



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

***Hydrogen and its
potential to
decarbonize
Industrial Hubs
through Ports***

Bart Biebuyck

14 / 10 / 2021 Virtual



**SUSTAINABLE
ENERGY WEEK**

An initiative
of the



European
Commission

Strong public-private partnership with a focused objective

A combined private-public of **more than 2 billion Euro** has been invested to bring products to market readiness



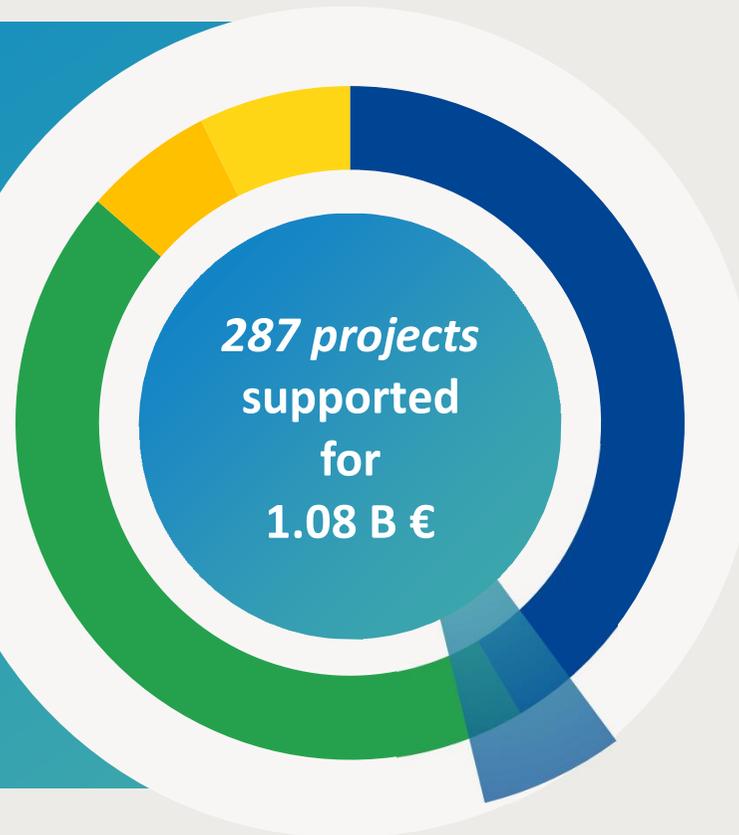
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Industry grouping
±300 members
50% SME



Research grouping
±100 members



Energy	Transport	Cross-cutting
H ₂ production and distribution H ₂ storage F/C for CHP	Road vehicles Non-road vehicles Refueling infra Maritime, rail and aviation applications	standards, safety, education, consumer awareness, ...

45 %	
483.6 million euros 154 projects	
41.4 %	
446.7 million euros 78 projects	
6.3 %	
67.3 million euros 48 projects	
7.3 %	
78.9 million euros 7 projects	



Similar leverage of other sources of funding: 1.08 B €

Global Ports Hydrogen Coalition launched under the CEM.

H2Port project Valencia: First application of hydrogen technologies in port handling equipment in Europe.



CEM H2 Initiative:

HYDROGEN INITIATIVE
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

Global Ports Hydrogen Coalition
Launched on 1st of June

Co-Led by IEA H2I & DG ENER – Support by FCH-JU

Out of 25 ports, 12 European Ports participate
(Norway:4, Germany:3, Spain:1, Sweden:1, The Netherlands:1, Belgium 1, Portugal)

<p>Brunsbüttel Ports (Germany)</p> <p>Flam Port (Norway)</p> <p>North Queensland Bulk Ports (Australia)</p> <p>Pecém Port Complex (Brazil)</p> <p>Port of Auckland (New Zealand)</p> <p>Port of Bahía Blanca (Argentina)</p> <p>Port of Berlevåg (Norway)</p> <p>Port of Brisbane (Australia)</p> <p>Port of Duqm (Oman)</p>	<p>Port of Farsund (Norway)</p> <p>Port of Grenland (Norway)</p> <p>Port of Gothenburg (Sweden)</p> <p>Port of Hamburg (Germany)</p> <p>Port of Houston (USA)</p> <p>Port of Mejillones (Chile)</p> <p>Port of Rotterdam (The Netherlands)</p> <p>Port of Valencia (Spain)</p> <p>Port of Vancouver (Canada)</p>	<p>Portuguese Ports Association</p> <p>Southern Ports (Australia)</p> <p>Lehmann GmbH</p> <p>Neltume Ports (Chile)</p> <p>Woodside (Australia)</p> <p>Free Hanseatic City of Bremen (Germany)</p> <p>Hydrogen Council</p> <p>International Association of Ports and Harbours</p> <p>Port of Antwerp</p>
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Port of Valencia

Implementing Fuel Cells and Hydrogen Technologies in Ports

H2 PORTS

FCH | FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

Reach Stacker in MSC Terminal

- FC: 90-120 kW
- 2 years / 5000 h of operation

Mobile HRS

- Hydrogen supply logistics at ports
- Port regulatory framework
- Safety procedures

Yard Tractor in Valencia Terminal Europa

- FC: 85 kW
- 2 years / 5000 h of operation

H2PORTS project in the port of Valencia

- Reach stackers and yard tractors will be demonstrated in the port
- A mobile hydrogen refueling station will be operated inside the port

DURATION: 2019-2022; project 4.1 M€ (4 M€ by FCH-JU)



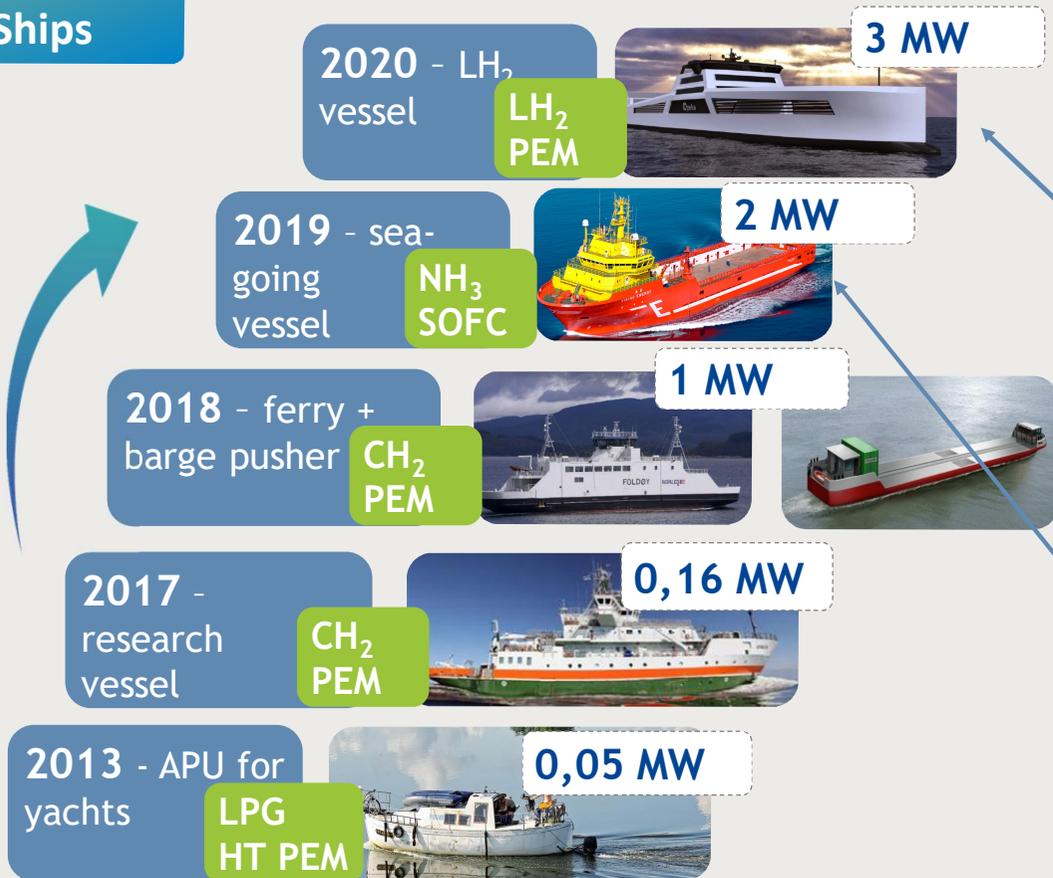
Soon a European Ports Initiative starts aiming to establish a roadmap for hydrogen in ports.

FCH 2 JU support for FC and H2 in maritime applications

Moving towards larger sizes of vessels, no « size fits all »



Ships



HySHIP

- RoRo vessel, for coastal goods transport
- 3MW fuel cell system using LH₂ (>5t storage)
- Conceptual designs for a 20MW ship
- Develop a standardised bunkering system
- LH₂ distributed to a series of maritime bases in a containerized system

ShipFC

- Platform support vessel in North Sea (Norway)
- Length: 95m, Gross tonnage: 5073MT
- Operation: 2024
- Zero emission ammonia

Hydrogen valleys as an accelerator for a European hydrogen economy



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



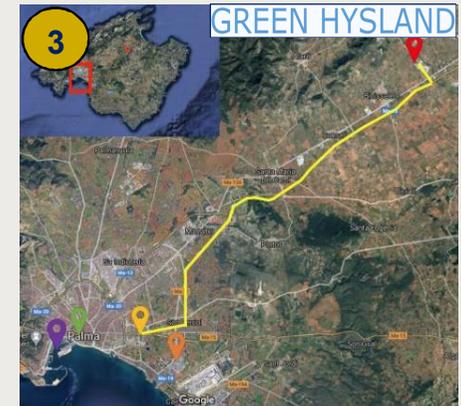
Orkney's Island (Scotland):

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



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)



Hydrogen Island (Spain)

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



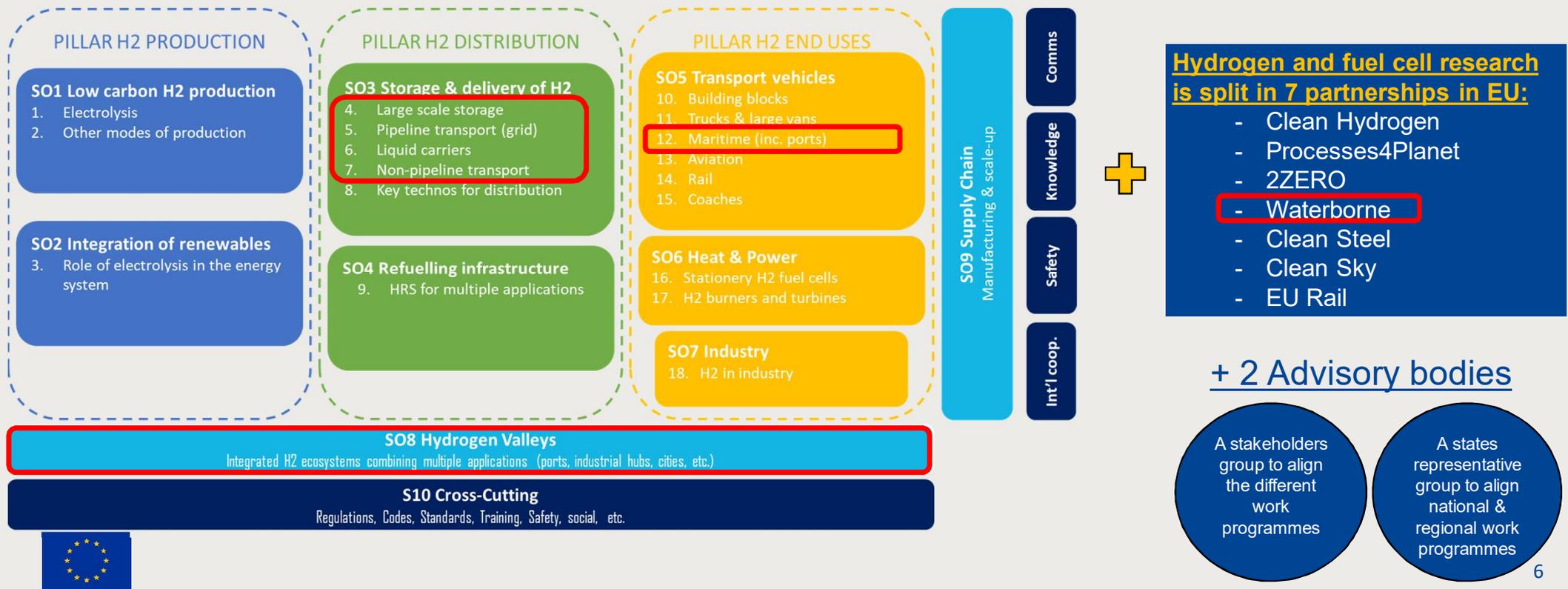
Future Possible (cross border) H₂ valleys: **Ports**, Airports, Industrial hubs, Logistical hubs, A H₂ city (or area)

Hydrogen – Research and innovation

Partnership under Horizon Europe Programme
with a stronger focus on Hydrogen and hard to decarbonizing sectors.



Maintain and strengthen EU's global leadership role
Clean Hydrogen Partnership start in Q4 2021 with a budget of **1 billion EUR**



The 2nd European Hydrogen Week

The biggest European hydrogen conference hosting key policy makers at European, National and regional level.

A promotional banner for the European Hydrogen Week. The background is a gradient from dark blue to light green, featuring several glowing, spherical hydrogen molecules. The text 'European Hydrogen Week' is prominently displayed in white, with 'Hydrogen' in a larger font. Below it, the dates '29 Nov - 3 Dec 2021' are shown. At the bottom, it says 'with the launch of Clean H₂ JU Brussels, Belgium'. Logos for FCH and the European Union are in the top right corner.

The president of the European Commission Ursula von der Leyen will open the hydrogen week





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