The 4th IPHE Steering Committee Meeting
Kyoto, Japan

Hydrogen & Fuel cell Activity in Korea

September 14, 2005

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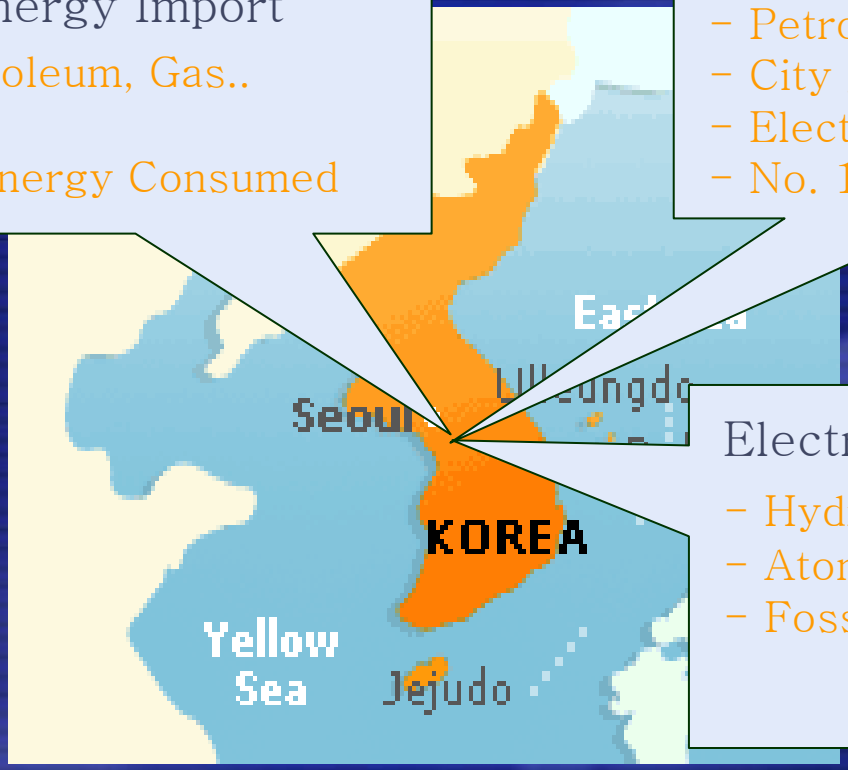
Ministry of Commerce, Industry and Energy (MOCIE)

Energy Situation in Korea (2004)

Primary Energy Import
- Coal, Petroleum, Gas..
- $ 49 B
- 96 % of Energy Consumed

Energy Consumption
- Coal: 34 B M/T
- Petroleum: 719 M bbl
- City gas: 15 B m^3
- Electricity: 312 TWh
- No. 10 in World



Electricity Production
- Hydro: 1.7 %
- Atomic: 38.2 %
- Fossil : 60.1 %

Hydrogen Economy

Hydrogen Energy : Most Feasible Solution to Energy Problems

Fuel Cell : Core Technology for Hydrogen Energy Utilization

Selected as One of 10 Economy Growth Engine for Next Generation

Investment for H_2 and FC R&D

Period		'89 ~ '04
Objectives		Fundamental Technology Developments
Budget	Hydrogen	Government : $ 10 M Private Sector : $ 4.9 M
	Fuel Cell	Government : $ 54 M Private Sector : $ 48 M
Total		$ 116.9M

1$ = 1,050 won

Current & Future Government Budget for H2 and FC R&D

	Government Budget			
	MOCIE ('04-'08)	MOST		Total
		HERC (2003-2013)	Nuclear Hydrogen (2004-2019)	
R&D for Hydrogen	$ 94 M	$ 90 M	$ 1000 M	$ 1184 M
R&D for Fuel cells	$ 237 M		-	$ 237 M
Demo. & Dissemination	$ 175 M	-	-	$ 175 M

- **MOCIE** (Ministry of Commerce, Industry and Energy)
  : Short and medium-term projects, Development of industrial application technology
- **MOST** (Ministry of Science and Technology)
  : Long-term projects, Development of basic technology

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)

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

Target : Commercialization of hydrogen and fuel cell technology for the hydrogen economy

Hydrogen	• Hydrogen Production/Storage for Commercialization • Development and Demonstration of Hydrogen station • Hydrogen Codes, Standards and Safety
Fuel Cell	• 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

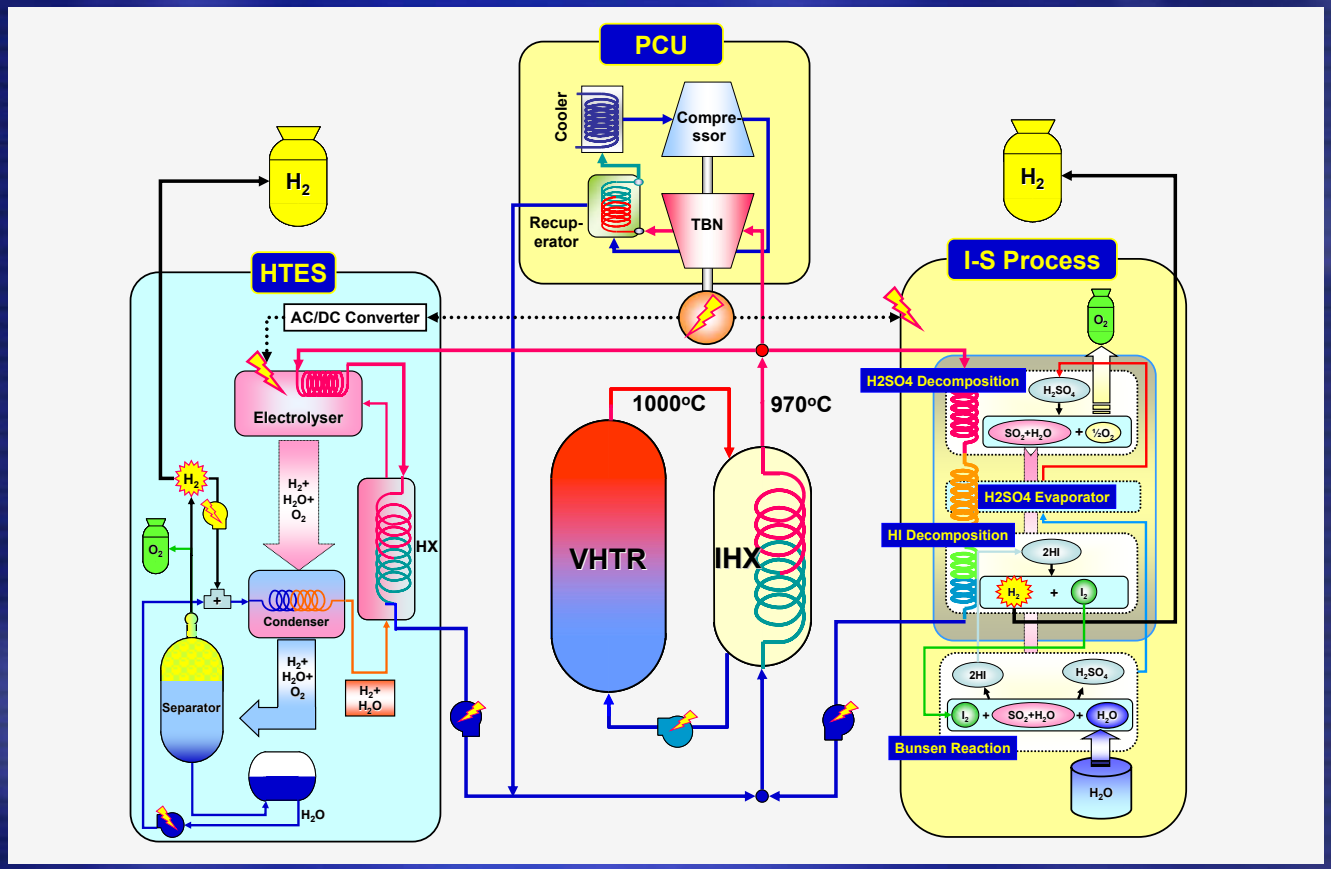
21st Frontier Hydrogen Energy R&D Program (MOST)

Target: Fundamental technical development of hydrogen energy with funding $ 90 M for 10 years since 2003

Hydrogen Production Technology	• Hydrogen station technology (NG steam reforming) • Water splitting using Biological, Thermo-chemical or • Photocatalytic methods • High/Low Temperature Water Electrolysis
Hydrogen Storage Technology	• Compressed hydrogen gas storage • Hydrogen storage using Metal Hydrides, nano-structured materials or Chemical Hydrides
Hydrogen Utilization Technology	• Hydrogen fueled Power/Generation system • Hydrogen Sensor and Safety

Nuclear Hydrogen Program (MOST)

Target : Complete the development and demonstration of the nuclear based hydrogen production technology with funding $ 1000 M for 16 years since 2004 and Cover about 20% of the energy demanded in the transportation sector in 2020s



PEMFC for Transportation

■ Participants

- Main Contractor: Hyundai Motor Company
- Sub Contractors: KIST, SK, Universities

2000

➢ Development of methanol reformer for 25kW-class system (SK)

➢ Development of 25kW-class PEMFC stack (HMC, KIST)

2001

2002

2003

➢ Development of 10kW-class PEMFC stack (KIST, HMC)

2005

➢ Development of 80kW class PEMFC hybrid FCV

MCFC for Power Plant

■ Participants

- Main Contractor: KEPRI, POSCO
- Sub Contractors: KIST, RIST, TWIN Energy, Hyosung HI

➢ 100kW Developed

PEMFC for RPG

- Participants
  - Main Contractor: GS FuelCell
  - Sub Contractors: KOGAS, KIER, KITECH

RPG System

➢ 3kW Development

stack

NG
Reformer

Near-term Target for Dissemination of Fuel Cells

Transportation Fuel Cell Systems

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

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

Workshop/Conference/Symposium in Korea (2005)

Domestic Meeting

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

International Meeting

- 1st International symposium on Hydrogen Energy, September in 2005 (Ulsan)
- Frontiers in Hydrogen Storage Materials and Technology, Dec , 2005 (Gyeongju)


Thank You!