INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update November 2016: JAPAN

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Covered Period	From May 2016 to October 2016

1. New Policy Initiatives on Hydrogen and Fuel Cell

- On March 23, 2016, METI published the revised "Strategic Road Map for Hydrogen and Fuel Cells", which was originally published in June 2014. The Road Map indicates updated / new targets on fuel cells and hydrogen, as well as specific steps to achieve the targets

2. Hydrogen and Fuel Cell R&D Update

- In October, NEDO held its annual project summarizing event on the HFC RD&D program. In this event, NEDO took the opportunity to inform stakeholders about IPHE's activities.
- In 2016, NEDO started 3 R&D projects about hydrogen firing combustor for gas turbine with the aim of expanding hydrogen demand after 2030 and 6 R&D projects about hydrogen from renewable electricity to stabilize the grid.
- NEDO also continued PEMFC and SOFC R&D projects. These results and achievements can be applied to the next generation of FCEV on the road in 2025 – 2030 and to SOFCs for commercial and industrial use onto the market in 2017.

3. Demonstration and Deployments Update

- As of August 2016, 909 FCEVs were on the road. Also, Honda released a new FCEV "CLARITY FUEL CELL" in March 2016.
- There are 93 sites (78 in operation) of hydrogen stations (70 MPa) as of September 2016.
- 180,511 units of ENE-FARM, residential micro-CHP fuel cell, are sold as of September 2016.

4. Events and Solicitations

- From 1st to 3rd in March 2017, there will be the largest exhibition in Tokyo called 'FC-EXPO 2017'. The exhibition focuses HFC technology in markets.

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

All of the items are Budget Requests for Hydrogen and FCs in FY 2017 (METI).
TOTAL: [JPY94.4 billion = US$ 348 million]

- Promotion of stationary FCs:
  Subsidies for Micro-CHP FC sales [JPY10.4 billion = US$ 10 million]
- Promotion of FCEVs:
  Subsidies for CAPEX and OPEX of HRS [JPY 5.2 billion = US$ 50 million]
  Subsidies for clean-energy vehicle sales (incl. FCEV) [JPY 14.0 billion = US$ 138 million]
- Establishing hydrogen supply-chain:
  Demonstration of a hydrogen supply chain [JPY 55 billion = US$ 54 million]
- R&D on FCs [JPY 4.0 billion = US$ 39 million]
- R&D on HRS [JPY 4.4 billion = US$ 43 million]
- R&D on hydrogen production, transport and storage
  (incl hydrogen production from renewables) [JPY 1.4 billion = US$ 14 million]

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Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles[1]	40,000 by 2020 200,000 by 2025 800,000 by 2030	909 (as of Aug 2016)	-	• Subsidy for purchase (national government initiative)
FC Bus	Over 100 by 2020 (Tokyo Government)	a few in demo	-	• Subsidy for R&D, demonstration (national government initiative)
Fuel Cell Trucks[2]	No Target	-	-	• Subsidy for R&D, demonstration (national government initiative)
Forklifts	No target	4 Ministry of Env.	• FC forklifts will be launched in 2016	• Subsidy for R&D, demonstration (national government initiative)
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
70 MPa On-Site Production	160 by 2020 320 by 2025	15 [Open 13] (as of Sep 2016)	• Initially focusing on four major metropolitan areas	• Subsidy for CAPEX / OPEX (national government and partially local government initiative)
70 MPa Delivered		78 [Open 65] (as of Sep 2016)		
35 MPa On-Site Production	100	18 [Open 5] Ministry of Env. (as of Sep 2016)	• Municipality lead introduction as official vehicles	• Subsidy for CAPEX / OPEX (national government and partially local government initiative)

[1] Includes Fuel Cell Electric Vehicles with Range Extenders
[2] As above

35 MPa Delivered	No target	-	-	-
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Small[4]	1.4 mil by 2020 5.3 mil by 2030	180,511 (as of Sep 2016)	• Establishing ENE-FARM partners (manufacturers, gas companies and constructors)	• Subsidy for purchase (national government initiative)
Medium[5]	No target	5: SOFC 49: PAFC (Sales number)	• 'Commercializing fuel cells for industrial application by 2017' (Strategic Roadmap, METI)	• Subsidy for R&D, demonstration (national government initiative)
Large[6]	No target	-	-	-
District Grid[7]	No target	-	-	-
Regional Grid[8]	No target	-	-	-
Telecom backup	No target	-	-	-
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Fossil Fuels[10]	No target	-	• Commercialized at on-site HRSs	-

[3] Targets can be units installed and/or total installed capacity in the size range indicated
[4] <5 kW (e.g., Residential Use)
[5] 5kW – 400 kW (e.g., Distributed Residential Use)
[6] 0.3MW – 10 MW (e.g., Industrial Use)
[7] 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)
[8] 30MW plus (e.g., Grid Storage and Systems Management)
[9] Target can be by quantity (Nm^3, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target
[10] Hydrogen produced by reforming processes

Water Electrolysis[11] (PEM, Alkaline, SOEC)	No target	-	• Promoting under renewable H2 project (effectively converting surplus renewable energy into hydrogen as an energy storage)	• Subsidy for R&D, demonstration (national government initiative)
By-product H_2	No target	-	• Commercialized at off-site HRS	-
Energy Storage from Renewables	**Target[12]**	**Current Status**	**Partnership, Strategic Approach**	**Policy Support**
Power to Power[13] Capacity	No target	-	• Utilization of hydrogen to support expansion of renewable energy	-
Power to Gas[14] Capacity	No target	-	-	-

[11] Please indicate if targets relate to a specific technology (PEM, Alkiline, SOEC)
[12] Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity
[13] Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity
[14] 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)