106th IDEA 2015 Conference
Inspiring the Next Generation

Panel Discussion #2
[Paradigm Shift - Utility of the Future]

June 29, 2015
History of District Heating in Korea (1978 & 1985)

• In 1978: The Korea government considered to introduce DHC
  ➢ Energy conservation & greenhouse gas reduction

• In 1985: Established Korea District Heating Corp.

The Korea government considered to introduce DHC

Established Korea District Heating Corp.
In 1991: Development of new cities of metropolitan area

- Increasing requirement of electricity and district heat
- Adopting “The Act of District Heating and Cooling”
- The new city must be provided DHC (if the city exceed certain scale)
  - Over 5,000 households
  - over 600,000m²
The Propagation rate of DHC are increased more than twice (5.5 → 12.7%)

The trend of DHC in Korea
- 36 district heating companies
- 2.43 million households
  - KDHC: 1.3 million households and 2,100 buildings

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (thousand)</th>
<th>Supply (thousand)</th>
<th>Supply rate(%)</th>
<th>Number of Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>'95</td>
<td>9,570</td>
<td>525</td>
<td>5.5</td>
<td>2</td>
</tr>
<tr>
<td>'00</td>
<td>11,472</td>
<td>980</td>
<td>8.5</td>
<td>8</td>
</tr>
<tr>
<td>'05</td>
<td>13,222</td>
<td>1,390</td>
<td>10.5</td>
<td>15</td>
</tr>
<tr>
<td>'10</td>
<td>14,677</td>
<td>2,008</td>
<td>13.7</td>
<td>26</td>
</tr>
<tr>
<td>'11</td>
<td>15,007</td>
<td>2,178</td>
<td>14.5</td>
<td>28</td>
</tr>
<tr>
<td>'12</td>
<td>18,551</td>
<td>2,220</td>
<td>12.1</td>
<td>33</td>
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<tr>
<td>'13</td>
<td>18,884</td>
<td>2,323</td>
<td>12.3</td>
<td>34</td>
</tr>
<tr>
<td>'14</td>
<td>19,217</td>
<td>2,436</td>
<td>12.7</td>
<td>36</td>
</tr>
</tbody>
</table>

The Annual trend of district heating propagation in Korea
History of District Heating in Korea (2001)

♠ Establishing the master plan for national DHC (every 5 years)

♠ In 2001: Structure reforming of electric power industry

⇒ DHC companies entering the electric power market
Future Plan of Distributed power generation in 2030

- by DHC: more than 11%
- by Renewable energy: more than 14%

History of District Heating in Korea (2030, Future plan)

<table>
<thead>
<tr>
<th></th>
<th>'13</th>
<th>~'20</th>
<th>~'25</th>
<th>~'29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>86,969</td>
<td>131,663</td>
<td>135,654</td>
<td>136,906</td>
</tr>
<tr>
<td>Distributed Energy by DHC</td>
<td>5,322</td>
<td>10,262</td>
<td>13,662</td>
<td>15,482 (11.3%)</td>
</tr>
</tbody>
</table>

The plan for distributed power generation in Korea
History of District Heating in Korea (2030, Future plan)

♠ Under 500MW scale CHP is appropriate method (in Korea)

♠ The electricity and district heating demands are focused on the metropolitan area

➢ Metropolitan area required approximately 40% of total electrical demands but 23% plant are existed around

Distribution power generation by DHC will supply more than 11% of entire power generation

Current Status of KDHC (2014)

- 18 district branches
- 1.3 million households
- 2,100 buildings
The success of government assistance policy for DHC depends on:

- Evaluation of contribution level as distributed power sources
- Evaluation of energy conservation rate
- Evaluation of the greenhouse gas reduction rate
- Compensation of those in quality

The district energy business in Korea has been developed:

- As Social and economical mandatory national energy system during the past 30 years
- The assistance policy acted most important index
Conclusion

♦ KDHC proceeding the **joint research with IDEA**

♦ KDHC planning **transnational MOU** (2015. 8. 27, Seoul)
  ➢ Among Korea, U.S., E.U., China and Mongol(Japan)

♦ KDHC taking those action for :
  ➢ **Increasing DHC business** of each countries
  ➢ contributing to the “**United Nations framework convention on climate change**”
In 2030: Distributed power generation by DHC will supply more than 11% of entire power generation

Distributed generation by Renewable source has limitation (in Korea)

The Korea government considered to introduce DHC
- Established Korea District Heating Corp.
- Development of new cities of metropolitan area
- DHC companies entering the electric power market
- Distributed power generation by DHC will supply more than 11% of entire power gen.

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