

# Clean Hydrogen Partnership

## Funding opportunities and territorial cooperation

Cross-border cooperation in the Pyrenees for  
the development of a green hydrogen  
economy & adaptation to climate change  
3 June 2022 – EU GREEN WEEK

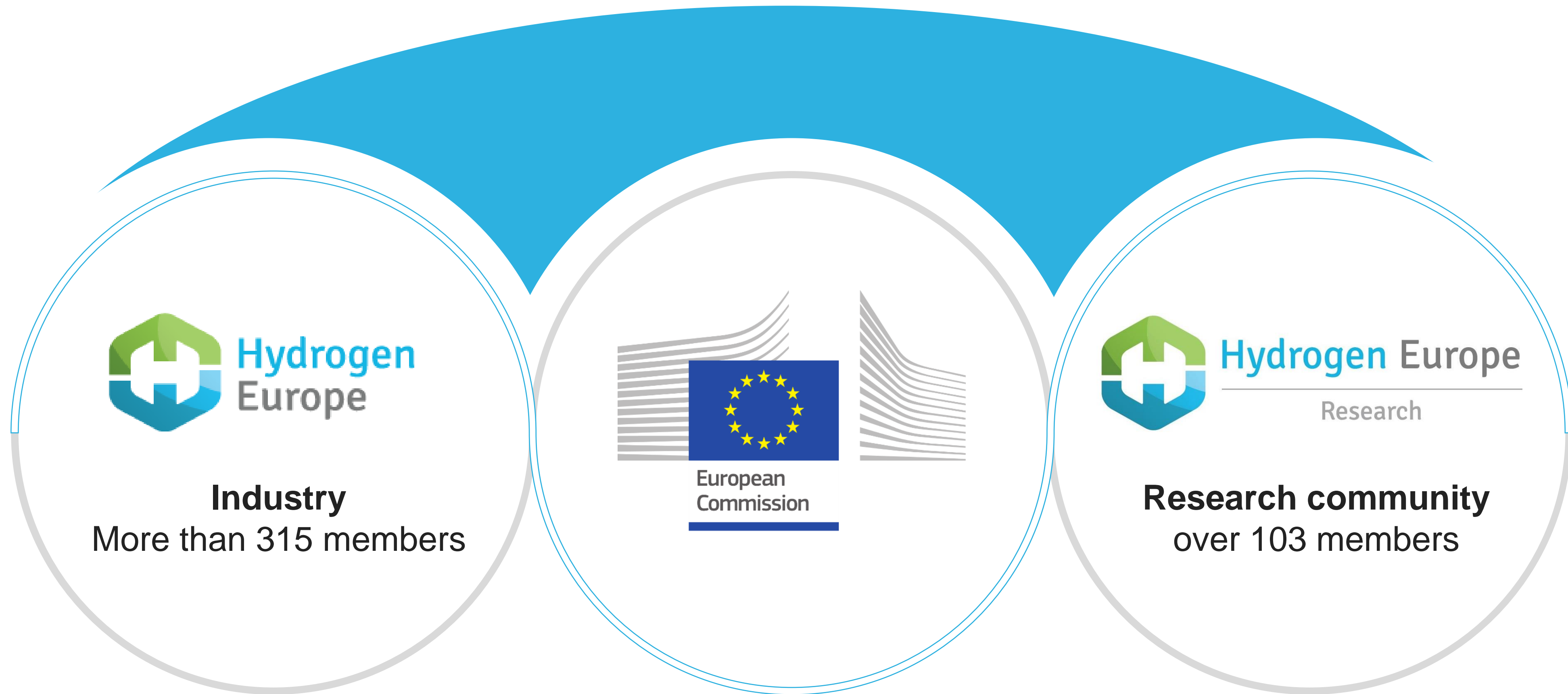
Alberto J. Garcia Hombrados

Project Officer - Clean Hydrogen Joint Undertaking



# Clean Hydrogen Partnership Overview

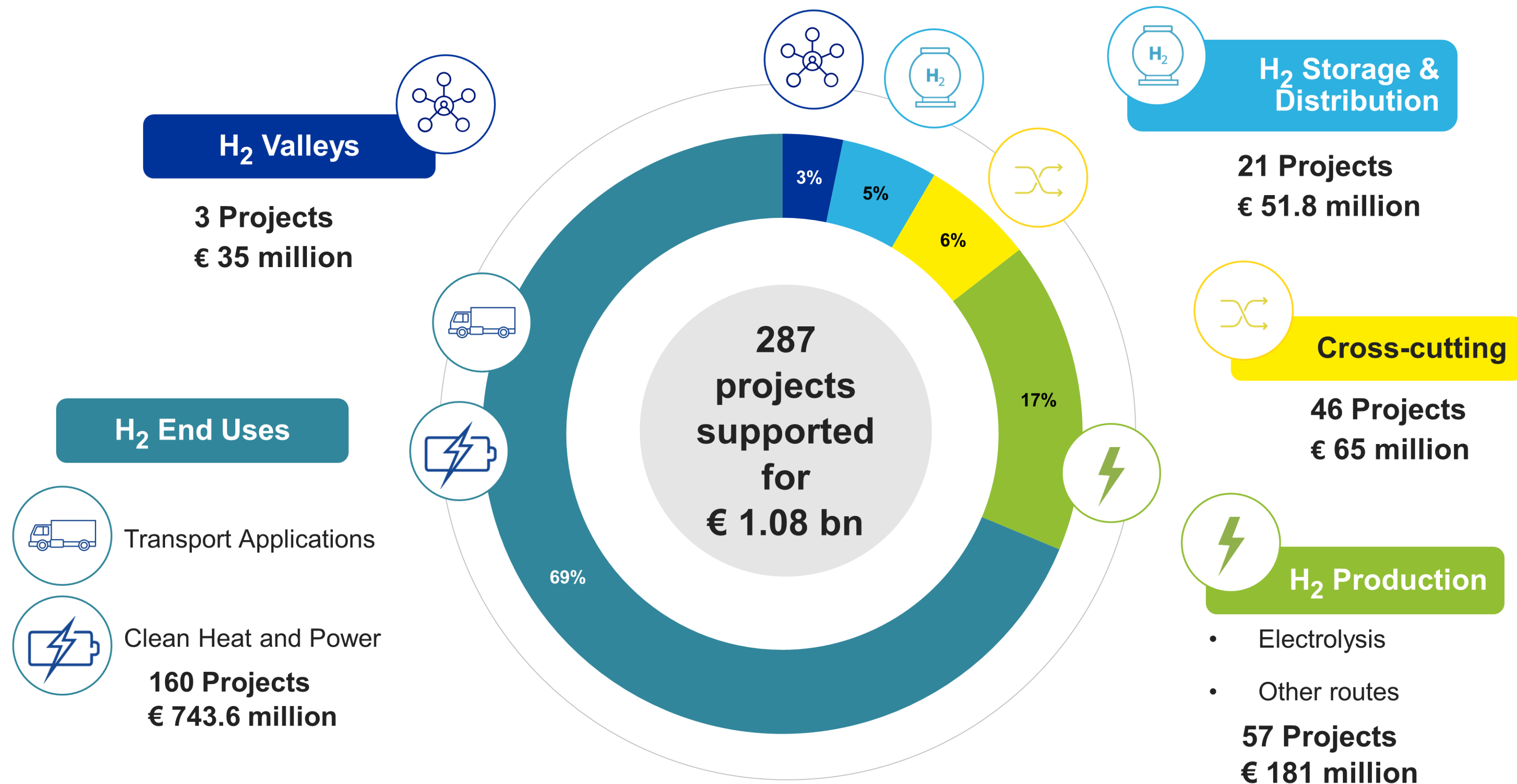
EU Institutional Public-Private Partnership (IPPP)



**Mission:** To facilitate the transition to a greener EU society through the development of hydrogen technologies  
**Budget:** 1 billion EURO from Horizon Europe (to commit until 2027 and implement until 2031)

# Clean Hydrogen Partnership Continuation of the FCH JU – Programme implementation (\*)

- Clean Hydrogen Partnership (legal name: Clean Hydrogen Joint Undertaking)
- Universal successor of the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU) and has taken over its legacy portfolio

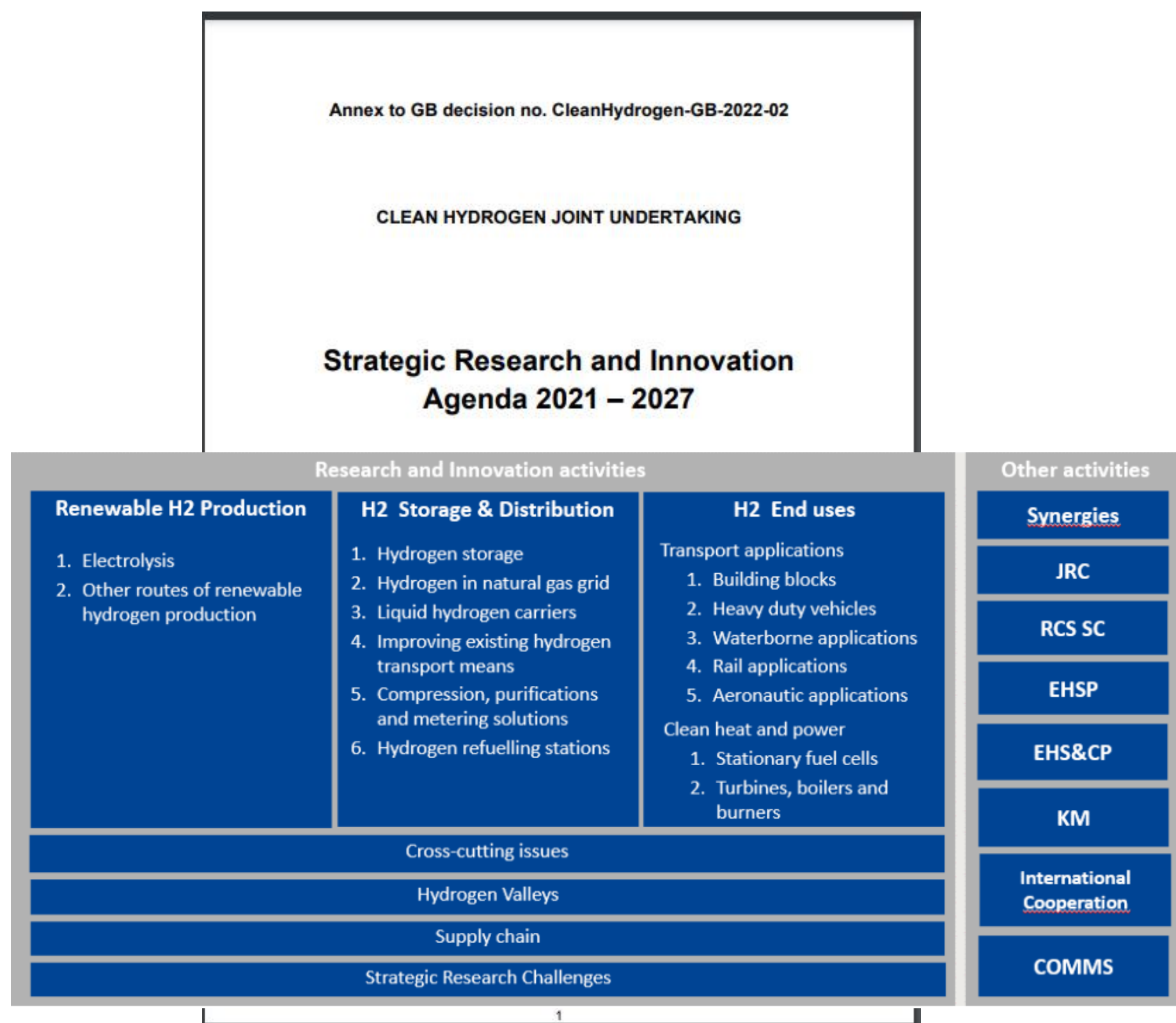




# Clean Hydrogen Partnership Key documents

- **Strategic Research and Innovation Agenda (SRIA):**
- **Key priorities and the essential technologies and innovations** required to achieve the objectives of the JU

- **Work Programme 2022:**
- **Scope and details of the activities for the year 2022**



**Clean Hydrogen JOINT UNDERTAKING (Clean Hydrogen JU)**

**WORK PROGRAMME 2022**

**Clean Hydrogen Partnership**

In accordance with the Council Regulation (EU) 2021/2085 and with Article 33 of the Financial Rules of the Clean Hydrogen Joint Undertaking. The work programme is made publicly available after its adoption by the Governing Board.

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<b>RENEWABLE HYDROGEN</b> HORIZON-JTI-CLEANH2-2022-02-01: Compatible grid materials with hydrogen HORIZON-JTI-CLEANH2-2022-02-02: Hydrogen detection system for continuous monitoring and Hydrogen/Natural gas mixture networks HORIZON-JTI-CLEANH2-2022-02-03: Validated prototype HORIZON-JTI-CLEANH2-2022-02-04: Ammonia for ammonia cracking HORIZON-JTI-CLEANH2-2022-02-05: Efficient organic hydrogen carriers HORIZON-JTI-CLEANH2-2022-02-06: Development of ammonia cracking HORIZON-JTI-CLEANH2-2022-02-07: Increase in temperature steam electrolysis HORIZON-JTI-CLEANH2-2022-02-08: Development of high capacity and energy-efficient H2 compressed storage HORIZON-JTI-CLEANH2-2022-02-09: Sampling HRS HORIZON-JTI-CLEANH2-2022-02-10: Implementation of components for high flow HRS HORIZON-JTI-CLEANH2-2022-02-11: Development of stationary compressed hydrogen refuelling solution for short-distance maritime operations <b>HYDROGEN END USES: TRANSPORT APPLICATIONS</b> HORIZON-JTI-CLEANH2-2022-03-01: Development of versatile PEMFC stacks for high power range applications HORIZON-JTI-CLEANH2-2022-03-02: Innovative next generation of improved PEMFC stacks for liquid hydrogen applications HORIZON-JTI-CLEANH2-2022-03-03: Large scale Duty Vehicle along the TEN-T corridors HORIZON-JTI-CLEANH2-2022-03-04: Liquid hydrogen propelled inland waterway vessels HORIZON-JTI-CLEANH2-2022-03-06: Development of Cells for Aviation: Development of dedicated station system HORIZON-JTI-CLEANH2-2022-03-07: Development of system with a gauging, fuel metering, heat management HORIZON-JTI-CLEANH2-2022-03-08: Development of Cells for Aviation: disruptive next-gen high temperature aviation <b>HYDROGEN END USES: CLEAN HEAT AND POWER</b> HORIZON-JTI-CLEANH2-2022-04-01: Design and industrial deployment of innovative manufacturing processes for solid oxide fuel cells systems and fuel cell components		

# Clean Hydrogen Partnership - Funding Opportunities

## Call for proposals 2022



**Call: HORIZON-JU-CLEANH2-2022**



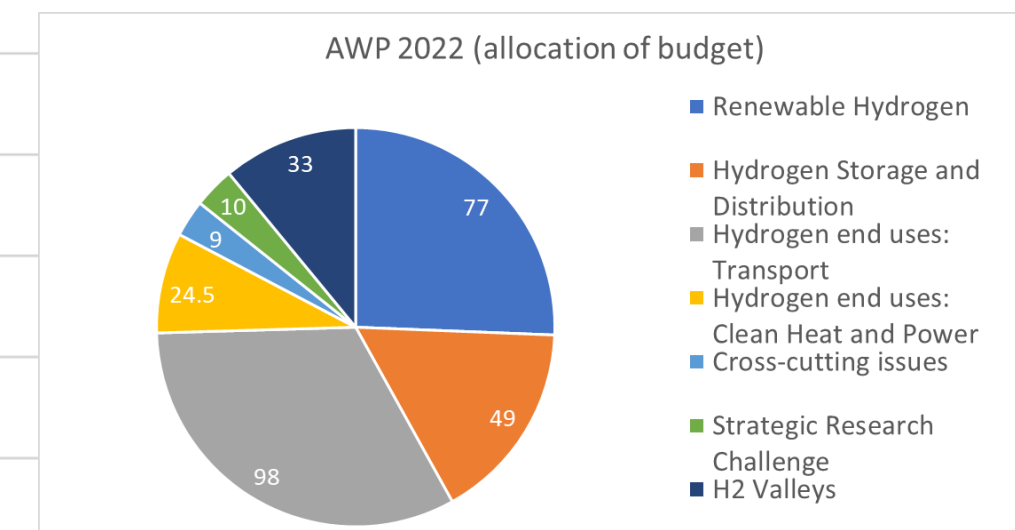
**Total budget:  
300.5 M€**

**41 topics**

- Renewable hydrogen production
- Hydrogen storage and distribution
- Transport
- Heat and Power
- Cross-cutting
- Hydrogen Valleys
- Strategic Research Challenges

### 41 topics available

- 10 - Renewable Hydrogen Production
- 11 - Hydrogen Storage and Distribution
- 8 - Transport
- 4 - Heat and Power
- 5 - Cross-cutting
- 2 - Hydrogen Valleys
- 1 - Strategic Research challenge



The topics will be grouped into 10 Innovation Actions (IA), 29 Research and Innovation Actions (RIA) and 2 Coordination and Support Actions (CSA). 6 Innovation Actions (IA) are considered of strategic importance and are selected as **flagship projects**, expected to have a significant impact in accelerating the transition to a hydrogen economy.

Synergies with other European partnerships and programmes, as well as with Member States and regional programmes are at the core of a number of topics.

	Budget (EUR 300.5 million)	Publication	Deadline
First deadline	179.5	1 March 2022	31 May 2022
Second deadline	121.0	1 March 2022	20 September 2022

# Clean Hydrogen Partnership - Funding Opportunities

## Call for proposals 2022

### Call HORIZON-JTI-CLEANH2-2022-1: Call deadline 31 May 2022



26 topics - €179.5m funding

Results: 79 proposals submitted by the closing deadline  
749 participating organisations (49 countries)  
€706m funds requested

**Closed!**

### Call HORIZON-JTI-CLEANH2-2022-1: Call deadline 20 Sep 2022

Area	Topic	Type of Action	Ind. Budget (M€)
RE H2 production	HORIZON-JTI-CLEANH2-2022-01-04: Design for advanced and scalable manufacturing of electrolyzers	RIA	2 x 2
	HORIZON-JTI-CLEANH2-2022-01-05: Scaling up of cells and stacks for large electrolyzers	RIA	6
	HORIZON-JTI-CLEANH2-2022-01-08: Integration of multi-MW electrolyzers in industrial applications	IA	18
	HORIZON-JTI-CLEANH2-2022-01-10: Demonstrating offshore production of renewable hydrogen	IA	20
H2 transport and distribution	HORIZON-JTI-CLEANH2-2022-02-01: Compatibility of Distribution non-steel metallic gas grid materials with hydrogen	RIA	2,5
	HORIZON-JTI-CLEANH2-2022-02-04: Ammonia to Renewable Hydrogen: efficient system for ammonia cracking	RIA	3
	HORIZON-JTI-CLEANH2-2022-02-05: Efficient system for dehydrogenation of liquid organic hydrogen carriers	RIA	3
	HORIZON-JTI-CLEANH2-2022-02-06: Development of large scale LH2 containment for shipping	RIA	6.5
	HORIZON-JTI-CLEANH2-2022-02-11: Development and demonstration of mobile and stationary compressed hydrogen refuelling solutions for application in inland shipping and short-distance maritime operations	IA	7
End-uses: Transport	HORIZON-JTI-CLEANH2-2022-03-01: Development and optimisation of reliable and versatile PEMFC stacks for high power range applications	RIA	2 x 3,5
End-uses: Heat and	HORIZON-JTI-CLEANH2-2022-04-01: Design and industrial deployment of innovative manufacturing processes for solid oxide fuel cells systems and fuel cell components	IA	7
Cross-cutting issues	HORIZON-JTI-CLEANH2-2022-05-01: Public understanding of hydrogen and fuel cell technologies	CSA	1
	HORIZON-JTI-CLEANH2-2022-05-03: Safe hydrogen injection management at network-wide level: towards European gas sector transition	RIA	3
H2 Valleys	HORIZON-JTI-CLEANH2-2022-06-01: Hydrogen Valleys (large-scale)	IA	25
	HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen Valleys (small-scale)	IA	8

15 topics  
€121.0m funding

**Open!**

- Definition of a Hydrogen Valley ([JU SRIA](#) p.13)

*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.*

- Call for proposals 2022 - Hydrogen Valley Topics

Topic	Type of Action	Ind.Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-06-01: Hydrogen Valleys (large-scale)	IA 	25	20/09/2022
HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen Valleys (small-scale)	IA 	8	20/09/2022

# Clean Hydrogen Partnership - Funding Opportunities Call for proposals 2022 – Hydrogen Valleys´ Topics

## 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

## 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

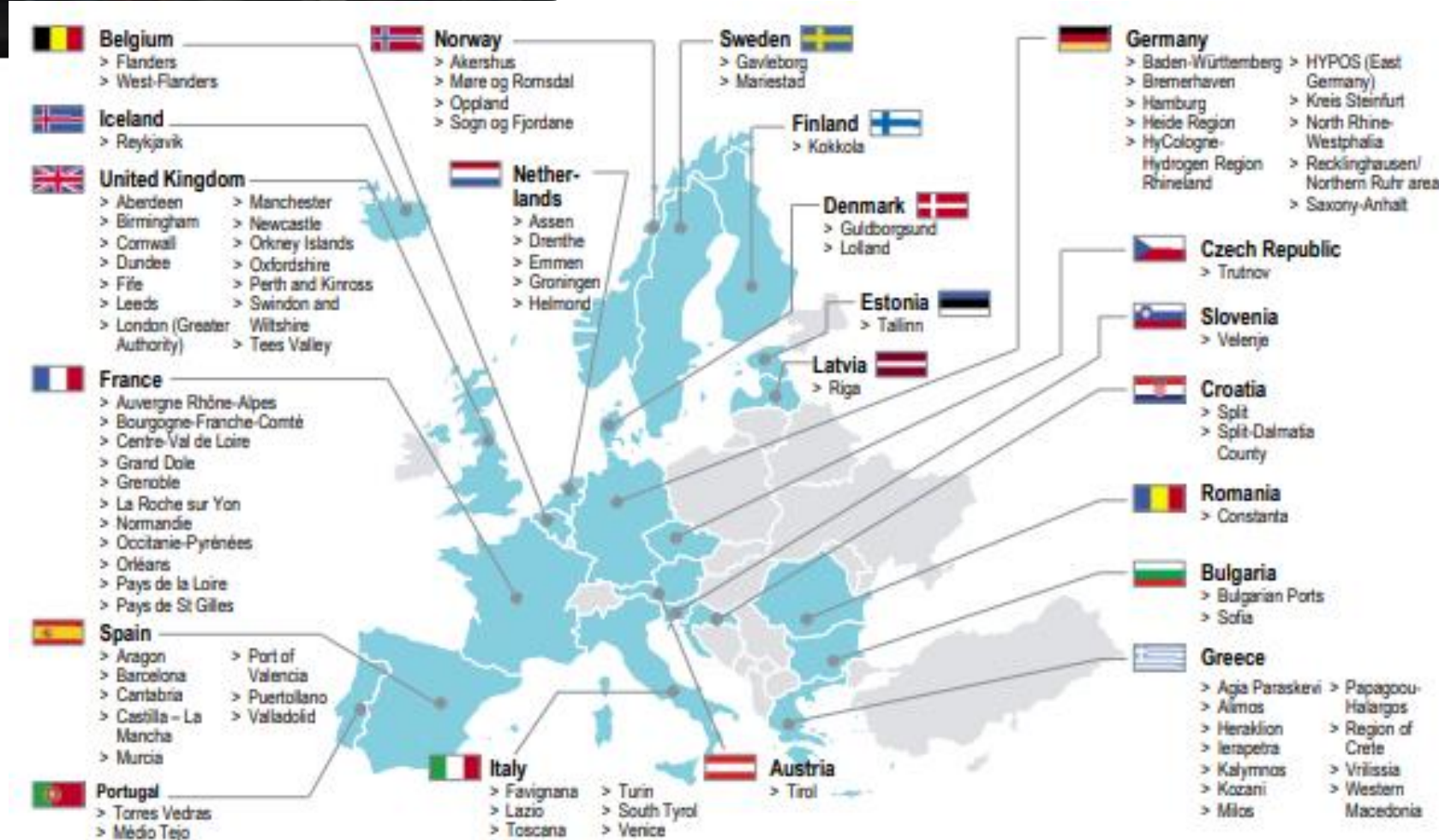


# Clean Hydrogen Partnership - Territorial cooperation Background information – JU's Regions Initiative

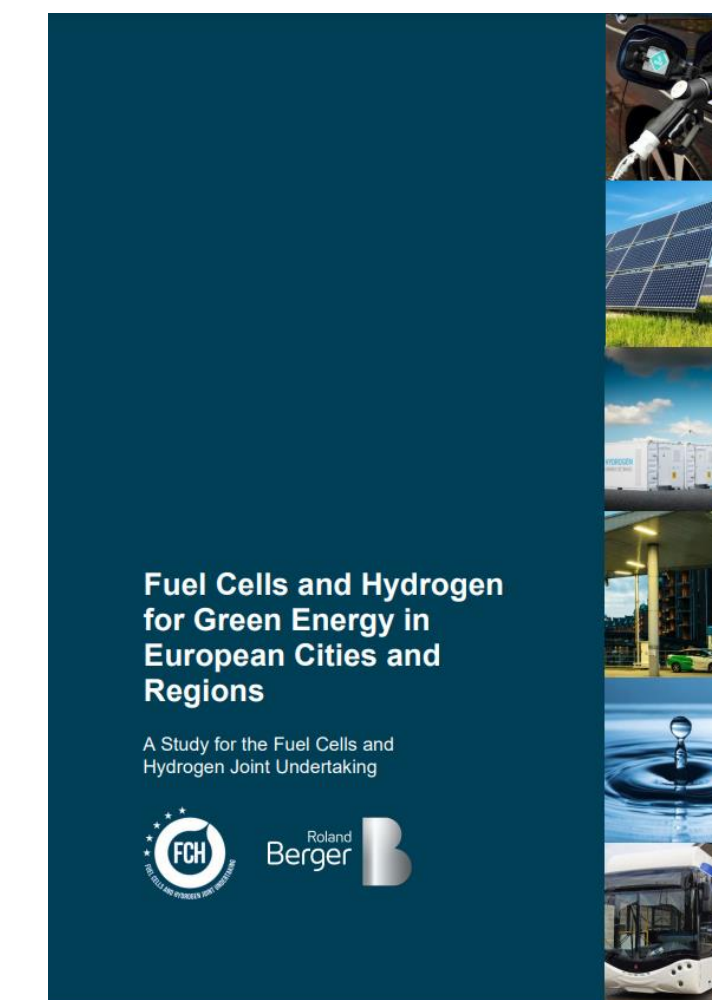
- In 2016 FCH 2 JU established a collaboration **platform to support European Regions and cities**, and work with them to develop market opportunities
- In 2017 FCH 2 JU launch of a **study on Development of Business Cases for Fuel Cells and Hydrogen Applications for European Regions and Cities**:



92 Regions and cities  
involved (through a MoU)



Legend: Map shows all regions and cities which have signed the Memorandum of Understanding (MoU)



[Final report \(2018\)](#)

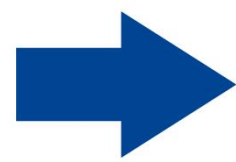
- Launch of European Hydrogen Valleys Partnership (EHV-S3P) under the Smart Specialisation Platform in 2018
- Pilot Project Development Assistance (PDA) in 2019

# Clean Hydrogen Partnership - Territorial cooperation JU's Project Development Assistance (PDA) for Regions

- **Objective:** Building a pipeline of H2Valleys in Europe: 35 applications (Q1 2020)
  - 11 regions selected for direct assistance
  - others invited to join the Initiative's Observer Network
- PDA activities: 12 months, until June 2021

## Project Development (11)

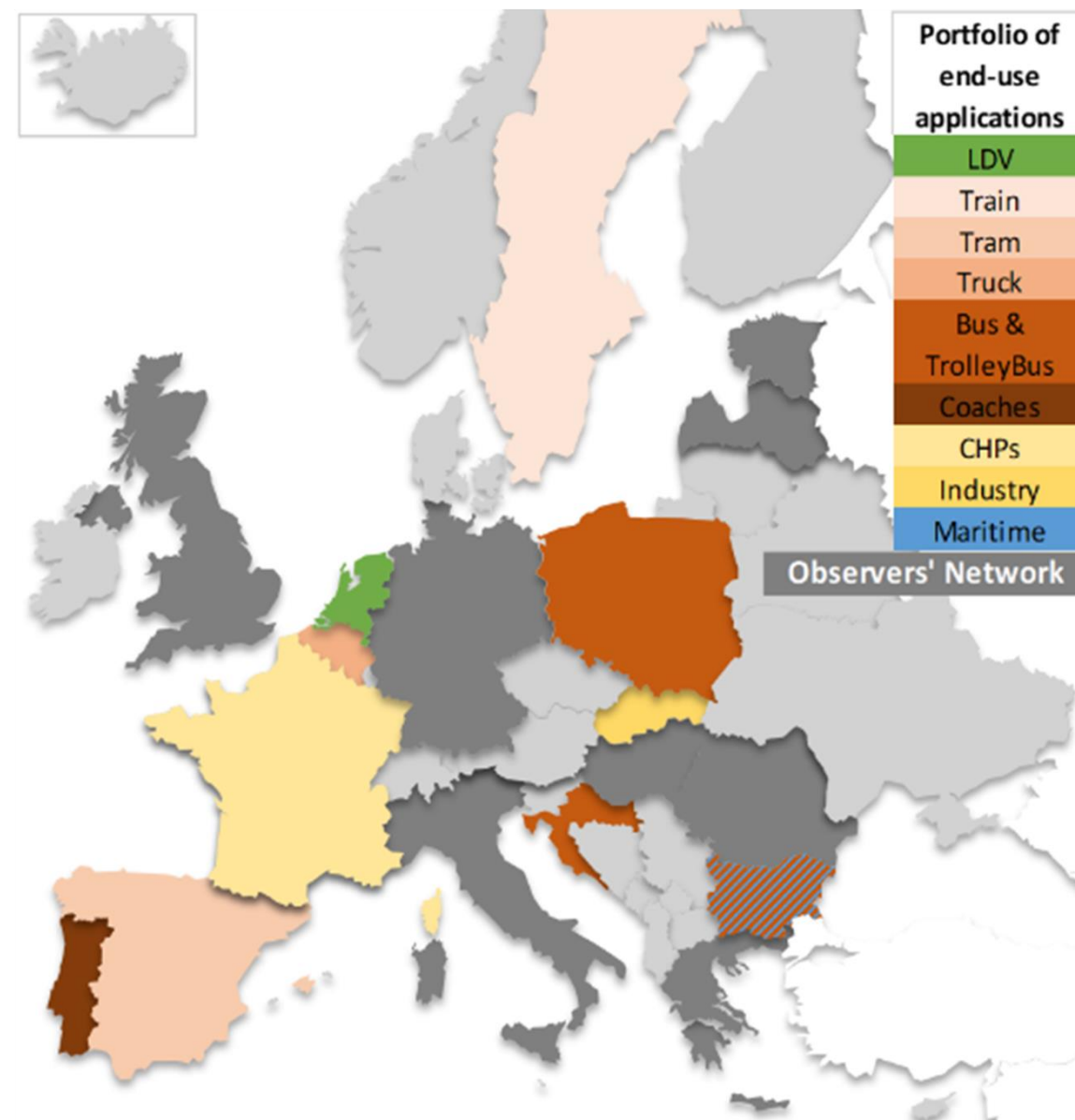
Concept



Plan

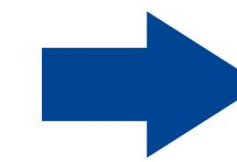
- Detailed project budgets
- Detailed project plans
- Financing and funding plans
- Strategies and best practices for procuring H2 tech

June-2020 – June-2021



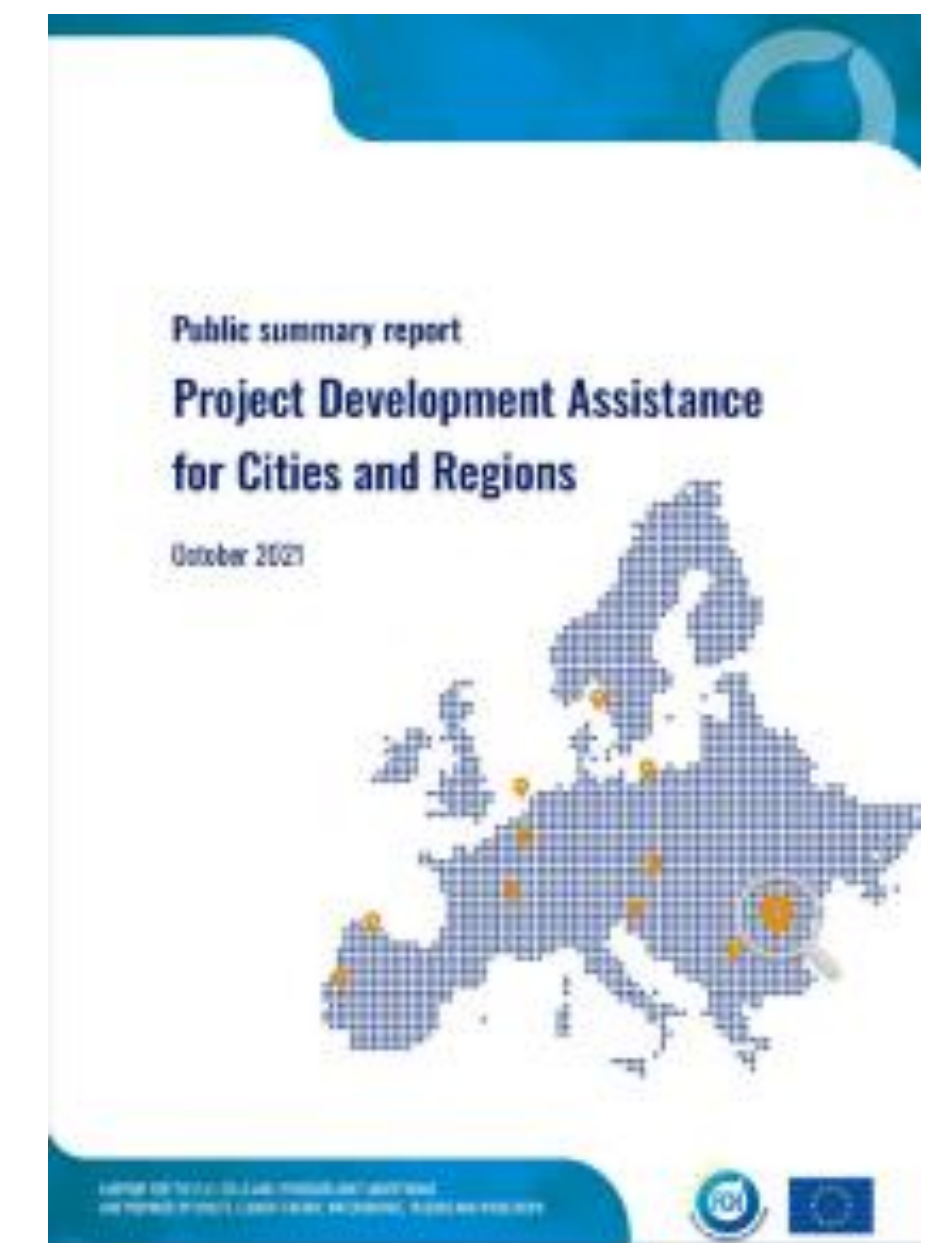
## Observers' Network (+24)

Survey to define scope



Wide offer of webinars

- Webinars
  - 1<sup>st</sup> tech - FCH buses and trucks (15/10/2020)
  - 1<sup>st</sup> peer review (17/11/2020)
  - Funding & Financing (16/12/2020)
  - 2<sup>nd</sup> tech - HRS and H2 distribution (11/02/2021)
  - 3<sup>rd</sup> tech – H2 production (26/05/2021)
- Database of suppliers
- Request for Information (template)
- Policy ([white paper](#)) support for H2
- [FCH Regions' Hub](#)



[Final report](#) (2021)

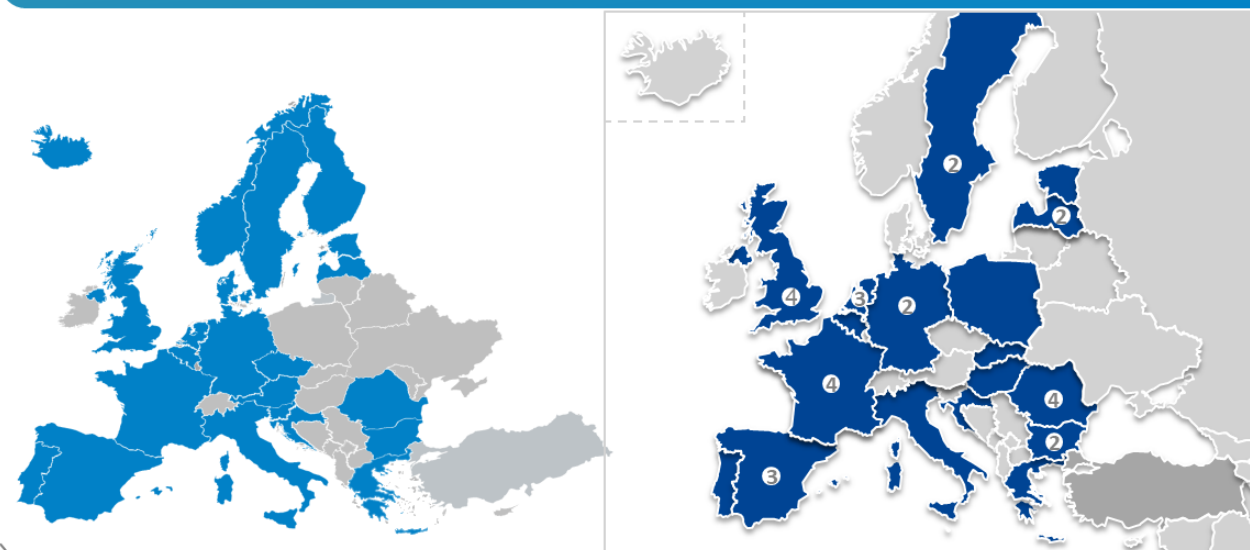
# Clean Hydrogen Partnership - Territorial cooperation JU's PDA for Regions II

- Focus on Cohesion Countries, Outermost Regions and Islands

## Planned Schedule:

- Award by **May 2022**

Supporting regions and cities in assessing various FCH applications ( $\frac{1}{4}$  of EU population and GDP)



## Build on the FCH Regions Initiative (2018) and its follow-up activities:

- H2Valley (2019)
- H2Island (2020), and
- PDA for Regions (2019-2021)

Support detailed project planning

Explore other geographies

Raise awareness for Funding and Financing community

## Tasks

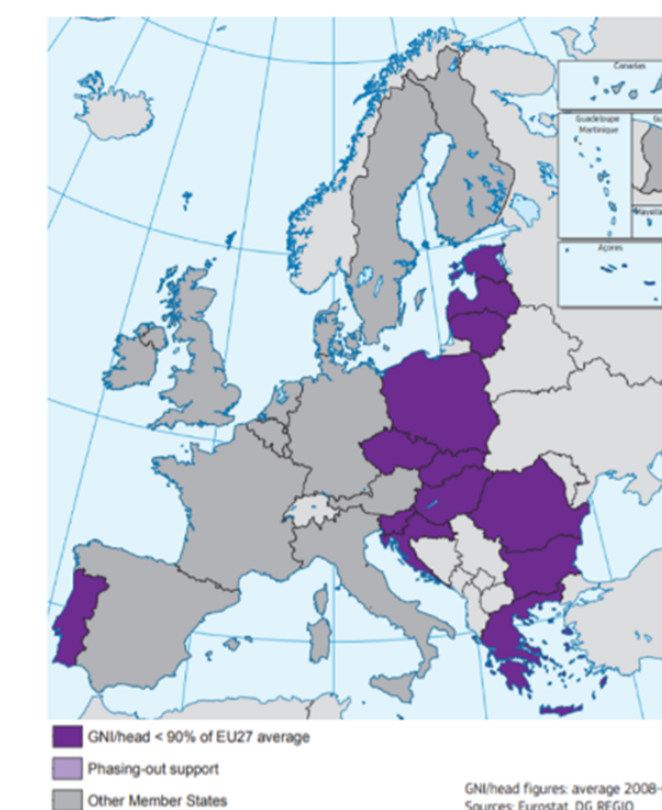
- Select at least 15 projects
- Provide PDA support to bring projects to a high level of preparedness
- Create Observers' Network(s) of inter-island, inter-regional and cross-city networks to generate specific blueprints
- Raise awareness of relevant Regional and National ESIF Managing Authorities and Promotional Bank

## Outermost Regions



6+12 month / € 1,000,000

## Cohesion Fund eligibility (15 MS)





- **Global** collaboration and go-to-platform for all information on large-scale hydrogen flagship projects (Hydrogen Valleys – H2Vs).



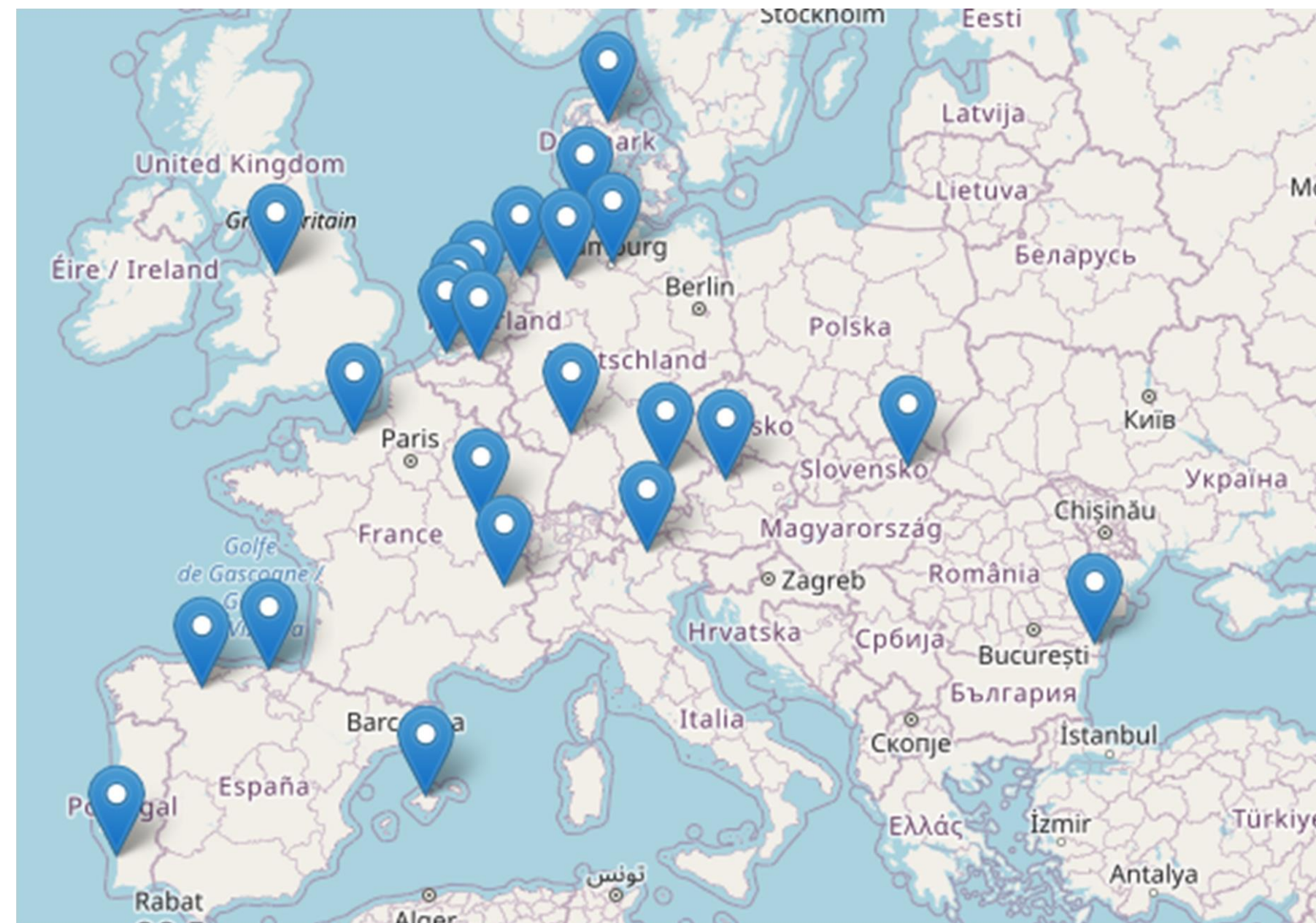
## 23 Hydrogen valleys in 10 EU countries + U.K.

 3 in The Netherlands:  
 - North Netherland  
 - Zuid Holland  
 - Zeeland (H2 delta)

 2 in U.K.:  
 - North West England  
 - Orkney Islands

 4 in France:  
 - Rhone Alpes  
 - Normandy  
 - Bourgogne Franche Comté  
 - French Guiana


 1 in Portugal:  
 Sines industrial hub



 3 in Spain:  
 - Island Mallorca  
 - Basque (BH2C)  
 - Green Crane

 1 in Italy:  
 Bolzano

 1 in Austria:  
 Linz (WIVA)

 1 in Denmark:  
 Hobro (Hybalance)

 5 in Germany:  
 - Munich (Hybayern)  
 - Mannheim (H2rivers)  
 - Heide (eFarm)  
 - Hamburg (NDRL)  
 - Oldenburg (HyWays)

 1 in Slovakia:  
 Kosice (Black Horse)

 1 in Romania:  
 Constanza (Blue Danube)

# Hydrogen Valleys/ Regions related activities Mission Innovation



HYDROGEN VALLEYS ANALYSIS TOOLBOX MATCHMAKING JOIN

Platforms and databases Reference studies Stakeholders

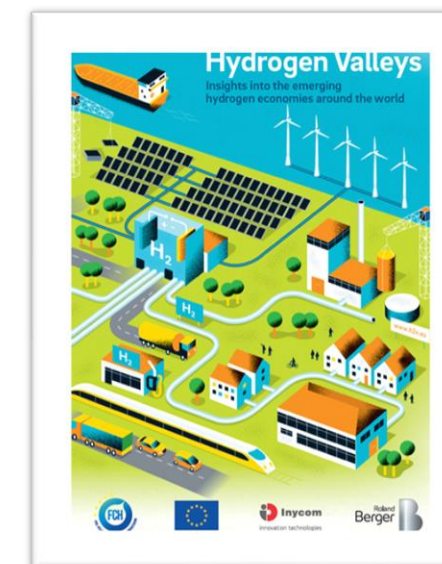
Fuel Cells and Hydrogen Joint Undertaking – Current projects  
The FCH JU website offers a broad range of current initiatives, projects and published studies regarding the market introduction of FCH technologies in Europe.

Fuel Cells and Hydrogen Observatory  
The FCHO provides data and up-to-date information about the entire hydrogen sector. It focuses on technology and market statistics, socio-economic indicators, policy and regulation, and financial support.

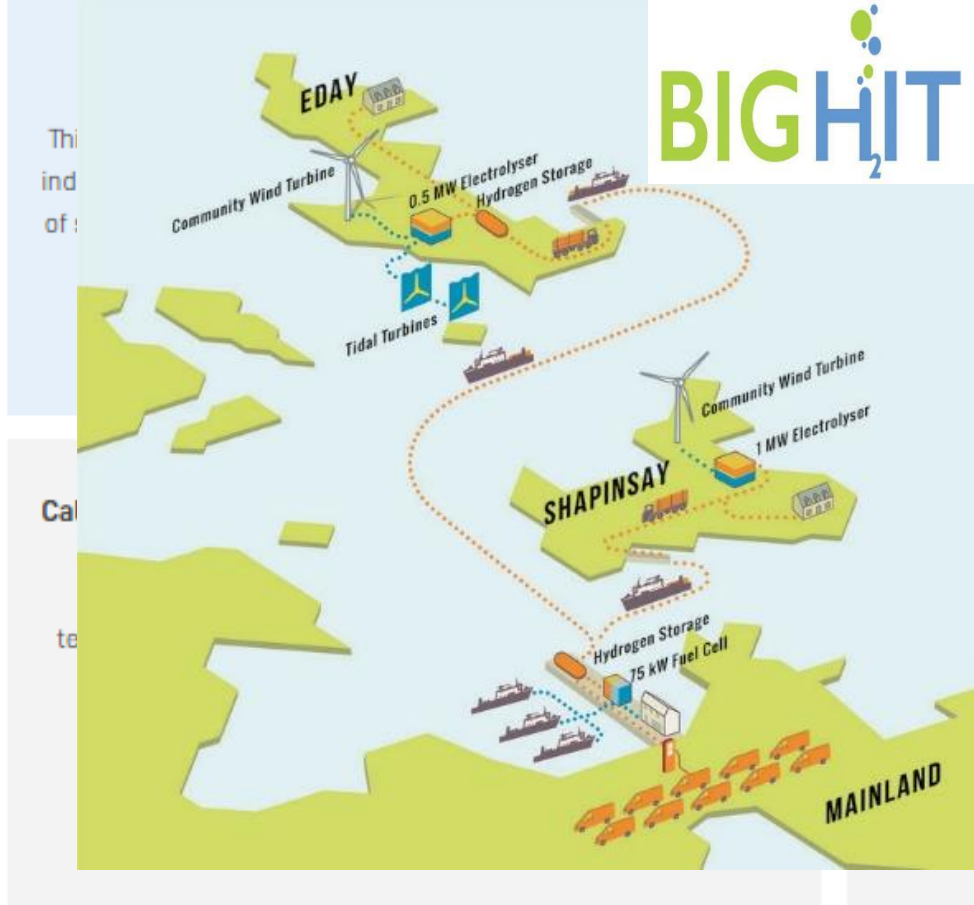
Hydrogen Territories Platform  
The HTP is an interregional platform that provides information and methodologies for the implementation and deployment of FCH technologies in isolated or island territories.

Fuel Cells and Hydrogen Joint Undertaking – Technology introduction & preliminary business cases' dossiers  
The presentations introduce a broad range of technology dossiers and outline preliminary business cases per hydrogen application.

Final report (2021)



- BIGHIT project: Fostering replicability of Hydrogen Territories



ization Hydrogen and Fuel Cell  
ogy) – Project finder  
rovides a geographical overview and  
lic

The HTP provides support to identify **local replication opportunities** for the development, deployment, and exploitation of hydrogen and fuel cell technologies for integrated local energy systems.

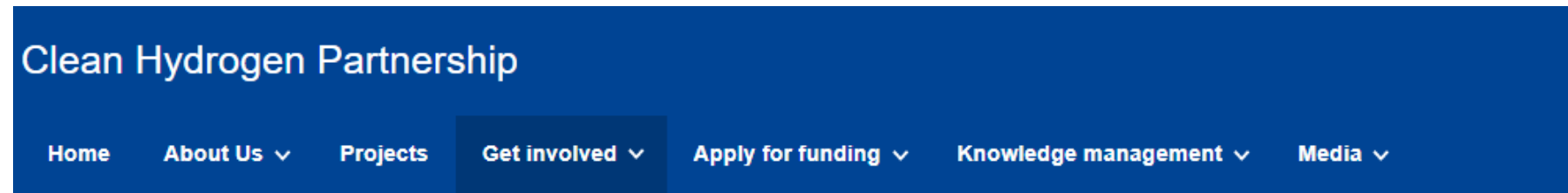
Supported with a series webinars

**Replicability tool**

<http://h2territory.eu/replicability-tool/>

# Hydrogen Valleys/ Regions related activities Clean Hydrogen Partnership - FCH Regions' Hub

- Clean Hydrogen JU supports European Regions and Cities to Launch Investments: **FCH Regions' Hub**



European Commission > Clean Hydrogen Partnership > Get involved > FCH Regions' Hub

## FCH Regions Hub

Navigation FCH Regions Hub | FCH Regions' Hub | Background Info | Latest News and Publications | More >

## Supporting European Regions and Cities Hub

The FCH-Regions' Hub supports regional and local authorities and other public bodies across the European Union to develop and turn their concepts for regional hydrogen and fuel cell (FCH) projects into detailed work plans. Raising awareness and providing project development assistance to regional FCH projects will further accelerate the deployment of hydrogen in Europe, contributing to carbon neutrality and zero pollution.

## How the FCH-Regions' Hub Works

The FCH-Regions' Hub concentrates the relevant information we gather within the funded projects, studies and initiatives. It further links you to specific external sources and complementary initiatives capable of assisting you in the endeavour of deploying your Regional FCH plans.

[Latest News and Publications](#)

[PDA for Regions](#)

### Hubs for regions

[Opportunities for other PDA support](#)

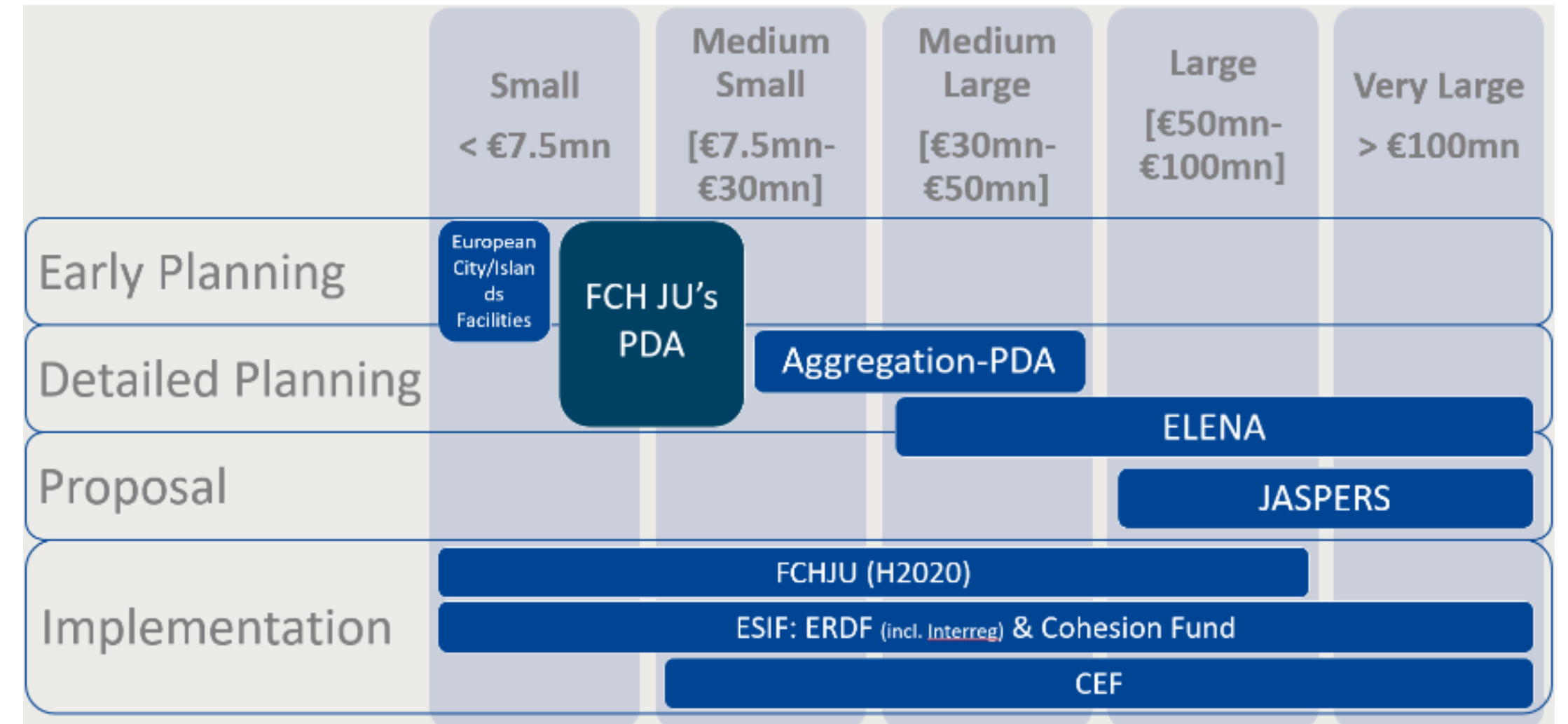
[Initiatives to support networking among regions](#)

[Tools to support the development of business models](#)

[Reference Studies and Reports](#)

[Demo Projects to access specific expertise on the deployment of different FCH](#)

[H2 Islands](#)



Type	Title
Initiative (S3P)	European Hydrogen Valley Partnership
Initiative	Clean Energy for EU Islands
Platform	Mission Innovation Hydrogen Valley Platform
Initiative	Covenant of Mayors. The world's largest movement for climate and energy actions
Association	CPMR - Conference of Peripheral and Maritime Regions


Type	Title	Source	Link	Last update
Technology introduction & preliminary business cases' dossiers	FCH Technology introduction & preliminary business cases' dossiers	FCH Regions Initiative (FCH JU: 2+26 PDF files)	All: - Technology Introduction Dossiers - Preliminary Business Cases Per applications:	
Business cases/models	Business models	Funding and Finance (FCH JU website)	<a href="https://www.fch.europa.eu/page/advice-complex-business-models">https://www.fch.europa.eu/page/advice-complex-business-models</a>	
Business cases/models	Teaser for Coupling wind farms (or any RES) and Electrolysers	Funding and Finance (FCH JU website)	<a href="https://www.h2v.eu/https://www.fch.europa.eu/page/advice-complex-business-models#PtH2">https://www.h2v.eu/https://www.fch.europa.eu/page/advice-complex-business-models#PtH2</a>	
Modelling tools	Mobility business case tool	FCH Regions Initiative (FCH JU Excel sheet)	Excel file	27/03/2018
Funding tools	FCH Funding and Financing navigation tool	FCH Regions Initiative (FCH JU; Roland Berger; Excel sheet)	Excel file	08/02/2018


For further information  
<https://www.clean-hydrogen.europa.eu/>



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