



*IPHE Steering Committee Meeting
Paris, France*

Hydrogen & Fuel cell Activity in Korea

January 26-28, 2005

Jong-Yeon Yoon

Ministry of Commerce, Industry and Energy (MOCIE)

Recent Energy Situation in Korea

Primary Energy Import (2003)

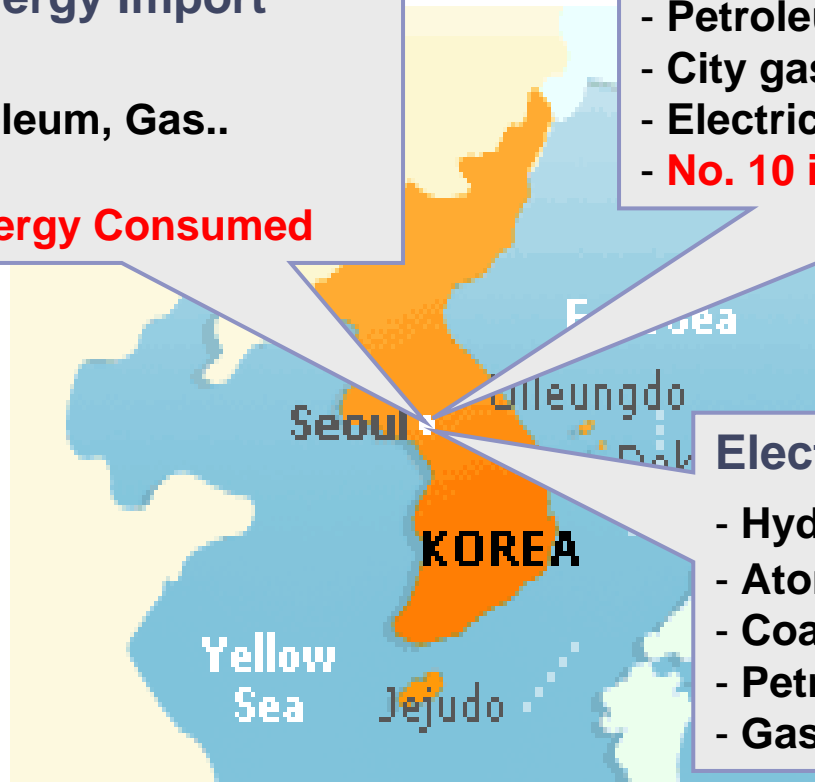
- Coal, Petroleum, Gas..
- \$ 38 B
- **96 % of Energy Consumed**

Energy Consumption (2003)

- Coal: 35 M M/T (35 M TOE)
- Petroleum: 723 M bbl (55 M TOE)
- City gas: 15 B m³ (13 M TOE)
- Electricity: 294 TWh (2 M TOE)
- **No. 10 in World**

Electricity Production (2003)

- Hydro: 2.1 %
- Atomic: 40.2 %
- Coal: 37.3 %
- Petroleum: 8.2 %
- Gas: 12.1 %





Funding Sources of Hydrogen Energy/Fuel Cell R&D in Korea

Ministry of Commerce, Industry and Energy (MOCIE)

- Short and medium-term projects
- Development of industrial application technology

Ministry of Science and Technology (MOST)

- Long-term projects
- Development of basic technology

Funding for Academic research institutions, Government-led research institutions, and Commercial research organizations (industries)



Past Hydrogen/Fuel Cell R&D Activities

Period		'90 ~ '03
Objectives		Fundamental Technology Developments
Budget	Hydrogen	Government : \$ 5 M Private Sector : \$ 1.5 M
	Fuel Cell	Government : \$ 35 M Private Sector : \$ 34 M



Government Policy

Increase portion of new and renewable energy in national energy consumption

- From 2.0 % in 2003 to 5 % by 2011

Reduce income tax or corporate tax for all new and renewable energy equipments

- Tariff : 8.0% → 2.8%

Strong support for R&D : Cooperation between MOCIE and MOST

- National RD&D Organization for Hydrogen and Fuel Cell (MOCIE, 2004-2008)
- 21st Frontier Hydrogen Energy R&D Program (MOST, 2003-2013)
- Nuclear Hydrogen Program (MOST, 2004-2019)



Government Budget

	Government Budget			
	MOCIE (2004- 2008)	MOST		Total
		HERC (2003-2013)	Nuclear Hydrogen (2004-2019)	
R&D for Hydrogen	\$ 94 M	\$ 90 M	\$ 1000 M	\$ 1,184 M
R&D for Fuel cells	\$ 237 M		-	\$ 237 M
Demo. & Dissemination	\$ 175 M	-	-	\$ 175 M




Current R&D Activities

(21st Frontier Hydrogen Energy R&D Program (MOST))

R&D Goal: Fundamental technical development of hydrogen energy

Hydrogen Production Technology	<ul style="list-style-type: none">• Hydrogen Station Technology (NG steam reforming)• Water Splitting using Biological, Thermo-chemical or Photocatalytic Methods• High/Low Temperature Water Electrolysis
Hydrogen Storage Technology	<ul style="list-style-type: none">• Compressed Hydrogen Gas Storage• Hydrogen Storage using Metal Hydrides, Nano-structured Materials or Chemical Hydrides
Hydrogen Utilization Technology	<ul style="list-style-type: none">• Hydrogen Fueled Power/Generation System• Hydrogen Sensor and Safety





Current R&D Activities

(National RD&D Organization for Hydrogen and Fuel Cell (MOCIE))

R&D Goal: Commercialization of hydrogen and fuel cell technology for the hydrogen economy

Hydrogen	<ul style="list-style-type: none">• Hydrogen Production/Storage for Commercialization• Development and Demonstration of Hydrogen Station• Hydrogen Codes, Standards and Safety
Fuel Cell	<ul style="list-style-type: none">• Development of 100kW class MCFC System for Stationary Application• Development of 80kW Class PEMFC System for Transportation• 3 kW PEMFC System for Residential Power Generation• 50W class PEMFC System, DMFC system for Portable Application• 3kW SOFC System for APU Application

Near-term Target for Dissemination of Hydrogen/Fuel Cell

Transportation Fuel Cell Systems

- Fuel Cell Vehicles (4 units)
- Hydrogen Stations (3 units)



Building/Residential Power Fuel Cell (3 units)

- Building (<50 kW PEMFC)
- Residential (<3 kW PEMFC)



Distributed Power Fuel Cell Systems

- MCFC (250kW)



Construction of Hydrogen/Fuel Cell Power Park



▲ Molten Carbonate Fuel Cell, 25kw



Workshop/Conference/Symposium in Korea (2005)

| Domestic Meeting

- **Spring Meeting of Korean Hydrogen New Energy Society, May in 2005 (Chonnam)**
- **Fall Meeting of Korean Hydrogen New Energy Society, September in 2005 (Ulsan)**
- **Hydrogen & Fuel Cells Joint Symposium 2005 July in 2005 (Seoul)**
- **3rd Symposium on Hydrogen Energy in Korea November in 2005 (Seoul)**

| International Meeting

- **1st International Symposium on Hydrogen Energy, August in 2005 (Ulsan)**