

Spanish Hydrogen Association

Hydrogen and FCV R&D in Spain

Industrial and governmental policy overview

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Chairman

21st November 2021

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ASOCIACIÓN ESPAÑOLA
DEL HIDRÓGENO

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FCV R&D

THE VOICE OF THE HYDROGEN SECTOR IN SPAIN

Since 2002



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.

MISION

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

+270
members

+20 years
supporting
the sector

+15 years
international
collaboration



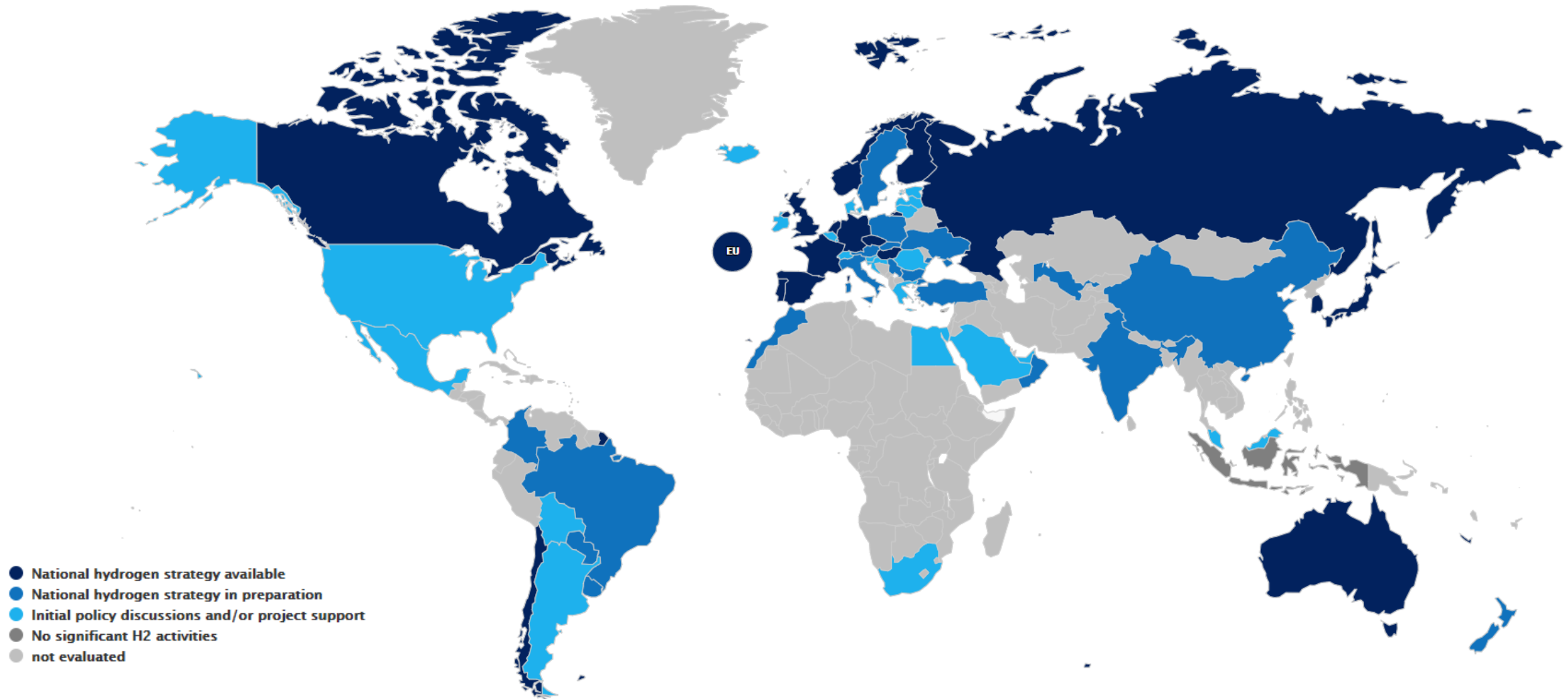
AeH2's members



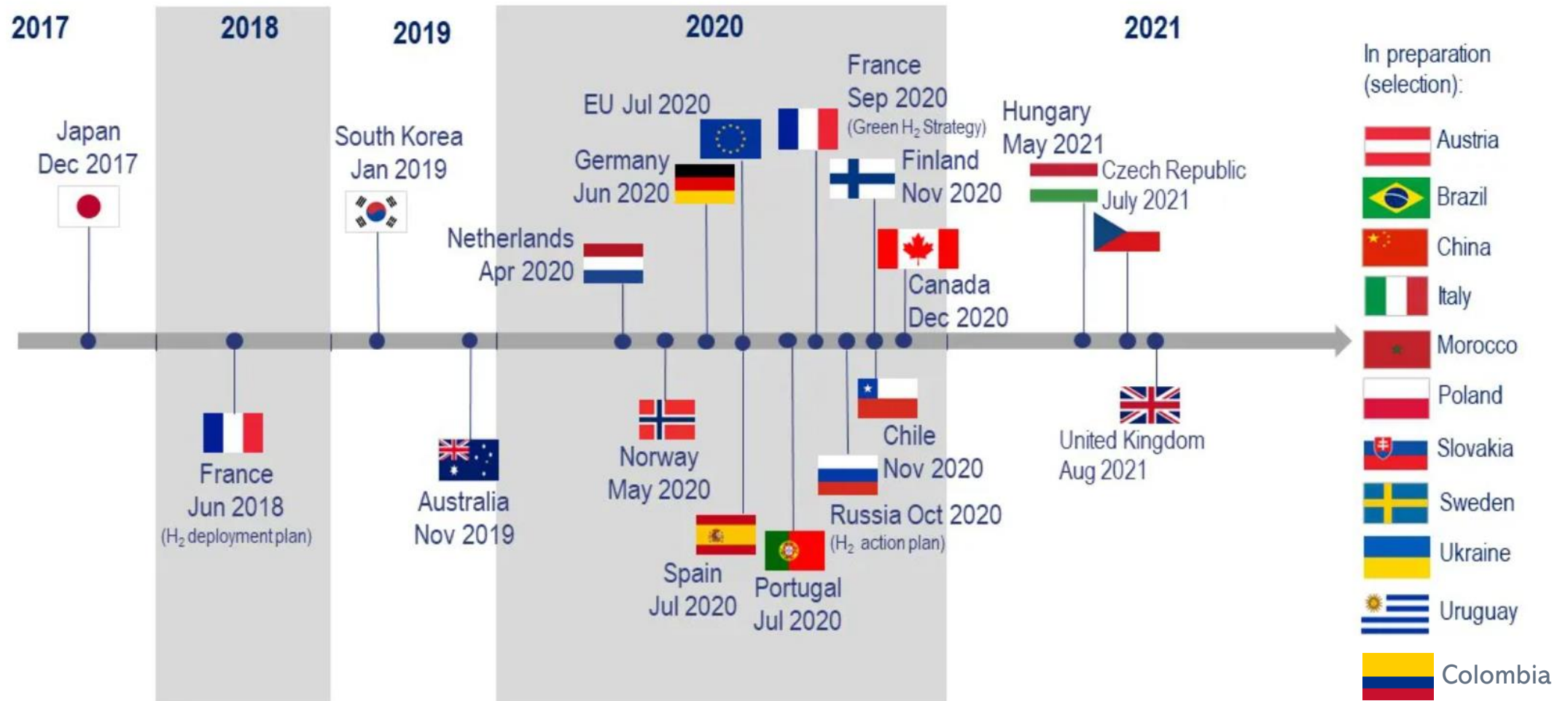
AeH2's promoters



World Hydrogen Overview



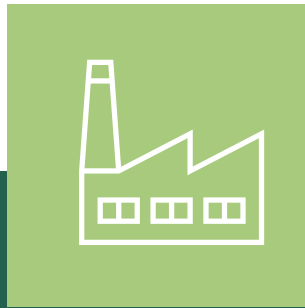
National hydrogen strategies



Hydrogen potential in Spain



Allows greater penetration of renewable energies in the mix



Transversality: transport, industry, electricity production and buildings decarbonization



Key to the “coupling sector” and the circular economy



Huge potential for renewable hydrogen production. Strategic geographical position.

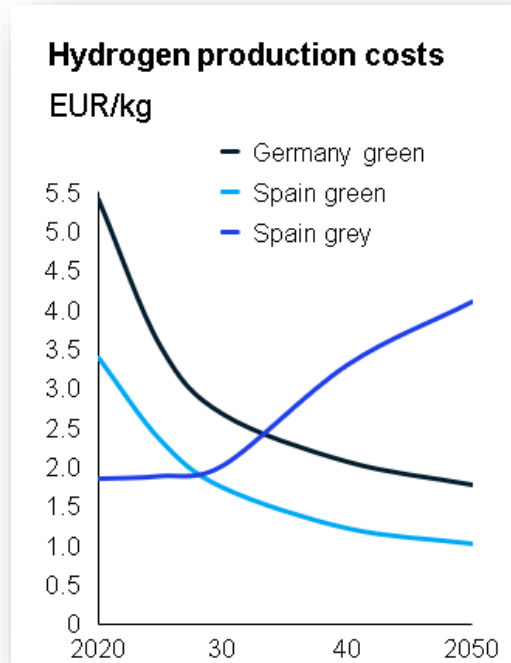


Self-sufficiency and supply of hydrogen

Great opportunity for economic and in-house technology development

Europe & Spain favorable conditions for Renewable H₂

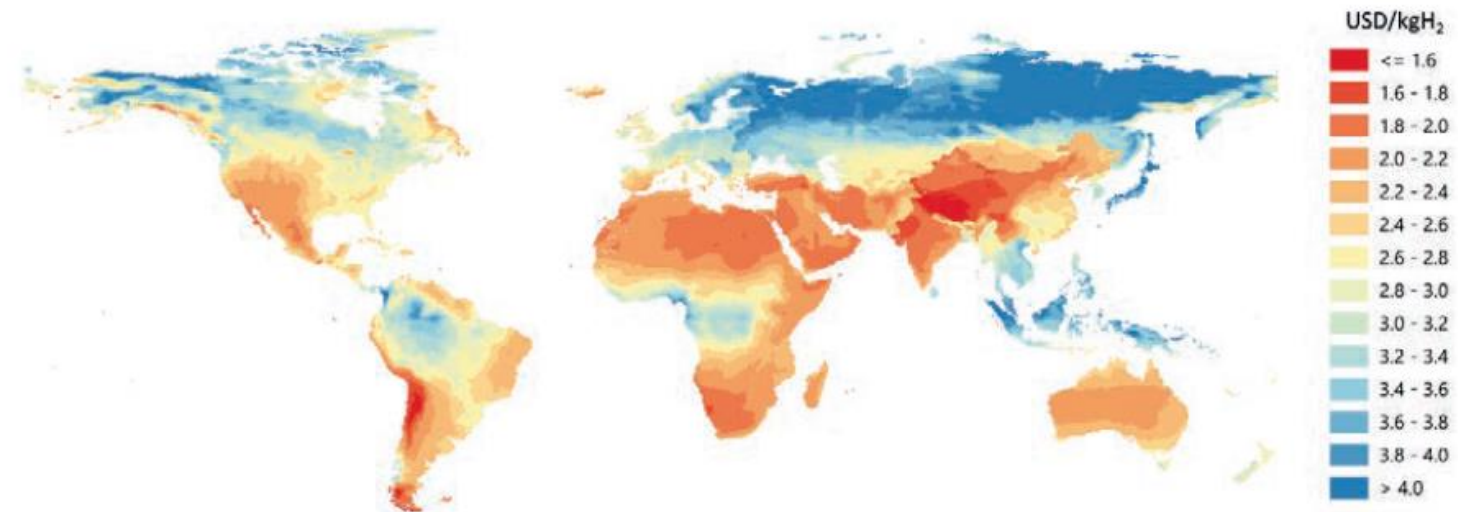
Spain holds a firm position to take advantage of hydrogen technologies



Source: McKinsey & Company

- ✓ Hydrogen production costs will be reduced 40% in the next 10 years.
- ✓ It has an important gas infrastructure installed.

Figure 14. Hydrogen costs from hybrid solar PV and onshore wind systems in the long term



Notes: This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. Electrolyser CAPEX = USD 450/kW_e, efficiency (LHV) = 74%; solar PV CAPEX and onshore wind CAPEX = between USD 400–1 000/kW and USD 900–2 500/kW depending on the region; discount rate = 8%.

Source: IEA analysis based on wind data from Rife et al. (2014), NCAR Global Climate Four-Dimensional Data Assimilation (CFDDA) Hourly 40 km Reanalysis and solar data from renewables.ninja (2019).

Strengths & Opportunities

Strength 1

- ✓ RENEWABLE RESOURCES
- ✓ GEOGRAPHIC SITUATION
- ✓ LARGE TRACTOR COMPANIES

Strength 2

- ✓ SPECIALIZED INDUSTRIAL AND PRODUCTIVE FRAMEWORK, FOR THE WHOLE HYDROGEN VALUE CHAIN

Strength 3

- ✓ TECHNOLOGICAL AND INDUSTRIAL DEVELOPMENT CAPABILITIES

National context



Hydrogen Momentum

November 19, 2020: Historic day for the hydrogen sector in Spain
Conference "Renewable hydrogen: an opportunity for Spain"





VICEPRESIDENCIA
CUARTA DEL GOBIERNO DE ESPAÑA

MINISTERIO
PARA LA TRANSICIÓN ECOLÓGICA
Y EL RETO DEMOGRÁFICO

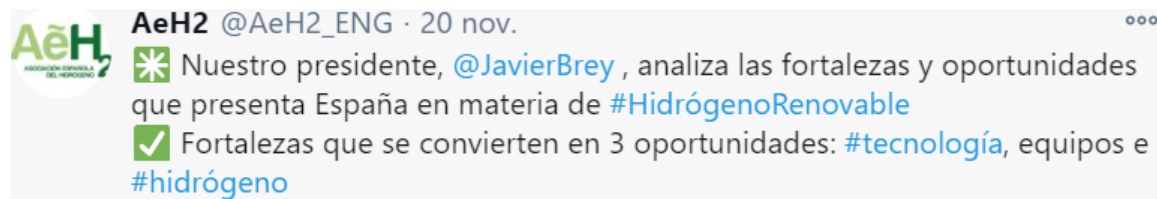


Hidrógeno Renovable: Una Oportunidad para España

El Gobierno destinará más de 1.500 millones al impulso del hidrógeno renovable hasta 2023 a través del Fondo Europeo de Recuperación

Pedro Sánchez defiende el uso del hidrógeno renovable para alcanzar la neutralidad climática e impulsar la recuperación económica

La Moncloa, Madrid, jueves 19 de noviembre de 2020





Hoja de Ruta del Hidrógeno: una apuesta por el hidrógeno renovable

Aprobado en Consejo de Ministros, el 6 de octubre de 2020, a propuesta del Ministerio para la Transición Ecológica y el Reto Demográfico (MITECO).

VISIÓN DE ESPAÑA PARA 2030:



“Spanish Hydrogen Roadmap: a commitment to renewable hydrogen”

6th of October- Approved by the Council of Ministers



- ✓ 60 national measures & objectives for the implementation of renewable hydrogen by 2030, aligned with the European Hydrogen Strategy.
- ✓ **Intermediate milestone for 2024: having an installed capacity of between 300 and 600 MW.**
- ✓ Objectives aimed at the production of renewable hydrogen and the areas of activity where a greater demand for renewable hydrogen has been identified: industry, mobility and the electricity sector or energy storage.
- ❖ A great step to promote the development of renewable hydrogen and move towards a hydrogen economy in our country.
- ❖ **Green hydrogen will be key for Spain to achieve climate neutrality and a 100% renewable electricity system no later than 2050.**

Accelerating the hydrogen sector

June 2020, Call for abstracts – Ministry of Industry (MINCOTUR) - Important Projects of Common European Interest (IPCEI).

- ✓ Accelerate the development of the hydrogen industrial sector from across the entire value chain.
- ✓ 28 abstracts.

December 2020, Call for abstracts – Ministry for the Ecological Transition and the Demographic Challenge (MITECO) – Recovery Plan

- ✓ 502 abstracts received accounting for more than 10.000 M€.
- ✓ Greater investment than stipulated in the Spanish Hydrogen Roadmap.



Industria y PYME > Participación pública > DetalleParticipacionPublica

Proyecto Europeo en la cadena de valor del hidrógeno verde bajo el mecanismo "Proyectos Importantes de Interés Común Europeo"

Consulta Cerrada Rango de la Norma: Disposición de otras autoridades Carácter de la consulta: No Normativas

Tipo de participación: Proyectos no normativos



Energía > Participación pública > DetalleParticipacionPublica

Manifestación de Interés: Plan de Recuperación, Transformación y Resiliencia. "Proyectos tractores para una transición energética justa e inclusiva: Hidrógeno Renovable"

Consulta Cerrada Rango de la Norma: Disposición de otras autoridades Carácter de la consulta: No Normativas Tipo de participación:

Proyectos no normativos

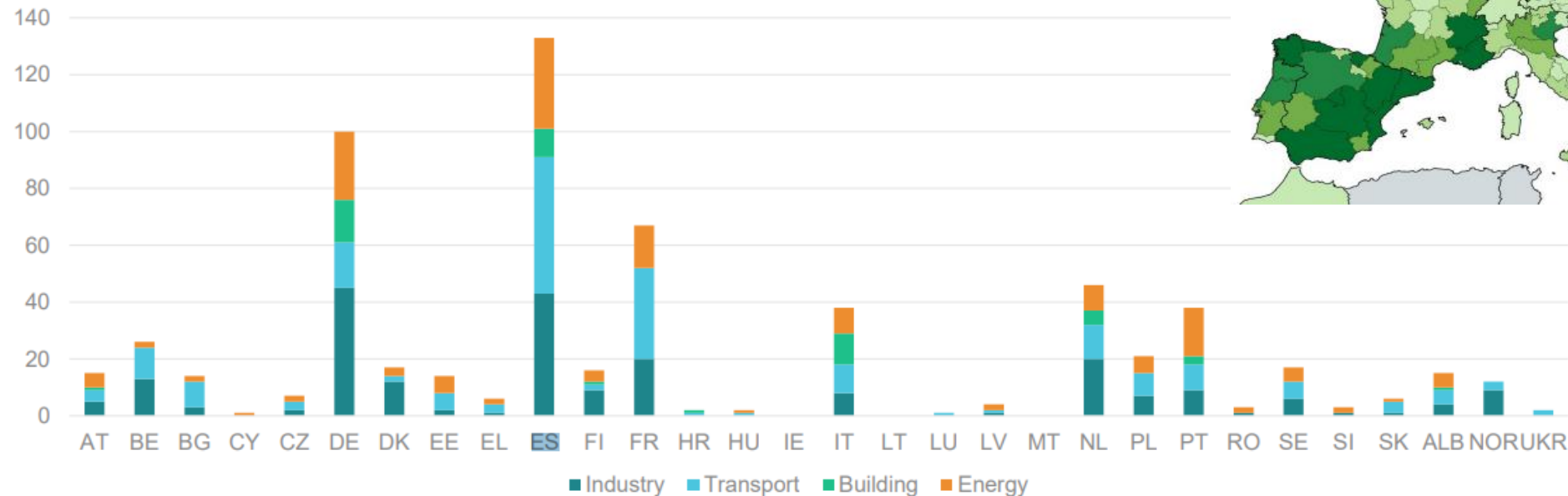
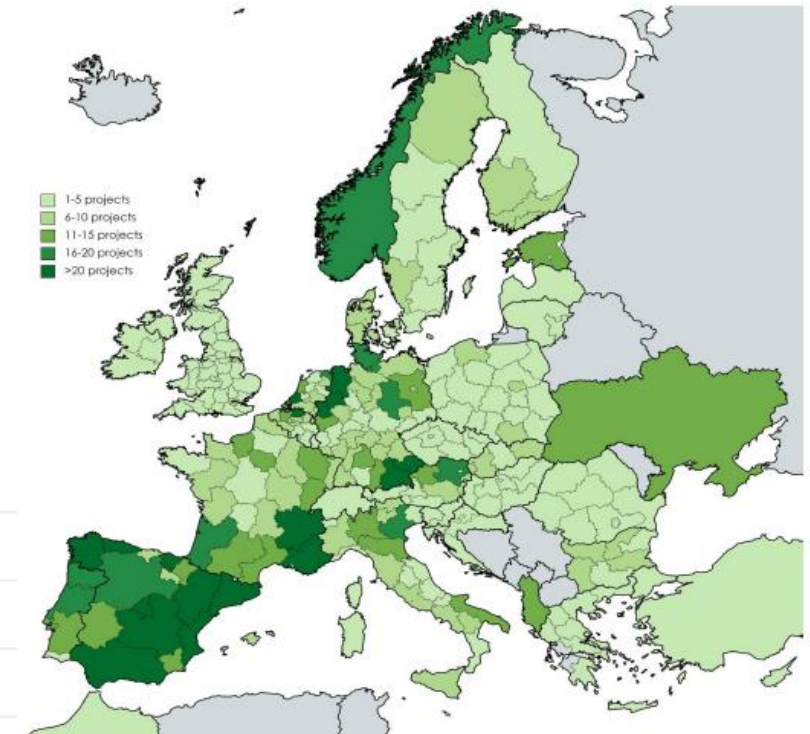


May 2021, Call for abstracts – European Clean Hydrogen Alliance (ECH2A)

- ✓ Project compilation as a first step towards building a portfolio of viable investment projects to achieve the objectives in the hydrogen strategy for a climate-neutral Europe.
- ✓ 1052 abstracts.

ECH2A: Overview of all eligible projects collected

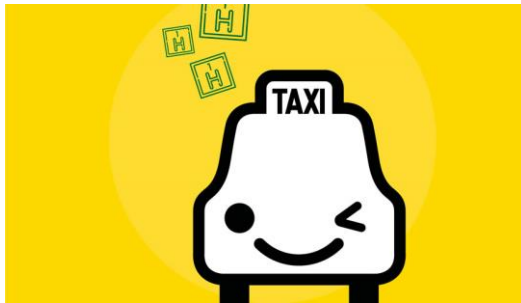
- ✓ Large-scale deployment planned: **997 eligible projects collected.**
- ✓ Deployment starting now: two thirds of hydrogen production and consumption projects
- ✓ scheduled for deployment within 3 1/2 years
- ✓ **Strong focus on renewable hydrogen: 84% of hydrogen production projects are on electrolyzers that can produce renewable hydrogen**
- ✓ **Spain > 130 projects**



FCEV Research & Development

El objetivo es reemplazar gradualmente al menos 1.000 taxis hasta 2026 con una inversión de 100 millones de euros

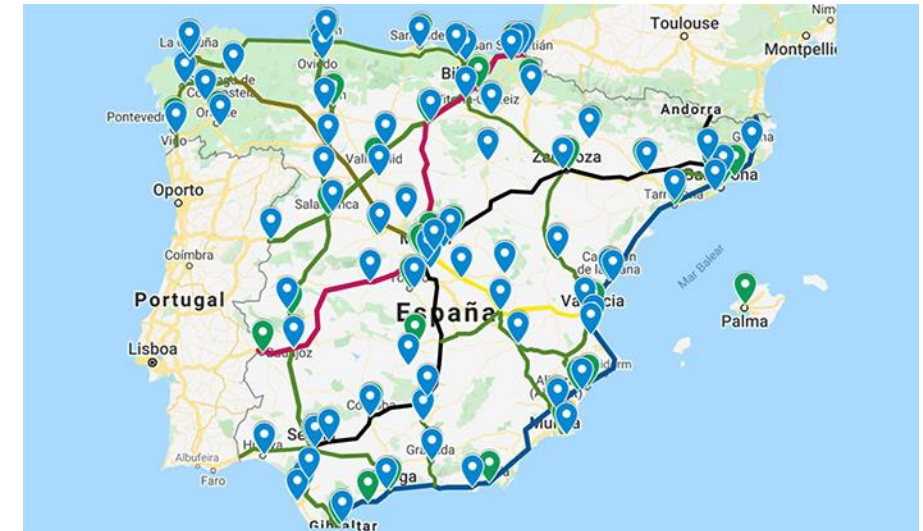
FPTM impulsa “el mayor proyecto de movilidad pública con hidrógeno verde”



La Comunidad de Madrid presenta el primer autobús de hidrógeno que circulará en España



Development of a network of at least 150 HRS to meet the Hydrogen Roadmap objectives



Source: [Gasnam & ANFAC | Informe despliegue de hidrogeneras](#)



FCV at EHEC 2018, Málaga. March 2018

Spanish Hydrogen Association

Thank you for your attention

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Chairman



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