Perspectives from South Korea

2008 Energy Security Conference

Opportunities and Constraints:
Prospects for Russian Oil and Gas Supply to Asia

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South Korea in Northeast Asia
Energy Demand & Economic Growth in Korea

Index

Energy

GDP

KOREA ENERGY ECONOMICS INSTITUTE
Primary Energy Consumption by Source

- **Oil**: 58.1 → 53.8 → 43.8
- **Coal**: 33.3 → 26.2 → 24.4
- **LNG**: 0 → 3.2 → 13.3
- **Nuclear**: 1.6 → 14.2 → 16.1
Energy Imports in Korea

Import (mill. toe)  Import Expenditure (bill. US $)

Year 00 01 02 03 04 05 06
Import 213.8 215.4 214.8 214.9 226.6 228.3 237.3
Expenditure 37.6 33.7 32.3 38.3 49.6 66.7 85.6

Bill. US $
Energy Imports in Korea

**Major Feature (2006)**
- Import Dependency: 96.8%
- Energy Imports: US $ 85.6 billion
- Petroleum Dependence: 43.8%
- ME Oil Dependency: 82.2%

**Imports (2006)**
- **Crude Oil**: US $ 55.9 billion (888.4 million barrels)
  - Saudi Arabia, UAE, Kuwait, Iran, Qatar, …
- **LNG**: US $ 11.9 billion (24.3 million tons)
  - Indonesia, Qatar, Oman, Malaysia, Brunei, …
- **Coal**: US $ 5.3 billion (76.0 million tons)
  - Australia, China, Indonesia, Russia, Canada, …

**Korea’s energy imports from Russia (2006)**

<table>
<thead>
<tr>
<th></th>
<th>Crude Oil</th>
<th>Coal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Russia</strong></td>
<td>14.0</td>
<td>5.03</td>
</tr>
<tr>
<td><strong>Share</strong></td>
<td>1.6%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>
Primary Energy Demand by Fuel
Republic of Korea (Reference Case)

Million TOE

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>53.1</td>
<td>63.4</td>
<td>69.5</td>
<td>79.7</td>
</tr>
<tr>
<td>Oil</td>
<td>100.6</td>
<td>110.7</td>
<td>114.5</td>
<td>120.4</td>
</tr>
<tr>
<td>N. Gas</td>
<td>28.4</td>
<td>34.6</td>
<td>35</td>
<td>38.9</td>
</tr>
<tr>
<td>Nuclear</td>
<td>32.7</td>
<td>41.7</td>
<td>51.1</td>
<td>55.9</td>
</tr>
<tr>
<td>Hydro</td>
<td>1.47</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>NRE</td>
<td>3.99</td>
<td>7.4</td>
<td>9.7</td>
<td>12.4</td>
</tr>
<tr>
<td>Total</td>
<td>220.3</td>
<td>259.2</td>
<td>281.2</td>
<td>308.7</td>
</tr>
</tbody>
</table>
Scenario Analysis Energy Demand Outlook

SD = Sustainable Development
RC = Regional Cooperation in NE Asia

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2020(BaU)</th>
<th>2020(SD)</th>
<th>2020(RC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>53,127</td>
<td>79,670</td>
<td>52,810</td>
<td>63,921</td>
</tr>
<tr>
<td>Oil</td>
<td>100,638</td>
<td>116,123</td>
<td>103,963</td>
<td>116,197</td>
</tr>
<tr>
<td>N. Gas</td>
<td>28,351</td>
<td>38,912</td>
<td>42,565</td>
<td>48,228</td>
</tr>
<tr>
<td>Hydro</td>
<td>1,465</td>
<td>1,445</td>
<td>1,391</td>
<td>1,445</td>
</tr>
<tr>
<td>Nuclear</td>
<td>32,679</td>
<td>55,881</td>
<td>41,871</td>
<td>51,130</td>
</tr>
<tr>
<td>NRE</td>
<td>3,977</td>
<td>12,391</td>
<td>15,011</td>
<td>12,391</td>
</tr>
<tr>
<td>Total</td>
<td>220,237</td>
<td>304,421</td>
<td>257,611</td>
<td>293,311</td>
</tr>
</tbody>
</table>

"< jcryu@keei.re.kr >"
Why does Korea need Russian gas?

- **Energy Security**
  - Diversification of energy sources
    - from nuclear & coal: Siting + Environment issues for a small country
  - Import source diversification from the Middle East
    - Is Russia more reliable and attractive supplier?

- **LNG Demand & Supply Gap**

  \[
  \text{Long-term Natural Gas Demand/Supply in Korea}
  \]

  \[
  \begin{array}{ccc}
  \text{Year} & \text{Demand} & \text{Contracted Supply} & \text{Expected Shortage} \\
  \text{2011} & 31.73 & 25.20 & 6.53 \\
  \text{2015} & 32.38 & 20.23 & 12.15 \\
  \text{2020} & 39.34 & 17.59 & 21.75 \\
  \end{array}
  \]

  - Tightened international LNG market ⇒ Russia can be an option for gas import source for Korea in future.
Slow progress for Korea-Russia gas project: Why?

• Big power’s game
  – **Russia vs Western majors:** Operation + Equity
    • Sakhalin II + Kovykta, then Sakhalin I?
  – **Russia vs China:** Price issues
  – **Russia vs Japan:** Territorial issues + ?
  – **Gazprom vs Rosneft:** Oil & gas in East Siberia and Sakhalin
    • Gazprom’s role in gas development in East Siberia & Sakhalin

⇒ Russia was not ready because of the power games

• Korean side issues
  – Financial crisis in the late 1990’s
  – Energy sector restructuring issues: public (*Kogas*) vs private
  – No policy for Russian energy
  – North Korean nuclear issues

⇒ Korea is too small and weak to drive the project alone
Korea-Russia Gas Projects

• Kovykta Project of the TNK-BP, CNPC & Kogas
  – Not approved by Moscow

• Korea’s LNG Imports Sakhalin-II
  - LNG of 1.5 million tonnes from Sakhalin-II from 2008

• Korea-Russia Intergovernmental Agreement for Gas Industry
  – Signed in October 2006
  – More detailed implementation plan for natural gas supply from Russia to Korea to be settled between Kogas and Gazprom in 2007 ~2008.

⇒ No fruitful outcome yet
Two Different Dreams between Korea & Russia

- **Korea’s Dream**
  - Imports of 15 bcm Russian gas from 2012 ~ 15
    - Which source, Kovykta or Sakhalin?
  - Imports of 20 bcm Russian gas in the long-term, after 2020
    - 1/3 of Korea’s total natural gas imports

- **Russia’s Dream**
  - Sakhalin-III alone for Korea: 12 bcm from 2012
    - Question: Will Sakhalin-III be feasible given expected difficulty?
  - Chayanda after 2015
    - In the UGSS Eastern Program
Feasible Solutions to Match the Dreams To Realize before 2015

• <Sakhalin–III> + <Sakhalin–I> through pipelines
  – Subject to <Khabarovsk – Vladivostok> pipeline construction before 2012 & North Korean involvement
    • Project with China excluded
  – Operator & Asset Evaluation Problems with the Exxon/Mobile
• <Sakhalin–III> + <Sakhalin–II> for LNG
  – Most likely scenario for the short-term interest, not long-term
• <Sakhalin–I> + <Kovykta> through pipelines
  – Maximizing the economics and export markets
    • Timing of construction of LNG export terminal in Vladivostok
  – In the long term, it will be developed to a larger scaled project with the Chayanda included for LNG export project even to the US West Coast
Gas Pipeline Network in Northeast Asia
Oil Development Project

• West Kamchatka Offshore Oil Development Project
  – Korean consortium + Rosneft Joint Project

• Korea’s participation in oil development project
  – Availability of additional projects in Kamchatka, Sakhalin and Republic of Sakha regions

• East Siberia-Pacific Ocean (ESPO) Oil Pipeline Project
  – Timing and plan for the construction of the 2\textsuperscript{nd} stage plan
    • Volume of crude oil to transport by railway Kozmino oil export terminal after the completion of the first stage of the ESPO oil pipeline

• Integrated Oil and Gas Supply Infrastructure
  – Creation of crude oil market in Vladivostok (Kozmino oil export terminal)?
    • Korean companies will have an opportunity to invest in the construction of oil complex.
New Route of the ESPO Oil Pipeline
Korea’s Approach to Energy Cooperation with Russia

- **Energy Partnership**
  - Korea will provide Russia with stable energy demand market
  - Russia needs to guarantee the long-term stable supply of oil and natural gas to Korea

- **Enhancing Direct Bilateral Cooperation with Russia**
  - Inter-governmental as well as industrial levels

- Energy projects to be linked with other economic/industrial development projects in Russia
  - Vladivostok development plan, Mega-Policy development plan, etc
  - Promotion of technology and capital investment cooperation
Thank you very much

Gamsa’hamnida

- End -