



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

### IPHE Country Update April 2018: European Commission

|                            |   |
|----------------------------|---|
| <b>Name</b>                | Katarzyna Drabicka  |
| <b>Contact Information</b> | <a href="mailto:katarzyna.drabicka@ec.europa.eu">katarzyna.drabicka@ec.europa.eu</a><br>+32 229-63999 |
| <b>Covered Period</b>      | November 2017 – April 2018  |

#### 1. New Policy Initiatives on Hydrogen and Fuel Cell

- The European Commission will announce (May 2018) the 3rd Mobility Package with a proposal for the first-ever CO<sub>2</sub> emission standards for heavy-duty vehicles (including buses).
- Discussion on key files of the “Clean Energy Package for all Europeans” ([Clean Energy for All Europeans](#)), including on Renewable Energy, Electricity Market Design and Energy Efficiency for the 2030 timeframe are in the final stage. Elements relevant for hydrogen technologies, beyond setting the general level of ambition for decarbonisation, includes guarantees of origin for hydrogen and regulatory treatment of renewable hydrogen in transport (e.g. conditions for electrolyser set-up/grid connection/recognition of hydrogen used in refineries etc.)
- Emission Trading Scheme (ETS) reform concluded on 27/02/2018 ([ETS reform](#)); the carbon price has already doubled since. This is important for driving emissions reductions in energy-intensive industries.
- A High-Level Roundtable on Energy Storage & Sectorial Integration took place on 1<sup>st</sup> March 2018. Discussions included the role of energy storage in electricity, gas and heating networks, and, the potential expansion, as well as the challenges and opportunities of sectorial integration: connecting the energy, mobility and industrial sectors with the aim of using more renewables and reducing emissions. The workshop built on elements of the ‘[Clean Energy for All Europeans](#)’ package and previously published [background documents](#) and a European Commission [Staff Working Document](#) on energy storage.
- A new “Hydrogen Innovation Challenge (IC-8)” is being discussed for announcement at the Clean Energy Ministerial (May 2018) in Malmo/Copenhagen. Australia, the EU and Germany have agreed to co-lead.

#### 2. Hydrogen and Fuel Cell R&D Update

- The FCH JU's 2018 Call for Proposals closed on 24 April. The indicative budget is €73.2M. International collaboration with IPHE countries was encouraged for all topics of the Call, and in some cases specifically recommended. More information available here: <http://www.fch.europa.eu/page/call-2018>
- 25 new project Grant Agreements were signed between December 2017 and January 2018 for projects deriving from the FCH JU 2017 Call for Proposals (and 1 project from Call 2016), for a total funding value of > 110 M€.



# INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

## 3. Demonstration and Deployments Update

- Approximately 1,000 FCEVs (including range extenders, i.e. Symbio) are deployed in Europe, out of which 380 through the FCH JU.
- 67 FC Buses are in operation, of which 47 through FCH JU and 312 in planning/development stage.
- 142 HRS are in operation, out of which 32 deployed via FCH JU.
- 3,780  $\mu$ CHPs are contracted via FCH JU, out of which 1,130 deployed.
- Major new projects have started, including JIVE 2 (will deploy 152 FC buses - [JIVE 2](#)) and Refhyne that will demonstrate a 10MW electrolyser in a German Shell refinery - [Refhyne](#)
- Construction for the installation of the 6MW PEM electrolyser at Voestalpine steel plant in Austria under H2Future project has started. The Plant is scheduled to be operational by spring 2019 ([H2Future](#)).

## 4. Events and Solicitations

- The 2018 FCH 2 JU's Programme Review Days will take place on 14<sup>th</sup> -15<sup>th</sup> November 2018, followed by the Stakeholders Forum (16<sup>th</sup> of November).
- FCH 2 JU with Shift2Rail Joint Undertaking have recently launched a joint call for tender to conduct a study on the use of fuel cell and hydrogen in the railway environment. The purpose of this new study is to carry out market analysis, assess the potential of FCH technologies in the rail sector and identify R&I priorities. More information is available at <https://shift2rail.org/participate/procurement/ongoing-calls-for-tender/>
- The Hydrogen Safety Panel members were selected, in total 18 experts. The kick-off meeting took place on 12 March 2018, discussing the organisation of work and next steps.

## 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 €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.) do provide some ancillary financing on competitive basis (where FCH have to compete with other technologies). As a result, we estimate the EU level funding for FCH technologies is at some €120 M/year on average in the 2014-2020 timeframe.

## 6. Regulations, Codes & Standards Update

- The European Commission's Joint Research Centre (JRC) with the support of a number of experts has compiled "[EU harmonised terminology for low temperature water electrolysis for energy storage applications](#)" & "[EU Harmonised Polarisation Curve Test Method for Low Temperature Water Electrolysis](#)", published in February-March 2018<sup>1</sup>.

---

<sup>1</sup> This report was carried out under the Framework Contract between the Joint Research Centre and the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH2JU) Rolling Plan 2017



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

### Summary Country Update April 2018: European Commission

| Transportation                             | Target Number | Current Status   | Partnerships, Strategic Approach  | Policy Support                       |
|--|---------------|--|---|--------------------------------------|
| Fuel Cell light duty Vehicles <sup>2</sup> | No target     | - Ca 1000 FCEVs deployed in Europe (EU28+ CH + NO) of which 380 through FCHJU<br>-Ca 1,500 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. 67 deployed (including 2 discontinued) of which 47 deployed through FCH JU (of which 5 discontinued)<br>-312 more buses contracted through FCH JU | Addressed through FCH 2 JU Demo projects  | Subsidy per vehicle in demo projects |
| Fuel Cell Trucks <sup>3</sup>              | No target     | 15 garbage trucks contracted through FCH JU, 12 more expected from 2018 Call for Proposals   | 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 |

<sup>2</sup> Includes Fuel Cell Electric Vehicles with Range Extenders

<sup>3</sup> As above



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

| Forklifts                         | No target                  | -Ca. 325 deployed in Europe (of which 268 via FCH JU)<br>-15 more contracted through FCH JU   | Addressed through FCH 2 JU Demo projects | Subsidy per vehicle in demo projects         |
|-----------------------------------|----------------------------|---|--|--|
| H <sub>2</sub> Refueling Stations | Target Number              | Current Status  | Partnerships, Strategic Approach         | Policy Support                               |
| 70 MPa On-Site Production         | No target                  | -142 HRSs deployed for road transport (buses + cars) of which 32 via FCH JU of which: <ul style="list-style-type: none"> <li>• 5 x 350 delivered</li> <li>• 6 x 350 onsite prod.</li> <li>• 5 x 700 delivered</li> <li>• 7 x 700 onsite prod.</li> <li>• 6 x 350/700 delivered</li> <li>• 3 x 350/700 onsite prod.</li> </ul> -56 new HRSs contracted | 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 <sup>4</sup> | Current Status  | Partnerships, Strategic Approach         | Policy Support                               |

<sup>4</sup> Targets can be units installed and/or total installed capacity in the size range indicated



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

|                                 |                            |   |   |                                  |
|---------------------------------|----------------------------|---|---|----------------------------------|
| Small <sup>5</sup>              | No target                  | Ca 3780 planned via FCH JU of which 1130 deployed | Medium-scale deployment through FCH 2 JU demo project | Fixed amount of subsidy per unit |
| Medium <sup>6</sup>             | No target                  | 58 planned of which 25 deployed                   | Small-scale demo projects via FCH 2 JU                | Funding dependent on power level |
| Large <sup>7</sup>              | 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 <sup>8</sup>      | No target                  |   |   |                                  |
| Regional Grid <sup>9</sup>      | No target                  |   |   |                                  |
| Telecom backup                  | No target                  | 10 deployed via FCH JU                            | Small-scale demo projects via FCH 2 JU                | Funding dependent on power level |
| <b>H<sub>2</sub> Production</b> | <b>Target<sup>10</sup></b> | <b>Current Status</b>                             | <b>Partnerships, Strategic Approach</b>               | <b>Policy Support</b>            |
| Fossil Fuels <sup>11</sup>      | No target                  | Out of scope of the FCH 2 JU                      |   |                                  |

<sup>5</sup> <5 kW (e.g., Residential Use)

<sup>6</sup> 5kW – 400 kW (e.g., Distributed Residential Use)

<sup>7</sup> 0.3MW – 10 MW (e.g., Industrial Use)

<sup>8</sup> 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

<sup>9</sup> 30MW plus (e.g., Grid Storage and Systems Management)

<sup>10</sup> Target can be by quantity (Nm<sup>3</sup>, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

<sup>11</sup> Hydrogen produced by reforming processes



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

|   |                            |  |  |                       |
|---|----------------------------|--|--|-----------------------|
| Water Electrolysis <sup>12</sup><br>(PEM, Alkaline, SOEC) | No target                  | -26 deployed with FCH JU<br>(incl. 19 at HRSs, 4 at Telecom, 2 for grid autonomy and 1 for grid services)<br>-8 more planned, excl. HRSs<br>(4 for grid services, 2 for H <sub>2</sub> storage, 1 for HRS/fuel cell for harbour, 1 for refinery) |  |                       |
| By-product H <sub>2</sub>                                 | No target                  |  |  |                       |
| <b>Energy Storage from Renewables</b>                     | <b>Target<sup>13</sup></b> | <b>Current Status</b>  | <b>Partnership, Strategic Approach</b> | <b>Policy Support</b> |
| Power to Power <sup>14</sup><br>Capacity                  | No target                  |  |  |                       |
| Power to Gas <sup>15</sup><br>Capacity                    | No target                  |  |  |                       |

<sup>12</sup> Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

<sup>13</sup> Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

<sup>14</sup> Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

<sup>15</sup> 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)