

Strategic hydrogen storage for Spain

PCI 9.24.1. Hydrogen Storage North-1



**Co-funded by
the European Union**

Project information brochure

July 2025

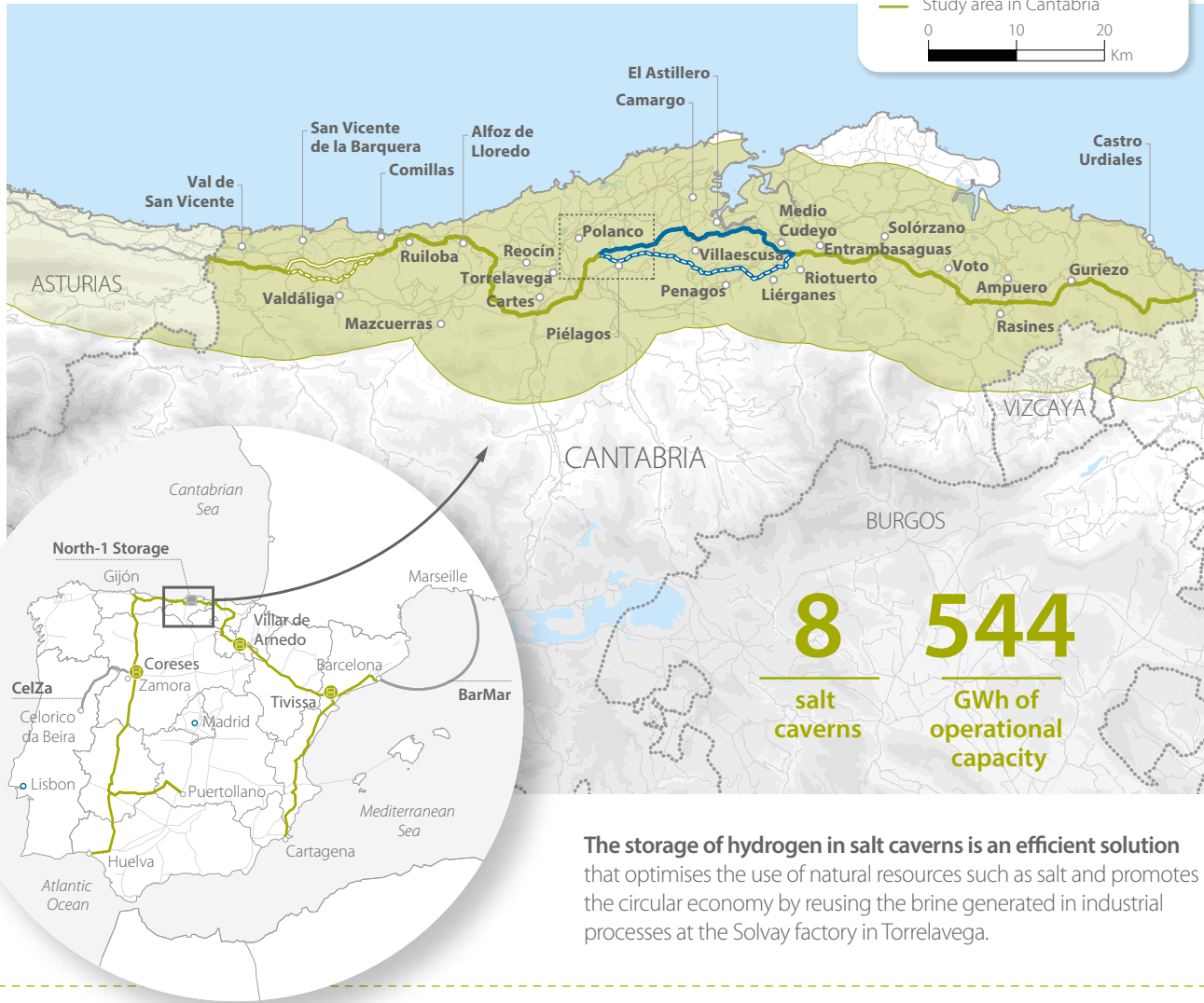
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www.infraestructurasdehidrogeno.es

Essential infrastructure for Spain's hydrogen network

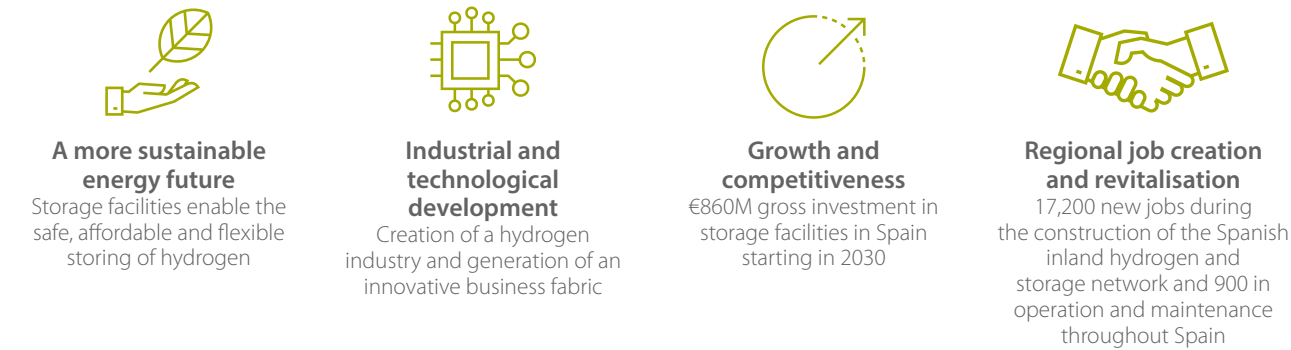
The objective of the PCI 9.24.1 "Hydrogen Storage North-1" project, located in Cantabria, is to develop an underground hydrogen storage facility to make the Spanish Hydrogen Backbone Network more flexible.

This storage facility, along with the domestic hydrogen backbone and the European H2med corridor, form the so-called 'Iberian Hydrogen Corridor', considered in the Integrated National Energy and Climate Plan (IPNEC) 2023-2030 as the infrastructure needed to comply with Europe's decarbonisation targets.



An opportunity for Cantabria and Spain

The hydrogen economy in Spain will generate more than €32 Bn of GDP and will maintain some 81,000 jobs each year during its development



Source: "Socio-economic impact of the development of the hydrogen economy in Spain", a report issued by PWC for Enagás (2023)

EU-funded PCI project

The Hydrogen Storage North-1 underground hydrogen storage facility was designated as a Project of Common Interest (PCI) in the European Commission's first call for hydrogen projects in April 2024.

In January 2025, the European Commission's Climate, Infrastructure and Environment Executive Agency (CINEA) granted 100% of the Connecting Europe Facility (CEF) Energy funds requested by Enagás for PCI 9.24.1. Hydrogen Storage North-1.



Project timeline

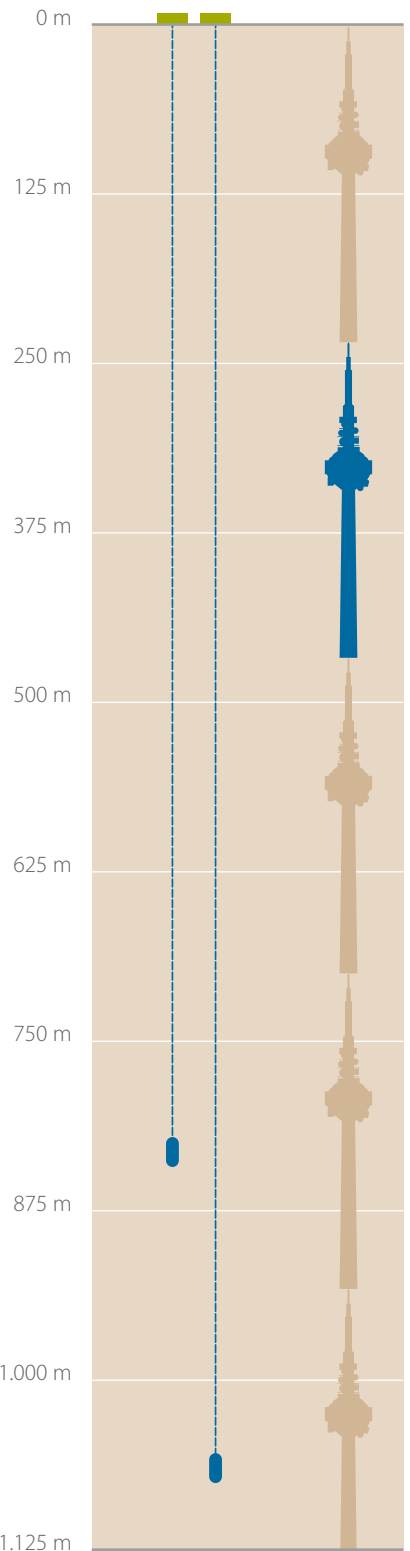


Main storage facilities

Eight salt caverns: Solvay will develop these caverns and then transfer them to Enagás Infraestructuras de Hidrógeno (EIH) for use as green hydrogen storage. They will be operated and maintained by EIH as the developer for the facility's entire service life.

Hydrogen compression and purification facilities: Renewable hydrogen will be injected into the salt caverns and extracted when demand exceeds production. For this purpose, compressors shall be used to adjust the pressure. When extracted, the hydrogen is wetted and may contain impurities, so it must be filtered and dried before being returned to the grid.

Height comparison



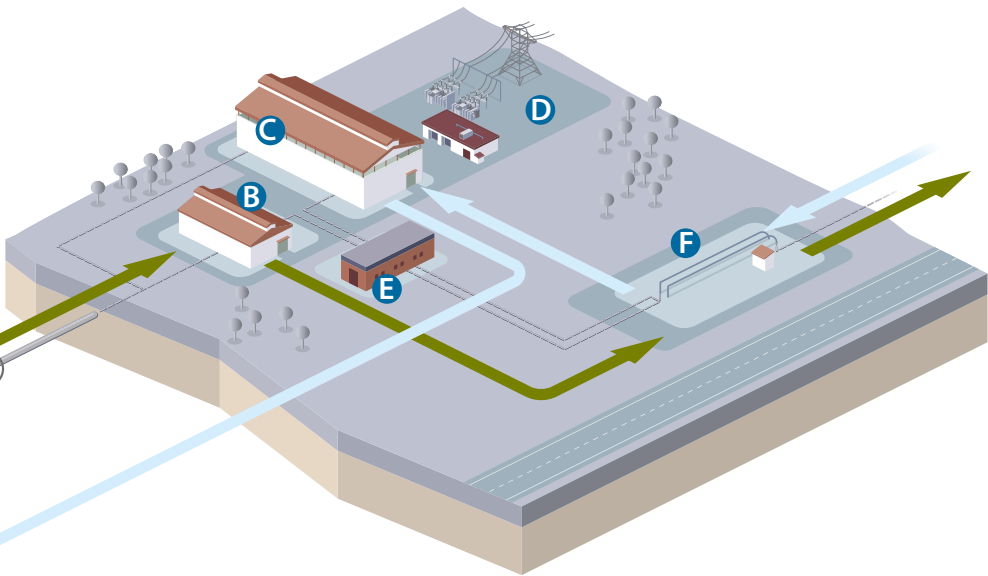
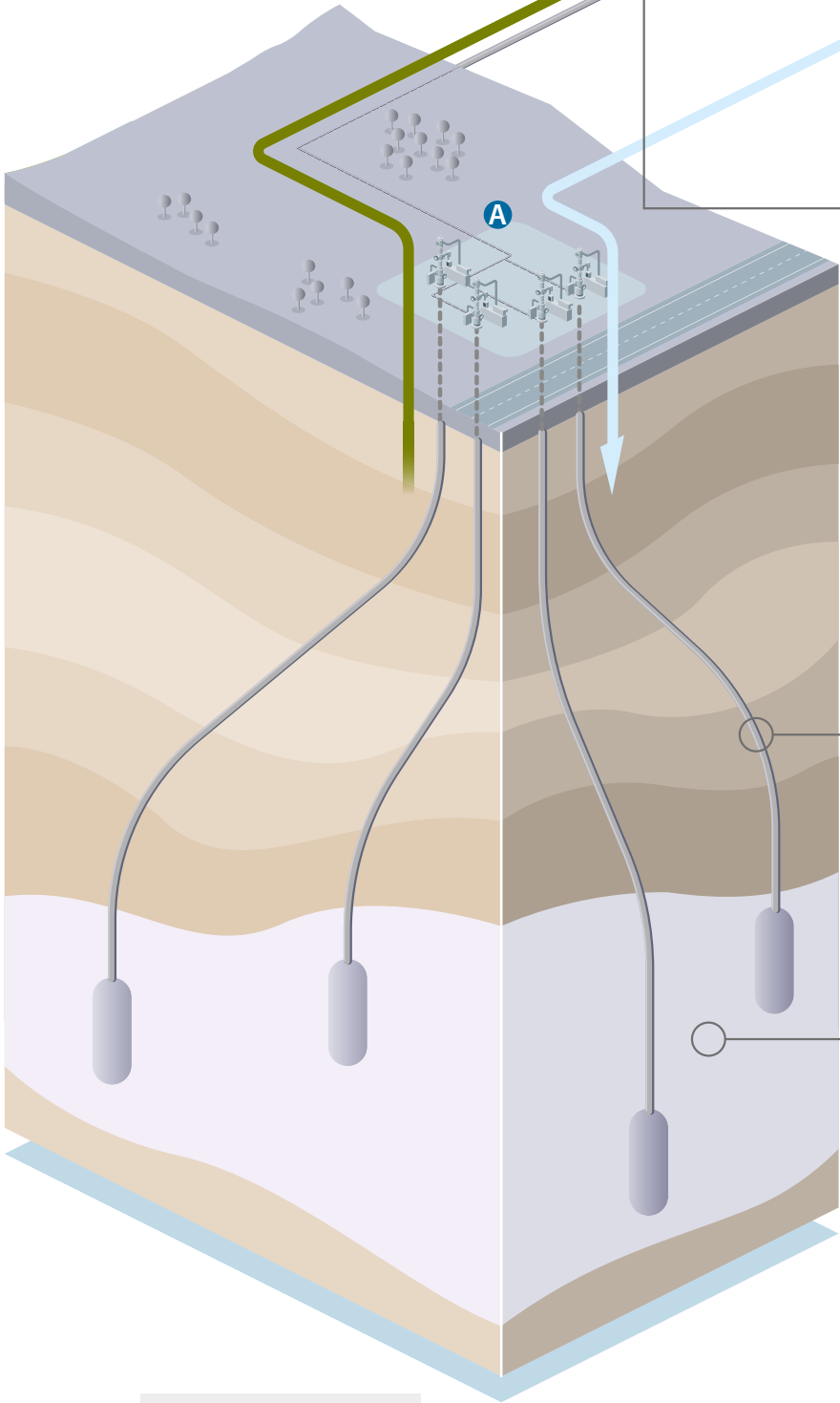
The deposits are located at a depth of between 850 m and 1,075 m, which is equivalent to four times the height of Torrespaña* (Madrid)

* 850 m is 3.6 times the height of Torrespaña and 1,075 m is 4.6 times the height of Torrespaña

Height of Torrespaña: 232 m

The main illustration is given for explanatory purposes. The dimensions of the caverns have been adjusted and are not depicted at true scale, in order to facilitate the understanding of the infograph.

Schematic diagram



The surface installations are connected by a single reverse flow pipeline.

Surface installations

- A Wellheads
- B Purification plant
- C Compression plant
- D Building and power line
- E Control and/or measuring station
- F Connection to the transport network

The underground salt caverns are connected to the surface by wells that are properly isolated from the geological layers they pass through.

Solid, compact and impermeable rock salt formation.

The shafts will be located within Solvay's mining concession



European Commission
Transparency Platform



Procedural manual

Why are underground hydrogen storage facilities necessary?

Underground hydrogen storage facilities represent a **key strategic infrastructure for the operation of the hydrogen network**, as well as contributing to security of supply.

They will enable the coverage of a large part of the daily and weekly intermittency in renewable hydrogen generation, as well as seasonal variations.

They will also help Spain to become the **European Union's first green hydrogen hub**.

Enagás, provisional operator of the hydrogen transmission and storage network

The company is the operator of the natural gas transmission networks (TSO) in Spain and Technical Manager of the Gas System. It has also been designated by the Spanish Government as the provisional manager of the future hydrogen network in Spain (HTNO). In July 2024, the Council of Ministers authorised Enagás Infraestructuras de Hidrógeno (a subsidiary incorporated in 2022) to develop European PCIs, which include the North-1 underground hydrogen storage facility.

Enagás has a solid track record in the development and operation of energy infrastructures. These include the three main underground natural gas storage facilities in Spain: Serrablo (Huesca), Gaviota (Bizkaia) and Yela (Guadalajara).

Its experience in this type of projects positions Enagás as a benchmark in the energy sector.

A transparent participation process

Enagás has begun the formal process for the granting of authorisations for Project of Common Interest 9.24.1 Hydrogen Storage North-1, in compliance with the Council of Ministers Agreement of 30 July 2024 and in accordance with Regulation (EU) 2022/869 and the Procedure Manual for the Authorisation of Energy PCIs


in Spain, published by the Ministry for Ecological Transition and the Demographic Challenge in October 2023.

In March 2025, the Directorate General of Industry, Energy and Mines of the Government of Cantabria approved the Public Participation Conceptual Plan (PPCP) for this PCI, submitted by Enagás.


Objectives




Improve the project's acceptance
by taking into account environmental sensitivity and social legitimacy from an early stage




Involve the community
and encourage their active participation in the process



Identify and mitigate impacts
in advance and ensuring the most appropriate actions are taken to address them



Resolve doubts and explain the project



Be transparent in disclosing information
about the future hydrogen network to all stakeholders

What does it involve?

The deployment of this public participation process can be consulted on the following website www.infraestructurasdehidrogeno.es.

Enagás will report in detail on this process in the participatory meetings that shall be held throughout the country with the project stakeholders: local councils, associations and citizens.

These are some of the main informative and participative initiatives that Enagás will carry out:



Website




Information brochure and non-technical summary



Workshops with experts



Participatory meetings with citizens and the administration



Dissemination through information points (fixed and mobile)



Commitment to environmental and social sustainability

Green hydrogen is a 100% renewable vector essential for combating climate change and making advancements in the energy transition.

The Hydrogen Storage North-1 underground hydrogen storage project will have a very low environmental impact thanks to the implementation of preventive and corrective measures at all stages.

The surface facilities will be designed under strict criteria of efficiency, ensuring maximum safety and availability while minimising their impact on the surface.

Protected natural areas and areas of environmental or cultural heritage interest will not be affected.



Construction phase

Temporary impacts arising from implementation that shall be mitigated by appropriate measures.

Commissioning

Minimal impacts during the execution of the tests necessary to start up the installations.

Operational phase

Reduced impact from the emission-free operation of compressor stations, purification facilities and well placements, which shall be mitigated by regulatory measures.

Dismantling

Temporary impacts arising from land reclamation and environmental restoration.

With a view to maximising the positive effects of the project and improving environmental prevention, a **suite of preventive and corrective measures** have been implemented in the different phases of the project's design, construction and operation phases.

Preventive measures



Infrastructure optimisation
Use of the existing road and energy infrastructure for the corridors for connection pipelines and power lines to the surface facilities.



Sustainable construction
Correct maintenance of machinery, equipment and actions that minimise the impact and favour the conservation of soil, water, fauna and flora.

Corrective measures



Land reclamation
Land restitution, topsoil replacement and waste management.



Restoration of flora and fauna
Carrying out activities aimed at restoring and recovering the affected vegetation and local fauna.



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