The 7th Steering Committee Meeting
Sao Paulo, Brazil

Member State

Korea

24 April. 2007

SU-HA JUN
Ministry of Commerce, Industry and Energy

Vision of Hydrogen / Fuel Cell

<National Plan for the Hydrogen Economy (2040)>

- ◆ Hydrogen energy portion in final energy : 15%
- ◆ GDP portion of fuel cell industry : 5%

◆Vision : Creation of New Hydrogen · Fuel Cell industry

- 60% of Hydrogen produced from renewables
- Replacement of 54% of automobile fuel by hydrogen energy
- Replacement of 22% of Power plant by fuel cell generation
- Replacement of 23% of residential power by fuel cell generation

R&D → **Demonstration** → **Deployment**

R&D Budget Allocation

Intensive investment in H &FC R&D

- R&D budget on H & FC has increased sharply in the last 3 years
- Budget on Hydrogen occupies 39%, Transportation FC 31%, Stationary FC 23% respectively

* 1$ = 1,000WON

	2004		2005		2006	
	Projects	Budget (M$)	Projects	Budget (M$)	Projects	Budget (M$)
Hydrogen	29	14.3	27	15.5	31	18.9
Stationary FC	13	8.8	13	6.4	10	11.4
Transportation FC	1	3.3	2	6.9	4	15.3
Portable FC	3	2.4	4	5.0	3	3.6
Total	**46**	**28.8**	**46**	**33.8**	**48**	**49.2**

H and FC R&D Projects

Major Projects newly launched in 2006

- **A Study on Safety for Hydrogen & Fuel Cell System**
  - Safety evaluation of hydrogen system and optimal construction of safety management
  - Development of safety codes and promotion of safety regulation

- **Development of Fuel Processing System for Small Fuel Cell**
  - Reforming of LNG, LPG suitable for 1, 3 kW class FC
  - Field test : 5,000hr (DSS 60 times)

- **High Pressure Hydrogen Gas Storage System for FC Vehicle**
  - Development of 350 bar and 700 bar storage system
  - Development of Compatibility of High Pressure Hydrogen Storage System Built-in FC vehicle

H and FC R&D Projects

Major Projects newly launched in 2006

- **Development of Metal-Diaphragm-Type Hydrogen Compressor**
  - Development of Metal-Diaphragm Hydrogen Compressor for refueling pressure of 700 bar
- **Fuel Cell Hybrid System Used for a Small-sizes Cart**
  - DMFC(800W), Lithium Secondary Battery(1.6kWh), Driving - 5 hrs
- **Development of 5kW-class SOFC system for CHP**
  - Reformer for LNG, LPG and liquid fuel(kerosene, diesel)
  - Durability : more than 5,000 hrs
- **Development of 10kW-class PEMFC for Use in Commercial Buildings**
  - System Efficiency : 70%, Durability : more than 5,000 hrs

Demonstration Projects

Background

- **Fuel Cell Monitoring Project for Transportation**
  - Cost Down & Feasibility Test of PEMFC Vehicles before Full Scale Deployment
  - Promotion of FC Core-parts Manufacturing Companies
- **Fuel Cell Monitoring Project for Residential Power Generation(RPG)**
  - Evaluation of FC efficiency
  - Penetration of FC Market
  - Collaboration of Public Companies and Energy suppliers

Monitoring Project for Transportation

Project Objectives

- Demonstration of 30 FCV (80kW), 4 FC BUS (200kW) by 2009
- Build 4 hydrogen station (H production capacity: more than 30Nm3/hr)

Overview

- Budget : US$ 48 M
- Period : 3 Years from August, 2006
- Participants : HMC, NGV, KIST, SK, GS-caltex, KOGAS

Monitoring Project for Transportation

■ Project Areas

- **FCV Actual Road Test**

  - Vehicles performance, operation status, stack durability, parts replacement record, safety-related data, fuel efficiency, etc.

- **Ensuring the operation data of Hydrogen filling stations**

  - Hydrogen production, degree of hydrogen purity, parts replacement record, safety-related data, hydrogen price, etc.

- **Research on FCV/ Fuel cell station interface**

  - Frequency of filling, Safety, Convenience

- **Publicity and Education**

- **Carrying out Environmental and Economic evaluations of hydrogen and fuel cells vehicles**

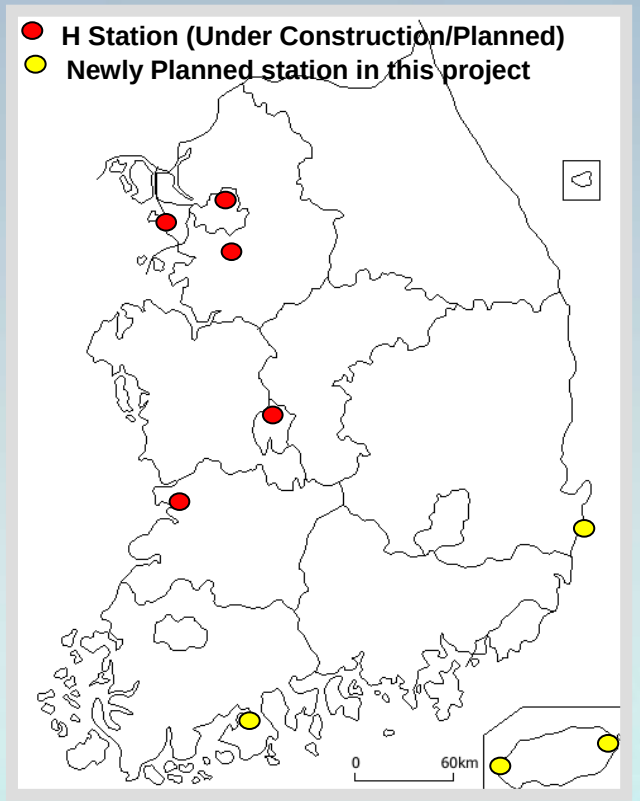
Plan for demonstration site

A. Seoul Metropolitan

- **LNG Reforming**
- **Naphtha Reformig**

B. Southern Region

- **Truck-in/Pipe line**



C. Central Region

- **LPG Reforming**

D. Jeju

- **Electrolysis**
  Wind Farm

Monitoring Project for RPG

■ Project Objectives

- Build the Fuel cell systems fit for Climate of Korea and Induce cost down through demonstration of the large production system
  - 40unit(1st year) → 70unit(2nd year) → 100unit(3rd year)

■ Overview

- Budget : US$ 41 M
- Period : 3 Years from August, 2006
- Participants :
  KOGAS, GS-FC, FC-Power, KIER,
  10 City Gas Suppliers

KOGAS
FuelCellPower
Energy Leader GS 퓨얼셀
한국에너지기술연구원 KOREA INSTITUTE OF ENERGY RESEARCH
해양도시가스
여러분의 에너지 서비스 파트너 KyungDong City Gas
JUNGBU CITYGAS
대한도시가스주식회사 DAEHAN CITY GAS CO., LTD.
대구도시가스 DAEGU CITY GAS
yesco happiness energy
Samchully
KYUNGNAM ENERGY CO., LTD.
(주)충남도시가스

Monitoring Project for RPG

■ Project Areas

- Evaluation RPG system in Actual conditions
  - Generation and heat efficiency of fuel cells
  - Reduction amounts of carbon dioxide, nitrogen oxide, sulfur oxide
  - Generation time
  - Troubleshooting methods
- Providing the information needed for the development of domestic fuel cells and hydrogen research.
- Establishing the residential fuel cell system available to all the regions and climate in Korea.
- Safety standards, data collection for adjusting regulations

Policy Initiative

Modification of Feed-In-Tariff

- From October 2006, Fuel cell was newly applied to F-I-T which is to compensate for the difference between NRE power generation cost and fossil fuel power generation cost to promote production and use of NRE.
  - ➢ F-I-T is provided to 9 power sources(PV, Wind, hydro, Waste, Bio, Ocean Energy and Fuel Cell) .

< Fixed Standard Prices of individual resource (won / KWh) >

Resource	Photovol-taic	Wind	Hydro	Landfill gas	Fuel Cell
Fixed Price	711.25 (30kw ↓) 677.38 (30kw ↑)	107.29	72.80~ 86.04	68.07 (20MW ↑) 74.99 (20MW ↓)	234.53 Using Biogas 282.54 Using other fuels

➢ **The price is applied for 15 years**

8th IPHE ILC Meeting in Korea

- Venue : Renaissance Hotel, Seoul
- Meeting Date : June 12 – 13
- Technical/Cultural Tour, June 14

Thank you