

Spanish Hydrogen Association

NEDO-CDTI Workshop 2023

“Overview of Hydrogen R&D and Hydrogen Valleys
in Spain”

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Chairman

January 2023

AeH₂
ASOCIACIÓN ESPAÑOLA
DEL HIDRÓGENO

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The AeH2

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The case of Europe

3

The case of Spain

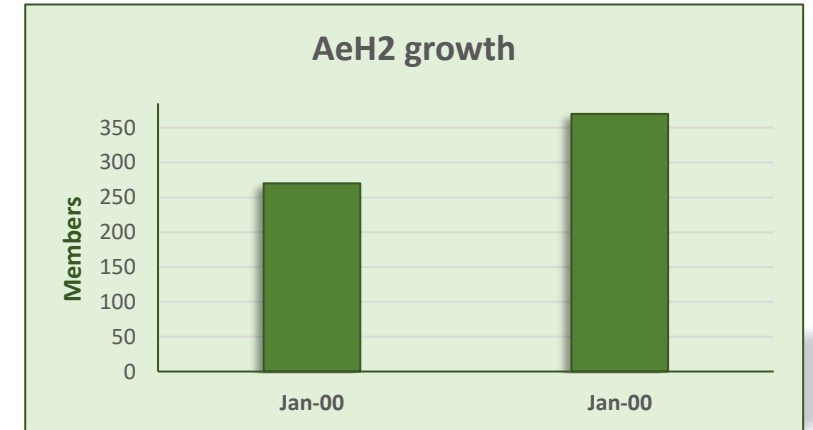
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Cooperation with Japan

THE VOICE OF THE HYDROGEN SECTOR IN SPAIN Since 2002



Circa 400 members,
+ Since 2021 the AeH2 has grown by 37%
+ 20 years supporting the sector
+ 15 years of international collaboration



🎯 MISSION

Promote and encourage the development and growth of hydrogen technologies in Spain, with the aim of strengthening and enhancing the national industrial fabric.

🎯 VISION

Hydrogen is a key energy vector in the decarbonization of the Spanish economy to achieve climate neutrality in 2050. Hydrogen allows to reactivate, redefine and transform the national economy, through the creation of a technological and productive industrial fabric, and the generation of highly qualified employment.

Promoters



Objectives



CLUSTER

To be the gathering place of the sector, bringing together companies, institutions, technology and research institutes and, universities with activity in hydrogen and fuel cells.



EDUCATION

Offering professional education through specific courses already consolidated with various universities and training centers.



R&D&i

To promote research and innovation in hydrogen and fuel cells, as well as the promotion of startups and technological knowledge.



LEGISLATION

Promoting laws and rules for the regulation of hydrogen as an energy vector.



DEVELOPMENT

To support the development, promoting the production, storage, and distribution applications of hydrogen, and its use in fuel cells.



DISSEMINATION

To make hydrogen acknowledged as an energy vector by our society.

The European Hydrogen Strategy

- The first phase relies on the installation 6 GW of renewable hydrogen electrolyzers in the EU by 2024
- By 2030, the strategic objective is to install at least 40 GW of renewable hydrogen electrolyzers.
- In May 2022 was publicated the RepowerEU plan. The Commission outlines a ‘hydrogen accelerator’ concept to scale up the deployment of renewable hydrogen, which will contribute to accelerating the EU’s energy transition and decarbonising the EU’s energy system.
 - The REPowerEU plan’s ambition is to produce 10 million tonnes and import 10 million tonnes of renewable hydrogen in the EU by 2030



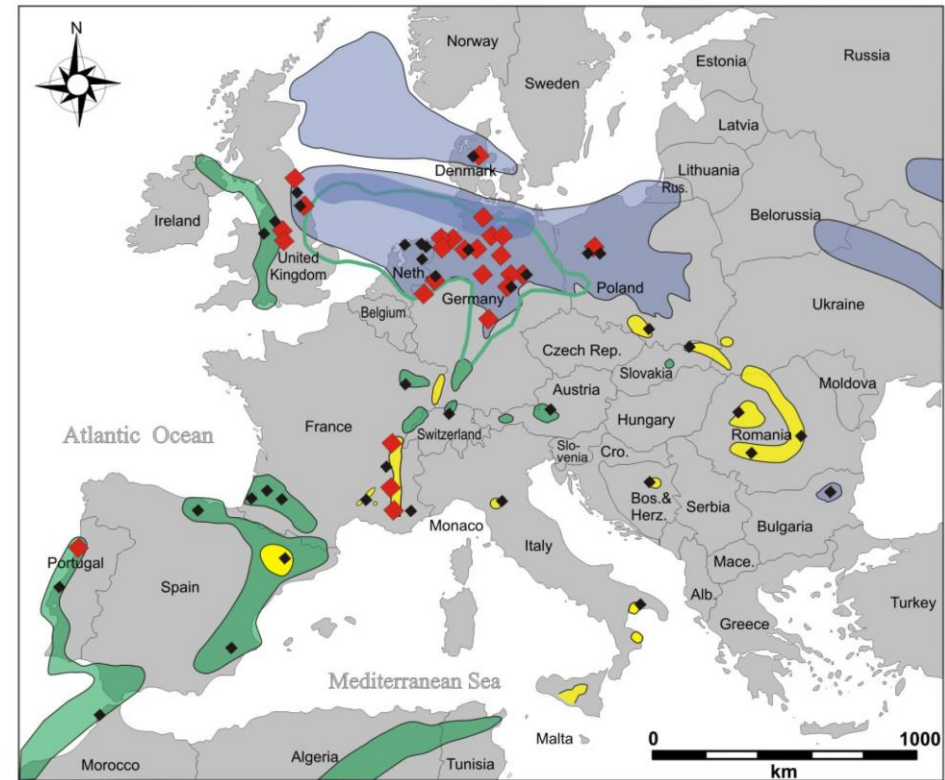
The European Hydrogen Backbone (EHB)

- The "European Hydrogen Backbone" (EHB) initiative proposes a hydrogen network of 39,700 km by 2040, with further growth after 2040. This network connects 21 European countries. The vision released in 2021 follows the EHB report published in 2020; that report described a 23,000 km network covering just ten countries.
- Approximately 69% of the proposed hydrogen network consists of reused existing natural gas networks. The remaining 31% of newly built pipelines are needed to connect new buyers and are located in countries with small gas networks today, but high hydrogen demand and supply in the future.



Underground Hydrogen storage

- It is estimated that 5 to 12 Million tons of hydrogen should be stored along the European Union.
- Europe has many usable salt deposits and many salt caverns that could be useful in that sense.

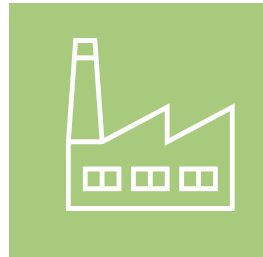


Source A review at the role of storage in energy systems with a focus on Power to Gas and long-term storage - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Underground-salt-deposits-and-cavern-fields-in-Europe-225_fig5_319417820 [accessed 26 Mar, 2020]

Spain's Hydrogen Potential



Allows greater penetration of renewable energies in the mix



Transversality: transport, industry, electricity production and buildings decarbonization



Key for technological partnerships and circular economy



Huge potential for renewable hydrogen production. Strategic geographical position



Self-sufficiency and potential to become a reference hydrogen exporter

Great opportunity for economic and technology development

Spain's Hydrogen Roadmap

“Hydrogen Roadmap: a commitment to renewable hydrogen”

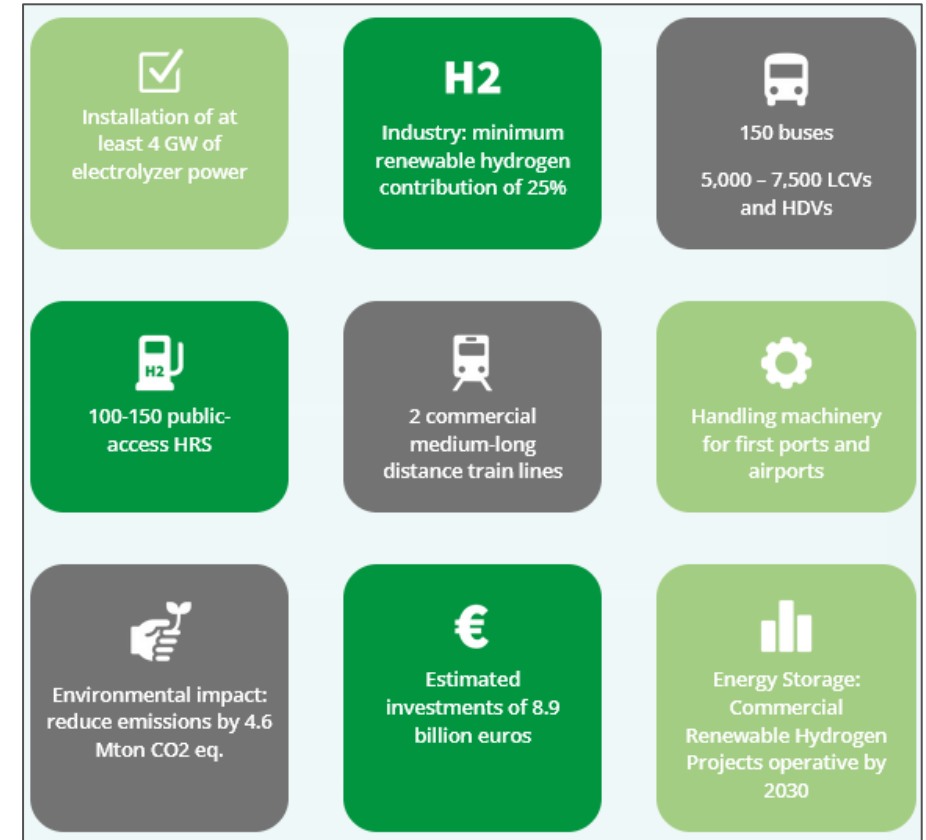
6th October 2020 - Approved in Council of Ministers



The Roadmap offers a 2030 and 2050 Vision, establishing ambitious country goals in 2030, which foresee an installed capacity of electrolyzers of 4 GW and a series of milestones in the industrial sector, mobility and the electricity sector, for which It will be necessary to mobilize investments estimated at 8,900 million euros during the 2020-2030 period.

The renewable potential of our country represents a great opportunity for the development of these technologies and the national business fabric, being able to turn Spain into a hydrogen-exporting country if the appropriate decisions are made

October 6th, 2020 - Spanish H2 Roadmap



2030 objectives



VICEPRESIDENCIA TERCERA DEL GOBIERNO

MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

PERTE on hydrogen

The Ministry for the Ecological Transition and the Demographic Challenge (MITECO) has published the first PERTE ERHA grants: renewable energies, renewable hydrogen and storage.

- ✓ It will allow the mobilization of 16,370€ million.
- ✓ **Creation of 280,000 jobs (direct and indirect).**
- ✓ **Public investment: 6,920 M€.**
- ✓ **Private investment: 9,450 M€.**



250 M €
8/04/22 - 7/06/22
(closed)



Source: [IDAE - Convocatorias abiertas 2022](#)

150 M €
7/03/22 - 6/05/22
(closed)



Hydrogen storage and distribution in Spain

The gas infrastructure in Spain is very important and a strength:

- Large natural gas storage, transportation and distribution network.
- 13,000 km of gas pipelines.
- 80,000 km of distribution network.
- 6 regasification plants.
- 3 strategic storages.
- 6 international connections linking the gas system with France, Portugal and North Africa.



Source: Enagás

Use for clean heat and power

Clean heating and power can be provided combined with renewable energy and using green hydrogen.



In Spain, several projects are emerging to use clean energy and heat.

- Many of them are emerging to use renewable gas and green hydrogen for homes.

- The construction and application of a renewable hydrogen production and supply infrastructure with the aim of supplying homes are also being established.



Use for clean heat and power

Green Hysland

GREEN HYSLAND aims to deploy a fully-functioning Hydrogen (H₂) ecosystem on the island of Mallorca, Spain, turning the island into Europe's first H₂ hub in Southern Europe. This will be achieved by producing green hydrogen from solar energy and delivering it to the end users, such as the island's tourism, transport, industry and energy sectors, including gas grid injection for green heat and power local end-use.



The project has a duration of 5 years (2020-2025) and has the participation and collaboration of a consortium formed by more than 30 entities, including the Spanish Hydrogen Association.

It will be first industrial-sized green hydrogen plant in Spain, which will produce at least 300 tonnes per year to serve various energy needs on the Balearic island.



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 101007201. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research. The content of this website reflects only the authors' view and the JU is not responsible for any use that may be made of the information it contains.

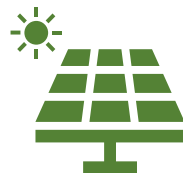


Hydrogen valleys

Hydrogen Valleys have become a global phenomenon with integrated projects emerging all around the world.

NextGen-EU funds can also be a mechanism to promote these types of projects throughout the European Union.

- **Spain** is one of the most likely territories to become a benchmark hub for the hydrogen economy in Europe.
- There are currently several **hydrogen valley** projects in Spain. In addition, many initiatives are emerging nowadays.
- Currently, in Spain, one of the most important projects is Green Hysland (mentioned before).



Hydrogen valleys

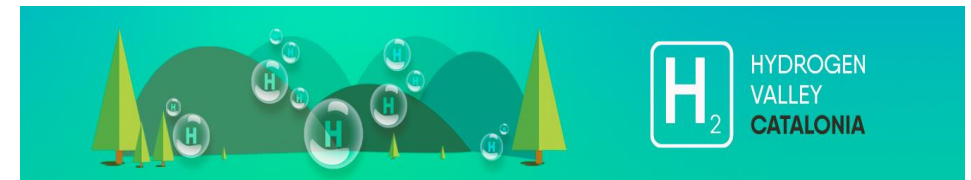
Basque Hydrogen Corridor

It counts with +78 entities. This project is based on a comprehensive strategy, which includes 34 projects from the entire value chain and aims to be a lever to transform the productive fabric and manage to maintain the weight of industry in our economy.



Hydrogen Valley Catalonia

Hydrogen valley Catalonia works to consolidate an integrated ecosystem around the hydrogen value chain, a vital energy vector to achieve the objective of climate neutrality, in parallel to increasing business competitiveness and improving people's well-being.



Hydrogen valleys

Ebro Corridor

Aragon has been the setting chosen to present the Ebro Hydrogen Corridor, a project that seeks to boost inter-territorial connection and serve as a link between the major regional initiatives around renewable hydrogen that are already underway in northeastern Spain.



SHYNE

The SHYNE (Spanish Hydrogen Network) project, the largest renewable hydrogen consortium in Spain, made up of 33 entities from different sectors. SHYNE aspires to be a benchmark project in Europe, structuring new opportunities throughout the value chain.

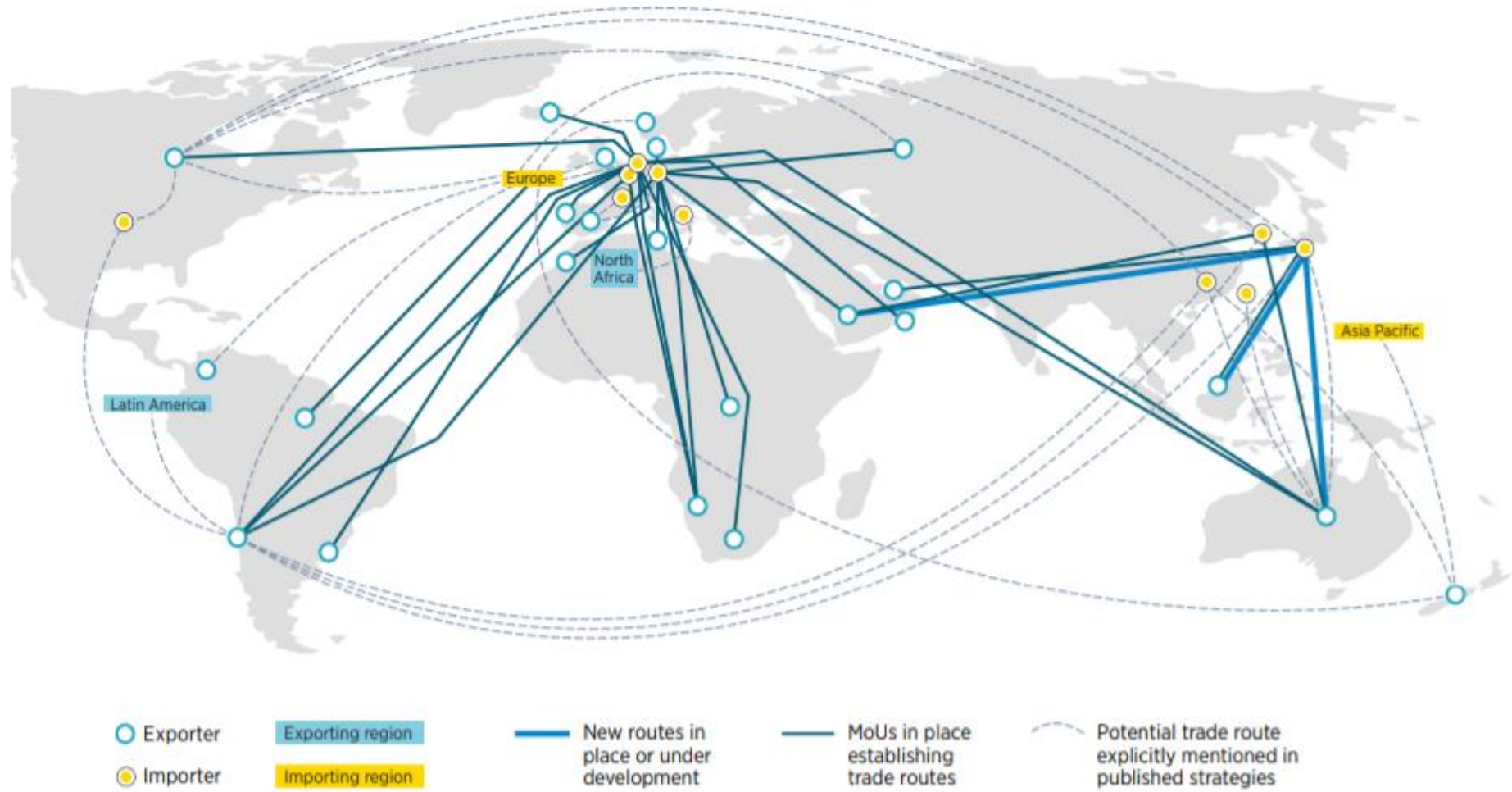


Hydrogen Valley Andalusia

A megaproject called the Andalusian Hydrogen Valley, which contemplates the development of two production plants for this clean fuel. A company plans to invest 5,000 million euros in six years to start up this hydrogen hub,



Collaborations



Collaboration: Spain-Japan

MOU between AeH2 and JH2A:

- On October 14th, 2022, both associations established a non-binding strategic partnership to build a practical environment to exchange ideas and collaborate.



Collaboration: Spain-Japan

Potential areas of cooperation:

- Renewable Hydrogen production
- Fuel cells and FC systems
- CHP and Micro - CHP



Through different approaches:

- R&D; universities and research centers
- Companies
- Projects
- Investments



Spanish Hydrogen Association

**Thank you
for your attention**

Javier Brey Sánchez
Chairman

Inés Gómez de Iturriaga Fica
Technical Secretariat

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