

FCH-JU a successful European public Private Partnership on hydrogen

Bart Biebuyck 19/11/2020 virtual



FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

New <<< >>>eMMergy

WSH62991



Strong public-private partnership with a focused objective

A combined private-public of about 2 billion Euro has been invested to bring products to market readiness by 2020





Similar leverage of other sources of funding: 1.005 b€

263 projects

supported

for

985 m€

41 % 404 million euros 70 projects \Box 6 % 58 million euros 43 projects 7 % 66 million euros 5 projects

46 %

457 million euros

145 projects





FCH-JU region initiative was key to boost the hydrogen awareness in EU

The regions initiative led to the H2 Valley partnership, PDA and a call topic on H2 Valleys

https://www.fch.europa.eu/page/about-initiative







https://www.fch-regions.eu/



Examples of Hydrogen valleys in Europe today

Its scope is system integration: Production of renewable H2, storage, distribution and end use (transport, stationary & industry)



Underground H2 storage (Hystock)







Hydrogen Island (Spain)*

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

(*) Subject of successful signing the grant by Dec 2020

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



Electrolysis projects: increase capacity & lowering cost (32 projects for 114m€)

Europe is world-leader in electrolysis systems (EU has the most patents and publications vs other parts of the world)





0.15 MW



Electrolyser: Hydrogenics (PEM)

Project: Haeolus

Funding: 5.0 m€

Place: Norway

Date: 2017

Date: 2016



1.2 MW

2.5 MW

3.4 MW

Project: Hybalance Place: Denmark Date: 2014 Electrolyser: Hydrogenics (PEM) Funding: 8.0 m€





Project: Demo4grid Place: Austria Date: 2016 Electrolyser: IHT (ALK) Funding: 2.9 m€







Project: Refhyne Place: Germany Date: 2017 Electrolyser: ITM (PEM) Funding: 10 m€



The European Green Deal call for proposals includes a topic to install a 100MW Electrolyser. Call timing: Mid. Sept – end Jan. 2021 **Details:** https://ec.europa.eu/info/f iles/electrolyser-11 en



(International) Hydrogen Valley Platform

Renewable and Clean Hydrogen Challenge (IC8) under MISSION

Mission Innovation



COPENHAGEN MALMÖ

- → IC8 Launched in May 2018 CEM9/MI-3
- \rightarrow 15 countries + EU
- → Objective: "To accelerate the development of a global hydrogen market by identifying & overcoming key technology barriers to the production, distribution, storage, and use of hydrogen at GW scale"

→ Scope:

- focused multinational research & large scale demonstration efforts
- from both public & private sectors
- industry-directed breakthroughs within the next 3 years
- renewable & clean hydrogen
- 4 activity streams: making, sharing, using hydrogen & cross-cutting issues

→ Co-lead `countries': Australia, <u>EU & Germany</u>





MISSION INNOVATION Accelerating the Clean Energy Revolution







The Hydrogen Valley Platform



A Global Information Sharing Platform,

- developed by the Fuel Cells and Hydrogen Joint Undertaking at the initiative of the Mission Innovation IC8 Member States
- will provide comprehensive information on large-scale hydrogen flagship projects, also known as Hydrogen Valleys

The platform can be accessed at: www.h2v.eu. Have a look at it right now!

SIGN UP HERE FOR UPDATES



Data will be collected globally from around 40 large-scale hydrogen projects

Our Mission

- is to advance the clean energy transition
- is to promote the emergence and the implementation of hydrogen projects
- is to raise awareness among policy. makers

25 Nov.: sneak peek during the Hydrogen Week



Hydrogen Valleys to accelerate the energy transition

Platform to become a global information sharing platform

H2 Valleys' concept picked up world wide to build Regional H2 economies



Raise awareness among policy makers

gathering and sharing lessons learnt

EU/EC/FCH JU in the lead also in terms of

Advance clean energy transition





 \checkmark

 \checkmark



FCH-JU has projects related to many different modes of transport

Heavy duty transportation is looking seriously to hydrogen due to the huge performance improvements of fuel cells





















JIVE and JIVE 2 – Deployment of 295 FCB in Europe

Hydrogen fuel cell buses for clean public transport in EU cities

- Orders placed for 230/295 buses (78%) with 5 suppliers Van Hool (80), Solaris (57), Wrightbus (65), SAFRA (10), and Caetano (18).
- **Delivery of the first 50 buses** in Cologne (35), Wuppertal (10), and Pau (5) and start of full route operation. Another 51 buses are due for delivery by the end of this year across 8 sites (Aberdeen, London, South Tyrol, Auxerre, Cologne, Groningen, Toulouse, and Wuppertal).
- All remaining vehicle orders are set to be finalized by end this year, with deliveries for a further 150 buses now expected for 2021.
- Increased interest from other European OEMs, with JIVE-compliant offers received from: Optare, Rampini, and SOL and continued interest from ADL, Daimler, VDL, and interest from 2 other major European OEMs.
- Best Practice Report widely disseminated -> translated into 8 languages by UITP.

















Refuse Vehicle Innovation and Validation in Europe

Main requirements

Scope: advance the development of **fuel** cell refuse trucks

Call Main requirements:

- Fleet: at least 10 trucks
- -Gross Vehicle Weight: 16/26 tons
- -FC system \geq : 40 kW (FC to provide at least 50% power)
- -Autonomy: daily back-to-base missions
- -Sites:3
- –Operation:2 years or 8.000 h

Project start: December 2017 until end 2021 FCH JU support: € 5 million







8 Sites (BE, NL, IT)



Key expected outcomes

- Technology validation: trucks trial in their operating environment;
- Design standardization towards mass production;
- Hardware and control strategies to meet highly demanding refuse truck duty cycles;
- Lessons learned including data on refueling operations;





23-27 November Save the date

https://www.fch.europa.eu/european-hydrogen-week







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For further information

www.fch.europa.eu www.hydrogeneurope.eu www.hydrogeneurope.eu/research



FUEL CELLS AND HYDROGEN JOINT UNDERTAKING





Visualization of the data: Real-time availability information https://h2-map.eu/











Fuel Cells and Hydrogen Observatory (Launched 15 Sept '20)

One stop shop to understand where the FCH sector is at and how it is evolving

- Go to resource for all things on fuel cells and hydrogen
- User friendly and reliable output
 - charts, graphs and data downloads
 - reports
- It covers
 - Technology & Market
 - **Policies & regulation**
 - **Codes & Standards**
 - Patents & Publications
 - Funding
 - Education & Training (to follow)
- **Global resource**
- www.fchobservatory.eu
 - info@fchobservatory.eu







JEL CELLS AND HYDROGEN







The Fuel Cells and Hydrogen Observatory has been prepared for the FCH 2 JU under a public procurement contract

Opportunities from the inclusion of Hydrogen in NECPs

EU27+UK NECPs were analyzed on the national opportunities for hydrogen deployment by 2030.





https://www.fch.europa.eu/publications/ opportunities-hydrogen-energytechnologies-considering-nationalenergy-climate-plans





In EU27+UK by 2030 depending on the scenario, 13-56 GW of electrolysers (4800Hrs full load) are needed reducing 20-67MtCO2/a, creating 7.5-29 bn € added value and 104k-358k jobs.







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Developing an EU wide Guarantees of Origin (GO) Scheme for Hydrogen

Two definitions: one for Green and one for Low-Carbon Hydrogen – more than 70,000 GOs issued already

Four production plants included in the pilot scheme which have been already audited

Air Liquide, Port Jerome (SMR +CCS) Colruyt Group, Halle (Electrolysis +RE)

Air Products, Rotterdam (by product H2 from Chlor-alkali process)







Two labels are defined for hydrogen





Uniper, Flakenhagen (Electrolysis + **RE and methanation**





https://cmo.grexel.com/Lists/ PublicPages/Statistics.aspx

On-going actions:

(1) Certifhy3: Setup of a platform for piloting a GO scheme for hydrogen across Europe. https://www.certifhy.eu/

(2) IPHE taskforce on Hydrogen Production Analysis methodology.

=> important to unlock future cross boarder trading.





