INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update May 2016: Korea

Name	Seungjin Ko
Contact Information	gsj0702@motie.go.kr, +82-44-203-5163
Covered Period	To May 2016

1. New Policy Initiatives on Hydrogen and Fuel Cell

Present supporting program

- The Renewable Portfolio Standard is a system that places an obligation on power suppliers with a capacity of more than 500 MW to produce a certain amount of power (3.5%, 2016) from New & Renewable sources. Korea included fuel cells in the targeted energy sources.
  - Provides incentives for installation of FC facilities in residential areas and buildings

- As for transportation, incentives are offered on the purchase of hydrogen-powered car and the installation of refuelling stations.

- The 3rd Eco-friendly Vehicle Development and Deployment Scheme (2016~2020)
  - The Korean government set out the 3rd Eco-friendly Vehicle Development and Deployment Scheme (2016~2020) to promote domestic eco-friendly vehicle market growth and to transform the current automobile landscape to a more eco-friendly one.
  - The scheme aims to deploy 9,000 FCEV on the street by 2020.
  - To meet this goal, there will be investments in FCEV technologies, consolidation of infrastructure, creation of an eco-friendly vehicle favourable social environment, and amendment on relevant laws.

2. Hydrogen and Fuel Cell R&D Update

- The 2016 budget for Hydrogen and Fuel Cell stands at a total amount of US$26 million. US$4 million goes to the Hydrogen sector, the rest goes to the fuel cell sector. Currently, it is focused on cost reduction and improving durability of fuel cell systems for residential power generation, vehicles, and hydrogen refuelling infrastructure.

- Coupled with the declaration of Mission Innovation, the budget for Clear Energy is expected to expand.

3. Demonstration and Deployments Update

- In order to facilitate and support hydrogen/fuel cell technologies and industries, a fuel cell system test-bed has been established in Ulsan city (i.e., pipeline, test platform, laboratory, etc), using by-product hydrogen from an Ulsan industrial complex (2014~2019).

- Total hydrogen fuel cells installed up to and including 2014 is 177,206kW, with hydrogen/fuel cell for power generation the leading category of use (43,240kW in 2014).

4. Events and Solicitations

- 26th IPHE Steering Committee Meeting
  - Date: Wednesday Nov 2nd to Friday Nov 4th 2016
  - Location: KIMDAEJUNG Convention Center, Gwangju, Korea

- Korea Energy Show (www.koreaenergyshow.co.kr)
  - Exhibition aiming to promote NRE entailing hydrogen and fuel cells Nov 8th to 11th at Il-san Kintex.

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

- US$5.4 million will be invested in FCEV, Hydrogen refuelling stations, and US$5.3 million will be focused on household and building applications in 2016.
  - 2016 R&D budget is US$26 million.

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Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles[1]	9,000 by 2020	As of ['15] 42	• Planning on lowering factory price to KRW 50 million/US$42 thousand (2020) • Negotiating with relevant authorities on tax benefits	• Incentive for purchase (national & local government initiative, *FCEV deployment and Market activation plan*)
FC Bus	Will be introduced in the next 10yrs			
Fuel Cell Trucks[2]				
Forklifts				
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
70 MPa On-Site Production	80 by 2020 (including 35 Mpa)	As of ['15] 7	• Amendment of law relevant to installation of refuelling station • Cost reduction on fuel station installation - Developing core technologies - Modularization of compression, storage, refuelling facilities	• Incentive for installation, operation, capacity enhancement
70 MPa				

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

Delivered				
35 MPa On-Site Production	80 by 2020 (including 70 Mpa)	As of ['15] 3		
35 MPa Delivered				
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Small[4]	1,190MW by 2029	As of ['14] 177,206kW installed	FCs for home disseminated as a part of Renewable Energy Deployment Project	• Incentive for installation
Medium[5]			Fuel cells for building disseminated particularly in public institutions facilitated by the New and Renewable Energy Obligation in Public Institution	
Large[6]			Investment in MCFC (Molten Carbonate Fuel Cell) increased with significant participation of big companies driven by the Renewable Portfolio Standard requirement initiated in 2012	• Fuel-cell is included in RPS
District Grid[7]				
Regional Grid[8]				

[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)

Telecom backup				
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Fossil Fuels[10]				
Water Electrolysis[11] (PEM, Alkaline, SOEC)				
By-product H_2				
Energy Storage from Renewables	**Target[12]**	**Current Status**	**Partnership, Strategic Approach**	**Policy Support**
Power to Power[13] Capacity				
Power to Gas[14] Capacity				

[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, 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)