



# INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

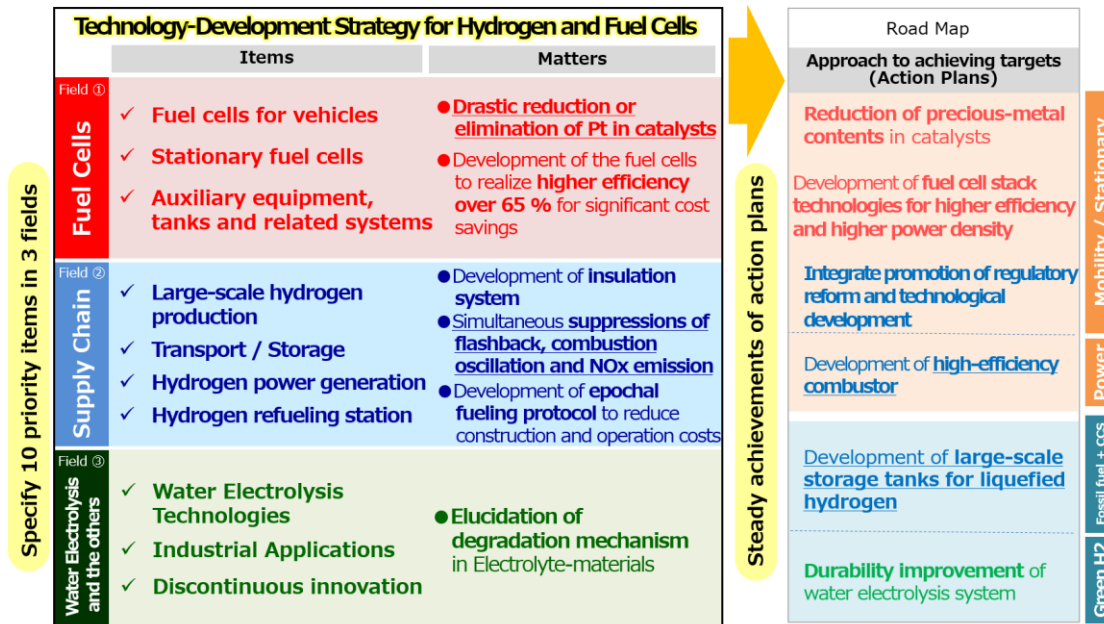
## IPHE Country Update October 2019: Japan

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| <b>Covered Period</b>      | April – October 2019  |

### 1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

Technology Development Strategy for Hydrogen and Fuel Cells, September 18, 2019:

- The strategy stipulates specific approaches to develop technologies to achieve goals set in the Strategic Road Map for Hydrogen and Fuel Cells. In the strategy, ten related priority areas in three fields are identified to promote technological development. The strategy also put emphasis on regular evaluation of the technology development projects, importance of matching user-demand and technological seeds, and enhancing collaboration with overseas countries.



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

Nothing new to report in this period.

### 3. Demonstration, Deployments, and Workforce Developments Update

Nothing new to report in this period.



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

### **4. Events and Solicitations**

Hydrogen Energy Ministerial Meeting 2019 in September 25<sup>th</sup>.

- In the meeting, representative from 35 nations, regions, and organizations discussed hydrogen, the latest developments, and shared the “Global Action Agenda” as a framework guiding actions for hydrogen RD&D.

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

Nothing new to report in this period.

### **6. Regulations, Codes & Standards, and Safety Update**

Nothing new to report in this period.



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

### Summary Country Update October 2019: Japan

| Transportation                    | Target Number  | Current Status   | Partnerships, Strategic Approach                      | Support Mechanism  |
|-----------------------------------|--|--|---|--|
| Fuel Cell Vehicles <sup>1</sup>   | 40,000 by 2020<br>200,000 by 2025<br>800,000 by 2030 | 3,433<br>As of August 2019                             | -   | • Subsidy for purchase (national and local government initiative)  |
| FC Bus                            | 100 by 2020<br>1,200 by 2030                         | 22<br>As of September 2019                             | -   | • Subsidy for purchase (national and local government initiative)  |
| Fuel Cell Trucks <sup>2</sup>     | No target  | -  | -   | • Subsidy for R&D, demonstration (national government initiative)  |
| Forklifts                         | 500 by 2020<br>10,000 by 2030                        | 160<br>As of September 2019                            | -   | • Subsidy for R&D, demonstration (national government initiative)<br>• Subsidy for purchase (national government initiative) |
| H <sub>2</sub> Refueling Stations | Target Number  | Current Status   | Partnerships, Strategic Approach                      | Support Mechanism  |
| 70 MPa On-Site Production         | 160 by 2020<br>320 by 2025                           | 17 operational<br>As of September 2019 (4 in progress) | • Initially focusing on four major metropolitan areas | • Subsidy for CAPEX/OPEX(national government and partially local government initiative)                                      |

<sup>1</sup> Includes Fuel Cell Electric Vehicles with Range Extenders

<sup>2</sup> As above



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

| 70 MPa Delivered          |                            | 92 operational<br>As of September 2019 (21 in progress) | <ul style="list-style-type: none"> <li>Establishing Japan H2 mobility LLC, (JHyM) for development of a hydrogen station network</li> <li>Regulatory reform of HRC</li> </ul>  |  |
|---------------------------|----------------------------|---|---|--|
| 35 MPa On-Site Production | -                          | 24 operational<br>As of November 2018                   | <ul style="list-style-type: none"> <li>Municipality lead instruction as official vehicles</li> </ul>  |  |
| 35 MPa Delivered          |                            | -   |   |  |
| Stationary                | Target Number <sup>3</sup> | Current Status  | Partnerships, Strategic Approach  | Support Mechanism  |
| Small <sup>4</sup>        | 5.3 M by 2030              | 295,452<br>As of September 2019                         | <ul style="list-style-type: none"> <li>Establishing ENE-FARM Partners (manufactures, gas companies and constructors)</li> <li>Commercializing fuel cells(PEFC) for application by 2019</li> <li>Commercializing fuel cells(SOFC) for application by 2021</li> </ul> | <ul style="list-style-type: none"> <li>Subsidy for purchase (national government initiative)</li> </ul>    |
| Medium <sup>5</sup>       | No target                  | SOFC:2  |   | <ul style="list-style-type: none"> <li>Subsidy for purchase of (national government initiative)</li> </ul> |

<sup>3</sup> Targets can be units installed and/or total installed capacity in the size range indicated

<sup>4</sup> <5 kW (e.g., Residential Use)

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



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

| Large <sup>6</sup>  | No target  |   |  |   |
|---|--|---|--|---|
| District Grid <sup>7</sup>                                | No target  |   |  |   |
| Regional Grid <sup>8</sup>                                | No target  |   |  |   |
| Telecom backup  | e.g., No target  |   |  |   |
| H <sub>2</sub> Production                                 | Target <sup>9</sup>  | Current Status  | Partnerships, Strategic Approach   | Support Mechanism   |
| Fossil Fuels <sup>10</sup>                                | Procure 300,000 ton of Hydrogen annually by 2030<br>Reduce the cost of hydrogen to JPY30/Nm <sup>3</sup> |   | <ul style="list-style-type: none"> <li>• Japan-Australia Hydrogen Supply Chain pilot project</li> <li>• Japan-Brunei Hydrogen Supply Chain pilot project</li> </ul>      | <ul style="list-style-type: none"> <li>• Subsidy for R&amp;D, demonstration (national government initiative)</li> </ul> |
| Water Electrolysis <sup>11</sup><br>(PEM, Alkaline, SOEC) | Energy consumption (kWh/Nm <sup>3</sup> ):<br>(Alkaline)<br>4.5 by 2020<br>4.3 by 2030<br>(PEM)          | (Alkaline)<br>5.0 As of March 2019<br>(PEM)<br>5.0 As of March 2019 | <ul style="list-style-type: none"> <li>• 10MW Alkaline water electrolyser project in Fukushima.</li> <li>• 1.5MW PEM water electrolyser project in Yamanashi.</li> </ul> | <ul style="list-style-type: none"> <li>• Subsidy for R&amp;D, demonstration (national government initiative)</li> </ul> |

<sup>6</sup> 0.3MW – 10 MW (e.g., Industrial Use)

<sup>7</sup> 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

<sup>8</sup> 30MW plus (e.g., Grid Storage and Systems Management)

<sup>9</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>10</sup> Hydrogen produced by reforming processes

<sup>11</sup> Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)



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

|  |                            |                       |  |   |
|--|----------------------------|-----------------------|--|---|
|  | 4.9 by 2020<br>4.5 by 2030 |                       |  |   |
| By-product H <sub>2</sub>                | No target                  |                       |  |   |
| <b>Energy Storage from Renewables</b>    | <b>Target<sup>12</sup></b> | <b>Current Status</b> | <b>Partnership, Strategic Approach</b> | <b>Support Mechanism</b>  |
| Power to Power <sup>13</sup><br>Capacity | No target                  |                       |  |   |
| Power to Gas <sup>14</sup><br>Capacity   | No target                  |                       |  | <ul style="list-style-type: none"> <li>Subsidy for R&amp;D, demonstration (national government initiative)</li> </ul> |

<sup>12</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>13</sup> Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

<sup>14</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)