Introduction of Renewable & Sustainable Energy Industry in Korea

WEBINAR

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ED Research

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1. Introduction of EEN Korea_EDR

- **EEN-Korea**
  - Has joined EEN since Yr. 2009
  - EEN-Korea Consortium: KIAT (Korea Institute of Advanced Technology), ED Research, KITA (Korea International Trade Association)

- **ED Research**
  - A private technology transfer and commercialization center, designated by Ministry of Trade and Industry, Republic of Korea

**Business Areas and Activities**

- Business Model & Strategy Consulting
- Business Innovation Program
- IP Licensing, Technology Transfer
- Start-up, Incubation
- Technology Commercialization
- Global Marketing, Partner Search, B2B Matching
2. Brief Overview of the Republic of Korea

- A peninsula located between China and Japan (continuous cultural and geographical interactions with China and Japan)
- Capital: Seoul
- Population: 51.6 million
- GDP: 42,925 USD per capita
- Major Industry: electronics, semiconductor, automobiles, telecommunications, shipbuilding, chemicals and steel
3. Situation in Energy & Environment Sector in Korea

**[Government Policy]**

- **Transition to Safe and Clean Energy**
  - Current Environmental Problems in Korea (fine dust, CO2 emission, waste(plastic), global warming)
- **Transition in the Industrial Structure**
  - New drivers of economic growth: Renewable energy, hydrogen, new service(EMS, energy big data, VPP(Virtual Power Plant))

<table>
<thead>
<tr>
<th>Renewable Energy</th>
<th>Hydrogen</th>
<th>New Service</th>
</tr>
</thead>
</table>
| • Solar cell, module, wind turbine  
• Strategic R&D | • Building H2 economy ecosystem (Hydrogen production, storage, distribution, application)  
• Hydrogen station, hydrogen vehicles, fuel cell  
• Hydrogen safety management system | • Energy efficiency management related industries (EMS)  
• Activate Virtual Power Plant, & Demand Response(DR) market  
• New business opportunity by opening/sharing energy big data |
3. Situation in Energy & Environment Sector in Korea

[Government Policy]

- **Green New Deal Policy**
  - Korean Government announced [Korean Green New Deal](#) in July 2020

- **5 Major Green New Projects**
  1. Green Smart School (installation of PV plants and environment-friendly insulating material in 2,890 schools)
  2. Smart Green Factories
  3. Green Remodeling (construction of public day-care centers and gyms using energy efficient building materials)
  4. Green Energy (construction of big-scale seashore wind energy plants)
  5. Green Mobility (1M EV, 200 thousand hydrogen vehicles, charging stations)
## 4. Chungnam Hydrogen Cluster

### Activation Strategy for National Hydrogen Economy

*Announcement of road map to activate hydrogen industry to make a leap towards becoming the leading country of hydrogen economy*

#### Vision

**Making leap towards becoming the world-class leader of hydrogen economy**

- Becoming no. 1 in world market share of hydrogen cars and fuel cells
- Transforming from lack of fossil fuel resource to green hydrogen producer

### Road Map for Activating Hydrogen Economy

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2022</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydrogen Car</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: units</td>
<td>1800</td>
<td>81 thousand</td>
<td>6.2 million</td>
</tr>
<tr>
<td>Export</td>
<td>900</td>
<td>14 thousand</td>
<td>3.3 million</td>
</tr>
<tr>
<td>Domestic</td>
<td>900</td>
<td>67 thousand</td>
<td>2.9 million</td>
</tr>
<tr>
<td><strong>Fuel Cell</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: GW</td>
<td>0.307</td>
<td>1.5</td>
<td>15</td>
</tr>
<tr>
<td>For Power Generation For Home/Building</td>
<td>0.007</td>
<td>0.05</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Hydrogen Supply</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: ton (yearly basis)</td>
<td>130 thousand</td>
<td>470 thousand</td>
<td>5.26 million</td>
</tr>
<tr>
<td><strong>Hydrogen Price</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: KRW (per kg)</td>
<td>-</td>
<td>6000</td>
<td>3000</td>
</tr>
</tbody>
</table>

*Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan*
3. Need for Fostering Chungnam Hydrogen Economy

1. Urgent need of measures to solve environmental problems caused by densely located thermoelectric power plants

- Chungnam has a very serious problem of air pollution due to its densely located thermoelectric power plants.
- Thirty of 60, 50% of thermo electric power plants in operation in Korea are located in the province.
- The amount of air pollutant emitted from the region is 52% of the total amount in the country.

Very serious environmental pollution problem in the region

Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan
4. Chungnam Hydrogen Cluster

3. Need for Fostering Chungnam Hydrogen Economy

3. Outstanding basis for fostering hydrogen electric vehicle parts industry as the auto parts industry cluster

- Producing 580 thousand cars/year from two automobile manufacturing companies in Chungnam region (14% of the whole country)
- About 1,000 auto parts companies are in Chungnam region, taking up 13% of the whole country, and considerable number of parts companies related to the body are clustered here.
- Eighty-six first-tier subcontractors including Hyundai Mobis, Hyundai Powertech, Han II E-Wha, and Hyundai Dymos are gathered in Cheonan, Asan, Dangjin, and Seosan regions.

Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan
4. Chungnam Hydrogen Cluster

Implementation Status of Chungnam Hydrogen Economy

1. Chungnam Hydrogen Fuel Cell Vehicle Fostering Project

- Project Period: 2017-2021 (5 years)
- Project Budget: 70.8 billion KRW (34.9 from government expense, 21.2 from province expense, 14.7 from private investment)
- Project Details: Establishing FCEV industry base and developing parts technology to respond preemptively to changes in the environment of futuristic auto parts industry, demonstrating parts vehicles

Parts Test Evaluation Center
(Yesan, new building)

- Two buildings (building A and B) and one hydrogen supply unit were built by considering durability, performance test, environment, and the effect of durability evaluation.
- Scale (draft): Site 16,500m²
  (Total floor area 3,224m² / building area 1,964m²)

Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan
4. Chungnam Hydrogen Cluster

Implementation Status of Chungnam Hydrogen Economy

2. Chungnam National Innovation Cluster Creation Project

- Key industries: Fostering hydrogen electric vehicle parts and hydrogen filling-based industry
- Project Period: 2018-2024 (7 years)
- Project Budget: 31.92 billion KRW (22.345 from government expense, 9.775 from province expense)
- Project Details: Technology development of hydrogen electric truck parts, enterprise support, investment attraction, international cooperation, etc.

Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan
4. Chungnam Hydrogen Cluster

Implementation Strategy for Chungnam Hydrogen Economy

2. Fostering Global Cluster for Hydrogen Electric Vehicle Parts

- Fostering Hydrogen Companies: ('20) 60 companies → ('40) 200 companies
- Creating and fostering world-class innovation cluster for hydrogen vehicle parts

Source: Chungcheongnam-do, Chungnam Hydrogen Economy Action Plan
5. Market & Cooperation Opportunities

- **Company name**: ECO Electric Power
- **Type of Cooperation**: Technology/ Business Offer
- **Cooperation Offer**: Construction of Micro-grid/ Solar/Wind/ Biomass Power Plant System
- **Type of Partner Sought**: energy companies with construction and engineering skills and those who can plan energy infrastructure project and invite Eco Electric Power to join their new projects. Also interested in joining government-led projects
- Currently cooperating with Indonesia
5. Market & Cooperation Opportunities

- **Company name:** BK Energy
- **Type of Cooperation:** Technology/ Business Offer / R&D
- **Cooperation Offer:** Construction of **Floating and Rotating PV Plants**
- **Type of Partner Sought:** energy companies with construction and engineering skills and those who can plan energy infrastructure project and invite BK Energy to join their new projects. Also interested in joining government-led projects
- **Currently cooperation with Portugal, Indonesia and Vietnam**
5. Market & Cooperation Opportunities

- **Company name**: JNK Heater
- **Type of Cooperation**: Technology/ Business Offer / R&D
- **Cooperation Offer**:
  1. (BO) steam methane reformer for hydrogen refueling station
  2. (TR) carbon dioxide reduction technology
  3. (BR) Equipment/materials for hydrogen refueling station
- **Type of Partner Sought**: companies, R&D institutions, university
Company name: GMB Korea
- Type of Cooperation: Business Offer
- Cooperation Offer: (BO) Electric Water Pump for EV and hydrogen vehicles
- Type of Partner Sought: EV / hydrogen vehicle manufacturers
5. Market & Cooperation Opportunities

- **Company name**: Samkee Automotive
- **Type of Cooperation**: Business Offer / R&D
- **Cooperation Offer**:
  1. (BO) Clutch Housing Assembly for HEV
  2. (BO) Valve Body Set
  3. (BO) Transmission Case Assembly
- **Type of Partner Sought**: EV / hydrogen vehicle manufacturers
5. Market & Cooperation Opportunities

- Company name: Younghwa Tech
  - Type of Cooperation: Business Offer
  - Cooperation Offer: (BO) Converter for EV and HEV
  - Type of Partner Sought: EV / hydrogen vehicle manufacturers

Function and feature
- Substitutes existing alternator for combustion engine
- Recharging 12V battery and supplying electric power to various automotive components
THANK YOU!