

# Clean Hydrogen Partnership: R&I activities in hydrogen technologies in Europe – focus on working with regions and H2 valleys

Renata Kadric, *Synergies Officer*





# EU Institutional Public-Private Partnership (IPPP) 2021-2031



**1 billion EURO from Horizon Europe\*** to implement R&I activities and facilitate the transition to a greener EU society through the development of hydrogen technologies

**\* additional 200 million EURO for Hydrogen valleys (under RePowerEU)**

# Clean Hydrogen JU Objectives

## General

- 

Support the implementation of the Commission's **Hydrogen Strategy**
- 

Stimulate **research and innovation on clean hydrogen** production, distribution, storage and end use applications
- 

Strengthen the **competitiveness of the EU clean hydrogen value chain**
- 

Contribute to the EU ambitious **2030 and 2050 climate ambition incl Green Deal**

## Specific

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Improve the **cost-effectiveness, efficiency, reliability**, quantity and quality of clean hydrogen solutions across **entire value chain**
- 

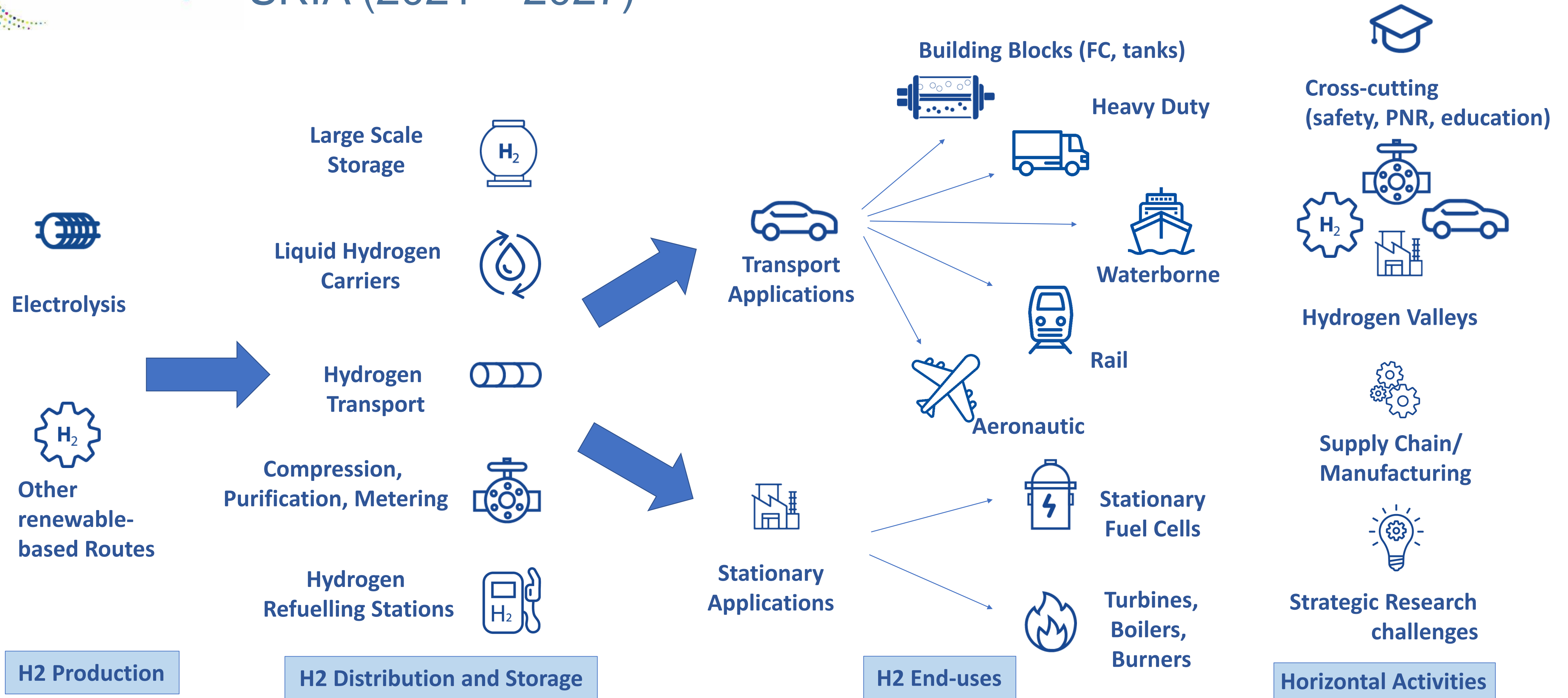
Strengthen the **knowledge/capacity of scientific and industrial actors** along the Union's hydrogen value chain while supporting the **uptake of skills**
- 

Demonstrations of clean hydrogen solutions with a view to **local, regional and Union-wide deployment**, aiming to involve stakeholders in all Member States and across **entire value chain**
- 

Increase **public and private awareness, acceptance** and uptake of clean hydrogen solutions



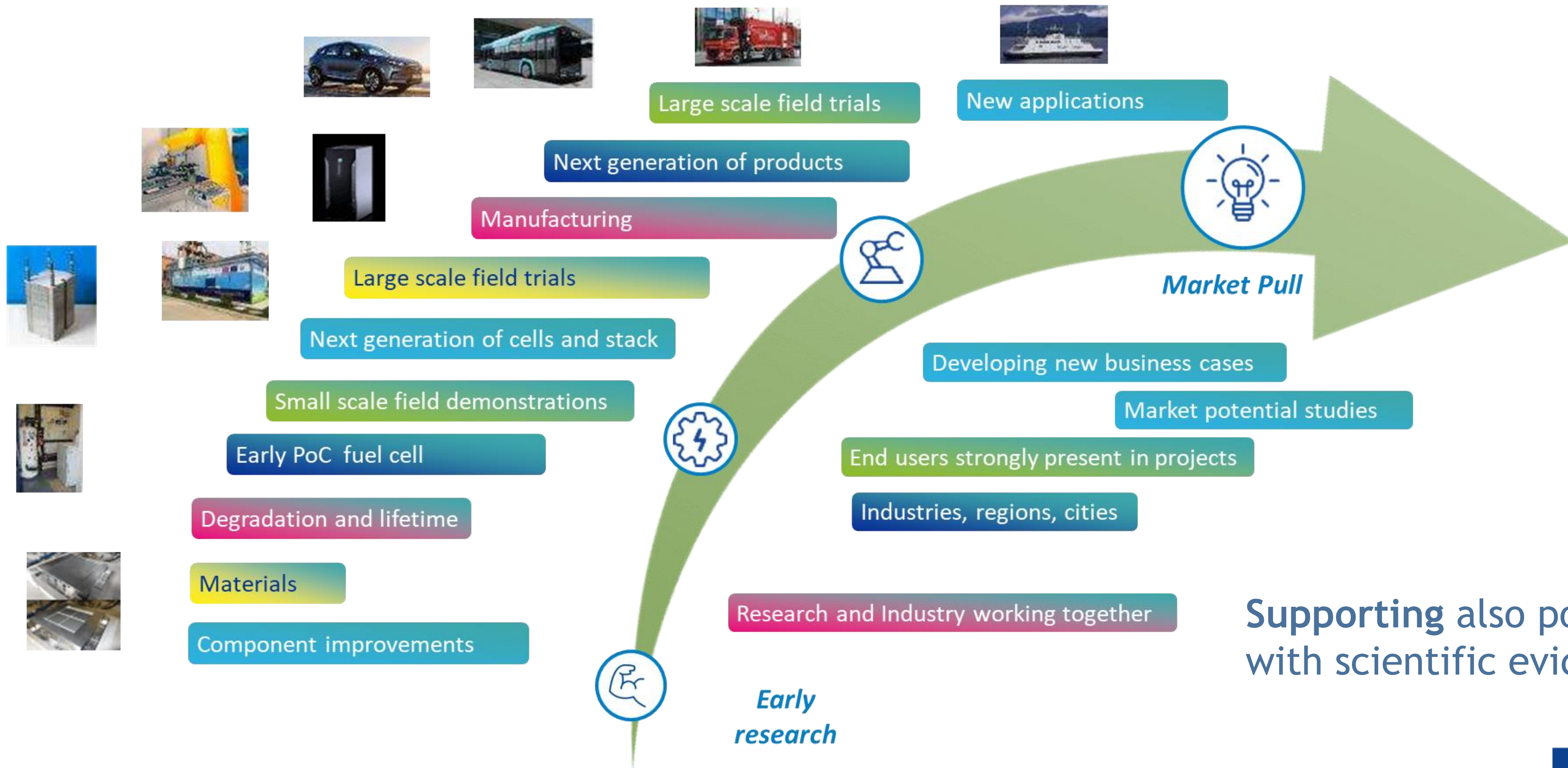




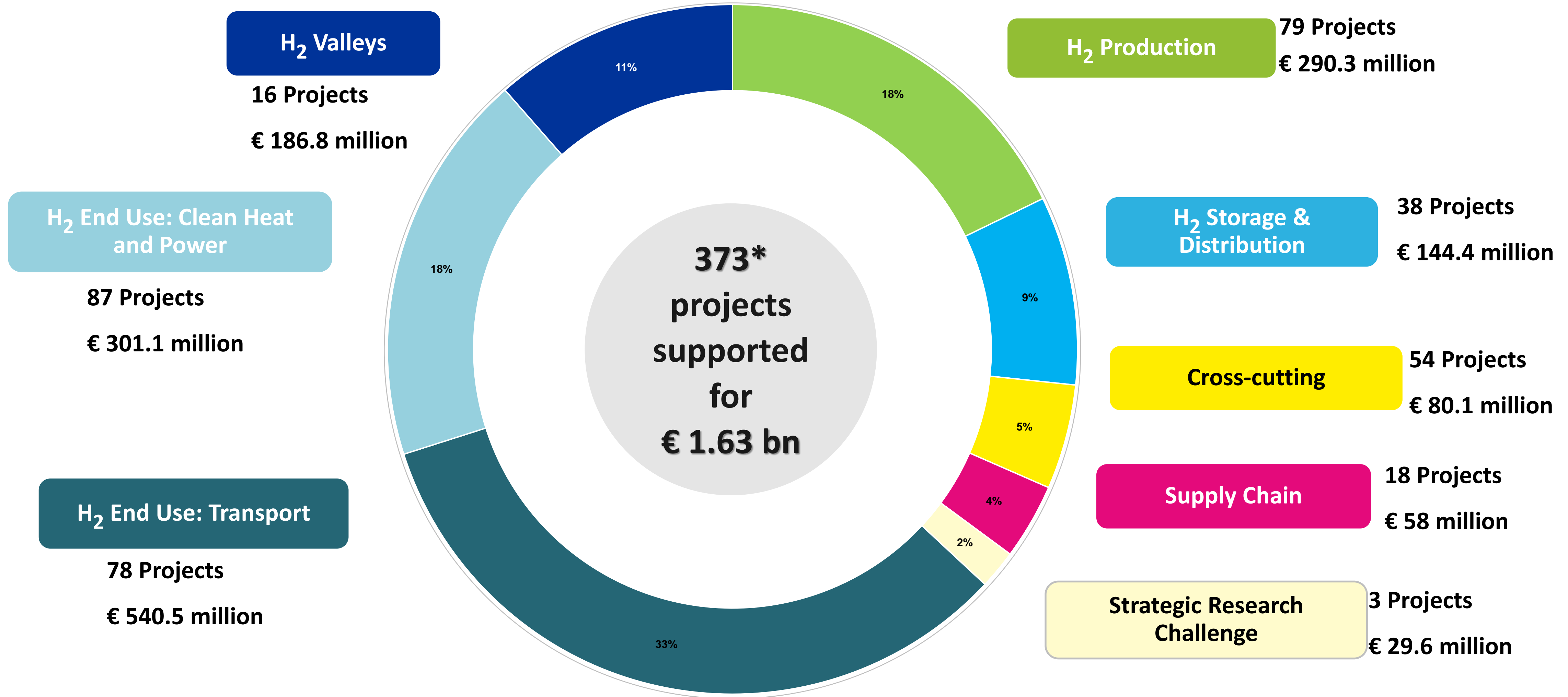


# 16 years journey of the Joint Undertaking

From research to delivering hydrogen solutions/innovations in the market, continuing the work of predecessor FCH JU...



Supporting also policy with scientific evidence!





Roadmap for accelerating the deployment of Hydrogen Valleys across Europe –  
Commission staff working document (June 2024)

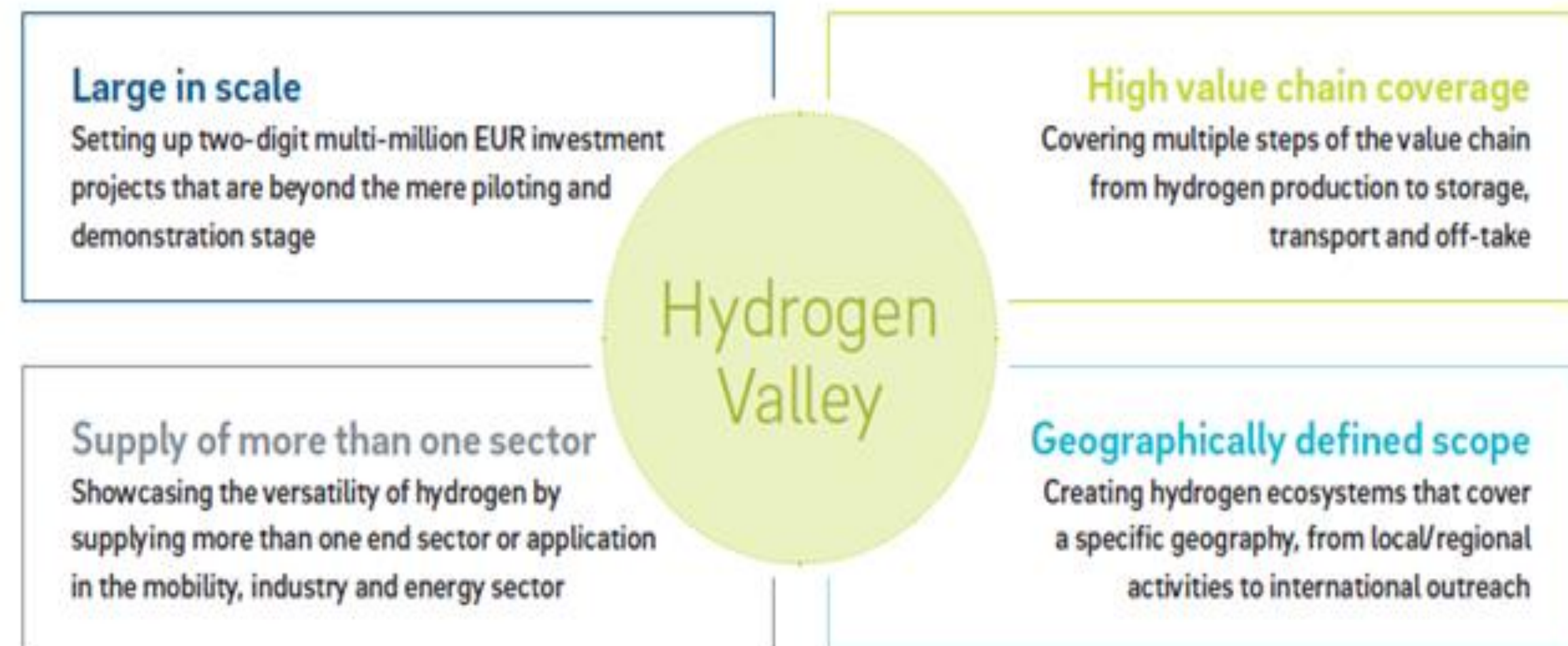
Hydrogen valleys = hydrogen ecosystems

H2Vs are defined as “geographic areas - a city, a region, an island or an industrial cluster - where several hydrogen applications, new and/or existing, are combined into an integrated hydrogen ecosystem that consumes a significant amount of hydrogen. These projects should cover the entire value chain: production, storage, distribution, and multiple end-uses”.

From idea to the build and operation of the valleys the following phases can be distinguished:

- Phase 1 - Project concept developed
- Phase 2 - Feasibility study ongoing
- Phase 3 - Pre-FID
- Phase 4 - Post-FID
- Phase 5 - Under construction
- Phase 6 – Operational

## A: What makes a Hydrogen Valley

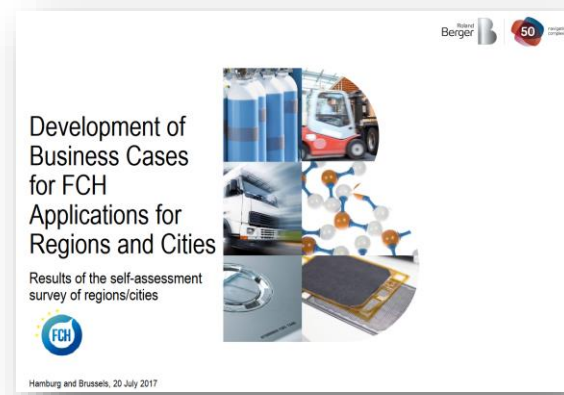




# Working with regions - Raising awareness, developing ideas and implementing hydrogen projects

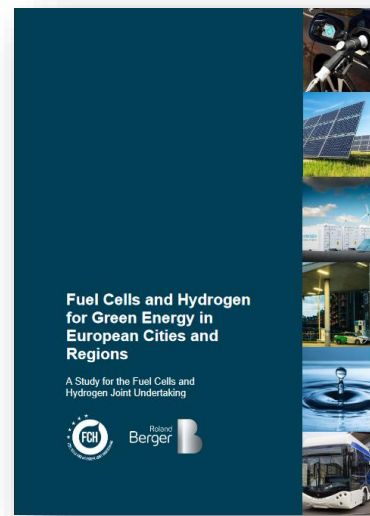
## Regions initiative (2016-2018)

To support cities and regions with an interest in FCH technologies



### Engagement

- Business cases for FCH applications;
- Mapping of local assets;
- Identification of existing funding;



### Report

- FCH applications: status and potential;
- FCH plans and ambitions;
- Way forward;



### MOU

- 89 European Regions;
- 22 countries
- 1/4 of Europe's population, surface & GDP;

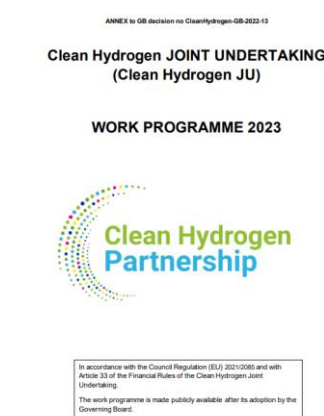
Hydrogen Valley S3P Platform

## Project Development Assistance (2021-onwards)



From idea to project plan

## JU Annual Work Plans



Support to investments: H2 projects including H2 Valleys

## MI2.0 H2V Platform



Global collaboration



# Working with regions - Raising awareness, developing ideas and implementing hydrogen projects

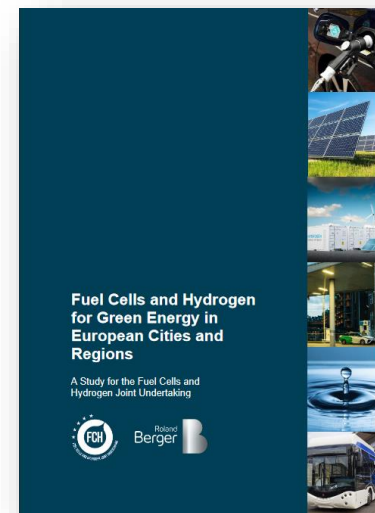
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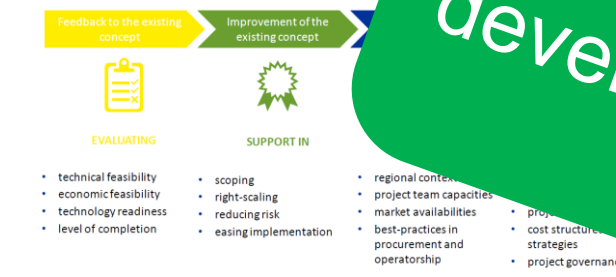


### MOU

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Hydrogen Valley S3P Platform

## Project Development Assistance (2021-onwards)



25 Regions across Europe supported in the development of hydrogen projects

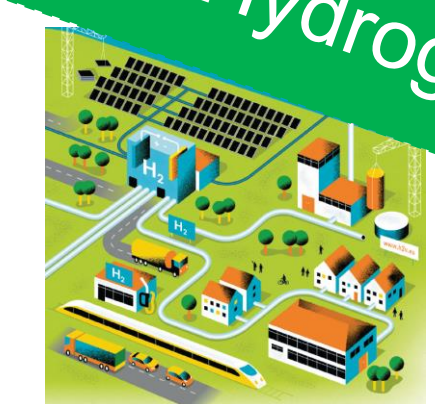


## JU Announcements

16 Hydrogen Valleys supported



## Hydrogen Valley S3P Platform



~100 Hydrogen Valleys worldwide



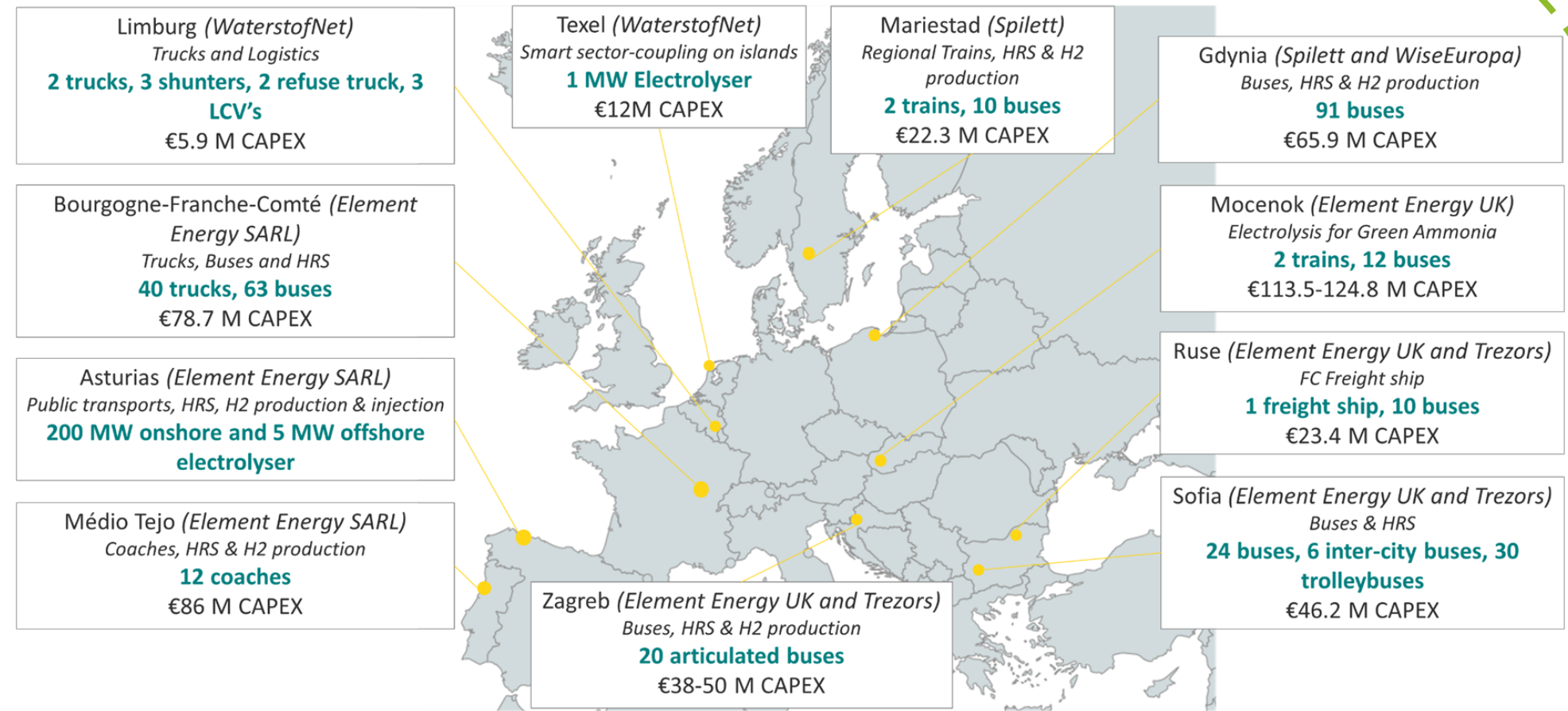


### Services provided to the regions

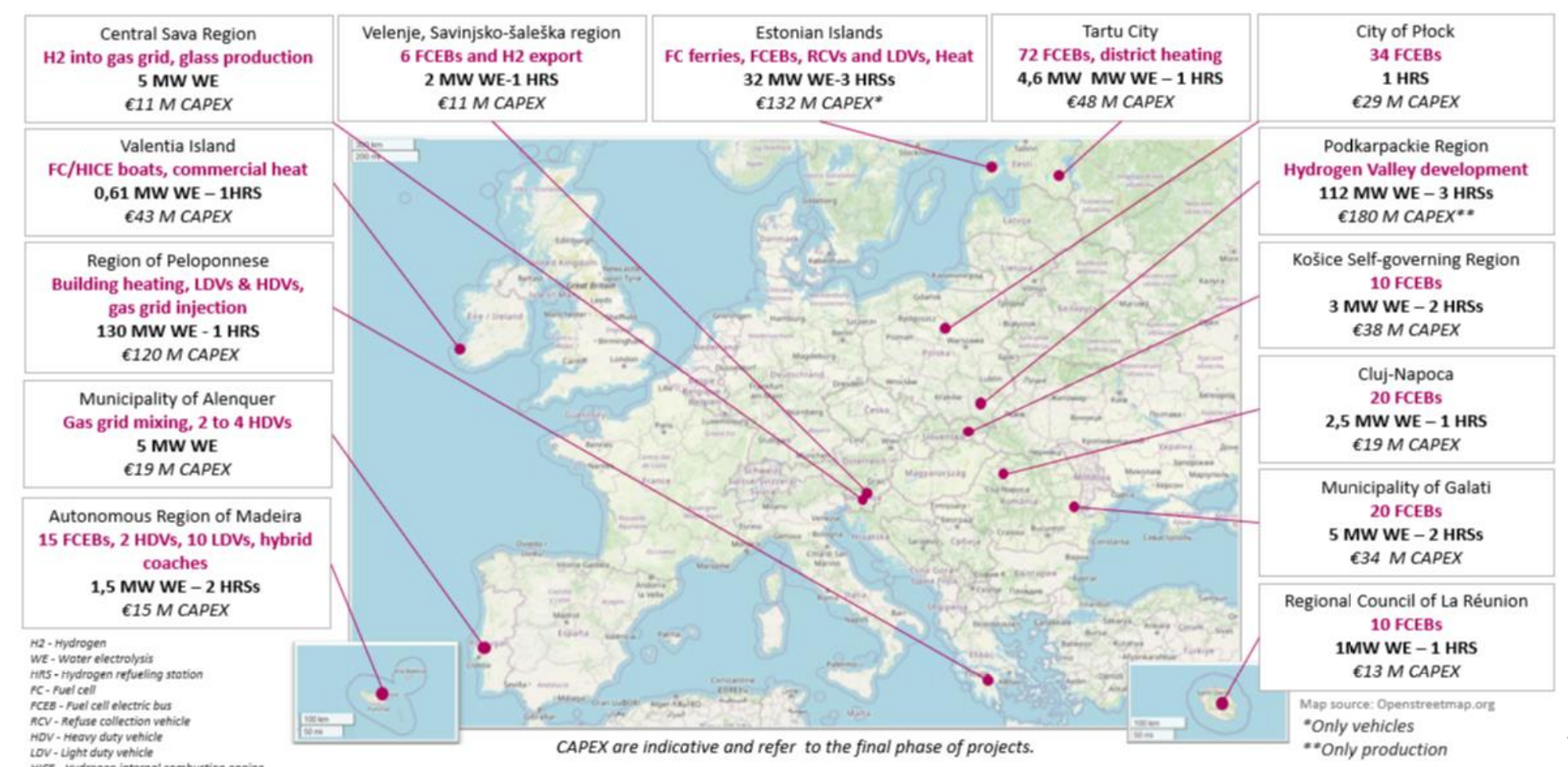


- 1 to 1 sessions with H2 project consultants;
- Development of project plans;
- Connecting regions to industry;
- Advise on proper funding strategies;

## PDA I ( 2020 – 2021) 11 projects



## PDA II ( 2023 – 2024) 14 projects



## PDA/ & PDA II Combined figures:

Regions supported  
25

CAPEX  
€ 1.4 bn

Electrolysers  
Over 500 MW

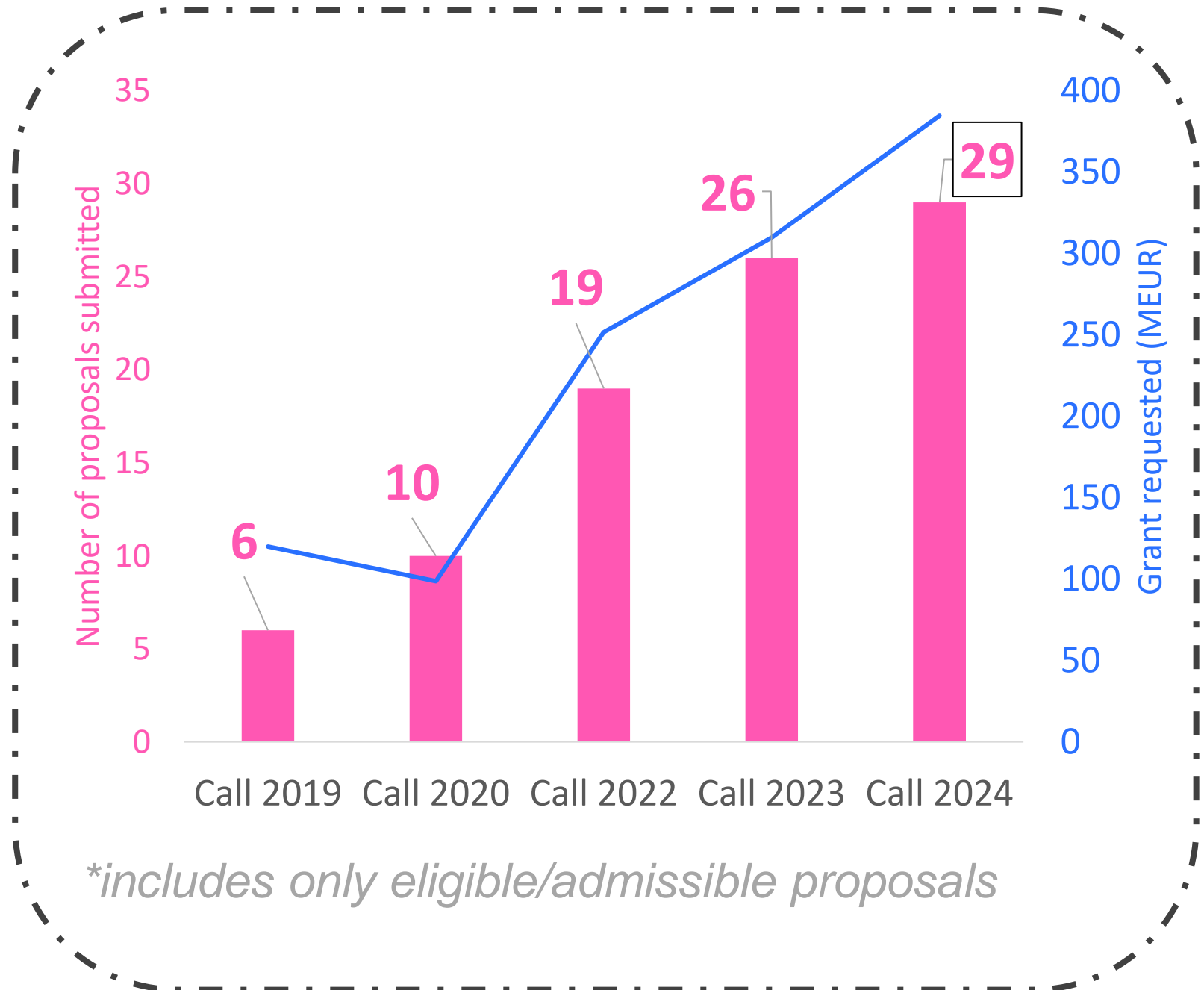
HRS  
More than 30

[Final report published](#)



Building on the Hydrogen Territory concept, introduced in the Call 2015 (BIG-HIT), the Clean Hydrogen Partnership has supported the demonstration of Hydrogen Valleys since 2019

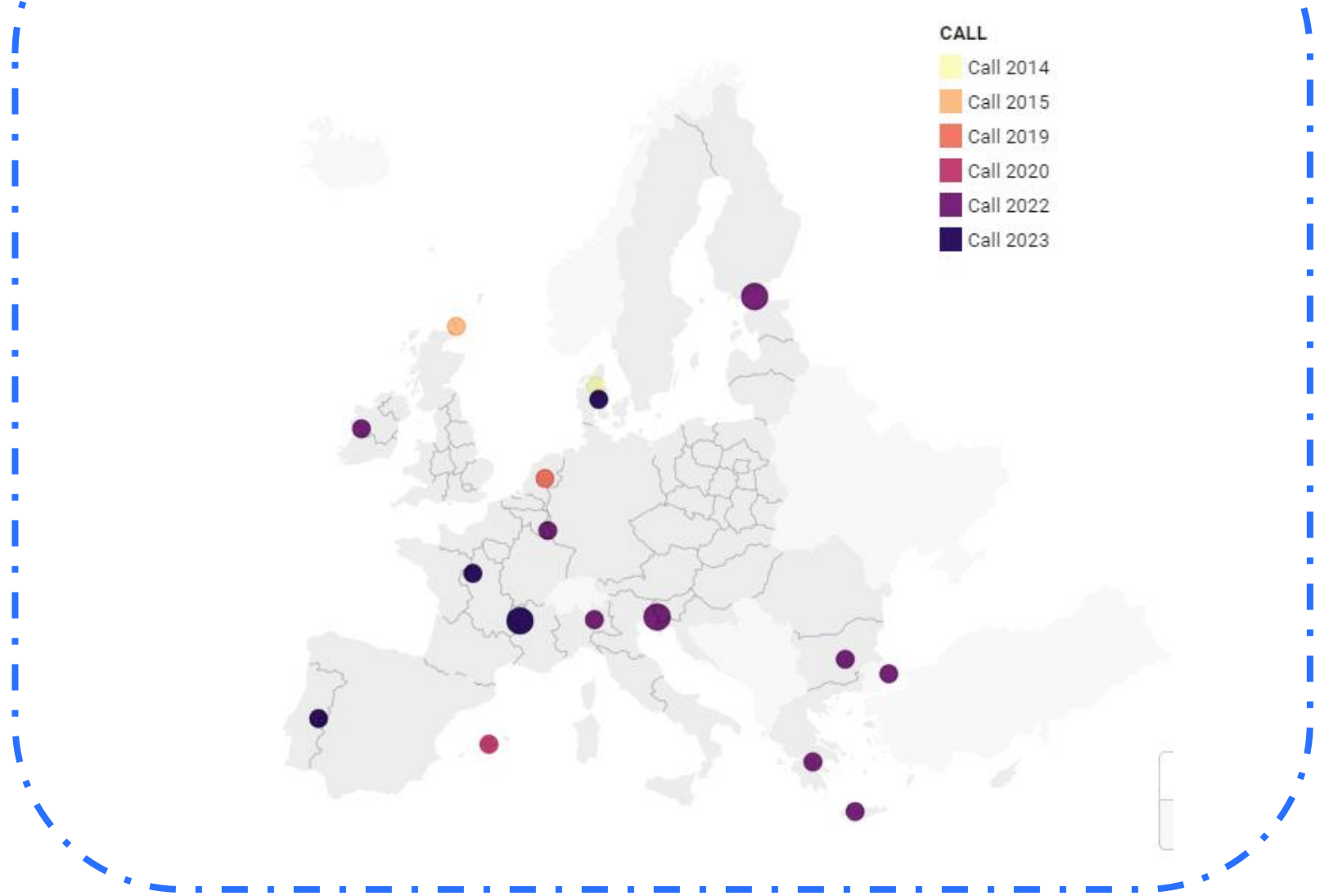
### Increased interest in the Clean Hydrogen JU Calls



The appetite to develop Hydrogen Valleys across Europe has increased

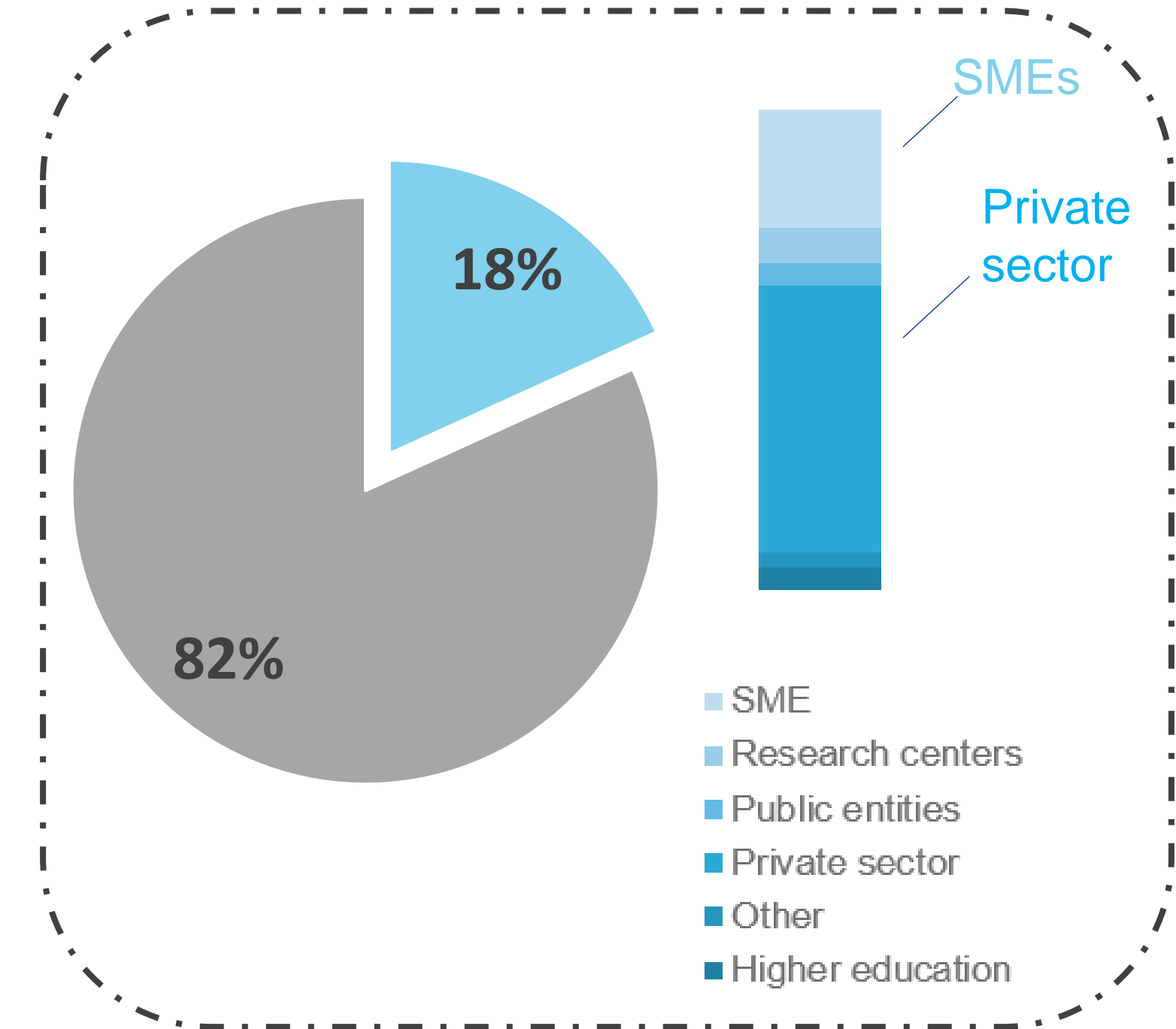
### REPowering the EU with Hydrogen Valleys (as of May 2022)

200 M€\* top-up, spread across 3 years, to double H2V in EU by 2025



**16 Hydrogen Valleys supported to date**  
**15 European countries**  
**>21, 000 tons H2 / year**  
**~ 200 MW equiv\*. Electrolyser capacity**

Total costs: **1,000 M€**  
 JU funding: **187 M€**



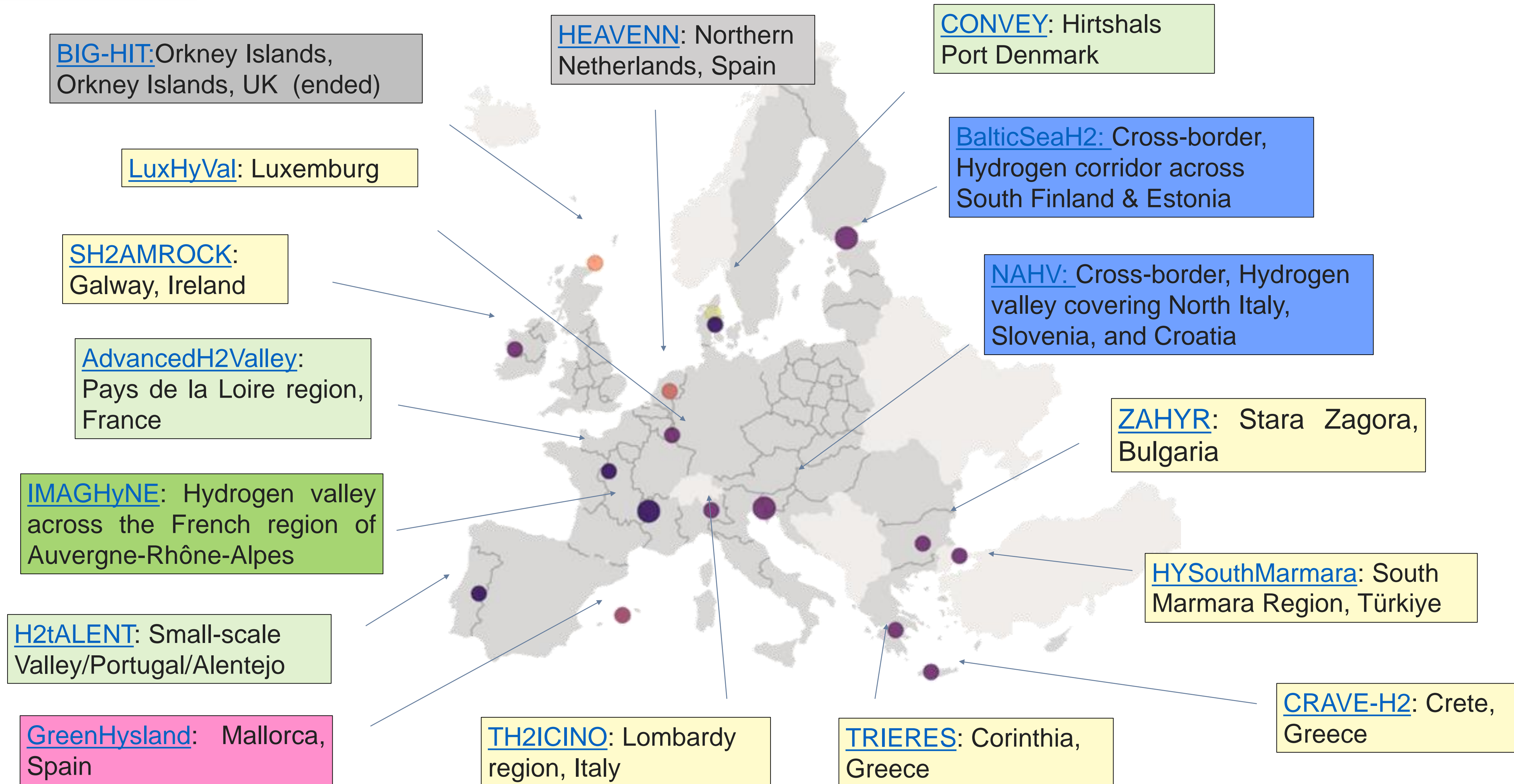
**357 beneficiaries from 37 countries**

*\* This is an estimated equivalent electrolyser capacity calculated using the H2 production requirements of the Call topics. The "to be installed" capacity may differ*



# Hydrogen Valleys supported by the Clean Hydrogen Partnership

Different scales, hydrogen production mainly via electrolysis, diverse end- uses





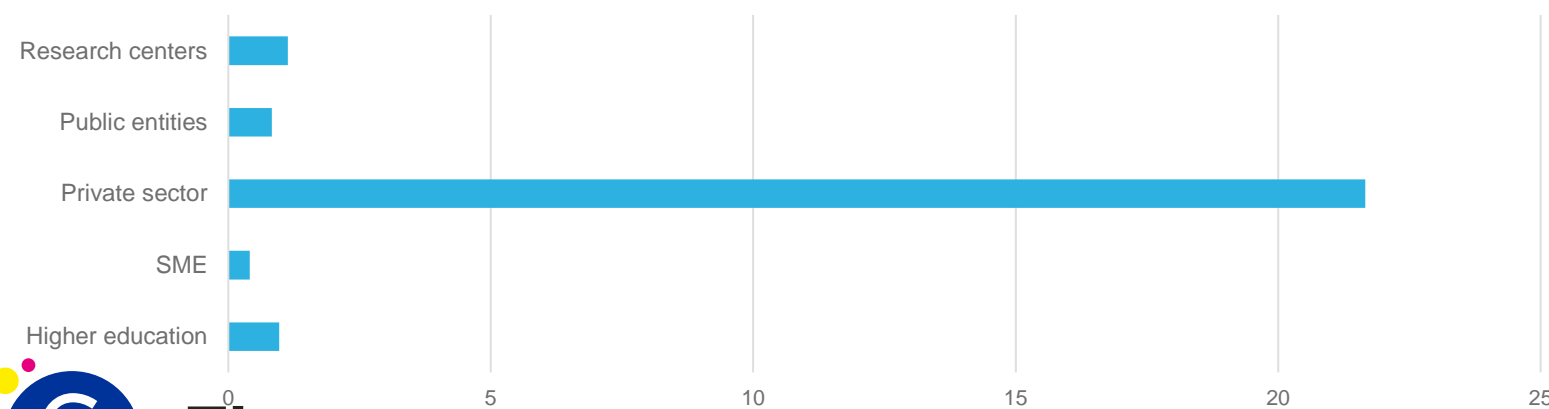
# North-Adriatic H2 Valley, NAHV

## – large scale cross-border H<sub>2</sub> valley

**Coordinator**  
Holding Slovenske elektrarne

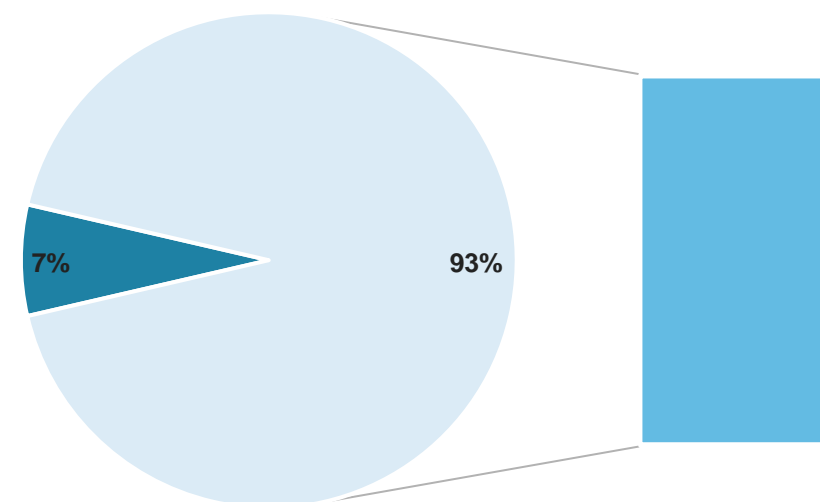
**Consortium**

- 37 partners
- 5 countries
- Entity types



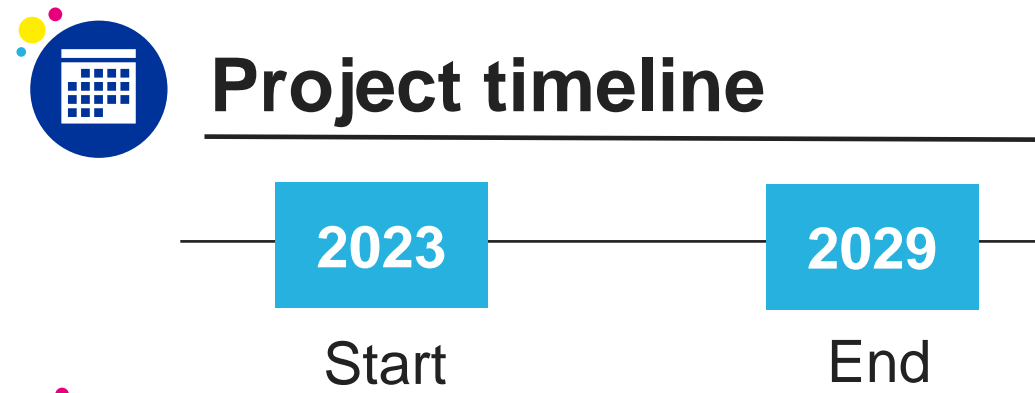
**Finances**

Total costs: 320.3 M€  
JU funding: 25 M€



**More info**  
Website: <https://www.nahv.eu/>

**H<sub>2</sub> production volume**  
> 5,000 tons per year



**Location**



**Synergies**

BIG HIT, HEAVENN, GreenHysland, HyCOMP (FCH/CH), H2Glass (HE), REACT (H2020), DEVH2FOREAF (EU's Research Fund for Coal and Steel)

**H<sub>2</sub> Value chain coverage**

**H<sub>2</sub> production**

- 5899 tpy from 49 MW of total capacity of the electrolysers and 276,5MW of installed PV panels
- 20% cross border transport and use
- Consumption: 52% for industrial applications, 28% for transport applications and 20% for other energy sector applications

**H<sub>2</sub> storage and distribution**

- Storage for more than 20 tonnes/year
- 900 bar electrochemical compressor

**H<sub>2</sub> end-uses:**

- 17 renewable H<sub>2</sub> supply-chain testbeds (TRL6-8) in hard to abate, energy and transport sectors

**Expected impacts**

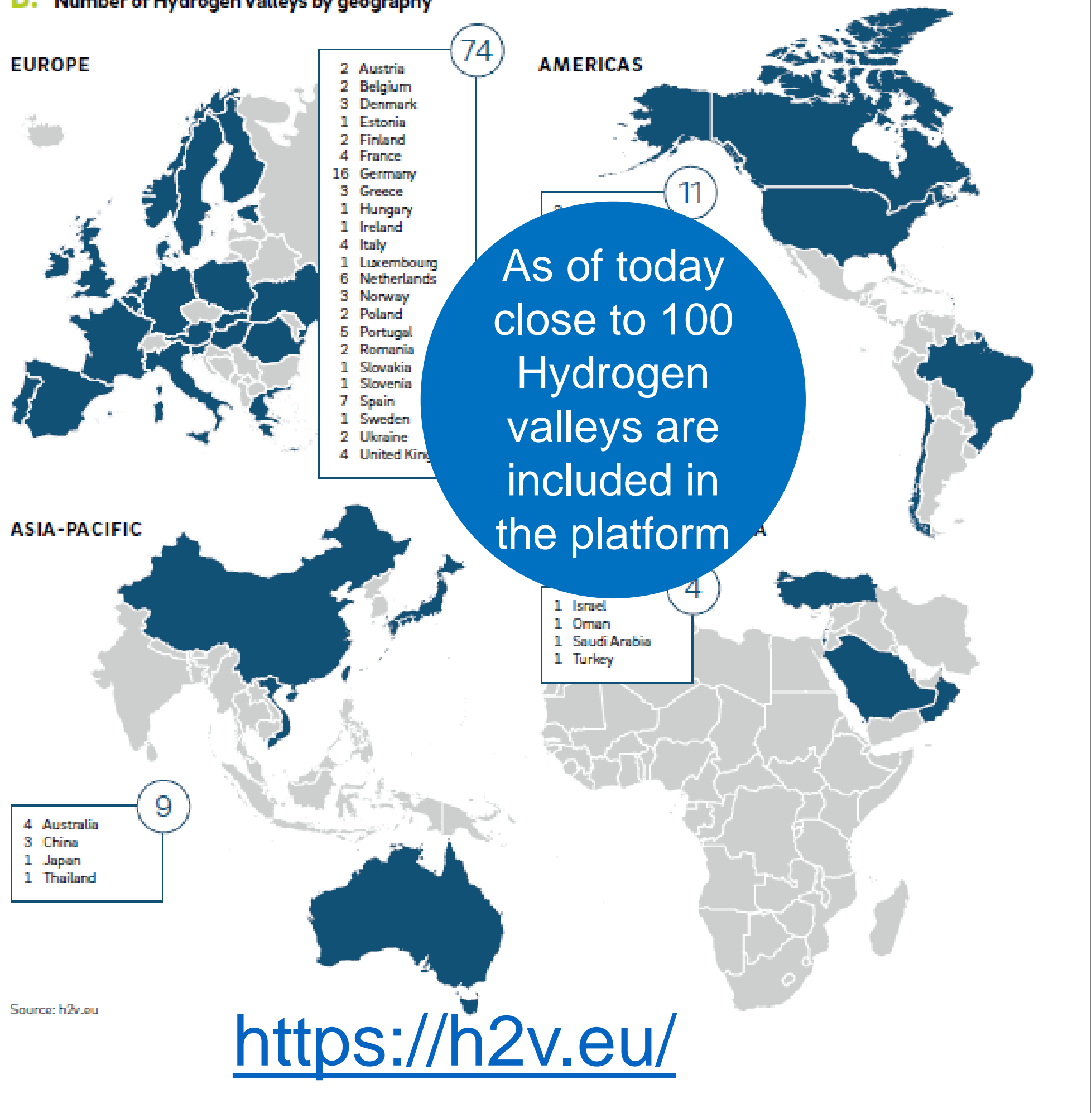
- 31.167 tonnes/year of CO<sub>2</sub>-eq avoided emissions



# Hydrogen Valleys: concept developed in Europe and now global phenomenon... ~ about 3/4 are yet to take a final investment decision

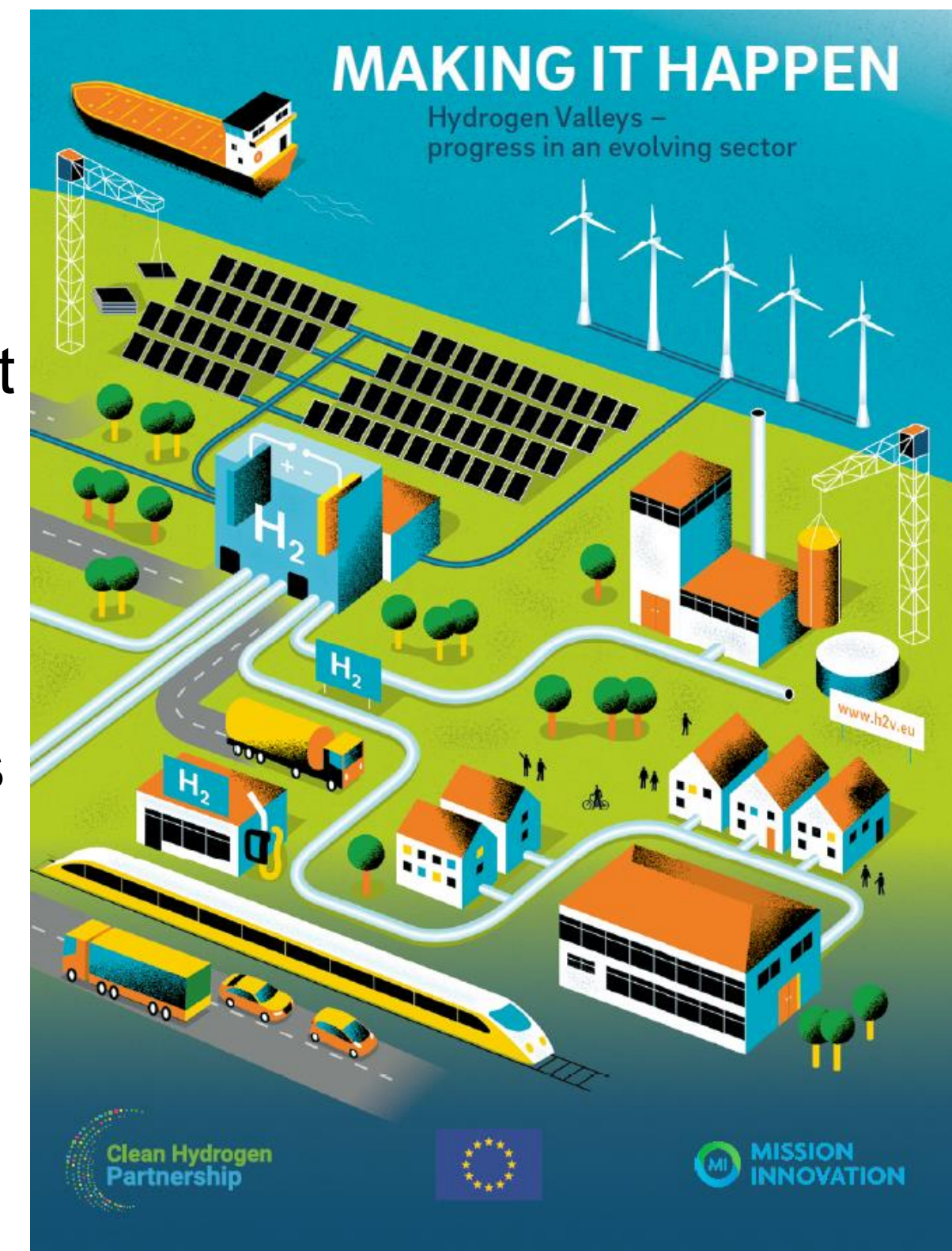
Updated report

B: Number of Hydrogen Valleys by geography



## Hydrogen Valleys Final Report just published

- State of the clean hydrogen sector by analysing empirical evidence from Hydrogen Valleys globally over the last three years.
- Development of the Hydrogen Valley concept and community as well as the necessary framework conditions for its development
- Recent challenges faced by Hydrogen Valleys and the clean hydrogen sector as a whole and seeks to find forward looking solutions





# JU continuous action plan for accelerating the deployment of Hydrogen Valleys in the years to come

- **Only a fraction (~25%) of the European Hydrogen Valleys in the H2VP have reached FID**
- The European Commission topped-up the **Clean Hydrogen JU with an extra €200 million with the aim of doubling the number of hydrogen valleys in the EU by 2025** (in support of the ambitions of the RePowerEU plan)
- This funding is insufficient to support all the Hydrogen Valleys projects in the pipeline

## Project Development Assistance for Hydrogen Valleys

Increase the number of projects supported by offering project development assistance (less resources intensive) to allow projects to mature towards FID

## Synergies

Join efforts and align strategies with national and regional authorities across Europe (and other European instruments such as Innovation Fund, Hydrogen Banks, etc)

+

- **Continue supporting R&I** to improve the technology, improve its performance and reduce costs
- Support to the **demonstration of hydrogen technologies including Hydrogen Valleys** via Call for Proposals
- Provide the necessary training to build **skills and to regional and local administrations**
- .....



# Hydrogen Valleys Facility

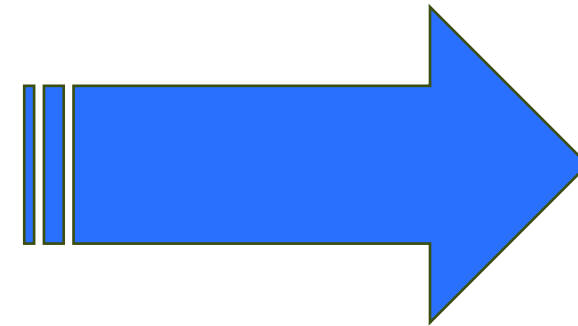
*A comprehensive tool to support the deployment of H2 valleys*

- **Duration: 2024-2030**
- **Budget: € 12.5 M**
- **3 core tasks**

Project Development Assistance

Capacity Development

Hydrogen Valleys Platform



## 1.PDA

PDA services to facilitate hydrogen valley projects from initial conception to detailed feasibility, offering tailored support and feedback mechanisms for advancing towards (and reaching) final investment decisions.

## 2.Capacity Development

This task aims to advance European hydrogen valley projects through knowledge sharing, capacity building, and addressing key project barriers, culminating in public outputs and an annual showcase event.

## 3.Hydrogen Valleys Platform

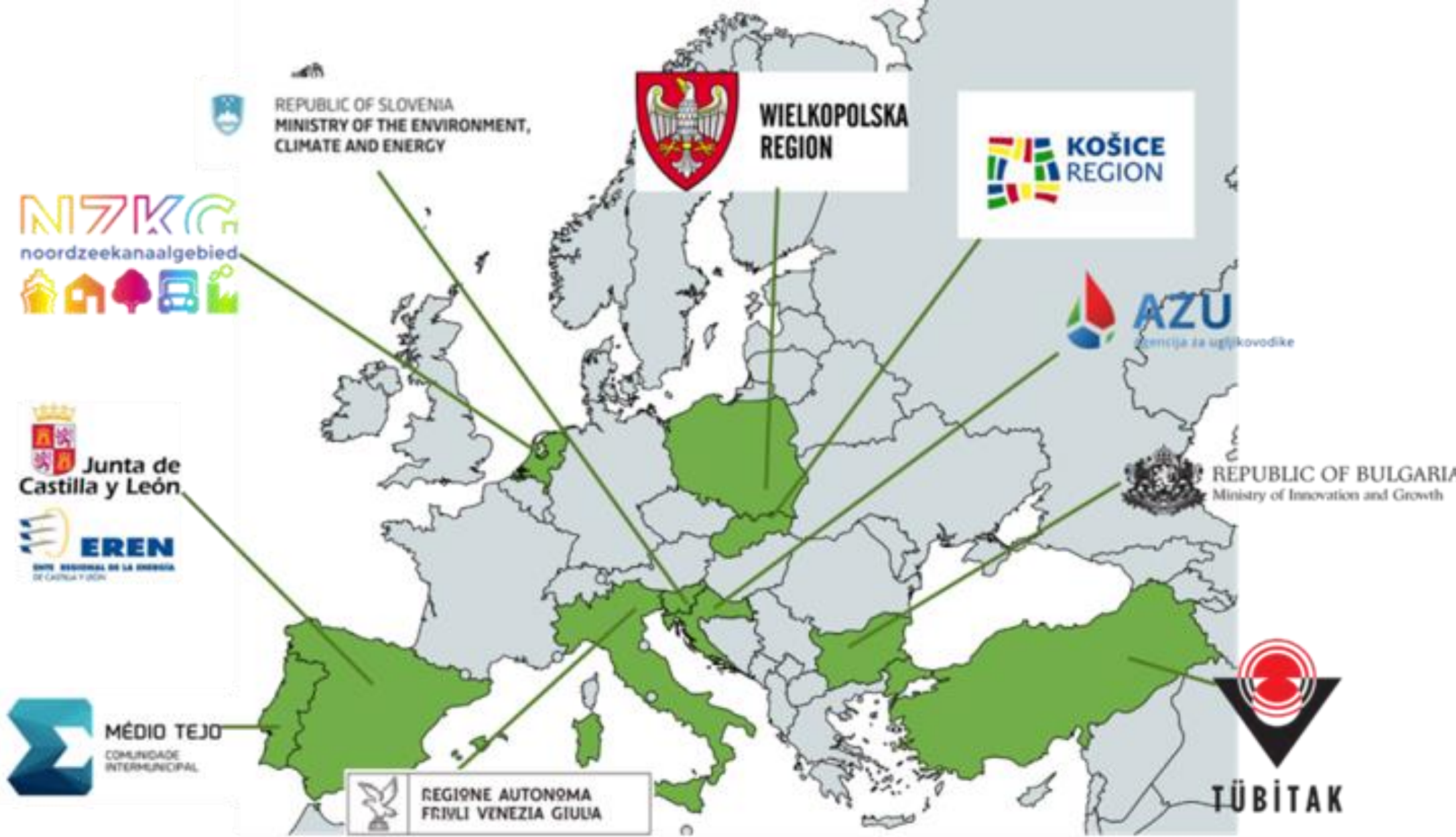
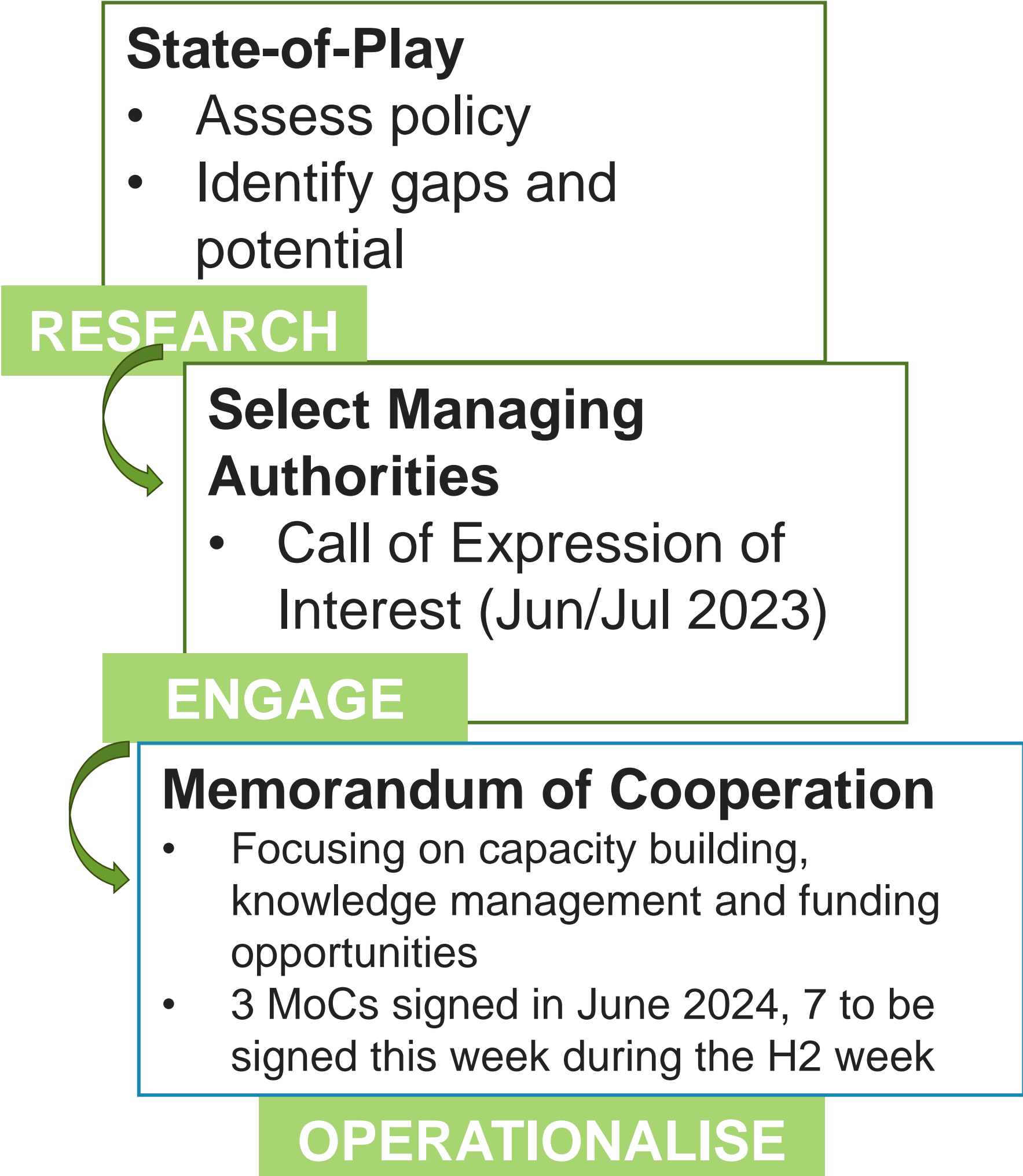
Sustain and further develop the global Mission Innovation Hydrogen Valley Platform (H2VP) as a hub for exchanging information and fostering collaboration among hydrogen valley projects worldwide.

Tender published in June, contract to be signed  
by the end of the year



# Synergies with national and regional managing authorities

Identifying areas of collaboration between the Clean Hydrogen JU JU (EU level) and National and Regional Public Authorities



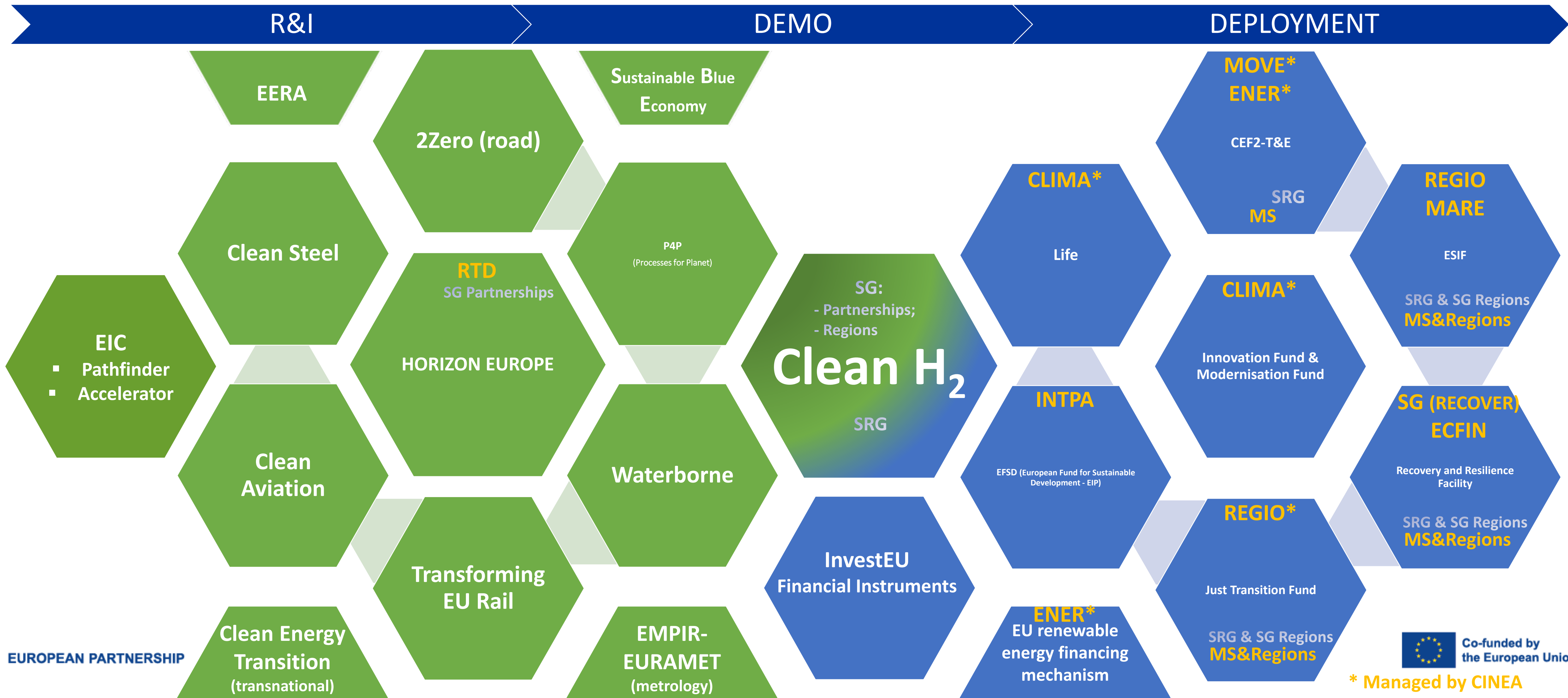
- Programme Office North Sea Canal Area (Netherlands)
- Wielkopolska Region (Poland)
- Friuli Venezia Giulia Region (Italy)
- Médio Tejo (Portugal)
- REPUBLIC OF SLOVENIA MINISTRY OF THE ENVIRONMENT, CLIMATE AND ENERGY (Slovenia)
- Košice Region (Slovakia)
- Croatian Hydrocarbon Agency (Croatia)
- Bulgarian Ministry of Innovation and Growth (Bulgaria)
- Regional Public Body of Energy – Castilla y Leon (Spain)
- Scientific and Technological Research Council of Türkiye (Türkiye)



# Synergies with other funding instruments

H2 evolving and growing: from R&D&I to large Demos and full Market Deployment

Strong cooperation is Key to deal with bigger yet fragmented EU Funds to meet EU Green Deal Ambition!





- 372 projects supported for €1.62 bn since 2008
- 25 regions have benefited from Project Development Assistance, PDA
- 16 Hydrogen Valleys supported across 15 European countries through grants (and additional public/private investments)
- Working in synergies with (European) Managing Authorities
- Support to Hydrogen valleys will continue in the years to come: **H2V Facility and grants support**



[https://www.clean-hydrogen.europa.eu/media/publications/hydrogen-valleys-progress-evolving-sector-update-report\\_en](https://www.clean-hydrogen.europa.eu/media/publications/hydrogen-valleys-progress-evolving-sector-update-report_en)



[https://www.clean-hydrogen.europa.eu/media/publications/final-report-project-development-assistance-regions-ii-cohesion-countries-outermost-regions-and\\_en](https://www.clean-hydrogen.europa.eu/media/publications/final-report-project-development-assistance-regions-ii-cohesion-countries-outermost-regions-and_en)



# Keep in touch!



**For further information**

[www.clean-hydrogen.europa.eu](http://www.clean-hydrogen.europa.eu)

 Clean Hydrogen Partnership



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