



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update Nov 2018: European Commission

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1. New Policy Initiatives on Hydrogen and Fuel Cell

- An informal meeting of the EU Energy Ministers dedicated to hydrogen and energy storage solutions took place in September. In the course of this meeting, the Austrian presidency proposed a **“Hydrogen Initiative”**, under which Member States commit to continue research and investment in the production and use of hydrogen as a future-oriented technology. The Initiative was highly successful, with 25 Member States (as well as Switzerland and Iceland) signing it¹.
- At the end of November, the European Commission adopted [the strategy for long-term EU greenhouse emissions reduction](#) in accordance with the Paris Agreement. The strategy presents 8 different pathways for the EU that achieve greenhouse gas emissions reductions between -80% by 2050 (compared to 1990) up to net zero greenhouse emissions by 2050 – all of them are in line with the Paris Agreement. It is not a legislative proposal, but a strategic vision, supported by a detailed analysis, on how the EU can deliver on the Paris Agreement while enhancing the socio-economic benefits of emission reductions and transforming its economy for the 21st century. It sets the scene for future policy choices of the EU. Hydrogen features strongly in this strategy as one of key enabling technologies.
- Tougher 2030 energy goals were agreed by the EU in June – it was decided to increase the bloc’s 2030 renewable energy target to 32 percent (up from 27) and to boost the energy efficiency target to 32.5 percent (up from 30).
- Discussions on the key files of the “Clean Energy Package for all Europeans” ([Clean Energy for All Europeans](#)) have progressed well and agreement has been reached on the Renewable Energy Directive (RED II), the Energy Efficiency Directive and the Governance Regulation. The redesign of the EU’s electricity market is still under negotiations. Beyond promoting decarbonisation, the package supports market based integration of energy storage, including hydrogen technologies. Some examples include:
 - Hydrogen is better reflected now in RED II – it is now specifically mentioned in particular in the context of Guarantees of Origin. In addition, the role of green hydrogen and derived e-fuels is specially emphasised in the transport sector, along with advanced biofuels.
 - In terms of security of supply, the proposal on Risk Preparedness in the electricity sector requires Member States to develop measures avoiding electricity crisis situations. Such measures include different kinds of storage.
 - The new Electricity Directive and Regulation also put more focus on flexibility mechanisms and energy storage, including hydrogen.
 - The definition of energy storage enables sectorial integration by referring not only to Power-to-Power, but also to power-to-gas and Power-to-Heat solutions.

¹ Slovakia is planning to sign, leaving Sweden and the UK as the only non-signatories.



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- In May 2018 the European Commission announced the [3rd Mobility Package](#), including a proposal for the first-ever binding carbon dioxide standards for new large trucks, proposing an emissions cut of 30 percent by 2030, based on 2019 levels. These targets complete the Commission's climate legislation proposals meant to ensure the EU reaches its goal of reducing greenhouse gas emissions by at least 40 percent by 2030 — the bloc's commitment under the Paris climate deal. A review foreseen in 2022 could expand the targets to other vehicles such as buses. The European Parliament and the EU countries are now discussing the proposal and must now reach an agreement before it becomes law.
- The European Commission is currently preparing a strategy for long-term EU greenhouse emissions reduction in accordance with the Paris Agreement. It will analyse cost-efficient pathways for the transition of the energy system and other sectors, the role of innovative technologies, sectoral integration and consumers' choice, as well as implications for security of supply, investments, competitiveness, growth and jobs. The intention is to present this strategy at COP24 in Katowice, Poland. It is expected that hydrogen will feature strongly in this strategy.
- The next EU Framework Programme for Research and Innovation, Horizon Europe, is currently under preparation. A partnership in the area of hydrogen and fuel cells has been included in the preliminary list of potential initiatives proposed by the European Commission.

2. Hydrogen and Fuel Cell R&D Update

- A total of 61 proposals were received in response to the 2018 FCH JU's Call for Proposals with a budget of ~ 73M€. 19 proposals have been preselected and are currently under the grant agreement preparation.
- The 2019 Call for Proposals of the FCH JU is currently under preparation with a tentative budget of ~ 80M€. It is foreseen to be launched in mid-January 2019, with the deadline in the 2nd half of April. For more information please refer to the FCH JU [website](#).

3. Demonstration and Deployments Update

- Ca. **1350²** FCEVs (including range extenders, i.e. Symbio) deployed in Europe, out of which **636** through the FCH JU (mainly via [H2ME](#), [H2ME2](#) and [ZEFER](#)).
- **68** FC buses in operation, of which **45** through FCH JU and **308** (via FCH JU mainly through [JIVE](#) and [JIVE 2](#)) in planning/development stage.
- Ca. **158** HRS in operation, out of which **48** deployed via FCH JU (mainly via [H2ME](#), [H2ME2](#)). From those **103** HRS are publically available for refuelling of passenger cars and other light duty vehicles.
- **3780** μ CHPs contracted via FCH JU, out of which ca. **1200** deployed (mainly via [PACE](#) and [EneField](#)).

4. Events and Solicitations

Events

- The 2018 FCH JU's Programme Review Days took place on 14th -15th November 2018, followed by the Stakeholders Forum (16th of November).
- The [PRD 2017 Report](#) has been published. The report includes an in-depth analysis of the FCH JU project portfolio ongoing in 2016 performed by the European Commission

² Latest status 31/7/2018, including non-commercial vehicles



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Joint Research Centre (JRC).

- FCH JU organised a session “Hydrogen and fuel cells greening European industry” at the [EU Sustainable Energy Week](#) on 7 June 2018. The session focused on the potential of green hydrogen to decarbonise large industries, such as steel making, refineries, ammonia/ fertilizer plants and food industry.
- The 7th and [8th General Assembly](#) of FCH JU's Regions and Cities Initiative took place in Brussels, showcasing various projects at local and regional level, and presenting funding and financing opportunities.
- A workshop on [PEMFC Stack and MEA manufacturing](#) took place in FCH JU Premises on 11 October aiming at strengthening the synergies between projects working on similar topics.

Procurements

- FCH JU published the [second procurement](#) for the development of [the European HRS availability system](#) aiming to set-up a system for HRS availability giving access to reliable, up-to-date and standardised data on the status of HRS in the European Union. The system will provide information free of charge. As of today it covers 77 HRS: <https://h2-map.eu/>
- FCH JU is also in the process of setting up of the [‘European fuel cells and hydrogen market and policy observatory’](#) to act as a reference point for information about fuel cells and hydrogen technologies and applications in Europe.

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

- The total budget of the FCH 2 JU for the period 2014-2020 is 665 M€, or, on average EUR 95 M/year, covering a broad range of R&I activities.

Beyond FCH 2 JU, other EU instruments such as TEN-T/CEF or H2020 (Energy Challenge, SME instrument etc.) provide some ancillary financing on a competitive basis (where FCH have to compete with other technologies). As a result, we estimate the EU level funding for FCH technologies is at ~120€ Million/year on average.

- The Connecting Europe Facility (CEF) has recently awarded [40€ M for the deployment of 600 fuel cell city buses](#) in Europe.
- In October, The European Commission [proposed](#) to invest through the Connecting Europe Facility (CEF) ~700 M€ in 49 projects aiming to develop a more sustainable transport infrastructure in Europe. Funding includes all transport modes, from airports and ports to rail and roads, including both battery-electric and fuel cell vehicles.

6. Regulations, Codes & Standards and Safety Update

- The Regulations, Codes & Standards (RCS SC) Group developed and executed a work plan that covers the activities in support of the Annual Work Plan and input towards the Annual Union Work Programme for Standardisation as well as the coordination of identified RCS needs and gaps towards appropriate standardisation platforms (such as Technical Committees and the Sector Fora) and regulatory bodies.
- The [‘Proposition of a testing protocol for certification of existing and future HRS’](#) was developed and published by Air Liquide in conjunction with a number of experts, as a



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deliverable of the study on 'Development of a Metering Protocol for Hydrogen Refuelling Stations' financed by the FCH JU.

- 4 Task Forces were launched and a safety guidance document for hydrogen and fuel cell projects was published by the European Hydrogen Safety Panel (EHSP). Also, the EHSP supported the FCH 2 JU in identifying safety issues and performed a comprehensive assessment of the safety data and events contained in the European Hydrogen Safety Reference Database. In close collaboration with JRC, the EHSP members have systematically reviewed more than 250 events.



Summary Country Update November 2018: European Commission

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell light duty Vehicles ³	No target	- Ca. 1350 FCEVs deployed in Europe (EU28+ CH + NO) of which 636 through FCH JU -Additional ~1350 cars planned/contracted through FCH JU to date	Addressed through FCH 2 JU Demo projects	Subsidy per vehicle in demo projects
FC Bus	No target	-Ca. 70 deployed (including 2 discontinued) of which 50 through FCH JU (of which 5 discontinued) -308 more buses contracted through FCH JU	Addressed through FCH 2 JU Demo projects	Subsidy per vehicle in demo projects
Fuel Cell Trucks ⁴	No target	-15 garbage trucks contracted through FCH JU (REVIVE) -12 more expected from 2018 Call for Proposals (Call 2018)	Addressed through FCH 2 JU Demo projects. As of today marginal activity, however upcoming projects will demonstrate a fleet within the next years	Subsidy per vehicle in demo projects
Forklifts	No target	-Ca. 328 deployed in Europe (of which 268 via FCH JU)	Addressed through FCH 2 JU Demo projects	Subsidy per vehicle in demo projects

³ Includes Fuel Cell Electric Vehicles with Range Extenders

⁴ As above



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H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
70 MPa On-Site Production	No target	-158 HRSs deployed for road transport (buses + cars, MHVs) of which 48 via FCH JU of which: <ul style="list-style-type: none"> • 9 x 350 delivered H2 • 6 x 350 onsite prod. • 4 x 700 delivered H2 • 11 x 700 onsite prod. • 6 x 350/700 delivered H2 • 5 x 350/700 onsite prod. • 5 (others) trucked-in • 1 (others) onsite - 51 additional HRSs contracted via FCH JU	Addressed through FCH 2 JU Demo projects	Fixed amount of subsidy per HRS installation
70 MPa Delivered	No target		Addressed through FCH 2 JU Demo projects	Fixed amount of subsidy per HRS installation
35 MPa On-Site Production	No target		Addressed through FCH 2 JU Demo projects	Fixed amount of subsidy per HRS installation
35 MPa Delivered	No target		Addressed through FCH 2 JU Demo projects	Fixed amount of subsidy per HRS installation
Stationary	Target Number ⁵	Current Status	Partnerships, Strategic Approach	Policy Support

⁵ Targets can be units installed and/or total installed capacity in the size range indicated



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Small ⁶	No target	Ca. 3780 planned via FCH JU of which 1200 deployed	Medium-scale deployment through FCH 2 JU demo project	Fixed amount of subsidy per unit
Medium ⁷	No target	70 planned of which 34 deployed	Small-scale demo projects via FCH 2 JU	Funding dependent on power level
Large ⁸	No target	3 planned of which one deployed (in China)	Small-scale demo projects via FCH 2 JU	Funding dependent on power level
District Grid ⁹	No target			
Regional Grid ¹⁰	No target			
Telecom backup	No target	10 deployed via FCH JU	Small-scale demo projects via FCH 2 JU	Funding dependent on power level
H₂ Production	Target¹¹	Current Status	Partnerships, Strategic Approach	Policy Support
Fossil Fuels ¹²	No target	Out of scope of the FCH 2 JU		

⁶ <5 kW (e.g., Residential Use)

⁷ 5kW – 400 kW (e.g., Distributed Residential Use)

⁸ 0.3MW – 10 MW (e.g., Industrial Use)

⁹ 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

¹⁰ 30MW plus (e.g., Grid Storage and Systems Management)

¹¹ Target can be by quantity (Nm³, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

¹² Hydrogen produced by reforming processes



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Water Electrolysis ¹³ (PEM, Alkaline, SOEC)	No target	-34 deployed within FCH JU (incl. 24 at HRSs, 4 at Telecom, 2 for grid autonomy and 4 for grid services) -7 more planned, excl. HRSs (2 for H ₂ storage, 1 for refinery, 4 P2G applications)		
By-product H ₂	No target			
Energy Storage from Renewables	Target¹⁴	Current Status	Partnership, Strategic Approach	Policy Support
Power to Power ¹⁵ Capacity	No target			
Power to Gas ¹⁶ Capacity	No target			

¹³ Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

¹⁴ Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

¹⁵ Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

¹⁶ Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)