Current Status & Future Perspective
Northeast Asia Supergrid

2018. 7. 23
1. Global Supergrid and NEA

2. Supergrid projects world-wide

3. Inter-Governmental Cooperation

4. Challenges and Perspective
1 Global Supergrid and NEA
“The Night View of City Lights”
“No Grid Interconnection Among C–K–J”
2 Supergrid Projects World-wide
2. Supergrid projects world-wide

Power Grid Interconnections World wide

- **Exist**
  - **North America**
    - USA, Canada, Mexico interconnection

- **Expansion**
  - **Europe**
    - Integrate diverse energy source/ Enhance the stability of power

- **In Progress**
  - **South East Asia**
    - **Project for 10 Countries** (Laos, Malaysia etc.)
Interconnections in Europe

Number of circuits on cross-frontier transmission lines as of 31 December 2016 in the ENTSOE area:

<table>
<thead>
<tr>
<th>AC circuits</th>
<th>AC cables</th>
<th>DC cables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 400 kV</td>
<td>302</td>
<td></td>
</tr>
<tr>
<td>380 kV ≤ x &lt; 400 kV</td>
<td>172230</td>
<td>826</td>
</tr>
<tr>
<td>220 kV ≤ x &lt; 380 kV</td>
<td>132844</td>
<td>3979</td>
</tr>
<tr>
<td>Under 220 kV</td>
<td>170823</td>
<td>105</td>
</tr>
<tr>
<td>Sum</td>
<td>476132</td>
<td>4806</td>
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</tbody>
</table>

Number of cross frontier lines in the ENTSOE area:

<table>
<thead>
<tr>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 400 kV</td>
<td>64</td>
</tr>
<tr>
<td>380 kV ≤ x &lt; 400 kV</td>
<td>130</td>
</tr>
<tr>
<td>220 kV ≤ x &lt; 380 kV</td>
<td>110</td>
</tr>
<tr>
<td>Under 220 kV</td>
<td>90</td>
</tr>
<tr>
<td>Sum</td>
<td>394</td>
</tr>
</tbody>
</table>

“Political · Economical · Technical”
Inter-Governmental Collaboration

Interconnections are actively promoted by EU & ENTSO-e (over the 400 projects)
3 Inter-Governmental Cooperation
Potential Risks in Supergrid Project

Policy: 87.8%
Financial: 85.6%
Planning & Consenting: 83.1%
Political: 76.3%
Infrastructure: 66.0%
Operational: 64.3%
Technical: 50.0%

Policy, Financial, Planning & Consenting, Political Risks are much bigger than Technical and Operational Issues

Source: Dr. McKinstray, the European Supergrid - Messiah or Pariah, 2013
Inter-governmental Cooperation Required

Cross Border Interconnection

Collaboration

Facilitator

Joint Committee

Inter-Governmental Joint Working Group

Steering Committee

Regular exchange opinion & discussion

High Level (Prime Minister, Minister) Collaboration
Greece–Turkey, beyond **Historical Disputes**

- **2000 ~ 2007**
  - Constant Co-op
    - MOU (Comprehensive corporation)
    - IGA (Inter-government Agreement)

- **2010**
  - MOU (Gas & Electricity)
    - Regular Meeting
  - JEG (Joint Energy Group)

- **2015**
  - Consensus
    - Commissioning
      - Gas Transit Pipeline Project
    - Consensus Grid inter-connect
Led by Joint Committee

<table>
<thead>
<tr>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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</thead>
<tbody>
<tr>
<td>Composition</td>
<td>Progressing</td>
<td>Consensus</td>
</tr>
<tr>
<td>Start from Joint Committee</td>
<td>3rd Joint Working Group Joint Declaration</td>
<td>MOU (Joint Feasibility study)</td>
</tr>
<tr>
<td></td>
<td>3rd Joint Working Group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joint Declaration</td>
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<tr>
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<td></td>
<td>MedGrid Project</td>
</tr>
</tbody>
</table>
Icelink UK–Iceland Interconnection

Trading Renewable Energy, Reducing CO2 Emission & Electricity rate

- **2013**
  - Pre-F/S
  - Joint Pre-Feasibility Study

- **2015**
  - Task Force
  - Inter-Governmental

- **2016**
  - Joint Declaration
  - Inter-governmental
  - Project Implementation
‘Top-Down’ & ‘Bottom-Up’ Harmonization

**Top-Down**
- Cooperation of High-level government Officials & Politicians

**Bottom-Up**
- Cooperation between Utilities
- Joint F/S

- **Beginning International Cooperation**
- **Comprehensive Cooperation As Energy Community**
- **Realizing Common Interest / Relieving international tension**
“Northeast Asia Super Grid” Concept

NEA Supergrid Vision

- Joint development and utilization of renewable energy in NEA
- Joint strategy for global climate change & environmental pollution
- Mutual Security and Economic Community through Energy Cooperation
C-K-J-R Super Grid Cooperation MOU

2016. 3.30, China

SoftBank Group

State Grid

KEPCO

ROSSETI
C-K-J Pre-F/S Joint Study

Technically → Possible
Economically → Feasible
President Moon, Suggested NEA Supergrid Cooperation
K–C Summit, Inter-Gov Cooperation MOU

2017. 12. 13, China
There are many things to corporate in energy Areas.

“\textit{I hope Supergrid Project for ‘North East Asia Energy Community’ could proceed fast through Joint Research from the private section}”

President Moon, Jae-in remarked at the summit in Tokyo May 2018
Concluded “MOU” for "Korea–Russia Power Grid Interconnection” Cooperation
Next Steps for Supergrid project

Cooperation & Consensus

Business Model
Regulatory Framework
Taxation
Power Trading Mechanism

Feasible & Bankable
Thank you