INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update November 2017: Japan

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1. New Policy Initiatives on Hydrogen and Fuel Cell

- At the first Meeting of Ministers Responsible for Renewable Energy, Hydrogen and Other Resources on April 11, 2017, Prime Minister Abe stated that Japan is aiming to be the first in the world to realize a hydrogen-based society, and instructed other Ministers to formulate a Basic Strategy for Hydrogen by the end of 2017. With this instruction, related ministries have started the discussion to prepare the Basic Strategy. The outline of the Basic Strategy was presented at the Hydrogen Fuel Cell Strategy Council on November 6. The more complete Strategy will be prepared by the end of 2017.

2. Hydrogen and Fuel Cell R&D Update

- Toward the realization of CO2-free hydrogen, two national projects of power-to-gas demonstrations have started:
  - one in city of Sendai, Miyagi prefecture in August 2017; and
  - one in Tomamae town, Hokkaido in September 2017
- Another national power-to-gas project was adopted; the demonstration project started August 2017 at Namie Town, Fukushima Prefecture. The aim is to supply hydrogen for the Tokyo Olympic/Paralympic games in 2020.
- In June 2017, a business-use 20 kW SOFC system was installed at Osaka Science & Technology Center to provide electricity and heat.

3. Demonstration and Deployments Update

- With 2017 as the commercialization target year for business-use stationary fuel cells as described in the “Strategic Roadmap for Hydrogen and Fuel Cells”, Kyocera has business-use stationary fuel cells for sale. MHPS (Mitsubishi Hitachi Power Systems), and Miura are also aiming to sell their systems in 2017.
- As of October 2017, around 2,200 FCEVs and two commercial-based FC Buses are on the road.
- There are 101 sites (91 in operation) of hydrogen stations (70 MPa) as of October 2017.
- As of October 2017, 223,092 units of ENE-FARM, residential micro-CHP fuel cell were sold.

4. Events and Solicitations

- Mr. Karlsson, Executive Director of the IPHE made speech at the International Session of the 30th Anniversary Symposium of the founding of the Fuel Cell Development Information Center (FCDIC) on May 26, 2017.
- Mr. Tim Karlsson, Executive Director of IPHE, and Mr. Bart Biebuyck, Executive Director of FCH JU, made keynote speeches at the Innovation for Cool Earth Forum (ICEF) in October 2017. ICEF is the policy forum on Cool Earth, Japan’s initiative for the prevention of climate change.
- The Fuel Cell Society (FCS), which is a voluntary organization, will hold its “6th International Meeting”, during FC EXPO, supported by FCDIC on Feb 27, 2018.
- ‘FC-EXPO 2018’ in Tokyo is from Feb 28 to Mar 2, 2018. This is the world’s largest exhibition focusing on HFC technologies in markets.

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

The total budget request amount of hydrogen and FC items (METI) for FY 2018 is JPY 43.2 billion (US$ 392.8 million).

- Promotion of stationary FCs:
  Subsidies for Micro-CHP FC sales: JPY 8.9 billion (US$ 80.9 million)
- Promotion of FCEVs:
  Subsidies for CAPEX and OPEX of HRS: JPY 5.7 billion (US$ 51.8 million)
  Subsidies for clean-energy vehicle sales (incl. FCEV): JPY 13 billion (US$ 118.2 million)
- Establishing hydrogen supply-chain:
  Demonstration of a hydrogen supply chain: JPY 9.4 billion (US$ 85.5 million)
- R&D on FCs: JPY 2.9 billion (US$ 26.4 million)
- R&D on HRS: JPY 2.4 billion (US$ 21.8 million)
- R&D on hydrogen production, transport and storage
  (incl. hydrogen production from renewables): JPY 0.9 billion (US$ 8.2 million)

6. Regulations, Codes & Standards Update

- 11 companies have signed the MoU on the strategic development of hydrogen stations on May 19, followed by the establishment of a new company within the year.
- For streamlining the regulations on FCVs and hydrogen stations, Japan conducted comprehensive reviews on the regulations on hydrogen stations, and the Regulation Reform Plan, including 37 hydrogen station/FCV-related regulations, was approved by the Cabinet on June 9. The main topics are the simplification of safety inspection for the reduction of hydrogen station OPEX, unmanned operation of hydrogen stations by remote-monitoring, quality control and simplified approval process upon the manufacturing of on-board tanks.

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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	2,161 (as of Oct 2017)	-	• Subsidy for purchase (national government initiative)
FC Bus	Over 100 by 2020 (Tokyo Government)	2 (Commercial-based)	-	• 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	38	-	• 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	16 (Open 15) (as of Oct 2017)	• Initially focusing on four major metropolitan areas	• Subsidy for CAPEX / OPEX (national government and partially local government initiative)
70 MPa Delivered		85 (Open 76) (as of Oct 2017)		
35 MPa On-Site Production	100	26（Open 19） Ministry of Env. (as of Oct 2017)	• 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	223,092 (as of Oct 2017)	• Establishing ENE-FARM partners (manufacturers, gas companies and constructors)	• Subsidy for purchase (national government initiative)
Medium[5]	No target	19: SOFC 47: PAFC (as of Oct 2017)	• 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)