate the development and improvement of advanced clean hydrogen applications which are ready to be commercialised, especially in the energy, transport, building and final industrial usage sectors, while strengthening the competitiveness of the Union's decarbonised hydrogen value chain. This institution's three partners are the European Commission, the fuel cell and hydrogen industry (represented by Hydrogen Europe) and the community of researchers, which is represented by Hydrogen Europe Research.

<https://www.clean-hydrogen.europa.eu>



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