

HYPSTER

HYDROGEN PILOT STORAGE FOR LARGE ECOSYSTEM REPLICATION



Project ID	101006751
PRR 2024	Pillar 2 – H ₂ storage and distribution
Call topic	FCH-02-7-2020: Cyclic testing of renewable hydrogen storage in a small salt cavern
Project total cost	EUR 15 514 301.73
Clean H ₂ JU max. contribution	EUR 4 999 999.00
Project period	1.1.2021–31.12.2024
Coordinator	Storengy SAS, France
Beneficiaries	Association pour la Recherche et le Développement des Méthodes et Processus Industriels, Axelera – Association Chimie-Environnement Lyon et Rhone-Alpes, École polytechnique, Element Energy Limited, Environmental Resources Management Limited, Equinor Energy AS, ERM France, ESK GmbH, Inovyn Chlorvinyls Limited, Institut national de l'environnement industriel et des risques SAS, Brouard Consulting, Storengy France

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

PROJECT AND GENERAL OBJECTIVES

Hypster aims to demonstrate the industrial-scale operation of cyclical hydrogen storage in salt caverns to support the emergence of the hydrogen energy economy in Europe in line with Hydrogen Europe's overall roadmap. The cavern is located in Etrez in Auvergne-Rhône-Alpes, France. For the production of green hydrogen, the Etrez storage site will rely on local renewable energy sources and a 1 MW proton exchange membrane electrolyser. In the long run, this facility will produce 400 kg of hydrogen per day (equivalent to the hydrogen consumption of 16 hydrogen-powered buses). The objective of the project is to test industrial-scale green hydrogen production and storage in salt caverns and the technical and economic reproducibility of the process in other sites throughout Europe.

NON-QUANTITATIVE OBJECTIVES

- Assessment of the economic feasibility of the process.
- Measurement of risk and environmental impacts.
- Definition of guidelines for regulation and normative adaptation in Europe.
- Study of its techno-economic replicability in Europe.
- Microbiological analysis.

PROGRESS AND MAIN ACHIEVEMENTS

- The workover of the EZ53 well was successfully completed in 2023.
- All works (civil, piping, electrical, instrumentation, automation) have been carried out and all equipment procured has been installed and connected, except the electrolyser stacks.
- Numerical simulation models for hydrogen storage in the salt cavern have been adapted.
- A risk analysis of underground hydrogen storage in the salt cavern has been performed.
- Commercial and microbiological analyses have started.
- The cold commissioning of the electrolyser has started (without hydrogen).
- The opening of the site was held in September 2023.

FUTURE STEPS AND PLANS

- Delivery of stacks in April 2024.
- Conduct of hydrogen tightness tests in April–May 2024.
- Conduct of hydrogen cycling tests, starting in June 2024.
- Production of hydrogen, starting in June–July 2024.
- Delivery of final workshop and wrapping up of the project in August–December 2024.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
MAWP addendum (2018–2020)	OPEX	€/kg	1	
	Power	MW	1	
	H ₂ mass	kg	2 000	
	CAPEX	€/kg	450	