INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update April 2019: Republic of Korea

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

- Announcement of Hydrogen Roadmap Korea on Jan 17, 2019.
- Legislative support in progress by national assembly for facilitating hydrogen-economy

2. Hydrogen and Fuel Cell R&D Update

- An R&D Roadmap is under development to cover the next 10 years with estimated total budget of KRW 2Trillion (approximately US$850M) excluding deployment budget. This Roadmap will include R&D needs from six Ministries.

3. Demonstration, Deployments, and Workforce Developments Update

- Ministry of Land, Infrastructure and Transport (MOLIT) announced a Hydrogen City Demonstration Program in three cities to be determined later, which includes Hydrogen Production Base, Delivery, and Use (FCEV Bus).

4. Events and Solicitations

- KIREC 2019 (Korea International Renewable Energy Conference) to be held in Seoul, Oct 23-26, 2019
- IPHE Steering Committee meeting and events are to be held during KIREC 2019

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

- A special purpose company called HyNet (Hydrogen Energy Network), founded by 13 leading Korean firms, plans to install 100 H2 refuelling stations by 2022.

6. Regulations, Codes & Standards, and Safety Update

- Korea is using a ‘Regulatory Sandbox’ approach to facilitate the installation and operation of H2 refuelling stations to support Hydrogen Economy Roadmap.

Summary Country Update April 2019: Republic of Korea

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles[1]	79,000 by 2022	889 As of 31/12/2018	• Green car deployment program (Ministry of Environment, MOE) with matching subsidy from local governments	• KRW 22,500K (MOE) • KRW 10,000K-13,500K (Local government)
FC Bus	2,000 by 2022	2 As of 31/12/2018	• Hydrogen City Program (Ministry of Land, Infrastructure, and Transport, MOLIT): 35 in 2019, 300 in 2020, 665 in 2021	• Subsidy system under study for operation and fuel incentives • Decision on the 3 H2 cities to be in 2019
Fuel Cell Trucks[2]				Verification of 5 ton class by 2020
Forklifts	Certification by 2022		• Demonstration project (Jeonbuk Prov.) 5 PEMFC- and 5 DMFC-powered ones	• Certification by 2022
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
70 MPa On-Site Production	1 site in 2019	2 (2) As of 31/12/2018	• Local governments and Ministry of Trade, Industry and Energy (MOTIE) • H2 City Project (MOLIT): 3 cities (H2 production base) to be named later	• Subsidy equal to 50% of installation cost • KOGAS HRS (potential 142 sites)

[1] Includes Fuel Cell Electric Vehicles with Range Extenders

[2] As above

70 MPa Delivered	21 in 2019 310 by 2020 1,200 by 2040	14 (4) As of 31/12/2018	• Local governments and MOCIE • HyNet (SPC): 100 privately planned by 2022	• Subsidy equal to 50% of installation cost (additional subsidy of 25% in highway) • Operation subsidy under study
35 MPa On-Site Production		1 As of 31/12/2018 (Landfill)	City of Seoul,	• Remodeling planned in 2019 (35→70 MPa, Landfill gas → NG)
35 MPa Delivered				
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Small[4]		As of 31/12/2017 1,826 kW installed (cum.)	Green home project by Korea Energy Agency (KEA)	• Subsidy covering ~70-80% of installation cost • Gas pricing for FCs (local supplier)
Medium[5]	50 MW by 2022 (+small)	As of 31/12/2017, 3,245 kW (cum.)	Hydrogen Economy Road Map Statistics by New and Renewable Energy (NRE) Center of KEA	• Subsidy covering ~70-80% of installation cost • NRE obligation in public buildings
Large[6]		As of 31/12/2017,	Statistics by NRE Center of KEA	• Renewable Portfolio Standard (RPS) with 2X Renewable Energy Certificates (REC)

[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)

		186,640 kW (cum)		• Gas pricing exclusive for FC
District Grid[7]				• RPS with 2X REC • Gas pricing exclusive for FC
Regional Grid[8]	1 GW by 2022 8 GW by 2040	As of 31/12/2017, 58,800 kW (cum)	Hydrogen Economy Road Map Statistics by NRE Center of KEA	• RPS with 2X REC • Gas pricing exclusive for FC
Telecom backup	e.g., No target			
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Fossil Fuels[10]				
Water Electrolysis[11] (PEM, Alkaline, SOEC)	200 Nm3H2/h alkaline		R&D and validation	KETEP (Korea Institute of Energy Technology Evaluation and Planning) 2019 RFP
By-product H_2	280k ton (potential)	50k ton	Production capacity in three major petrochemical complexes: 1.91 Mt	Feedstock use: 1.64 Mt

[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
[11] Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

Energy Storage from Renewables	Target[12]	Current Status	Partnership, Strategic Approach	Support Mechanism
Power to Power[13] Capacity				
Power to Gas[14] Capacity	CO2 methanation module R&D		30 Nm3CH4/h class (bio- and thermochemical methanation)	KETEP (Korea Institute of Energy Technology Evaluation and Planning) 2019 RFP

[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)