H2 AND FUEL CELLS IN MARITIME APPLICATIONS WORKSHOP

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The Hydrogen economy

FCH 2 JU: Strong Public-Private Partnership with a focused objective

Industry-led Public-Private Partnership (PPP)

Fuel Cells & Hydrogen Joint Undertaking (FCH2 JU)

Hydrogen Europe

Industry Grouping
About 105 members
~ 50% SME

European Commission

ON.ERGHY
RESEARCH ON FUEL CELLS & HYDROGEN

Research Grouping
About 65 members

The Joint Undertaking is managed by a Governing Board composed of representatives of all three partners and lead by Industry.

To implement an optimal research and innovation programme to bring FCH technologies to the point of market readiness by 2020

Legal basis:
Council Regulation: 559/2014 of 6 May 2014 (H2020)

FCH 2 JU: Objectives for a green economy

H_2 STORAGE FOR GRID BALANCING

Demonstrate on a large-scale hydrogen's capacity to harness power from renewables and support its integration into the energy system

HEAT & ELECTRICITY PRODUCTION

Increase fuel cell efficiency and lifetime

GREEN HYDROGEN PRODUCTION

Increase efficiency and reduce costs of hydrogen production, mainly from water electrolysis and renewables

MINIMAL USE OF CRITICAL RAW MATERIALS

Reduce platinum loading

CLEAN TRANSPORT

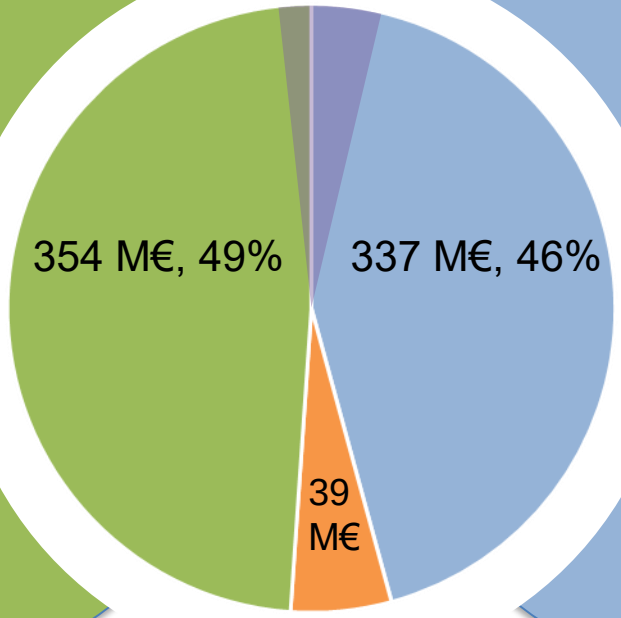
Reduce fuel cell system costs for transport applications

203 projects supported for 730 M€

Similar leverage of private funding: 782 M€

ENERGY
114 projects

- Hydrogen production and distribution
- Hydrogen storage for renewable energy integration
- Fuel cells for power & combined heat & power generation



TRANSPORT
52 projects

- Road vehicles
- Non-road vehicles and machinery
- Refuelling infrastructure
- Maritime, rail and aviation applications

Cross-cutting, 34 projects

(e.g. standards, safety, education, consumer awareness, …)

To the sea: MARITIME APPLICATIONS

FCH | FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

FCH2 JU projects

PURE (finished) – 36months, 2.8M€ budget, 1.6M€ funding

APU for recreational yachts from propane/LPG

pure
auxiliary power unit for recreational yachts

Achievements

- An integrated system small (25 L) and light weight (17.5 kg) which delivers 500 W of electrical power
  - 60% size reduction
  - 37% weight reduction
- Tested over 800hours

COBRA (on-going) – 36months, 3.8M€ budget, 2.3M€ funding

Corrosion constraints of the marine environment with ZeroCO2 on-field tests

Achievements

- BPP are cheaper and less prone to corrosion

COBRA

FCH2 JU projects and activities

BIG HIT (on-going) – 60 months, 7.3M€ budget, 5M€ funding

Innovative green H2 system in isolated territory

- 75kW PEM for cold ironing (3 ferries) and CHP at harbours offices and marina
- Integration with wind and tidal turbines (50t H2/y)
- CHP for 2 schools, a HRS for 10FCEvs

MARANDA (on-going) – 48 months, 3.8M€ budget, 2.9M€ funding

- 165kW APU under artic conditions (super A1 class)
- Dynamic Positionning mode, and slow survey mode (towing instruments, echosounding)

59.20m; 10.5knots; 1.734GT

Other - FCH JU workshop

Fuel Cells and Hydrogen for Maritime and Harbour Applications –June 2013
Follow-up Workshop – FC and H2 for Maritime Applications - June 2017

FCH2 JU - MoU INITIATIVE

MOU:
MEMORANDUM OF UNDERSTANDING

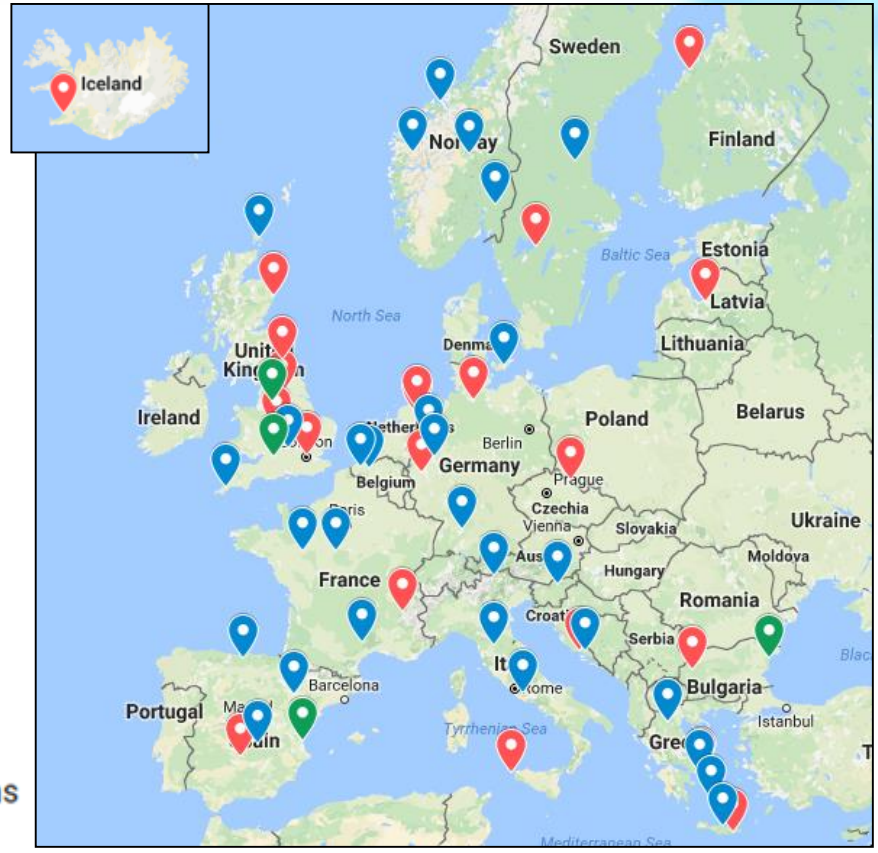
>60 PARTICIPANTS
FROM 19 COUNTRIES:
17 FROM EU
2 FROM EFTA

ACCOUNTING FOR:
90 MILLION CITIZENS (18%)
3 TRILLION EUROS (20% GDP)

Opportunity to participate in a large study:

- Defines business cases for Hydrogen & Fuel Cell based products
- Put Cities & Regions in direct contact with the Industry
- Help to find best financing schemes

At no cost to the Cities & Regions
(other than their own time and travel costs)



*POP and GDP of EU28 + Iceland and Norway

www.fch.europa.eu/page/about-regions

What next?

Integrated H2 project at a port: HRS, boats, cranes and MHVs on H2

- Small boats linked to port operations (mooring, pilot, pollution services)
- Port machinery: Terminal trucks, RTG and RS powered by FC.
- Cold ironing based on FC

Individual solutions exist, it is the combination of all which must be proven

The demonstration of the full transportation chain for the harbour logistic

THANK YOU FOR YOUR ATTENTION

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