

Russian Gas Trade: Barriers and Opportunities, a Korean Perspective

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Ji-Chul Ryu, Ph.D.

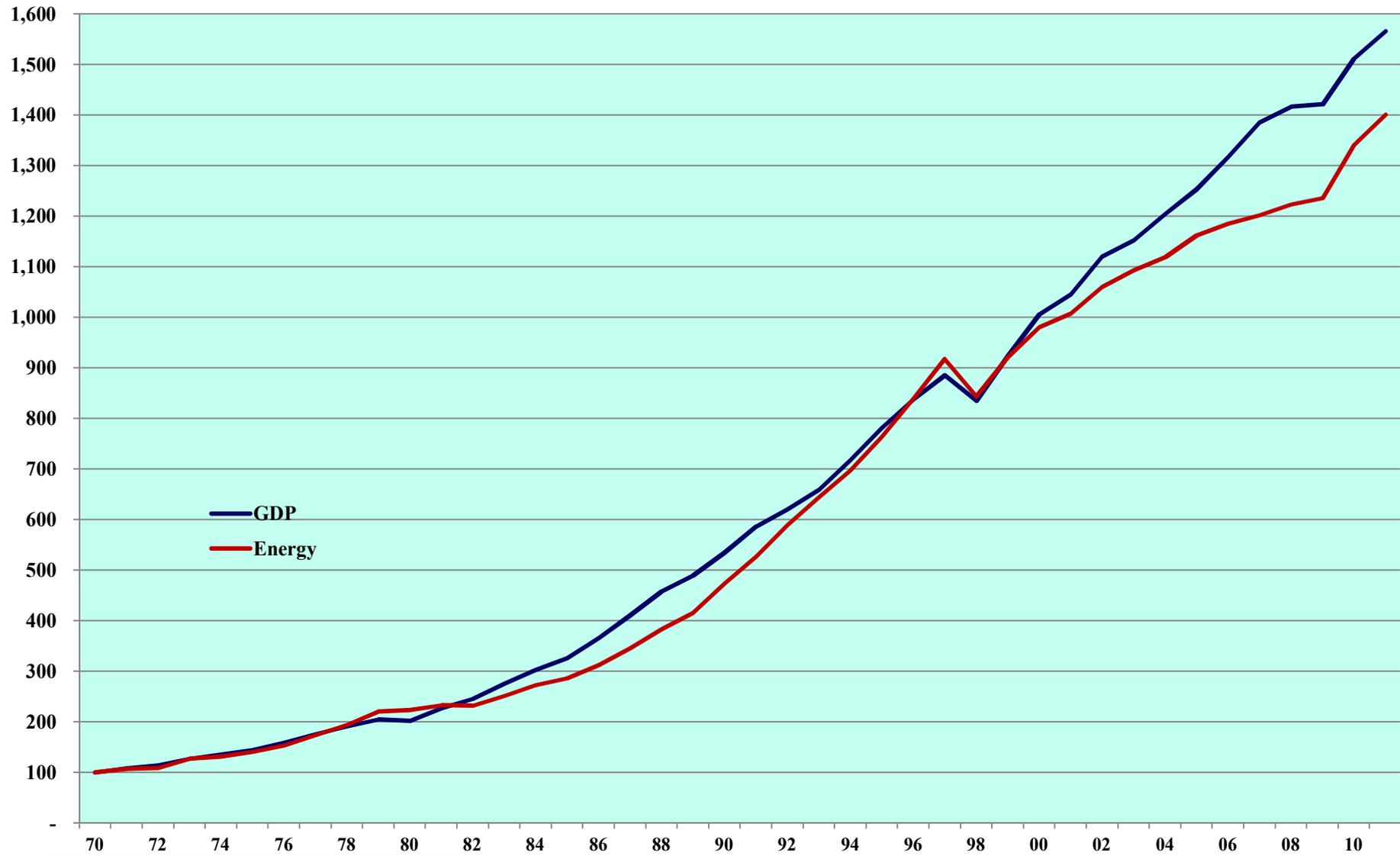
jcryu53@gmail.com

Korea at a Glance

- **Land Area: 99,646 km²**
 - ” **More than 70 %: Unproductive hill/mountains**
 - **Population: 49.8 million**
 - ” **High population density**
 - ” **Skilled man powers**
 - **Moderate Climates**
 - ” **Cold winter: Low productivity in agricultures**
- ⇒ **Economic Development Strategy:**
- ” **Industrialization by Manufacturing**
 - ” **High value-added industries**
 - ” **Export to international markets**

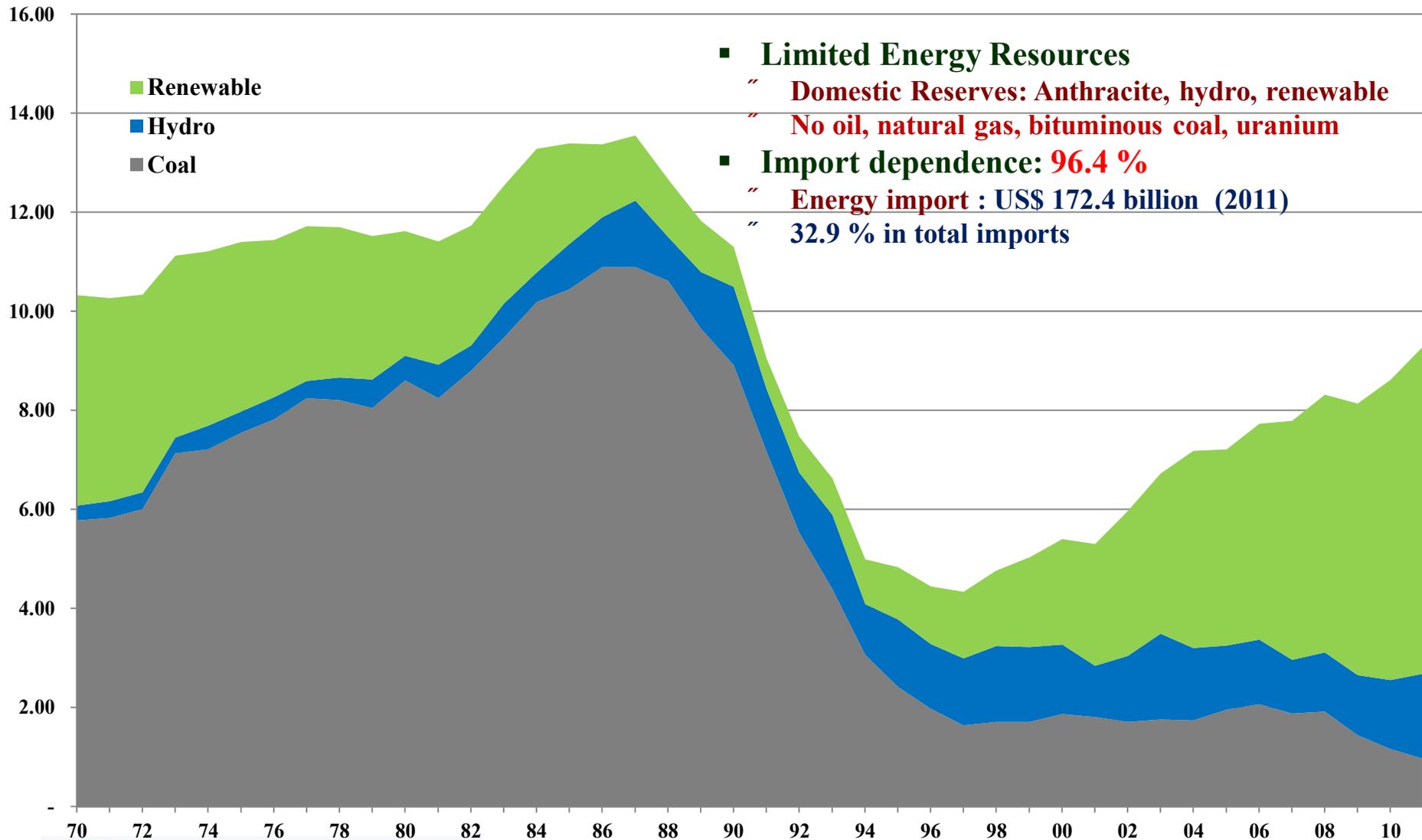


Energy Demand and Economic Growth in Korea



Domestic Energy Production in Korea

Million TOE



- **Limited Energy Resources**

- “ Domestic Reserves: Anthracite, hydro, renewable

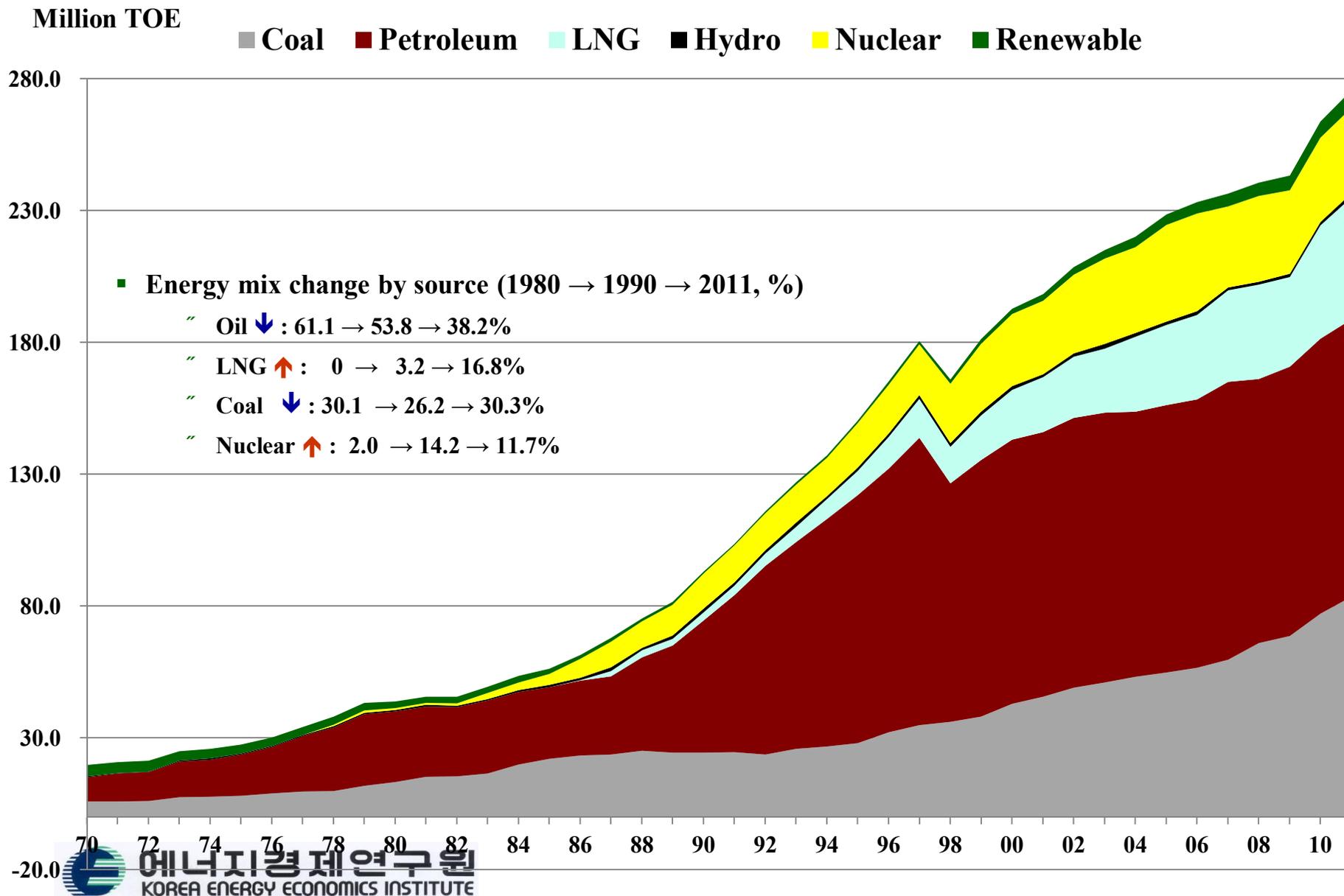
- “ No oil, natural gas, bituminous coal, uranium

- **Import dependence: 96.4 %**

- “ Energy import : US\$ 172.4 billion (2011)

- “ 32.9 % in total imports

Energy Mix Changes in Korea



Natural Gas Infrastructure in Korea

- Planned in 1984 & commercial operation start from 1987 and imports by LNG type from SE Asia and the Middle East
- Nation-wide trunk pipeline system: 3,023 km

National Pipeline System



Bird's-eye view of Incheon LNG terminal

| | Start | Storage Capacity (1,000 kl, #) | Re-gas Capacity (Ton/h) |
|--------------|-----------|--------------------------------|-------------------------|
| Incheon | Oct. 1996 | 3,480(18) | 3,690 |
| Pyeongtaek | Nov. 1986 | 1,000(10) | 3,016 |
| Tongyeong | Sep. 2002 | 1,400(10) | 1,350 |
| Total | | 4,880(38) | 8,056 |

LNG Import Source in Korea

| LNG (Million tons) | 1986 | 1995 | 2000 | 2005 | 2011 |
|--------------------|------|------|------|------|------|
| Indonesia | 0.1 | 5.3 | 6.1 | 5.5 | 7.9 |
| Malaysia | - | 1.0 | 2.4 | 4.7 | 4.1 |
| Qatar | - | - | 3.3 | 6.2 | 8.2 |
| Oman | - | - | 1.6 | 4.2 | 4.2 |
| Others | - | 0.8 | 1.2 | 1.7 | 12.3 |
| Total | 0.1 | 7.1 | 14.6 | 22.3 | 36.7 |

Why does Korea need Russian gas ?

É Energy Security

ó Diversification of energy sources

É from nuclear & coal: **Siting + Environment issues for a small country**

ó Import source diversification from the Middle East

É Is Russia more reliable and attractive supplier?

É LNG Demand & Supply Gap

ó Expected shortage of contracted supply for Korea's LNG imports

ó **Tightened international LNG market ⇒ Russia can be an option for gas import source for Korea in future.**

Energy Demand Outlook in Korea

Unit: million TOE

| | 2011 | 2025 | 2030 | 2035 | Growth rate pa (%) | |
|--------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------|-------------|
| | | | | | '11~'20 | '11~'35 |
| Coal | 83.6 (30.3) | 100.2 (28.3) | 107.7 (29.1) | 112.4 (29.7) | 1.92 | 1.24 |
| Oil | 105.1 (38.1) | 111.0 (31.3) | 107.1 (29.0) | 101.5 (26.9) | 0.82 | -0.15 |
| Natural Gas | 46.3 (16.8) | 64.8 (18.3) | 69.8 (18.9) | 73.3 (19.4) | 1.93 | 1.93 |
| Hydro | 1.7 (0.6) | 1.7 (0.5) | 1.9 (0.5) | 2.0 (0.5) | -0.35 | 0.70 |
| Nuclear | 32.3 (11.7) | 59.6 (16.8) | 65.3 (17.7) | 70.0 (18.5) | 4.85 | 3.28 |
| Others | 6.6 (2.4) | 16.8 (4.7) | 18.0 (4.9) | 18.8 (5.0) | 8.44 | 4.44 |
| Total | 275.7 (100.0) | 354.1 (100.0) | 369.9 (100.0) | 377.9 (100.0) | 2.09 | 1.32 |

Opportunity for Russia's Regional Energy Cooperation

- **Russia's Energy Export Market Diversification**

Share of Asia-Pacific region in Russia's total energy exports

| | 2008 | ~2015 | ~ 2022 | ~ 2030 |
|-------------|------|-----------|---------|-----------|
| Oil | 8 % | 10 - 11 % | 14-15 % | 22 - 25 % |
| Natural Gas | - | 11 - 12 % | 16-17 % | 19-20 % |

- **Oil, Gas and Coal Development Projects**

- “ Oil and gas (Sakhalin-III and Chayanda), Coal (Yakutia)

- **Natural Gas Pipeline Construction for Export**

- “ Total gas production in East Siberia and Far East = 150 bcm (2030)

- **Completion of ESPO Oil Pipeline Construction**

- **Development of Oil & Gas in Arctic Ocean Area (Yamal region)**

- “ Natural gas production and exports to Europe and Asia-Pacific Region by pipelines or LNG

Gas Development and Pipeline Network in Northeast Asia



Energy-Economic Cooperation: Korea – Russia

É Historical review

- **Yakutia Gas Development (1992): Cancelled because of economics**
- **Erel Coal Development in Saha Republic (1994)**
- **Kovykta Project of the TNK-BP, CNPC & Kogas (2003)**
 - É Not approved by Moscow
- **Korea-Russia Intergovernmental Gas Agreement (2006)**
- **Oil Development Projects**
 - “ West Kamchatka Offshore Oil Development Project: Korean consortium + Rosneft Joint Project (suspended)
- **Power Interconnection**
 - “ INTER-RAO & KEPCO negotiation, but difficulty because of North Korean Issues

Slow progress for Korea-Russia energy project: Why?

É Big power's game

ó **Russia vs Western majors: Operation + Equity**

É Sakhalin II + Kovykta gas projects

ó **Russia vs China: Price issues**

ó **Russia vs Japan: Territorial issues + ?**

ó **Gazprom vs Rosneft: Oil & gas in East Siberia and Sakhalin**

É Gazprom's role in gas development in East Siberia & Sakhalin

⇒ **Russia was not ready because of the power games**

É Korean side issues

ó **Financial crisis in the late 1990's**

ó **No policy for Russian energy**

ó **North Korean nuclear issues**

⇒ **Korea is too small to drive the project alone.**

Energy Cooperation Dilemma/Barriers in Northeast Asia

- **High capital requirement for energy development projects**
 - “ **Resource-rich countries (Russia) ≠ Capital-rich countries (Japan, Korea, China)**
- **Lack of Infrastructures and/or Vulnerability**
 - “ **Limited cross-border energy transportation network in SE and NE Asia**
- **Resource Nationalism**
 - “ **Policy barrier against foreign investment**
- **Energy Rivalry for Importing Countries**
- **Market uncertainty for energy exporting countries**
 - “ **Russia’s effort for diversification of export markets to the Asia-Pacific region**
- **Asymmetric endowment + interdependency relationship**
- **Rivalry in energy diplomacy and energy hegemony competition**
 - “ **China and Japan for the ESPO project, Southeast China Sea dispute**
 - “ **Conflict between multilateral vs bilateral relationships**
- **Political uncertainty: Territorial disputes, Korean peninsula issues**

Bilateral Cooperation: Korea – Russia

É Korea-Russia Summit in September 2008

- Russian PNG (piped natural gas) to Korea passing through North Korea: 7.5 MT/y (2015~)
 - É Joint feasibility study (2008~'10)
 - É Signing natural gas supply contract b/w KOGAS & Gazprom (2010)
- Joint construction and operation of gas/petrochemical industrial complex in Russian Far East
 - É Joint establishment of model for LNG liquefaction plants and petrochemical industrial complex construction and operation
- Mega-scale Korea-Russia economic cooperation projects
 - É Total scale of projects: more than US\$ 100 billion

⇒ Implications

- Encouraging DPRK participation → mitigation of Korean peninsula tension
- Stimulating other energy development projects in Russia
- Improve energy security capability in the Asia-Pacific region

Russia's Natural Gas Plan

Reserves

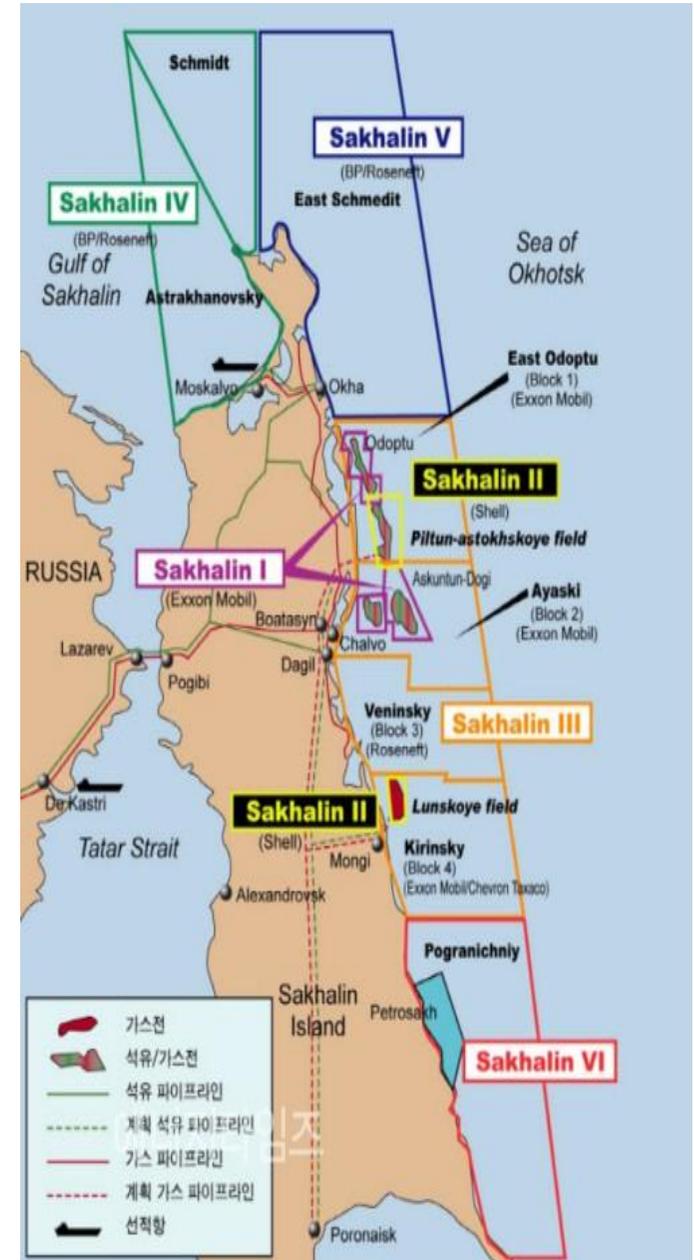
“ Irkutsk Center 2.0tcm, Yakutsk Center 1.24tcm, Sakhalin Center 2.09tcm

Pipelines

“ Sakhalin – Khabarovsk – Vladivostok : Nov. 2011

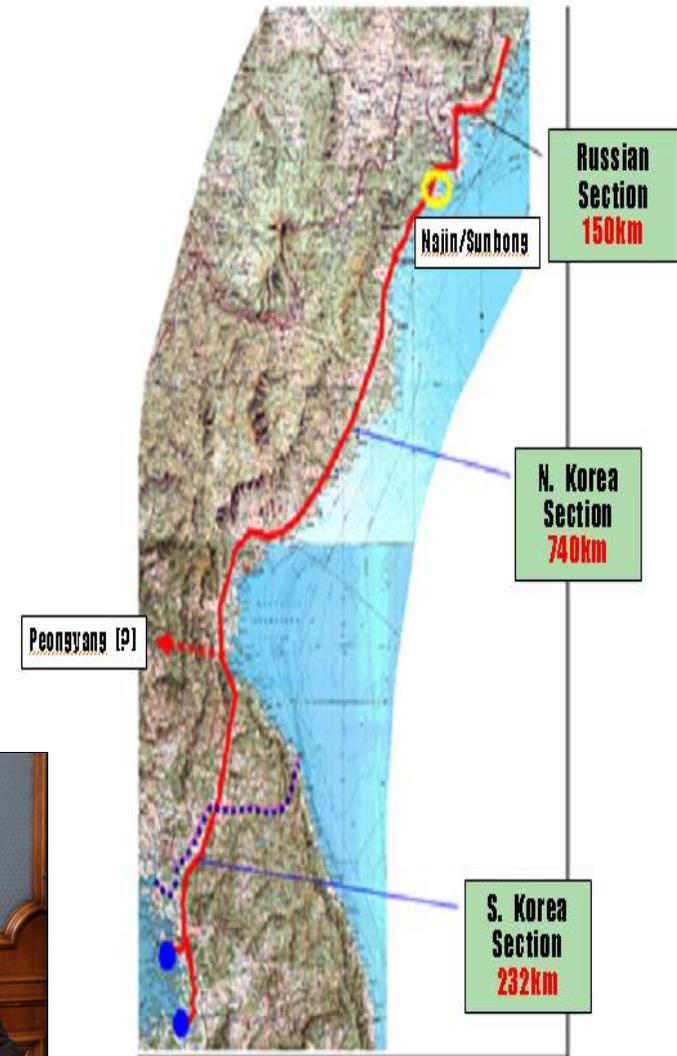
“ Yakutsk center - Khabarovsk gas pipeline: after 2016

“ Russia – N. Korea – S. Korea gas pipeline: 2015 – 2017



Russia – Korea Natural Gas Cooperation

- **Gas Supply from Russia to S. Korea**
 - 〃 **PNG Supply of 10bcm(7.5 million ton) from 2017**
- **LNG liquefaction and Gas Chemical Complex**
 - 〃 **LNG export terminal (5 million ton/y) in Vladivostok**
 - Signing of cooperation agreement between Gazprom and Japanese consortium in 2011 after Fukushima accident
- **Cooperation in Pipeline Construction in Far Eastern Russia**
- **Gas resource development in Far Eastern Russia**
 - 〃 **Sakhalin-III: Kirinsky, Yuzhno-Kirinsky**
 - 〃 **Chayanda gas field**
 - 〃 **Kovykta gas field**



Tasks ahead for Russian Gas Supply to Korea

| History | |
|------------|--|
| Sept. 2008 | É Signing of MOU between KOGAS and Gazprom at the Summit meeting in Moscow |
| June 2009 | É Joint research agreement on supply of Russian Natural Gas to Korea |
| April 2010 | É Completion of joint research work between Kogas and Gazprom |
| Sept. 2011 | É Signing of Road Map agreement between Kogas and Gazprom |

| Tasks Aheads | |
|---------------------------------|---|
| Commercial Negotiation | É Signing of HOA(Head of Agreement), SPA(Sales and Purchase Agreement) |
| Risk Identification and Hedging | É Arrangement of Financing, É Signing of IGA (Inter Governmental Agreement) among S. Korean, N. Korean and Russian governments <i>plus</i> HGA (Host Government Agreement) between N. Korea and pipeline operator, and GTA (Gas Transportation Agreement) between pipeline operator and Gazprom |
| Construction | “ FS (Feasibility Study), FEED (Front End Engineering Design), EPC (Engineering, Procurement & Construction), Commissioning |
| Supply | É Commencement of Gas Supply |

Implementation Issues for Korea-Russian gas project

É Challenges

ó International Financial Crisis

- Declines in asset values of Russian energy companies
- ⇒ Financing problem for investment of gas development and pipeline construction?

ó North Korean Issues

- North Korean nuclear weapon and missile tests
- Crisis of 6 Party Talks
- ⇒ Increased uncertainty for North Korean participation in the project

Shale Gas Revolution in N. America + LNG export potentials from the US ↑

- ⇒ Less incentives for gas importers to import Russian natural gas

É Approaches

ó Commercial Cooperation

- Joint leadership by Russian and Korean companies to encourage North Korean companies' participation
- ⇒ Agreement and Contract at the commercial basis

ó Multilateral Cooperation

- Creating peaceful political environment in the Korean peninsular
- Relating this project for energy assistant program for North Korea in 6 party talks framework
- ⇒ Peace Framework in Northeast Asia

Energy Cooperation Strategy for Korea and Russia

É Energy Partnership

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

É Technology and Investment Cooperation

- **Open energy projects in Russia to Korean Companies to facilitate the projects: Sakhalin-III and Chayanda oil and gas field**
- **Korea's technology advantage for investment in Russia:**

É Develop and Implement Economic Assistance Projects for North Korea

- **Political-neutral economic projects with strong Russian leadership**
 - **Multilateral investment framework/approaches**

É Diplomatic/Security Strategy

- **Task-sharing approach for peace making process in the Korean peninsular**
 - É **Russia is a chair country of a working group in 6 party talks for peace making mechanism of the Korean peninsular**

Conclusions

É Energy Project will require

- Long term and high investment period *plus* mutual trusts between participants
- ⇒ Trust establishment among the countries in the region will be important for the implementation of energy projects.

É Russia-Korea Energy Cooperation Project

- *Win-Win* project for two Korea and Russia
- ⇒ Great potentials and impacts to contribute peace making process in Northeast Asia

É Russia's opportunity to increase its roles in regional and global energy markets

- To be tested with energy projects in Northeast Asia

Thank you
Gamsa'hamnida

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