



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update April 2017: JAPAN

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Covered Period	November 2016 to March 2017

1. New Policy Initiatives on Hydrogen and Fuel Cell

- Prime Minister Shinzo Abe delivered a policy speech to the 193rd Session of the Diet on January 20, 2017. He said "The hydrogen energy is a trump card for energy security and global warming mitigation measures. The world's first electric power supply will be started using a hydrogen generator in Kobe by spring 2018. We will challenge to transport a large amount of hydrogen using the world's first liquefied hydrogen carrier and we will build hydrogen supply chain covered from production through to transport and consumption. For realizing these challenges, we will proceed with the reformation by sorting out all regulations among ministries."
- On March 10, 2017, progress on Hydrogen / FC Strategy Roadmap which was revised in March 2016, was reported at the Ministerial/Industry Council for a Strategy for Hydrogen and Fuel Cells, and challenges for the future were discussed.
- A Working Group was established under the Ministerial/Industry Council for a Strategy for Hydrogen and Fuel Cells in May 2016, aiming at the future expansion of CO₂-free hydrogen utilization. The Working Group compiled the results into a Report in March 2017, describing streamlined current challenges and other tasks, and the direction of future efforts.
- Prime Minister Shinzo Abe attended the first meeting of the Ministerial Council on Renewable Energy, Hydrogen and Related Issues on April 11, 2017. He said, "Japan will be the first in the world to realize a hydrogen-based society. I request relevant ministers to formulate the basic strategy within this year. In particular, I would like relevant ministers to accelerate the establishment of hydrogen refuelling stations, and streamline regulations on them, and to formulate a common scenario toward the building of supply chains and the full-scale introduction of hydrogen power generation."

2. Hydrogen and Fuel Cell R&D Update

- NEDO continued to build and develop the hydrogen supply chain, from production through to transport and consumption, and to develop technologies for realizing a hydrogen-based society.
- 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 on the market in this fiscal year.

3. Demonstration and Deployments Update

- As of March 2017, around 1,800 FCEVs and two commercial-based FC Buses were on the road.
- There are 92 sites (90 in operation) of hydrogen stations (70 MPa) as of March 2017.
- 194,710 units of ENE-FARM, residential micro-CHP fuel cell, are sold as of March 2017.

4. Events and Solicitations

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



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- FC Association Japan, which is a voluntary organization, held its “5th International Meeting”, during FC EXPO, supported by FCDIC, (Fuel Cell Development Information Center) on Feb 28, 2017. Dr. Frois as IPHE Chair gave the closing address. The meeting was very successful, and the number of participants were 66. (The number of the mean participants from 1st to 4th of the meeting was 27.)
- FCDIC celebrates its 30th anniversary of the founding of this Center last fiscal year. Dr. Frois as IPHE Chair and Mr. Karlsson as Executive Director of IPHE gave a Congratulatory Address for the commemorative publication of the 30th anniversary.
- Mr. Karlsson as Executive Director of the IPHE will make speech at the international session at the symposium of the 30th Anniversary of the founding of the FCDIC on May 26.

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

All of the items are Budgets for Hydrogen and FCs in FY 2017 (METI).

TOTAL: [JPY 39 billion = US\$ 355 million]

- Promotion of stationary FCs:
Subsidies for Micro-CHP FC sales [JPY 9.4 billion = US\$ 85.1 million]
- Promotion of FCEVs:
Subsidies for CAPEX and OPEX of HRS [JPY 4.5 billion = US\$ 41 million]
Subsidies for clean-energy vehicle sales (incl. FCEV) [JPY 12.3 billion = US\$ 112 million]
- Establishing hydrogen supply-chain:
Demonstration of a hydrogen supply chain [JPY 4.7 billion = US\$ 42.7 million]
- R&D on FCs [JPY 3.1 billion = US\$ 28.2 million]
- R&D on HRS [JPY 4.1 billion = US\$ 37.3 million]
- R&D on hydrogen production, transport and storage
(incl. hydrogen production from renewables) [JPY 1.0 billion = US\$ 9.1 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	1,800 (as of Mar 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	21	-	• 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 15) (as of Mar 2017)	• Initially focusing on four major metropolitan areas	• Subsidy for CAPEX / OPEX (national government and partially local government initiative)
70 MPa Delivered		77 (Open 75) (as of Mar 2017)		
35 MPa On-Site Production	100 by 2020 (from renewable energy sources)	19 (Open 10) Ministry of Env. (as of Mar 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



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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	194,710 (as of Mar 2017)	<ul style="list-style-type: none"> Establishing ENE-FARM partners (manufacturers, gas companies and constructors) 	<ul style="list-style-type: none"> Subsidy for purchase (national government initiative)
Medium ⁵	No target	18: SOFC 48: PAFC (as of Mar 2017)	<ul style="list-style-type: none"> Commercializing fuel cells for industrial application by 2017' (Strategic Roadmap, METI) 	<ul style="list-style-type: none"> 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	-	<ul style="list-style-type: none"> 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 (Nm³, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

¹⁰ Hydrogen produced by reforming processes



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Water Electrolysis ¹¹ (PEM, Alkaline, SOEC)	No target	-	<ul style="list-style-type: none"> Promoting under renewable H2 project (effectively converting surplus renewable energy into hydrogen as an energy storage) 	<ul style="list-style-type: none"> Subsidy for R&D, demonstration (national government initiative)
By-product H ₂	No target	-	<ul style="list-style-type: none"> Commercialized at off-site HRS 	-
Energy Storage from Renewables	Target¹²	Current Status	Partnership, Strategic Approach	Policy Support
Power to Power ¹³ Capacity	No target	-	<ul style="list-style-type: none"> 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, Alkaline, 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)