

The Formation of the EU's Energy Union and Its Implications for the Northeast Asian Energy Market

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Abstract

Since the European Commission announced the “Energy Union” in February 2015 to make efforts toward integrating the EU’s internal energy market, it has been expected that secure, sustainable, competitive and affordable energy would be delivered to consumers in the European Union. However, it would not be easy to achieve this goal, considering the historical barriers remaining in the EU’s energy market, such as heavy dependence on Russian energy, insufficient regulatory frameworks, and lack of funds to modernize aging infrastructure and to enhance interconnectivity. The energy market in the Northeast Asian region could learn lessons from the EU’s historical experience over the last decade and the formation process of the Energy Union. A Northeast Asian energy market is necessary for initiating an integrated energy grid, a multilateral cooperation mechanism, and collaborative regional energy research to further economic synergy within the region.

Keywords: Energy Union, Northeast Asian energy market, internal market integration, EU energy policy

1. Introduction

The European Commission announced the “Energy Union” in February 2015 to provide European Union consumers with secure, sustainable, competitive and affordable energy by fundamentally transforming the energy system in Europe. The EU is the largest energy importer in the world, spending €400 billion per year (Modrall, 2015). A substantial amount of the energy that Europe imports is from Russia; Europe imported 39% of its natural gas, 32% of its oil, and 26% of its coal from Russia in 2013 (Russell, 2015).

Forming the Energy Union in Europe will improve energy efficiency through active communication between member countries, solve energy security challenges in Europe with the diversification of energy sources, and make a sustainable and competitive European energy market. The Energy Union has five strategies to bring about energy security, sustainability, and competitiveness: 1) energy security, solidarity, and trust; 2) a fully integrated European energy market; 3) energy efficiency contributing to moderation of demand; 4) decarbonizing the economy; and 5) research, innovation, and competitiveness (European Commission, 2015). The implementation of the plan will require more than €1 trillion over the next five years.

Compared to the EU’s accelerating drive for the integration of its energy market, Northeast Asian countries show a lack of consensus on an integrated energy grid. However, Northeast Asia is home to resource-rich countries that are highly dependent on energy exports, as well as major energy-consuming nations that are heavily dependent on energy imports. For this reason, joint development of energy resources in the region would substantially enhance stability in energy supply and demand in the region. Moreover, considerable improvement can be made to

the energy distribution structure of Northeast Asia by connecting railroads, pipelines, and power grids in the region and by engaging in the joint development and use of Arctic routes. This would lead to the establishment of a single energy and economic market in the region.

In fact, Northeast Asian countries are at different phases of economic development and are diverse in their industrial structure. There are countries which are rich in capital, including human capital, technology, and energy. This signifies that there is a great potential for economic growth that can be achieved through cooperation among Northeast Asian countries. The effects of economic synergy can be doubled when the countries go beyond a simple form of economic cooperation that is focused on merchandise trading, and creatively bring together their unique strengths.

This paper consists of two major sections: the EU's Energy Union and Northeast Asian energy integration. In the first section, a history of European energy policy and the opportunities for the Energy Union will be addressed. In the following section, the need for the integration of the Northeast Asian energy market will be assessed. The future direction of the Northeast Asian energy market and concluding remarks will be given at the end of the paper.

2. The History of the EU's Energy Policy: From the First Energy Package to the Energy Union

The European Commission implemented market liberalization to enhance energy cooperation among European countries. All three Energy Packages were adopted to transform the fundamental energy market structure in each country; the first was in 1996, the second in 2003, and the third in 2009. Until the 1990s, the energy market in Europe was dominated by state-owned enterprises, and the electricity and natural gas markets especially were operated by vertically integrated businesses through production, transmission and sales. The EU adopted the "First Electricity Directive" in 1996, and the "First Gas Directive" in 1998, and tried to gradually open the electricity and gas markets. The "Second Electricity and Gas Directive" adopted from 2003 required a complete opening of energy markets. Ownership unbundling which separates ownership among operators from the energy transmission or distribution network and suppliers on the production side was also included. Allowing a third party to access transmission networks created a competitive environment where energy consumers would have a choice when selecting favorable energy suppliers (EurActiv, 2008). However, the EU's efforts to dismantle big energy businesses were not successful, in that energy majors continued to monopolize the European energy market by controlling energy imports and domestic production, adjusting consumer prices, and preventing new businesses' entry. The EU decided to adopt more powerful regulation to transform the market structure and adopted the "Third Energy Package" in 2009. The package includes ownership unbundling and the establishment of the Agency for the Cooperation of Energy Regulators (ACER).

Table 1: The Changes in EU Energy Policy

	Pre-1996	1996 Directive	2003 Directive	2008 Directive
Generation	Monopoly	<ul style="list-style-type: none"> • Authorization • Tendering 	Authorization	Authorization (Requirement)
Transmission & Distribution	Monopoly	<ul style="list-style-type: none"> • Regulated TPA • Negotiated TPA • Single Buyer 	• Regulated TPA	• Regulated TPA
Supply	Monopoly	Account Separation	Legal Separation	Ownership (TSO) Legal (DSO)
Customers	No choice	Eligible Customers	Industrial (2004) All (2007)	Charter of Energy Users (Energy Poverty)
Regulation	Government Department	Not Specified	Regulatory Authority	Independent Regulator & European Regulator

Source: *Durr (2008)*

During the financial crisis in 2008, Europe experienced the failure of integrating its internal European energy market and of establishing governance for strengthening co-operation between the EU members and stakeholders. All three energy packages were virtually unsuccessful because of poor participation from member countries. Failure had already been expected when considering the fact that the EU would eventually implement the policies with weak pressure on what member countries agreed. The EU energy policy is in a transition period between national priorities in energy policy and the EU's own policy.

Meanwhile, Russia's annexation of Crimea in March 2014 shook Europe's energy security. Ukraine and Russia have often caused conflicts with each other since the Soviet Union collapsed in the early 1990s. Considering the fact that about 40% of gas in Europe is imported from Russia, and about half of that is transported through Ukraine, frequent conflicts between the two countries have raised the instability of Europe's energy security. At the time of the Russia-Ukraine gas conflicts in 2006 and 2009, Europe experienced gas supply disruption. A sense of crisis among European countries worsened at that time. Sanctions against Russia were imposed by Europe for its takeover of Crimea, and simultaneously Europe facilitated the integration of its internal energy market through the interconnection of the gas and electricity markets (Ghilès, 2014). Therefore, by implementing the Energy Union, the European Union will try to install interconnections across borders to expand the interconnection of the gas and electricity market and improve competitiveness through the liberalization of its energy market. The European Union is also seeking supply alternatives, such as its gas supply plans from sources other than Russia: the Middle East, Eurasia, and North Africa.

3. Forming the Energy Union

In June 2014, the President of the European Commission Jean-Claude Juncker set the launch of the Energy Union as a major EU energy strategy, and he appointed Maroš Šefčovič as Vice-President of the European Commission, responsible for the Energy Union, and Miguel

Arias Cañete as an EU Commissioner for Climate Action and Energy, respectively. The basic concept of the Energy Union is based on the vision of the “European Energy Community”, introduced in 2010. The European Commission started to discuss the diversification of energy supply sources, a reduction of energy import dependency, an expansion of renewable energy development, and climate change action (Lee, S. et al., 2015). On 6 February 2015, the Latvian government in collaboration with the European Commission organized a high-level seminar to encourage discussion among the EU Energy Ministers, representatives from the EU institutions and international organizations, academics and other energy policy-makers on the new European Commission initiative on creation of a European Energy Union. After the seminar, on 25 February 2015, the European Commission announced an “Energy Union Package” for improving energy infrastructure and integrating the EU’s energy market to provide secure, sustainable, and competitive energy for internal consumers. The Energy Union Package consists of “a Framework Strategy for a Resilient Energy Union”, “Paris Protocol: A blueprint for tackling global climate change beyond 2020”, and “Achieving the 10% Electricity Interconnection Target: Making Europe’s electricity grid fit for 2020”.

The Energy Union suggests five framework strategies: 1) energy security, solidarity and trust; 2) a fully integrated European energy market; 3) energy efficiency contributing to moderation of demand; 4) decarbonizing the economy, and 5) research, innovation and competitiveness.

Table 2: The Structure of the Energy Union

Energy security, solidarity and trust	<ol style="list-style-type: none"> 1. Diversification of supply (energy sources, suppliers and routes) 2. Working together on security of supply 3. Stronger European role in global energy markets 4. More transparency on gas supply
A fully integrated European energy market	<ol style="list-style-type: none"> 1. The internal market’s hardware: connecting markets through interconnections 2. Implementing and upgrading the internal energy market’s software 3. Enhanced regional cooperation within a common EU framework 4. A new deal for consumers 5. Protecting vulnerable consumers
Energy efficiency contributing to moderation of demand	<ol style="list-style-type: none"> 1. Increasing energy efficiency in the buildings sector 2. Towards an energy-efficient, decarbonized transport sector
Decarbonizing the economy	<ol style="list-style-type: none"> 1. An ambitious EU Climate policy 2. Becoming the number one in renewables
Research, innovation and competitiveness	<ol style="list-style-type: none"> 1. Collaboration in renewables, smart-grid, and energy efficiency

Source: European Commission (2015)

3.1. An Integrated European Gas Market through the Energy Union

The EU made efforts to liberalize and integrate the internal gas market by introducing the “Security of Gas Supply Regulation” in 2010 and the “Regulation on Energy Market Integrity and Transparency (REMIT)” in 2011, even after adopting the Third Energy Package in 2009. However, there has been no great change in the EU energy market due to conflicts of interest

among the countries. The EU emphasizes the introduction of the Third Energy Package and stimulates the integration of the gas market through the Energy Union.

With the integration of the internal energy market, Europe has an urgent issue to be solved concerning heavy gas dependency on Russia. Gas in Europe is supplied to European countries through LNG facilities or gas pipelines. Supply of LNG is available only to countries adjoining the Mediterranean Sea and the Atlantic Ocean, such as Spain, France and Britain, for geographical reasons. Other than the geographical barriers, considering the fact that gas supply as LNG is more expensive than that through gas pipelines, most countries are supplied by gas pipelines and 40% of the gas Europe imports is transported from Russia.

Market distortion was created as Russian gas dominated the European gas market, and was because Russia differentiated prices for each country depending on to what degree the country's supply sources were diversified. Gazprom from Russia, for example, sold gas to Germany at a price of €24/MWh, in contrast to Lithuania and Bulgaria at €38/MWh, and €43/MWh, respectively. It is expected that the Energy Union will be able to solve gas issues by integrating regulation among European countries and enhancing the interconnection of gas pipelines. Moreover, the European Commission plans to diversify the EU's gas supply sources to find gas alternatives other than Russian gas to boost the EU's energy security. The EU has three strategic sources for its alternatives: 1) importing gas from the MENA region, such as Iran, Iraq, Algeria, and Libya; 2) intensifying collaboration with Azerbaijan, Kazakhstan, and Turkmenistan on the Southern Gas Corridor; and 3) Importing LNG from the United States, Australia and East Africa (Tcherneva et al., 2015).

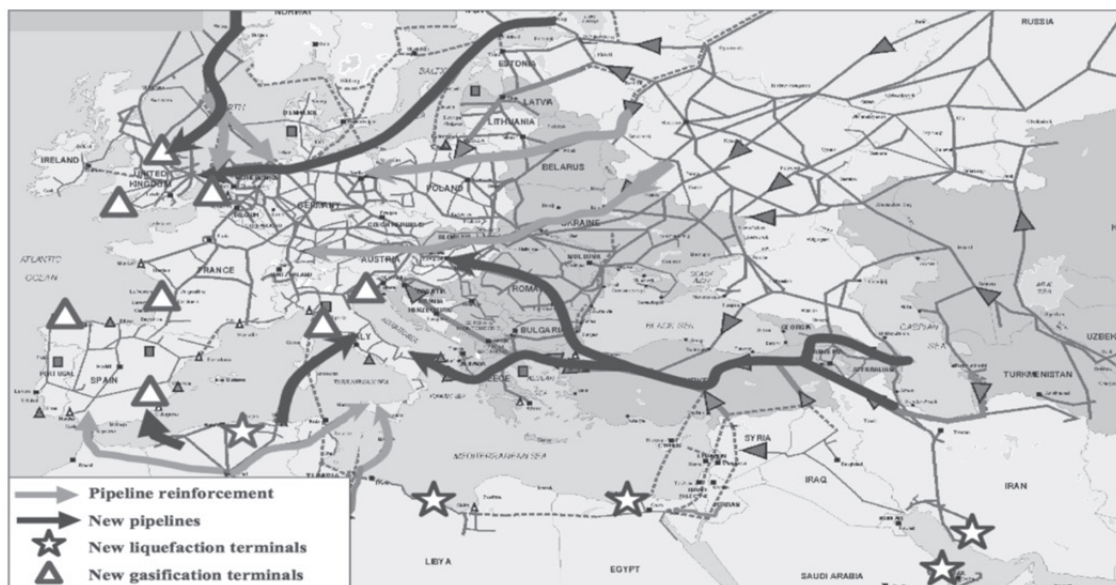
Table 3: Europe's Alternatives to Russian Gas

Country	Pros	Cons
Iran	<ul style="list-style-type: none"> • Vast oil and gas resources • E3+3 talks create new possibilities 	<ul style="list-style-type: none"> • International sanctions still in place • Infrastructure and transit problems
Iraq	<ul style="list-style-type: none"> • Oil and gas resources • International companies are already present 	<ul style="list-style-type: none"> • Political instability
Kurdistan	<ul style="list-style-type: none"> • Rapprochement with Turkey would facilitate transit to Europe 	<ul style="list-style-type: none"> • Disputes between Erbil and Baghdad over hydrocarbons, export strategies and revenue sharing
Algeria	<ul style="list-style-type: none"> • In the past, it was Europe's second largest external gas supplier (after Russia) 	<ul style="list-style-type: none"> • Its potential is limited due to the difficulties in launching new projects
Libya	<ul style="list-style-type: none"> • Could potentially supply up to 15bcm per year to Europe 	<ul style="list-style-type: none"> • Political instability • Lack of export infrastructure
Egypt	<ul style="list-style-type: none"> • Traditional gas supplier to Europe 	<ul style="list-style-type: none"> • Political turmoil • Growing domestic demand
Israel	<ul style="list-style-type: none"> • Discovery of the offshore Leviathan and Tamar gas fields in the Mediterranean Sea 	<ul style="list-style-type: none"> • Its priority is to protect its national interests (60% of its reserves to the domestic market) and to export to its neighbors
Azerbaijan	<ul style="list-style-type: none"> • Supplier best placed to respond to EU's needs • Investments in TAP 	/
Turkmenistan	<ul style="list-style-type: none"> • Rich gas reserves 	<ul style="list-style-type: none"> • It shifted its export strategy towards China
Turkey	<ul style="list-style-type: none"> • Proximity and geopolitical importance 	<ul style="list-style-type: none"> • EU's energy security is treated as a bargaining chip, not an opportunity; Russian pressure

Source: Tcherneva et al. (2015)

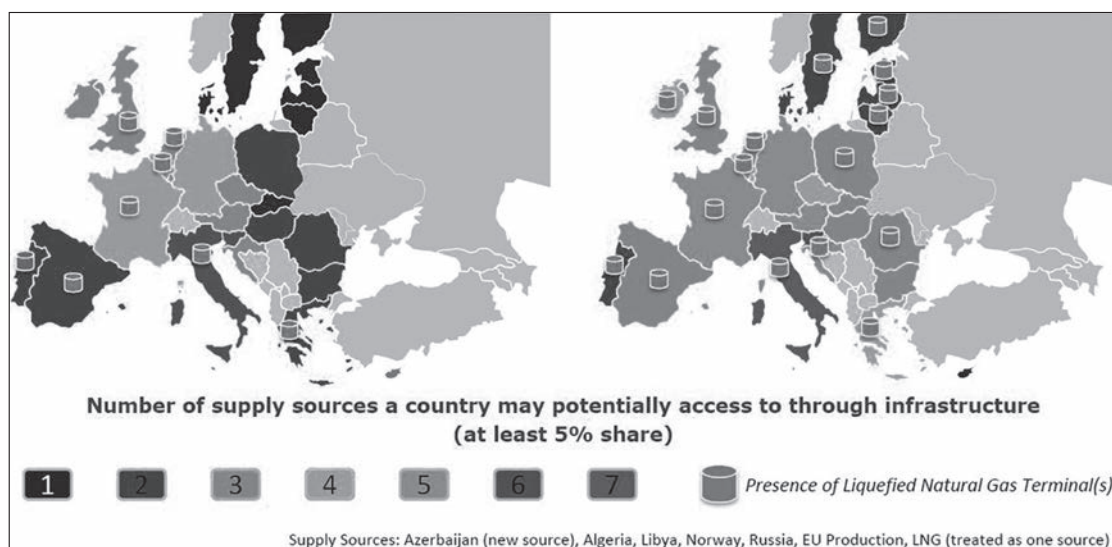
The MENA region would be difficult to consider for a major EU gas supply strategy because of its political instability and lack of infrastructure. Due to economic competitiveness, LNG imports from United States, Australia, and East Africa would not be an option. Instead, the EU seems to have the Southern Gas Corridor as a key strategy for gas supply. Stretching over 3,500 kilometers, crossing seven countries and involving more than a dozen major energy companies, the Southern Gas Corridor is comprised of several separate energy projects representing a total investment of approximately US\$45 billion. It will build three major pipelines including the South Caucasus Pipeline traversing Georgia, the Trans-Anatolian Pipeline traversing Turkey, and the Trans-Adriatic Pipeline traversing Greece, Albania, and Italy. It will transport gas produced from Azerbaijan, Turkmenistan, Iran and Iraq in the Caspian region to the European market. It is expected that Caspian gas will be delivered to countries such as Italy, Switzerland, Germany, the Netherlands, and the United Kingdom (TAP, n.d.).

Figure 1: Connecting Gas Markets



Source: Energos21 (2014)

The final point is that the EU expects to complete the integration of its internal energy market by reinforcing gas pipelines and interconnections. Through the interconnections at borders, countries with few supply sources, such as Latvia, Finland, and Lithuania, will be able to import gas from Germany or the United Kingdom when a gas crisis occurs. The EU is pushing the construction of LNG terminals in eastern and northern Europe and is interconnecting gas pipelines, so that by 2022 all EU countries will have more than two supply sources.

Figure 2: Gas Supply Sources in 2014 and 2022

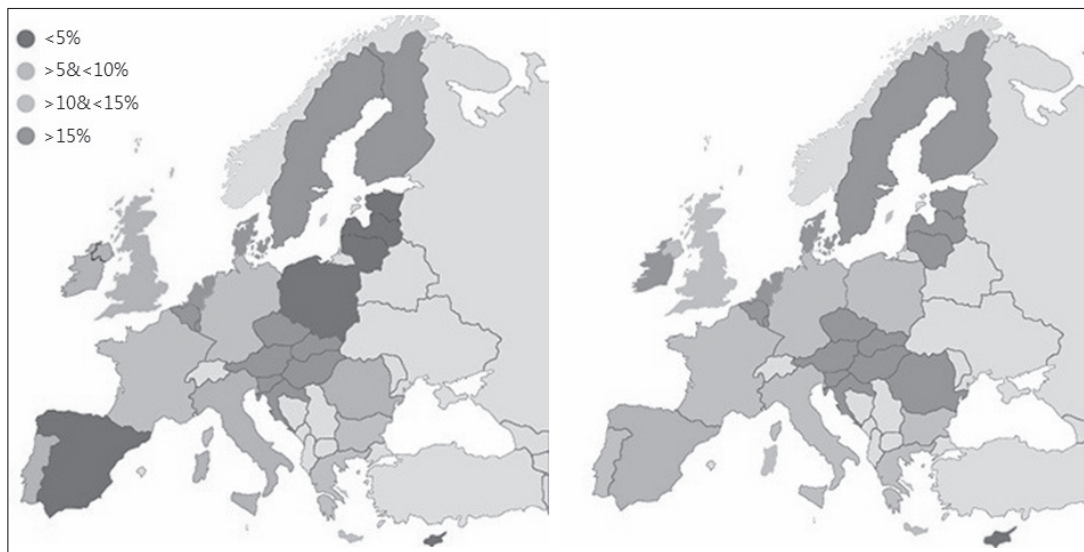
Source: Andoura (2015)

3.2. Connecting Electricity Markets

The EU's power market is in a rapid transitional phase. Only fragments remain from the time when state monopolies used to operate generation, transmission, distribution and sales. Generation used to be located where the demand was, so that large power stations were built near industrial complexes. There is a disconnect between the location of demand and that of supply. To deliver power from stations to end-users, the modernization of transmission networks is necessary. The EU's energy infrastructure is now aging and not adjustable to a trend for more renewable energy.

The EU has tried to activate the electricity trade and flows by revising regulations on electricity grids since the adoption of the Third Energy Package in 2009. The EU needs to reach a minimum electricity interconnection target of 10% by 2020 and of 15% by 2030 to achieve a resilient energy market and to implement the Energy Union. To achieve the target, aging transmission networks need to be upgraded and interconnections installed, so that each country will be able to transmit at least 10% of domestically produced electricity to neighboring countries. When interconnections are built, for example, they will provide electricity generated in Norway and the North Sea to energy intensive industry in Germany. When transmission and distribution systems are fully optimized, energy independence will increase and additional investment for peak seasons will be minimized. It is expected that this will lead to savings of €12~40 billion for European users (Gärdfors 2015).

Figure 3: Map of Interconnection Levels in 2014 after Implementation of Current PCIs



Source: Gärdfors (2015)

3.3. Funding Opportunities for European Energy Infrastructure

The electricity transmission system would need €140 billion and the gas pipeline would require €40 billion of the estimated €200 billion required to modernize the existing interconnections and install new ones (Currie, 2014). However, the financial crisis resulted in a funding shortfall across the EU. The Connecting Europe Facility (CEF) pushed by the European Commission will help leverage the shortage of funding, but it will need significant amounts injected by the market. The CEF should be arranged to implement the more financially challenged modernization projects (PCIs)¹ where these funds are vitally needed. Furthermore, in November 2014, the European Commission announced its three-year investment plan intended to promote investment of €315 billion across Europe. The investment plan, the “European Fund for Strategic Investment (EFSI)” drawn up by European Commission President Jean-Claude Juncker in July 2014, was announced. The investment plan necessary to stimulate investment and economic growth in the European Union will get €21 billion in guarantees and capital with a multiplier of 15, which could lead to investment of over €315 billion (European Parliament, 2015).

The funding plans, including both CEF and EFSI, increasingly expect investment from traditional banks as well as from private investors and public authorities. Besides insufficient funding, however, in order to reach the goals of connecting energy infrastructure, a regulatory alignment and transparency would be required. An ambiguous and changing regulatory framework is one of the main obstacles to investment in energy infrastructure and to attracting investors. While the available funds are getting greater, they are still limited and Europe needs to attract the interest of global investors.

Figure 4: A List of Promising Funding in the EU

European Fund for Strategic Investment (EFSI)
Connecting Europe Facility (CEF) for Projects of Common Interest (PCIs)
EU Cohesion Policy Funds
EIB's Project Bond Initiative
The European Energy Programme for Recovery
The European Structural and Investment Fund

Source: Currie (2014)

4. Implications of EU's Integration Experiences for the Northeast Asian Region

There are major energy-importing countries and exporting countries in Northeast Asia. The former are highly dependent on imports concentrated on a specific region, such as the Middle East. These factors expose the countries to constant energy security risks. The energy-producing countries, Russia and Mongolia, concentrate on European and Chinese markets. The level of dependence on Middle Eastern crude oil (crude oil imported from the Middle East / total crude oil consumption) was 33% for China, 80% for Japan, and 87% for South Korea in 2013. The degree of dependence on the Middle East for gas is also high at 32% for Japan and 57% for South Korea, although it is only 7% for China. Russia's gas exports to the former Soviet republics and Europe accounted for 92% of total gas exports. Exports to Asia accounted for the remaining 8% in 2013 (Park 2015).

Building a cross-border energy transportation network and establishing a regional energy market would enable both energy-consuming countries and energy-producing countries to enhance energy security and reap substantial economic benefits. A country would need to make considerable investments to independently achieve stability in energy supply in accordance with its energy demand. For example, South Korea needs to make investments totaling around KRW15.6 trillion (around US\$13.5 billion) to build new power generation facilities by 2022. However, the effective establishment of an energy grid would result in a substantial reduction in costs.

4.1. The Anticipated Effects of Establishing an Energy Grid

The establishment of an energy grid will contribute greatly to the environment, the integration of the regional economy, and the building of trust among countries in the region. Building an energy grid enables eco-friendly energy use. A country will face great limitations in both the aspects of development potential and costs if it attempts to increase the share of renewable energy. In contrast, joint, large-scale development and sharing of abundant renewable energy sources such as wind and solar would allow a substantial increase of that share. This would also lead to a considerable reduction in the economic burden caused by fossil fuel imports and use as well as environmental pollution triggered by CO₂ emissions. It would be meaningful

for Northeast Asia that European countries facilitate the development of the offshore wind power resources of northern Europe, and move forward with the establishment of the super grid in the region to raise the percentage of renewable energy to 27% by 2030 (Park, 2015).

The establishment of an energy grid will also facilitate the integration of the regional economy. The case of the EU shows that cooperation in the coal and nuclear energy sectors was the starting point of the integration of the European economy. The establishment of an energy grid will also contribute to greater peace in the Northeast Asian region. The connection of pipelines between Europe and the Soviet Union in the Cold War era played a significant role in building trust between the two parties.

4.2. Barriers

It cannot be denied that there are many barriers to energy integration in Northeast Asia. Northeast Asia remains the only region in the world where power grids have yet to be connected despite the high level of electricity demand in South Korea, China, and Japan, as well as the great supply potential of Russia and Mongolia. Energy transportation network connections were made between Russia and Mongolia, Russia and China, and China and North Korea, through which coal, oil, and electricity are traded, but only in small amounts.

However, there is also a lack in cooperative efforts made by the countries to form a regional energy market. Countries in the region have been focused on bilateral cooperation rather than multilateral cooperation. For this reason, there is no multilateral energy cooperation mechanism that is participated in by all countries in Northeast Asia. The Northeast Asian Gas and Pipeline Forum was launched in 1995 and the Northeast Asia Petroleum Forum in 2001 mainly by private companies and research institutions in Northeast Asia. However, there is a need to establish a multilateral cooperation mechanism at the government level that is participated in by all countries in the region. It is difficult to procure investment funds through financial and capital markets in Northeast Asia for long-term and large-scale energy projects. Compared to the high level of energy investment demand in Northeast Asia, there is a great shortage in the supplied investment funds (Park, 2015).

5. The Future Direction and Concluding Remarks

An energy grid, a multilateral cooperation mechanism in Northeast Asia, and a regional energy market should be established together. It is now time to further advance cooperation methods, which have remained at a low level. There will be a steady rise in demand for energy-related infrastructure investments in Northeast Asia. In addition, energy-related projects will grow in size. Northeast Asian countries are extensively moving forward with energy industry privatization and market liberalization. There are high expectations for the roles performed by the Asian Infrastructure Investment Bank (AIIB). In 2014, South Korean President Park Geun-hye announced the Dresden Initiative, stating that if North Korea decides to forgo its nuclear program, a Northeast Asia Development Bank can be established as an organization that assists North Korea. In a bilateral meeting with China that was held at the time of a G20 finance ministers' meeting, South Korea explained to China that the Northeast Asia Development Bank would connect China's One Belt, One Road strategy to the Korean Peninsula to contribute to

economic integration in Asia. In addition to supporting North Korea's economic development, the Northeast Asia Development Bank will be able to provide funding support for large-scale energy and economic investment projects in Northeast Asia, including the three northeast provinces of China, the Russian Far East, and Mongolia.

In conclusion, governments, companies, and private groups are all required to take part in establishing a multilateral cooperation mechanism to build an energy grid in Northeast Asia. Most projects that are aimed at establishing cross-border energy grids are led by a multilateral cooperation mechanism that is participated in by governments and the private sector to fully leverage the relevant benefits, such as investment financing and distribution of investment risks. In the long term, the integration of the Northeast Asian energy market will be accelerated by the establishment of a "Northeast Asian Energy Agency", similar to the International Energy Agency (IEA), which will share information and collaborate on energy research at the regional level. The launch of the agency will allow a "Northeast Asian Energy Outlook" to forecast internal energy demand in the Northeast Asian region. Of course, active collaboration in data sharing, researcher exchanges, and joint research and development between research centers within the region should be carried out beforehand. The common objectives of the Northeast Asian countries are a consolidation of cooperative efforts throughout the energy value chain, a promotion of renewable energy, an on-going effort on infrastructure, and an investment expansion in private sector investments in energy programs and projects. Regional cooperative efforts could play a very significant role in the promotion of the Asian Super Grid. Simultaneously, the EU experience in transmission systems and the electricity market are valuable and should be reflected in Northeast Asia from a technical, operational and regulatory viewpoint.

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¹ In October 2013, the European Commission presented a list of 248 energy infrastructure projects that are of common interest (Projects of Common Interest (PCIs)), which are intended to be launched between 2014 and 2020. The list of PCIs is updated every two years and the selection of PCIs is an on-going process in order to cater for new emerging projects geared to fulfill future needs.