

HYSTORIES

HYDROGEN STORAGE IN EUROPEAN SUBSURFACE



Project ID:	101007176
PRD 2023:	Panel 2 – H2 storage and distribution
Call topic:	FCH-02-5-2020: Underground storage of renewable hydrogen in depleted gas fields and other geological stores
Project total costs:	EUR 3 024 631.68
Clean H₂ JU max. contribution:	EUR 2 499 911.75
Project period:	1.1.2021–30.6.2023
Coordinator:	Geostock SAS, France
Beneficiaries:	Agencia Estatal Consejo Superior de Investigaciones Científicas, Bureau de Recherches Géologiques et Minières, Česká Geologická Služba, CO2GeoNet – Réseau d'Excellence Européen sur le Stockage Géologique de CO ₂ , Ethniko Kentro Erevnas Kai Technologikis Anaptyxis, Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón, Geoinženiring Družba Za Geoloski Inženiring DOO, Geological Survey of Denmark and Greenland, Geologische Bundesanstalt, Główny Instytut Górnictwa, Helmholtz Zentrum Potsdam – Deutsches GeoForschungsZentrum, Institut royal des Sciences naturelles de Belgique, Institutul National de Cercetare-Dezvoltare Pentru Geologie si Geoeologie Marina – GeoEcoMar, Instytut Gospodarki Surowcami Mineralnymi i Energia PAN, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Ludwigs-Bölkow-Systemtechnik GmbH, MicroPro GmbH, Middle East Technical University, Montanuniversität Leoben, NORCE Norwegian Research Centre AS, Sveučilište u Zagrebu Rudarsko-geološko-naftni fakultet, Tallinna Tehnikaülikool, UK Research and Innovation, Universidade de Évora

<https://hystories.eu>

PROJECT AND OBJECTIVES

Although storing pure hydrogen in salt caverns has been practised in Europe since the 1970s, no pure hydrogen storage in depleted fields or aquifers has been undertaken. Hystories will deliver technical developments applicable to a vast range of future aquifer or depleted field sites, conduct techno-economic feasibility studies and provide insights into underground hydrogen storage for decision-makers in government and industry. The project started on 1 January 2021 and is now 60 % complete.

PROGRESS AND MAIN ACHIEVEMENTS

- The project has attained technological developments for pure hydrogen storage in depleted fields and aquifers.
- It has gained techno-economic insights into the development of underground storage of hydrogen.

FUTURE STEPS AND PLANS

- Hystories will proceed with the implementation of the work, which has been delayed; the focus is on completing this ambitious project on time.
- The main technical development analyses are complete: the key preliminary results have been obtained and the hydrogen storage needed by the European energy system has been identified. The remaining tasks related to the techno-economic assessments are ready to be carried out.
- The techno-economic analyses are complete; the focus is on elaboration of the final implementation plan.

QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
MAWP addendum (2018–2020)	Large-scale H ₂ storage capital cost	€/kg	0.6	0.017 (salt) 0.011 (porous)	
	Large-scale H ₂ storage / release energy use	MWh/kg	9.3	1.7 (salt) 2.5 (porous)	✓
	Large-scale H ₂ storage chain efficiency	%	72	95 (salt) 92.5 (porous)	