



Contributing to the energy transition and the hydrogen market development through the deployment of large-scale hydrogen storage in salt caverns

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The HypSTER project has demonstrated the technico-economic feasibility of large-scale hydrogen storage in salt caverns.



H₂

1st demonstrator

First demonstrator of green hydrogen underground storage

15,5 M€

Total budget

5 million euros granted by the Clean Hydrogen Partnership, CHP

1 MW

Electrolyser

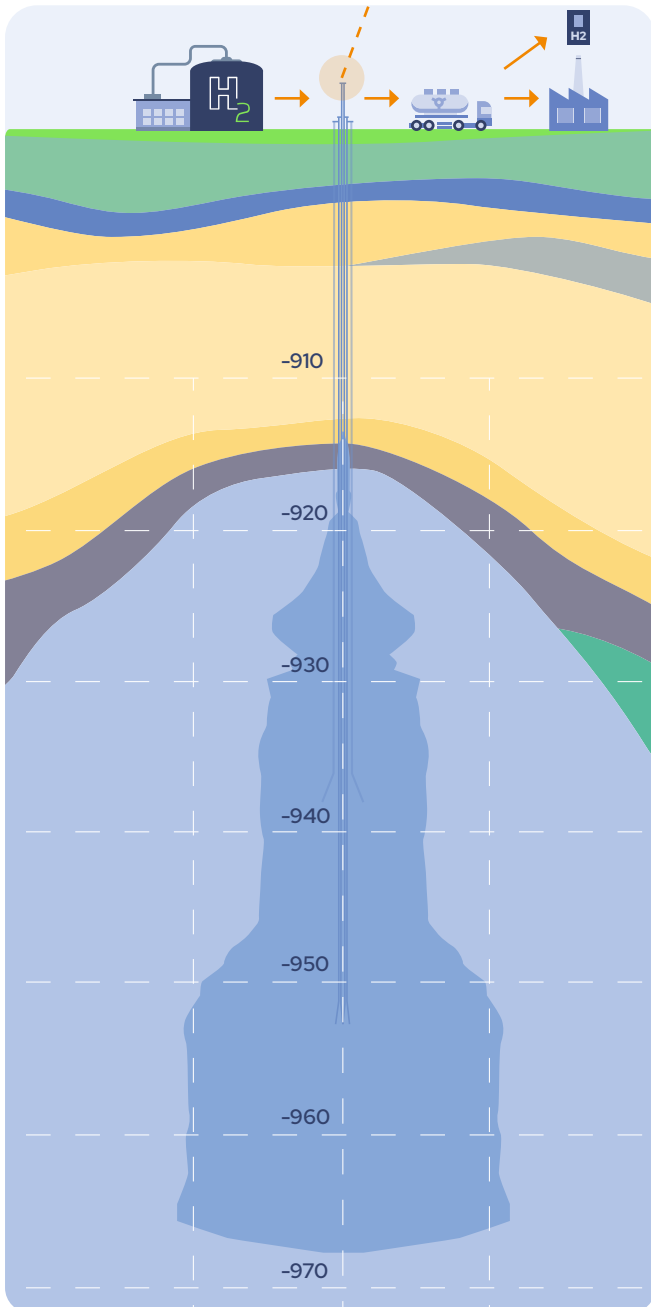
400 kg/day

Production of 400 kg of hydrogen per day
(the equivalent of the consumption of 16 hydrogen buses).

2.6 tons

Of green hydrogen stored
during the demonstrator phase

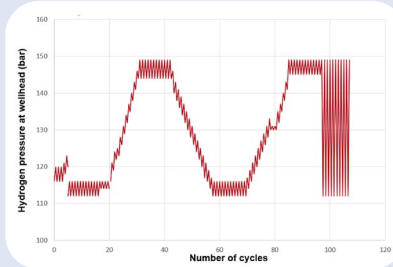
STORAGE OF H₂ IN SALT CAVERN



HyPSTER, has achieved a major milestone, making green hydrogen storage in salt caverns a reality and paving the way for the energy transition.

Cyclic testing in salt cavern

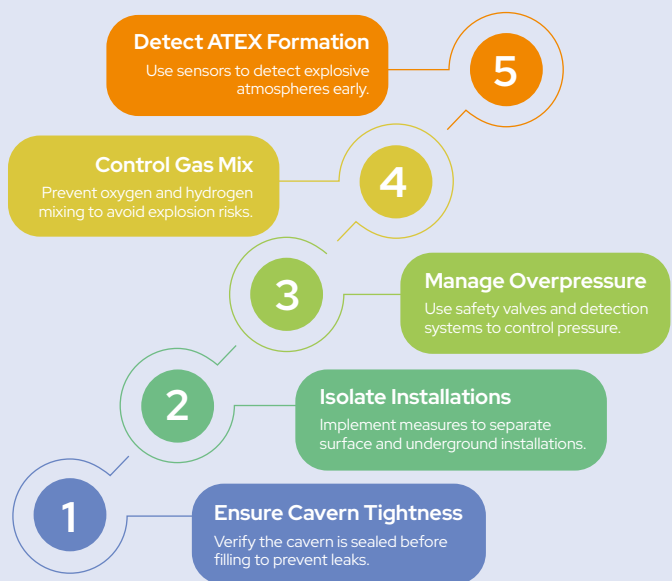
Cyclic tests validated the ability to commercially operate hydrogen storage in salt caverns.



100 cycles have been successfully carried out to study of the cavern and hydrogen response to different cycle profiles (slow/fast; low/high pressure variations), reflecting the variety of cycles which would be encountered in commercial operations.

Environmental, safety and regulatory assessment

Risk management was a priority throughout the project. Right from the design stage, a risk analysis was performed and safety barriers were implemented:



Safety was at the heart of operations, with trainings for employees about hydrogen risks, and the creation and implementation of appropriate procedures.

Safety was ensured throughout the project by applying risk prevention strategies.

Roadmap toward replication

4 key regions have been identified where salt caverns will benefit from infrastructures and hydrogen flows.

Europe, a high potential area:

Techno-economic assessment and replication in the EU

- ~0.5€/kg: average cost of H₂ storage
- From €40m to €140m: CAPEX required to build a salt cavern
- Up to 2000 : number of salt caverns could be needed in the EU by 2050 (estimation 2022 by HyUSPre project).

