



European Hydrogen Valleys

Workshop in Košice, Slovakia

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Executive Director

23 februari 2023

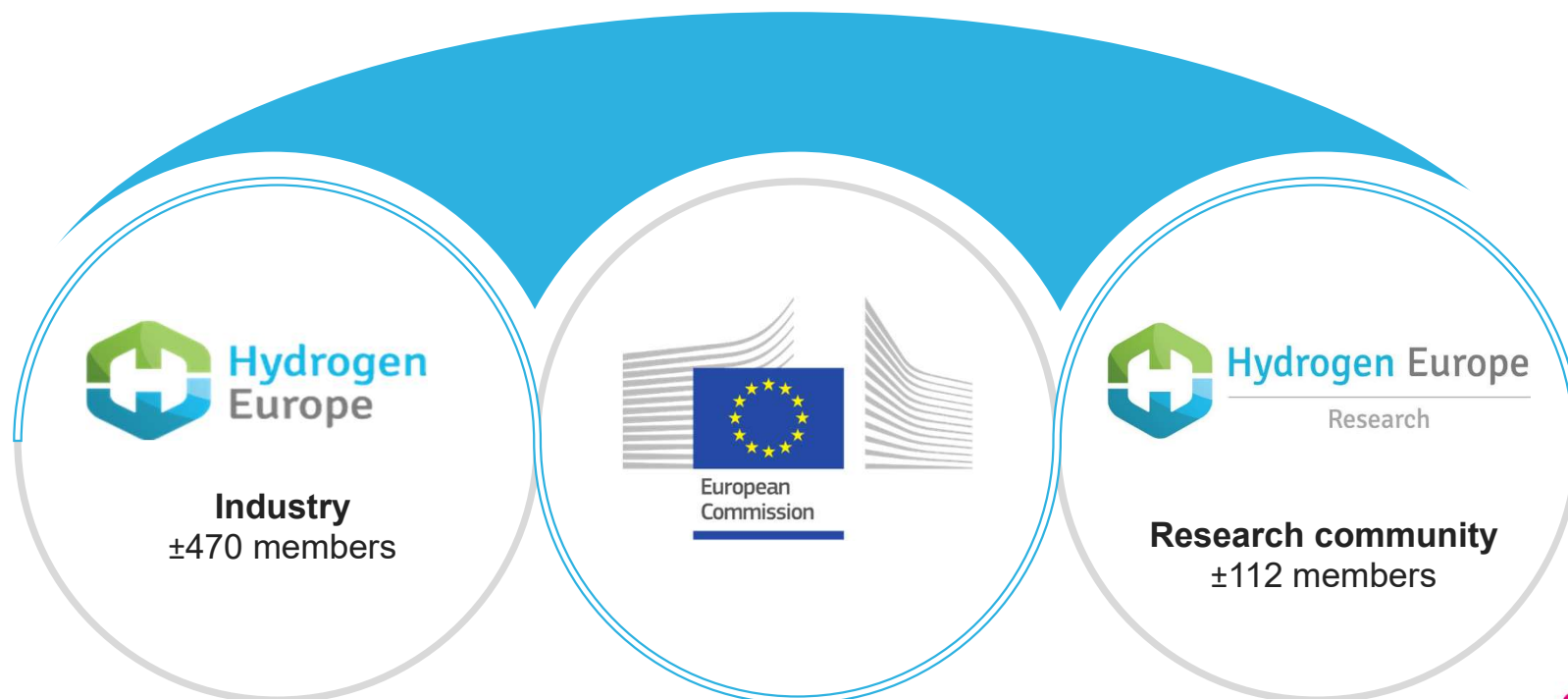
EUROPEAN PARTNERSHIP



 Co-funded by
the European Union

Clean Hydrogen Joint Undertaking

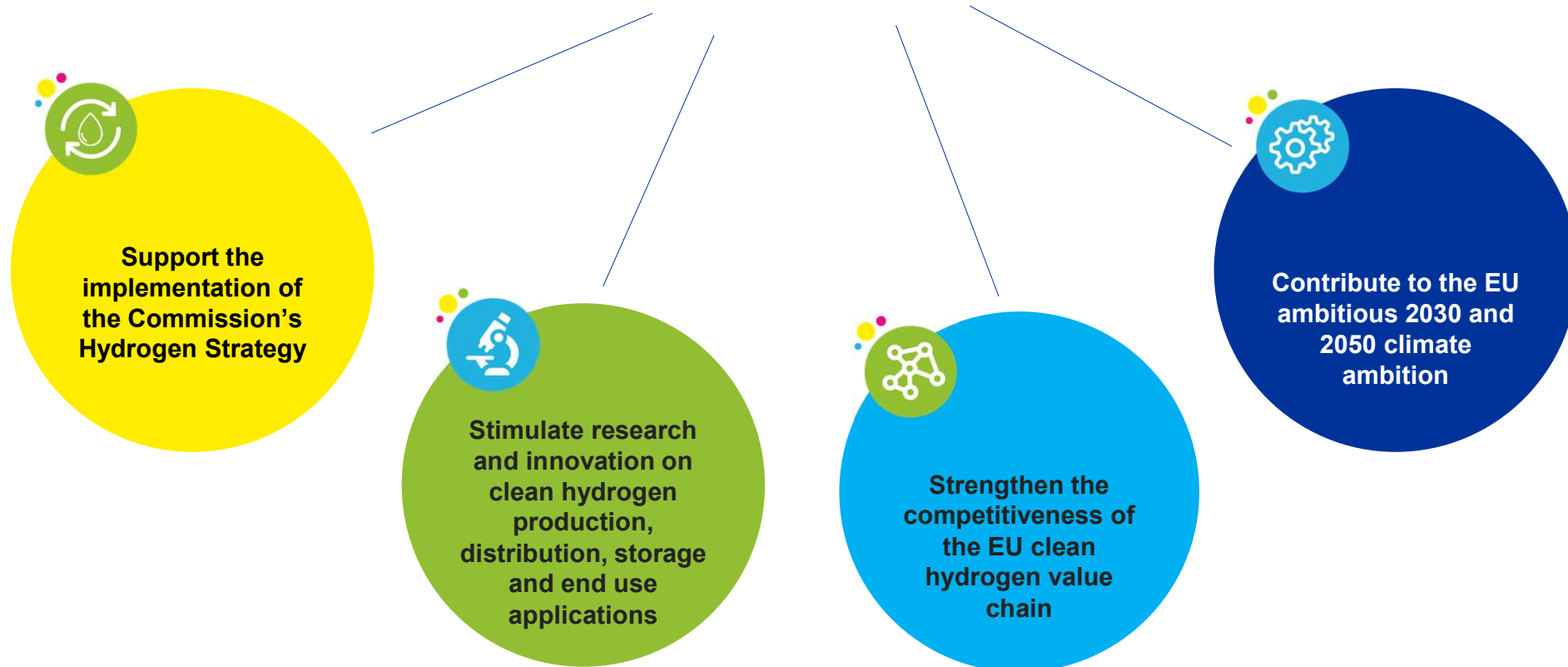
EU Institutional Public-Private Partnership (IPPP)



To facilitate the transition to a greener EU society through the development of hydrogen and fuel cell technologies

Clean Hydrogen JU Objectives

Support a sustainable hydrogen economy, contributing to EU's climate goals



EU Hydrogen Strategy launched on 8th July 2020

Objectives in 3 phases with the Clean Hydrogen JU to support the R&I agenda

Phase 1: 2020-2024

- **6GW** of renewable H₂ electrolyzers
- **1 million tonnes** renewable H₂
- Replace existing H₂ production
- Regulation for liquid H₂ markets
- Planning H₂ infrastructure

Phase 2: 2025-2030

- **40GW** of renewable H₂ electrolyzers
- **10 million tonnes** renewable H₂
- New applications in steel&transport
- H₂ for electricity balancing purposes
- Creation of "Hydrogen Valleys"
- Cross-border logistical infrastructure

Phase 3: 2030-2050

- H₂ technologies matured and deployed at large scale in hard to abate sectors.
- Expansion of hydrogen-derived synthetic fuels
- EU-wide infrastructure network
- An open international market

Clean Hydrogen JU supports the research agenda of the EU H₂ Strategy

8th March

2022

REpowerEU initiative to reduce EU dependency on Russian gas, increased the **target for H₂ to 20m tonnes/year by 2030.**

18th May

Action plan: EC decided to increase the JU budget with **200m EUR to double the amount of Hydrogen Valleys in EU to 50.**

14th Sept

State of the Union of EC president, launching the **EU Hydrogen Bank** to guarantee H₂ off-take by an EU facility using **3.0b EUR of innovation fund**

Clean Hydrogen JU Programme

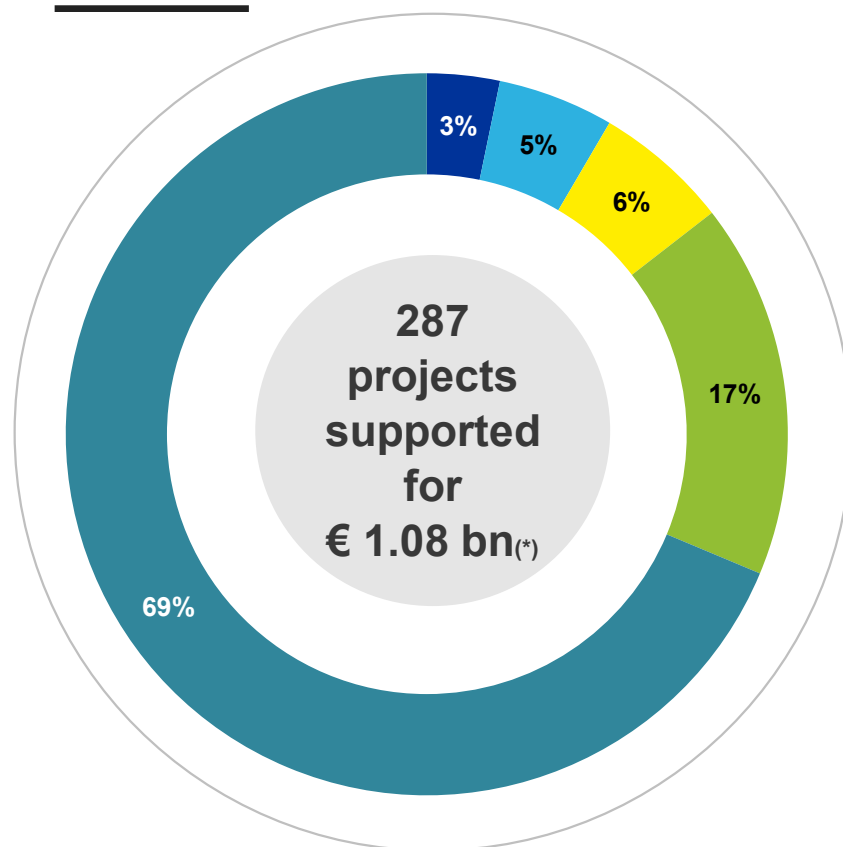
H₂ Valleys

3 Projects
€ 35 million

H₂ End Uses

- Transport Applications
- Clean Heat and Power

159 Projects
€ 739.6 million



(*) Similar leverage of other sources of funding: € 1.08 bn

H₂ Storage & Distribution

22 Projects
€ 55.8 million

Cross-cutting

46 Projects
€ 65 million

H₂ Production

- Electrolysis
- Other routes

57 Projects
€ 181 million



Slovakia



Clean H₂ Partnership

- 1 Project (HyUsPRe)
- 1 Beneficiary (NAFTA a.s.)

Other info *

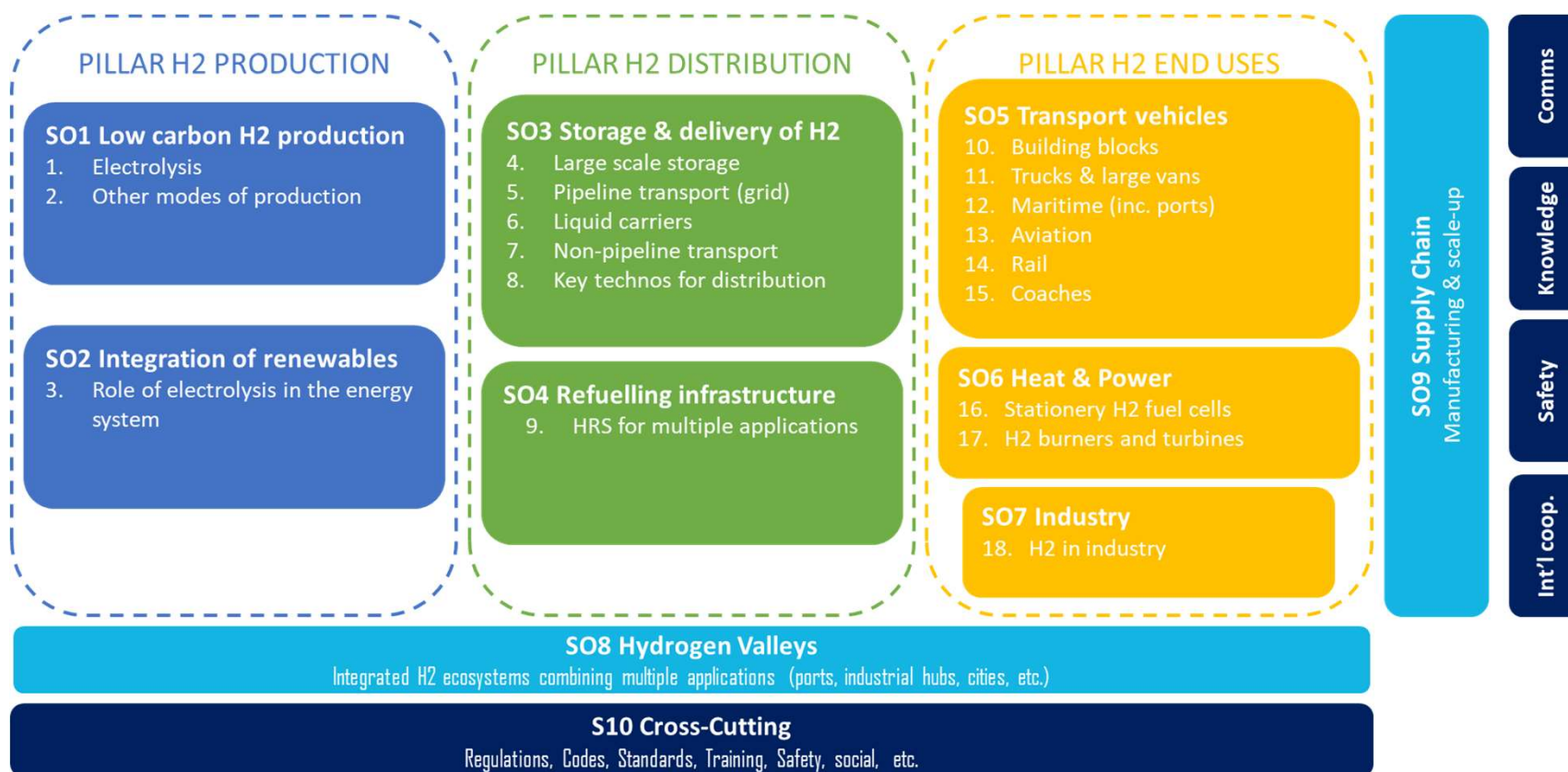
- H₂ Valley - **Black Horse** inc. V4 countries
- By 2023 → EUSTREAM to transport H₂

Announced plans:

- By 2024 → **H₂ train**
(Nové Zámky – Prievidza line)
- Ordered → **4 H₂ FC Buses**

Research and Innovation priorities in Clean Hydrogen JU

Maintain and strengthen EU's global leadership role through a € 2.4 bn research program



Hydrogen 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.

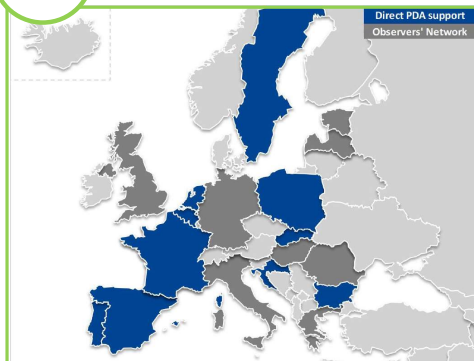
The region initiative was key to boost the H₂ awareness in EU

The 100 regions initiative led to the PDA, H₂ Valley partnership and funding of H₂ Valley

https://www.clean-hydrogen.europa.eu/get-involved/fch-regions-hub-0_en

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Project Development Assistance (PDA)



Great opportunity to bring on-board and share learnings with 'less FCH ready' but highly interested central and eastern European regions

Košice and 15 other regions in EU received support to create a regional Hydrogen Valley

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EU H₂ Valleys Partnership



Košice could apply to join the Hydrogen Valley Partnership creating synergies with other valleys in Europe

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

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Creation of H₂ Valleys



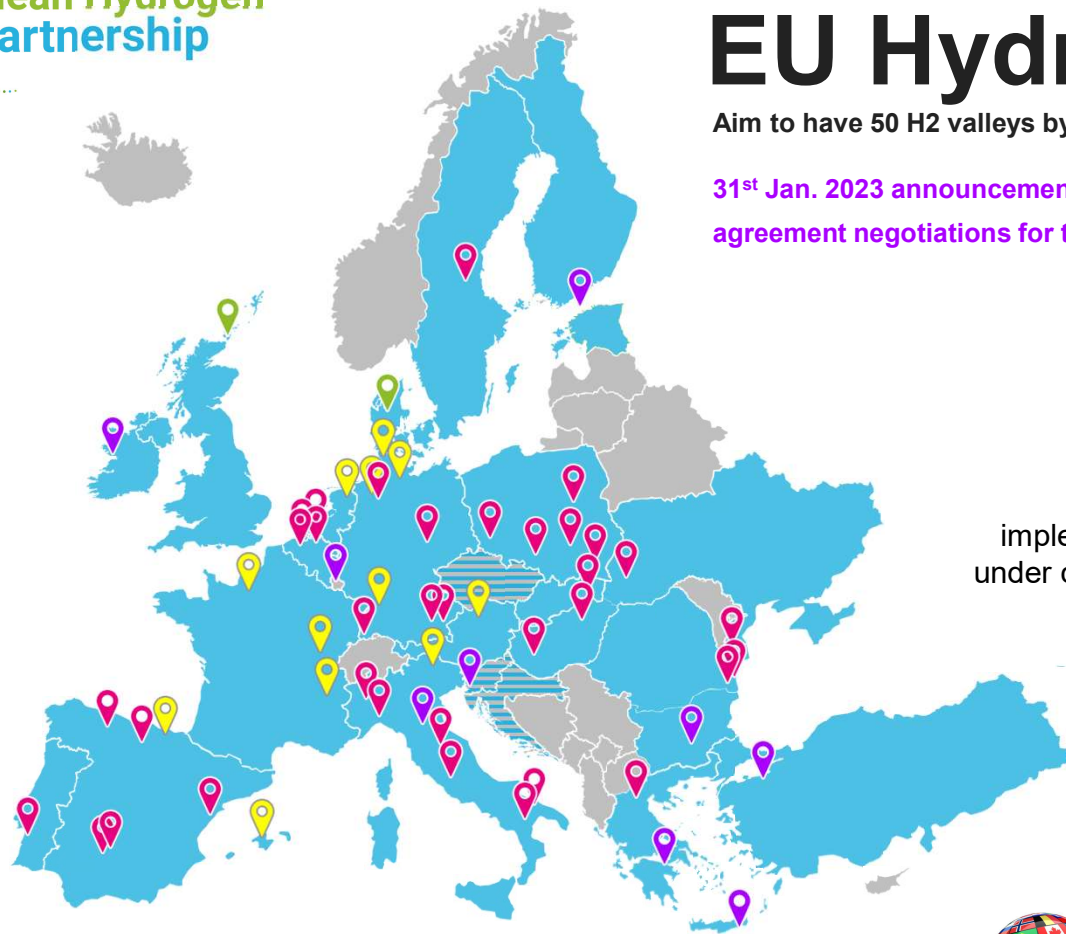
"I want Next Generation EU to create new European Hydrogen Valleys to modernise our industries, power our vehicles and bring new life to rural areas."




Košice could apply to the Clean Hydrogen Partnership for Hydrogen Valley Funding

EU Hydrogen Valleys

Aim to have 50 H₂ valleys by 2025 under construction in Europe

31st Jan. 2023 announcement of 9 hydrogen valleys that will start grant agreement negotiations for the EU funding

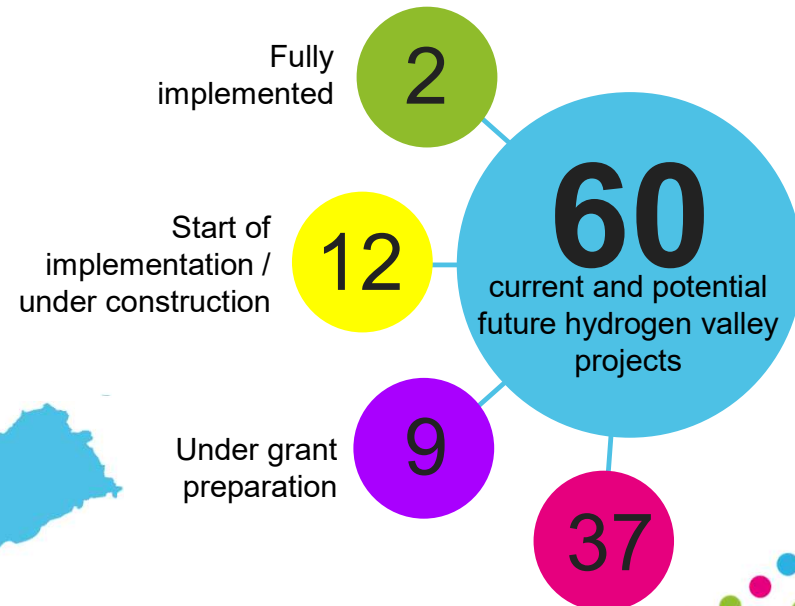


 Hydrogen valley located
  Member of the crossborder hydrogen valley
  No hydrogen valley located



**CLEAN
HYDROGEN**
MISSION

Co-funded by
the European Union



Clean Hydrogen Partnership funded Hydrogen Valleys

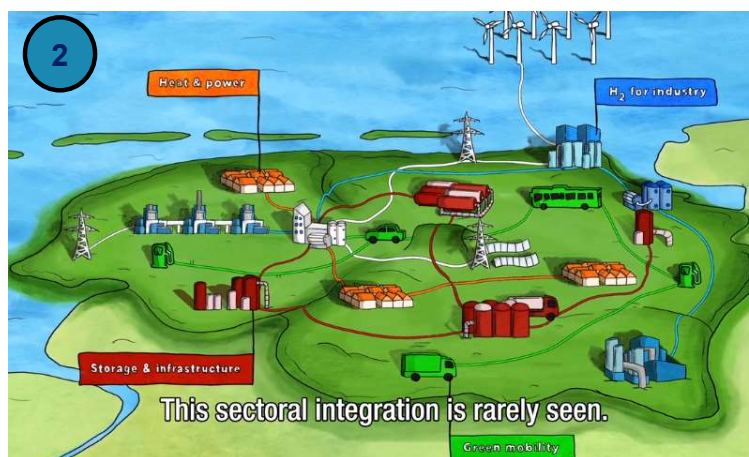
The importance of creating a good narrative + the roll of local authorities

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2015: Orkney's Island (Scotland):

- H2 production by wind on Islands
- Storage & transportation by truck
- Use: heat (school), power (ferries) & mobility (municipality cars)



2019: North Netherlands (Groningen):

- 31 partners (public + private)
- Electrolysis for green H2 production,
- H2 Mobility: buses, passenger cars and trucks
- H2 Refueling stations
- E-Kerosene for aviation
- H2 for an inland water transport barge
- Domestic Heat applications
- Underground H2 storage (Hystock)



2020: Hydrogen Island (Spain)

- H2 production from solar
- H2 injection in gas-grid
- Use: heat (hotel, municipality buildings), power (port of Palma), mobility (buses)

Future Possible (cross-border) H₂ valleys: Ports, Airports, Industrial hubs, Logistical hubs, A H2 city (or area)

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

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United Kingdom
→ HyNet North West
→ BIG HIT Orkney Islands

Netherlands
→ HEAVENN
→ Hydrogen Delta
→ Europe's Hydrogen Hub: H₂ 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

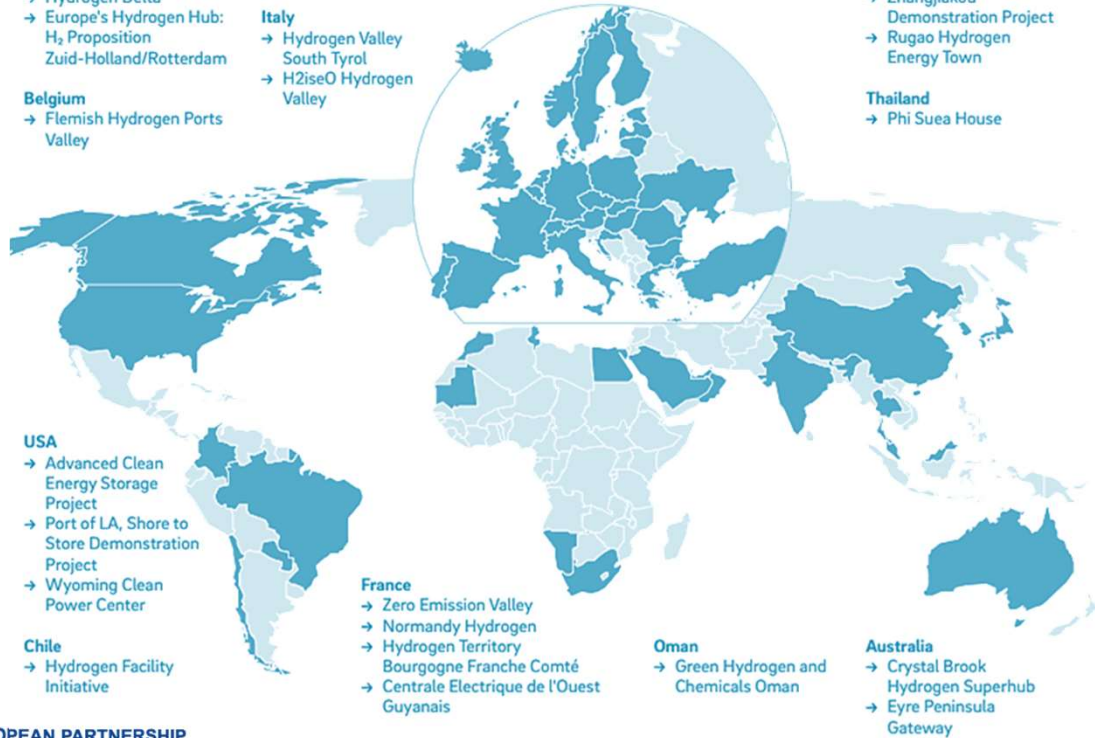
Thailand
→ Phi Suea House



20
Countries

38,995
Total investment (M€)

38
Hydrogen Valleys



USA
→ Advanced Clean Energy Storage Project
→ Port of LA, Shore to Shore 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

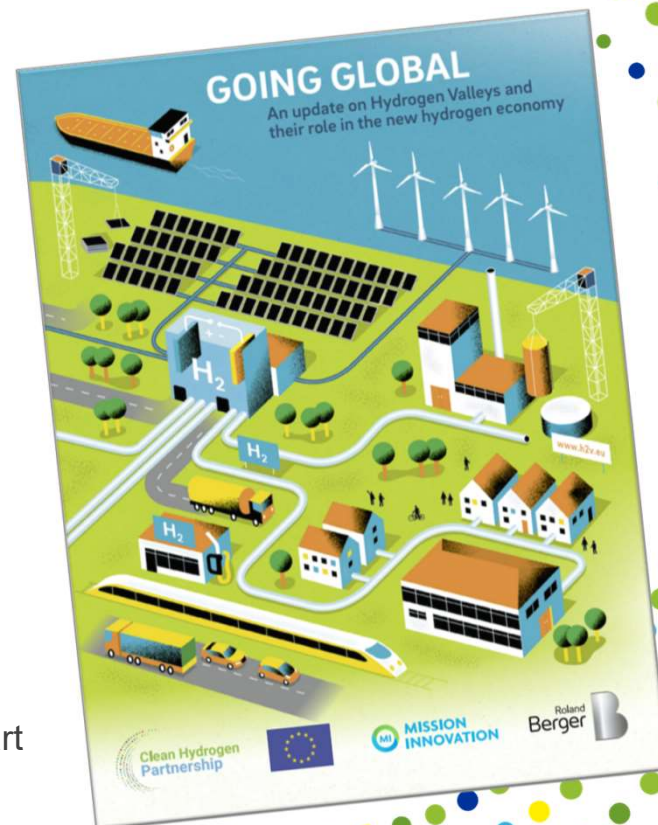
Update report on Hydrogen Valleys and the Mission Innovation Hydrogen Valley Platform

The report summarizes the emerging hydrogen market today and presents insights on Hydrogen Valleys from around the world. You can find the full report for download here: <https://h2v.eu/analysis/reports>



Currently, 38 global hydrogen valleys at different stages of development are part of the Mission Innovation Hydrogen Valleys Platform. The Platform is now entering its second stage of development.

The Mission Innovation H2Valley Platform is available here: <https://www.h2v.eu/>



Hydrogen Valleys continue under Mission Innovation 2.0

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Final report identified key barriers to be tackled under the next Hydrogen Mission



Mission Innovation 1.0 (~2020) identified Key Remaining Barriers:

- Obtaining **public funding support** to close funding gaps
- Finding green hydrogen off-takers and signing long-term contracts
- Ensuring Clean Hydrogen applications **Technology readiness**
- Ensuring adequate **legal regulatory support** (carbon pricing, standardization, fast permitting...)

Mission Innovation 2.0 ambition (2020~):

Further development and enhancement of the MI Hydrogen Valley Platform.
Target for 100 Hydrogen Valleys and minimum three in each member country.

Call for proposals 2023

January 17th 2023: Launch of the 2nd call for proposals

- **195m EUR call for 26 topics:**
 - ✓ Renewable hydrogen production (7)
 - ✓ Hydrogen distribution & storage (5)
 - ✓ Transport (3)
 - ✓ Heat and Power (4)
 - ✓ Cross-cutting (3)
 - ✓ **Hydrogen valley (2) (2 smalls of 9m € & 1 big of 20m €)**
 - ✓ Strategic Research Challenge (2)
- Submission date **18 April 2023 17:00Hrs CEST:**
Some topics were open for international cooperation



Until 2027 there will be every year a call for proposals that includes hydrogen valleys funding.
Until '25 we will use the REPowerEU budget to fund hydrogen valleys on reserve lists.

Topic: Large scale Hydrogen Valley

Building on the successful experience of previous years

- Indicative Budget of **Max. 20 million Euro** (proposal is ineligible if more is requested)
- At start TRL 6 → TRL 8 at the end of the project
- At least one partner in the consortia must be a member of Hydrogen Europe or Hydrogen Europe Research
- Seals of excellence will be rewarded to the ones passing the evaluation criteria but cannot be funded as there was a better project.
- Topic novelty is to make interlinkages of other places of H2 production and consumption outside its boundaries.
- Proposals need to show how to contribute to the European Hydrogen Strategy and the European Green Deal
- At least 2 years of demonstration to monitor at least the KPI's that are mentioned in the SRIA of the Clean Hydrogen Partnership
- **Min 5000 tonnes/yr.** renewable hydrogen production, different production sites are allowed
- Covering at least 2 sectors (Industry, Energy or Transport)
- Synergies with other funding programs are allowed and stimulated (eg CEF, innovation fund,...)
- Evidence of the **commitment and role of public authorities** in the form of an LOI
- GO's should prove the renewable hydrogen (by M/S issuing body or eg Certifhy scheme)
- Preliminary safety plan needs to be submitted with the proposal

Topic: Small scale Hydrogen Valley

Start building Hydrogen Valleys in area's of Europe with no or limited presence of H2 valleys

- Indicative Budget of **Max. 9 million** Euro (proposal is ineligible if more is requested)
- At start TRL 6 → 8 at the end of the project
- At least one partner in the consortia must be a member of Hydrogen Europe or Hydrogen Europe Research
- Seals of excellence will be rewarded to the ones passing the evaluation criteria but cannot be funded as there was a better project.
- **Topic calls for the deployment of a hydrogen valley in areas of Europe with no or limited presence of H2 valleys such as but not necessary limited to Central and Eastern Europe.**
- Proposals need to show how to contribute to the European Hydrogen Strategy & the European Green Deal
- At least 2 years of demonstration to monitor at least the KPI's that are mentioned in the SRIA of the Clean Hydrogen Partnership
- **Min 500 tonnes/yr.** renewable hydrogen production, different production sites are allowed
- Covering at least 2 sectors (Industry, Energy or Transport)
- Synergies with other funding programs are allowed and stimulated (e.g. CEF, innovation fund,...)
- Evidence of the **commitment and role of public authorities** in the form of an LOI
- GO's should prove the renewable hydrogen (by M/S issuing body or e.g. Certifhy scheme)
- Preliminary safety plan needs to be submitted with the proposal

CEF (Connecting Europe Facility) funding opportunities

Synergies with other EU funding instruments are envisioned

Call opening	16 September 2021				
	1 st cut-off date	2 ⁿ cut-off date	3 rd cut-off date	4 th cut-off date	5 th cut-off date
Deadline for submission:	19 Jan. 2022 17:00 CET (Brussels)	<u>7 June 2022</u> <u>17:00 CET</u> <u>(Brussels)</u>	<u>10 Nov. 2022</u> <u>17:00 CET</u> <u>(Brussels)</u>	13 April 2023 17:00 CET (Brussels)	19 Sept. 2023 17:00 CET (Brussels)
Evaluation:	Feb. – March 2022	July – Aug. 2022	Dec 2022 – Jan 2023	May – June 2023	Oct. – Nov. 2023
Information on evaluation results:	May 2022	Oct. 2022	March 2023	July 2023	Jan 2024
GA signature:	Sept – Oct. 2022	Feb. – March 2023	July – Aug. 2023	Dec. 2023 – Jan. 2024	May – June 2024

Consortia should submit for some topics another proposal to CEF for the Hydrogen Refueling stations

Other EU funding instruments

Clean Hydrogen JU has established various synergy roadmaps with other EU funding instruments

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R&I

DEMO

DEPLOYMENT

2Zero (road)

Clean Steel

EIC

- Pathfinder
- Accelerator

Clean Aviation

Metrology

Clean Energy Transition
(transnational)

Clean H₂
Inter-partnership
Assembly (RTD)
**HORIZON
EUROPE**

Transforming
EU Rail

P4P
(Processes for Planet)

Waterborne

Clean H₂
Partnerships SG
Clean H₂
Clean H₂
European/ Alliance/
MS&Regions SG

InvestEU
Financial Instruments

CLIMA*

Life

DEVCO

EFSD
(European Fund
for Sustainable
Development –
EIP)

ENER*

EU renewable
energy financing
mechanism

MOVE*
ENER*
CEF2-T&E

CLIMA*
Innovation
Fund

REGIO*

Just
Transition
Fund

REGIO
MARE

ESIF

MS&Regions

SG (RECOVER)
ECFIN
Recovery and
Resilience
Facility



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For further information

www.clean-hydrogen.europa.eu

www.hydrogeneurope.eu

www.hydrogeneurope.eu/research

[in](https://www.linkedin.com/company/clean-hydrogen-partnership) Clean Hydrogen Partnership

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