

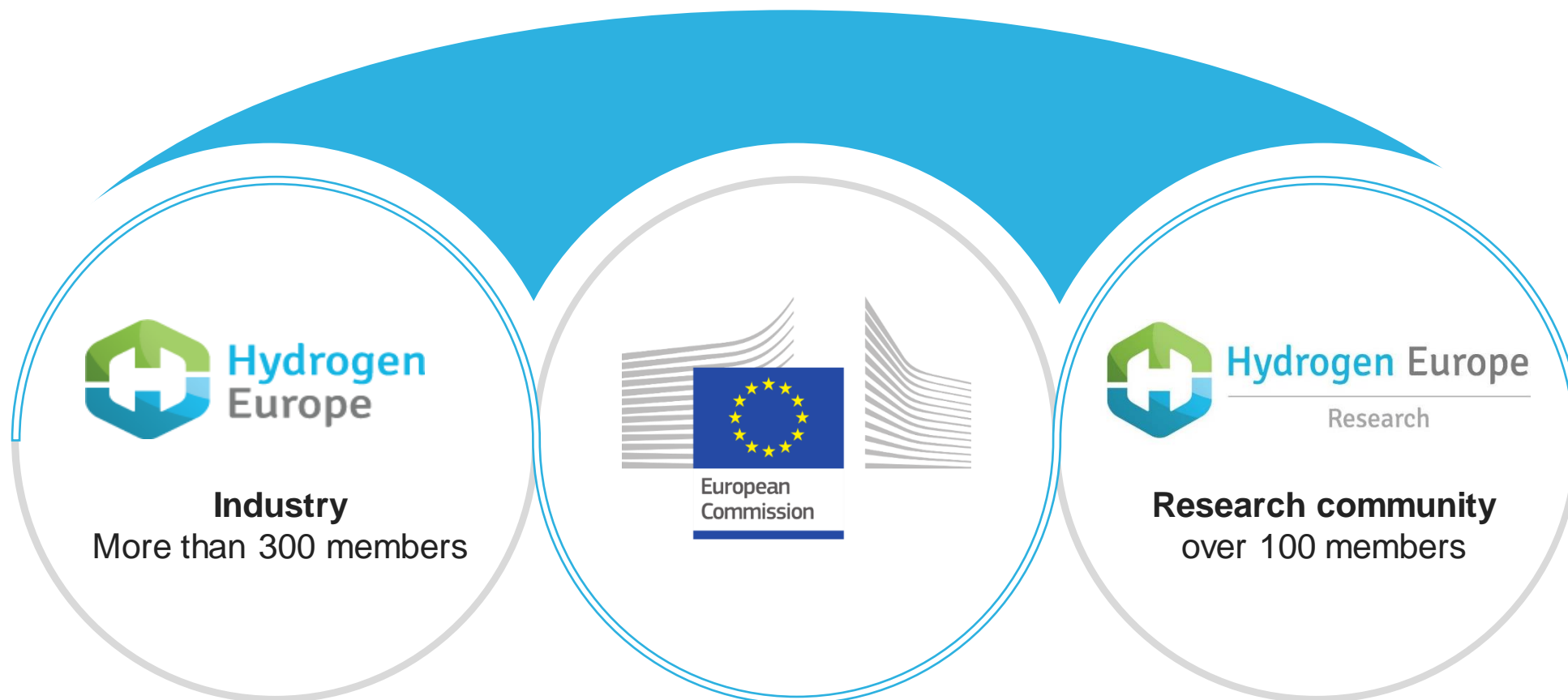
# Working in synergies with MS/regions for the green transition through hydrogen

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Head of Unit



# Clean Hydrogen Joint Undertaking

EU Institutional Public-Private Partnership (IPPP)



**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)**

# Building on FCH JU\* Programme legacy

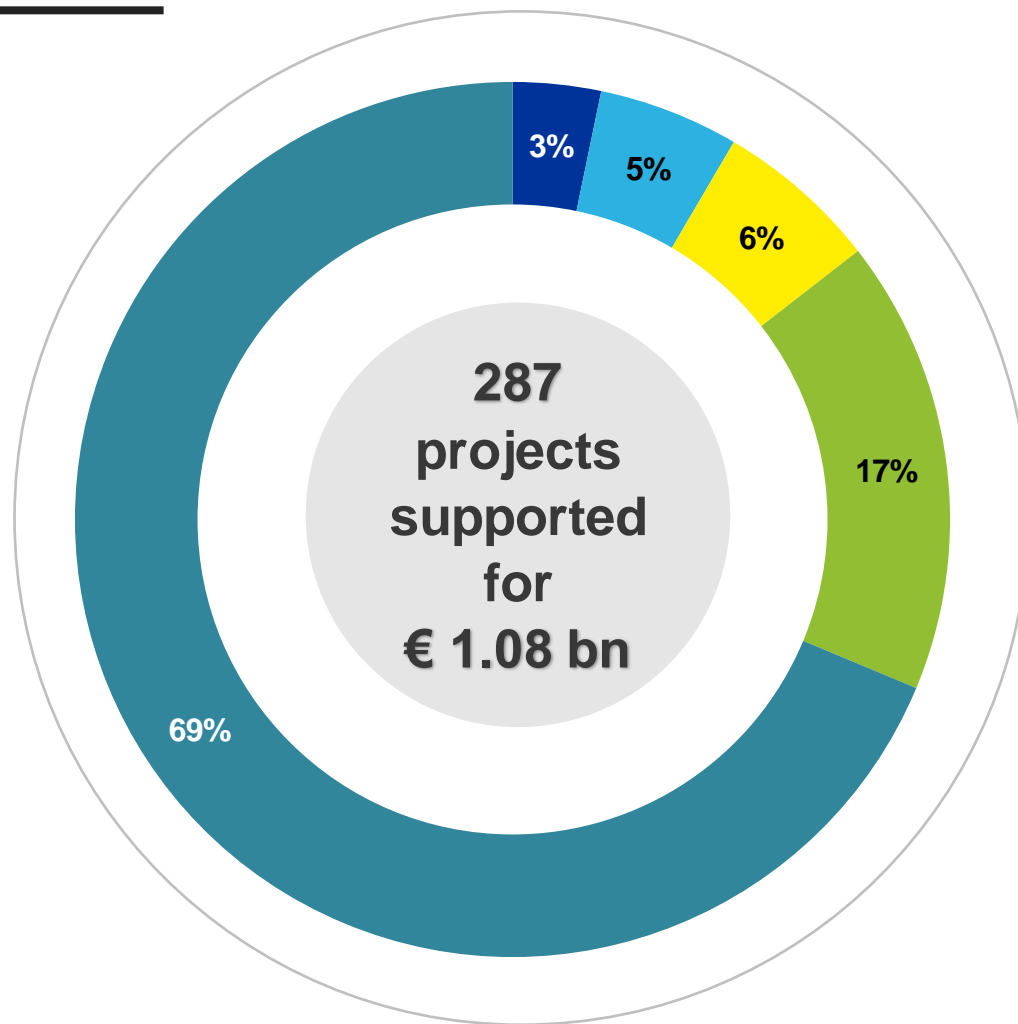
## H<sub>2</sub> Valleys

3 Projects  
€ 35 million

## H<sub>2</sub> End Uses

- Transport Applications
- Clean Heat and Power

159 Projects  
€ 739.6 million



## H<sub>2</sub> Storage & Distribution

22 Projects  
€ 55.8 million

## Cross-cutting

46 Projects  
€ 65 million

## H<sub>2</sub> Production

- Electrolysis
- Other routes

57 Projects  
€ 181 million

# Other Activities

Additional activities (along the calls/grants support) are necessary to fulfil the Clean Hydrogen JU objectives



- **Developing synergies with other partnerships and programmes**
- Regulations, Codes and Standards (PNR contribution)
- European Hydrogen Safety Panel
- European Hydrogen Sustainability and Circularity Panel
- Knowledge management (monitoring and reporting, Observatory, TRUST)
- International Cooperation (MI 2.0 H2Valleys Platform, IPHE, IEA tasks)
- Communication activities, public awareness/acceptance

## The JU's regions initiative was key to boost H<sub>2</sub> awareness in EU

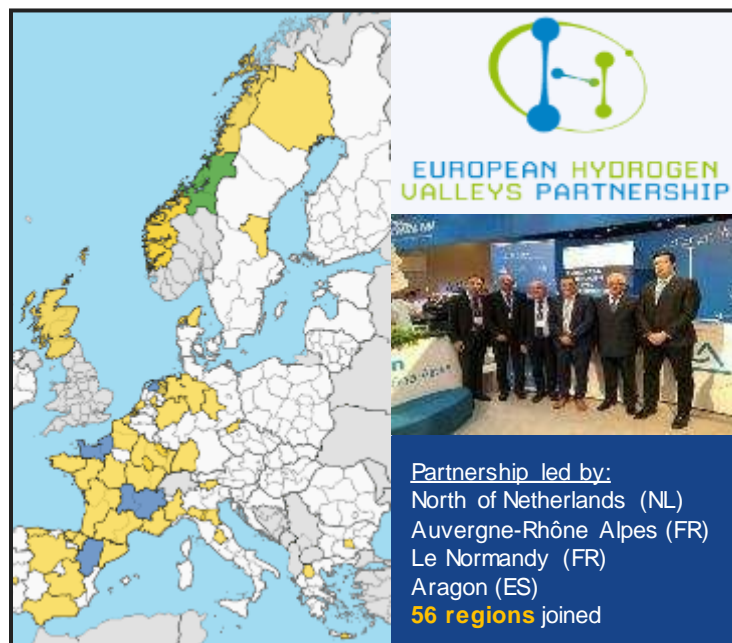
The 100 regions initiative led to the PDA, H<sub>2</sub> Valley partnership and funding of H<sub>2</sub>Valley topics  
[https://www.clean-hydrogen.europa.eu/get-involved/fch-regions-hub-0\\_en](https://www.clean-hydrogen.europa.eu/get-involved/fch-regions-hub-0_en)

### (1) Project Development Assistance (PDA)



**Q2 2022 another PDA launched; focus on Cohesion countries, outermost regions and islands**

### (2) EU H<sub>2</sub> Valleys Partnership



<http://s3platform.jrc.ec.europa.eu/hydrogen-valleys>

### (3) Creation of H<sub>2</sub> valleys





# Definition of a Hydrogen Valley

Used in the call topics and the Mission Innovation platform

*A Hydrogen Valley is a defined geographical area where hydrogen serves more than one end sector or application in mobility, industry and energy. They typically comprise a multi-million euro investment and cover all necessary steps in the hydrogen value chain, from production (and often even dedicated renewable electricity production) to subsequent storage and its transport & distribution to various off-takers.*

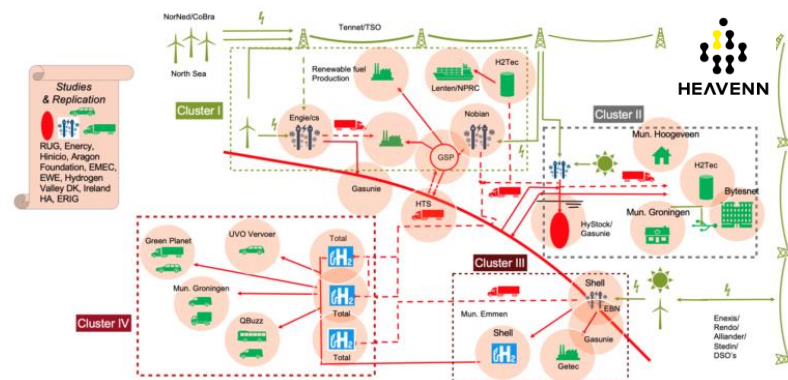


# Hydrogen valleys as an accelerator for an EU hydrogen economy



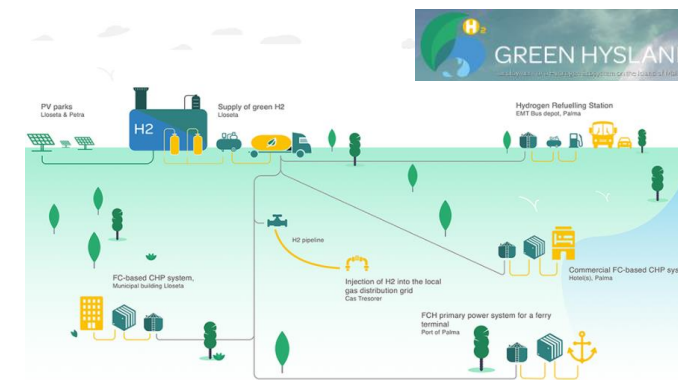
## 2015: Orkney's Island (Scotland):

- H<sub>2</sub> production by wind on Islands
- Storage & transportation by truck
- Use: heat (school), power (ferries) & mobility (municipality cars)
- [www.bighit.eu](http://www.bighit.eu)



## 2019: North Netherlands (Groningen):

- 31 partners (public + private)
- Electrolysis for green H<sub>2</sub> production,
- H<sub>2</sub> Mobility: buses, passenger cars and trucks
- H<sub>2</sub> Refueling stations
- E-Kerosene for aviation
- H<sub>2</sub> for an inland water transport barge
- Domestic Heat applications
- Underground H<sub>2</sub> storage (Hystock)
- 1,500 tons H<sub>2</sub>/year
- <https://heavenn.org/>



## 2020: Hydrogen Island (Spain)

- H<sub>2</sub> production from solar PV
- H<sub>2</sub> injection in gas-grid
- Use: heat (hotel, municipality buildings), power (port of Palma), mobility (buses)
- 300 tons H<sub>2</sub>/year
- [greenhysland.eu](http://greenhysland.eu)

Clean Hydrogen Partnership will continue to provide grants to future (cross-border) H<sub>2</sub> valleys

Ports, Airports, Industrial hubs, Logistical hubs, A H<sub>2</sub> city (or area)

# Hydrogen Valleys – Call Topics 2022

## HORIZON-JTI-CLEANH2-2022-06-01: Hydrogen Valleys (large-scale)



**Develop, deploy and demonstrate a large-scale H<sub>2</sub> valley with interlinkages outside its boundaries**

- Production of ≥ 5,000 tonnes of renewable H<sub>2</sub> per year using new hydrogen production capacity (GOs)
- ≥ 2 FCH applications from ≥ 2 sectors (energy, industry, transport)
- Demonstrate: existing/new H<sub>2</sub> markets, contribution to economic growth, impact and replicability, commitment of stakeholders
- Financing structure and strategy describing the business model, including envisaged sources of co-funding/co-financing needed
- **Seal of Excellence**



## HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen Valleys (small-scale)



**Develop, deploy and demonstrate a H<sub>2</sub> valley (particular attention to areas of Europe with no or limited presence of H<sub>2</sub> Valleys)**

- Production of ≥ 500 tonnes of renewable H<sub>2</sub> per year (GOs)
- Supply more than one end sector or application (mobility, industry energy) / >20% H<sub>2</sub> produced for each of the 2 main applications
- Demonstrate: existing/new H<sub>2</sub> markets, contribution to economic growth, impact and replicability and commitment of stakeholders
- Financing structure and strategy describing the business model, including envisaged sources of co-funding/ co-financing needed
- **Seal of Excellence**





# Hydrogen Valleys have become a global theme

Integrated projects are emerging all around the world and sharing lessons learned to accelerate the energy transition

## E: Global Hydrogen Valley activities and example projects from the Mission Innovation Hydrogen Valley Platform

**United Kingdom**  
→ HyNet North West  
→ BIG HIT Orkney Islands

**Netherlands**  
→ HEAVENN  
→ Hydrogen Delta  
→ Europe's Hydrogen Hub:  
H<sub>2</sub> Proposition  
Zuid-Holland/Rotterdam

**Belgium**  
→ Flemish Hydrogen Ports  
Valley

**Germany**  
→ H2Rivers  
→ HyBayern  
→ eFarm  
→ Northern German  
Living Lab  
→ Hyways for Future

**Italy**  
→ Hydrogen Valley  
South Tyrol  
→ H2iseO Hydrogen  
Valley

**Denmark**  
→ HyBalance

**Austria**  
→ WIVA P&G:  
Hydrogen Flagship  
Region

**Portugal**  
→ Sines Industrial Hub

**Spain**  
→ Green Hysland  
→ Basque Hydrogen  
Corridor

**Japan**  
→ FH2R Fukushima

**China**  
→ Foshan Nanhai Xianhu  
Lake Hydrogen Valley  
Town  
→ Zhangjiakou  
Demonstration Project  
→ Rugao Hydrogen  
Energy Town

**Thailand**  
→ Phi Suea House

**USA**  
→ Advanced Clean  
Energy Storage  
Project  
→ Port of LA, Shore to  
Store Demonstration  
Project  
→ Wyoming Clean  
Power Center

**Chile**  
→ Hydrogen Facility  
Initiative

**France**  
→ Zero Emission Valley  
→ Normandy Hydrogen  
→ Hydrogen Territory  
Bourgogne Franche Comté  
→ Centrale Electrique de l'Ouest  
Guyanais

**Oman**  
→ Green Hydrogen and  
Chemicals Oman

**Australia**  
→ Crystal Brook  
Hydrogen Superhub  
→ Eyre Peninsula  
Gateway

■ Countries with ongoing Hydrogen Valley activities

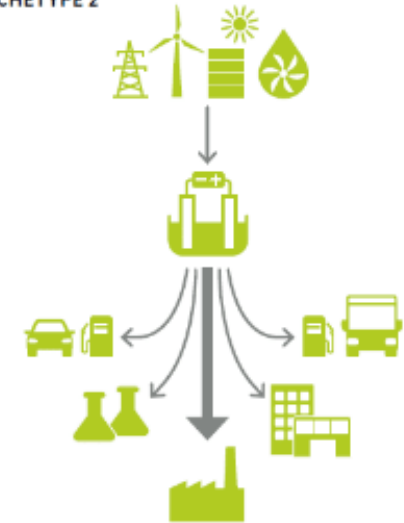
Source: Clean Hydrogen JUI, Roland Berger

### ARCHETYPE 1



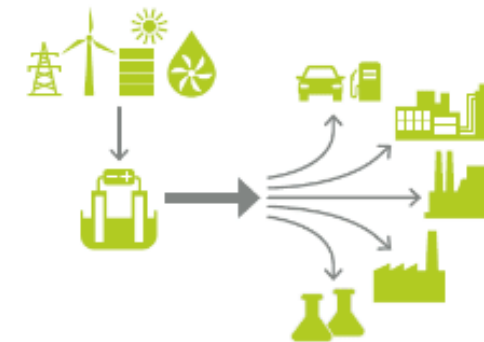
→ Smaller-scale local mobility-centred Hydrogen Valleys (typically 1–10+ MW of local electrolyser capacity)

### ARCHETYPE 2



→ Medium-scale Hydrogen Valleys focusing on industrial decarbonisation (typically 10–300+ MW of local electrolyser capacity)

### ARCHETYPE 3



→ Large-scale and ultimately export-oriented Hydrogen Valleys (typically 250–1,000+ MW of local electrolyser capacity)



## Mission Innovation Hydrogen Valley Platform

Showcasing hydrogen flagship projects around the world. A platform for project developers

LEARN MORE

New Update Report Available

38 Hydrogen Valleys

20 Countries

38,995 Total investment (M€)



### Next steps under MI 2.0:

- Further development and enhancement of the MI Hydrogen Valley Platform
- Target of 100 Hydrogen Valleys by 2030 (while doubling those in Europe by 2025)



### Key remaining barriers for Hydrogen Valleys

- > Obtaining public funding support to close the remaining funding gaps
- > Finding green hydrogen off-takers and signing long-term contracts to make projects bankable
- > Ensuring technology readiness of all fuel cells and hydrogen applications required
- > Ensuring adequate legal regulatory support (carbon pricing, standardization, fast permitting, etc.)



# Procurements to support regions/cities and their possible H2Valleys

**PROJECT DEVELOPMENT ASSISTANCE FOR  
REGIONS (2020-2021): 11 projects assisted**

**PROJECT DEVELOPMENT ASSISTANCE FOR  
REGIONS II (2022-...): applications until 10th Oct**

**TECHNICAL ASSISTANCE TO GENERATE  
SYNERGIES WITH MS&REGIONS**





# Thank you

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