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Northeast Asian Energy Corridor Initiative for Regional Collaboration*

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For historical and political reasons, South Korea (hereafter Korea), Japan and China have not achieved much progress in regional energy cooperation for decades. However, the rising importance of Northeast Asia (NEA) in the world energy sphere, especially in the global oil market, is providing an opportunity to create an integrated oil market in the region. This study suggests the Northeast Asian Energy Corridor (NEAEC) Initiative as an effective conduit for raising the possibility of the Northeast Asian oil hub project. The NEAEC Initiative combines the model of Europe's Amsterdam-Rotterdam-Antwerp (ARA) with Singapore's AsiaClear as a form of financial collaboration. The study suggests that an electronically integrated Over-the-Counter (OTC) market clearing mechanism accompanied by other key financial instruments among Korea, Japan and China can be an effective means for promoting financial collaboration in the region.

Keywords: Asian oil market, Northeast Asia Energy Corridor Initiative, OTC clearing, Regional energy integration, Oil hub
JEL Classification: F15, F36, Q48

I. Introduction

In the past five years, the most noticeable phenomenon in the world's energy market is increased volatility. Two main reasons are behind this unprecedented volatility (Rühl, 2012). First, the world economy experienced a global economic crisis and a sluggish recovery from it. Demand for energy plunged, then crawled back up. Also, for the first time in modern energy market history, the consumption of primary energy by non-OECD countries for commercial uses exceeded that of OECD members. Non-OECD countries have very low price elasticities of demand for most energy resources, which led to a higher volatility in energy prices, in particular price of oil. Second, more speculative funds have

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flown into the commodity markets. These speculative funds added to the volatility, and increased volatility has attracted more of these funds into the market, thereby creating a vicious circle of price instability (Brooks, 2009). This has caused financial regulators to worry about the instability of the financial market. With this concern in mind, governments are keen to closely cooperate in order to tighten regulations regarding the derivative markets.

Total primary energy consumption for Korea, Japan, and China rose from 1,186.5 million tons of oil equivalent (TOE) in 1990, which is about 15% of global primary energy consumption, to 3,353.8 million TOE in 2011 which accounts for more than 27% of global primary energy consumption. As far as oil is concerned, these countries consumed 8.7 million barrels per day in 1990, which is about 13% of global oil consumption (BP, 2012). It reached 16.6 million barrels per day in 2011, which is more than 19% of global oil consumption. In spite of these large shares of the three countries in the global energy market, there have been very few policy attempts to form an energy cooperation scheme in the region (Hippel, et al, 2011). Historical, political, and national pride are the major obstacles in promoting regional energy integration (REI) in the region. For more than several decades Korea and China have asked Japan to honestly apologize for its past colonization of the two countries. Politically, Japan is not accepting the notion of NEA for it may lead to the recognition of North Korea. North Korea's abduction of Japanese citizens is the most criticized political problem facing Japanese policy makers.

It is an important question to ask whether the Korean government's Northeast Asian oil hub project can be an effective initiative to promote the regional energy cooperation among Korea, Japan and China. The Korean government is building its first-stage oil-hub tank terminal in Yeosu, a southern port-city of Korea. The Yeosu project starts its operation in 2013. In addition, the Korean government is planning to build the second-stage tank terminals in Ulsan in southern Korea (Lee, et al, 2009; NLDI, 2005). An effective oil hub requires not just building facilities and infrastructure for storing and transmitting refined petroleum products but also liquidity. Liquidity for a properly functioning oil market refers to plenty of counterpart contracts in the derivative markets. Without proper liquidity, demands for storage cannot be created (Paik 2010). Korea, Japan and China can collaborate to create enough liquidity for the oil hub project.

This paper discusses the key developments in the world's petroleum product storage market and their implications for Asia's oil market. The paper reviews

theoretical discussions on regional energy market integration although there are few studies on this subject. We also investigate the Northeast Asia Energy Corridor (NEAEC) Initiative as an effective approach to create liquidity for the Northeast Asia oil hub project. The NEAEC Initiative is a regional financial collaboration scheme based on a networking of the regional over-the-counter markets for key energy commodities trading combined with other key financial instruments such as a surveillance system and a pricing scheme. It will allow for smoother operations of financial activities in the over-the-counter markets for energy commodities, and it will generate liquidity.

We found that conventional energy cooperation may not be effective in achieving high-level integration for Northeast Asia because of political and administrative factors. An oil hub approach is also limited in creating liquidity due to lack of financial capabilities. In contrast, the NEAEC Initiative can provide crucial financial conduits needed to create liquidity for oil trading, which is the key to a successful oil hub in the region.

II. Key Developments in Asia's Petroleum Storage Market

1. The World Petroleum Storage Market at a Glance

The total volume of the world's independent[1] tank storage for petroleum amounts to 617 million cubic meters. Asia takes about 34.3% whereas North America and Europe take about 25.1% and 27.5%, respectively. This reveals the increasing importance of Asia in the world's petroleum storage market. The number of tank terminals in the world is 1,248 and there are 56,771 tanks worldwide. The average size of the tanks is 10,866 cubic meters or equivalent to 68,000 barrels. These independent tank terminals store either crude oil or refined petroleum products, or both. Some tank terminals store natural gas, edible oils and others.

Geographically, tank terminals are mainly located in great numbers in close proximity to the world's three renowned places for oil hubs; they are the U.S. Gulf Coast, Amsterdam-Rotterdam-Antwerp (ARA) in Europe, and Singapore. Other than these three areas, Malaysia in Asia, the east coast of the United States, and Fujairah of the United Arab Emirates have crusts of tank terminals.

[1] Independent tank storage means that it is not affiliated to a refinery or a trading company; it is only available to third-party customers.

Among these, Malaysia and Fujairah are newly developing oil hubs. Japan has about eight independent tank terminals located mostly on its east coast.

Table 1. World Independent Tank Storages for Petroleum (2012)

Region	Number of Terminals	Capacity (m^3)	Share (%)	Number of Tanks
North America	347	156,227,886	25.1	14,039
Asia	277	211,374,903	34.3	20,251
Africa and the ME	135	57,235,611	9.3	3,105
Australia and New Zealand	14	1,673,094	0.3	362
South Europe	122	43,583,713	7.1	4,087
North Europe	152	63,039,767	10.2	8,078
West Europe	120	63,207,392	10.2	4,526
Caribbean, the M. & S. Americas	80	20,510,617	3.3	2,305
South Pole Area	1	35,000	0.0	18
Total	1,248	616,887,983	100.0	56,771

Source: Tankstorage Magazine (2012).

Table 2. Independent Tank Storages for Petroleum (2012)

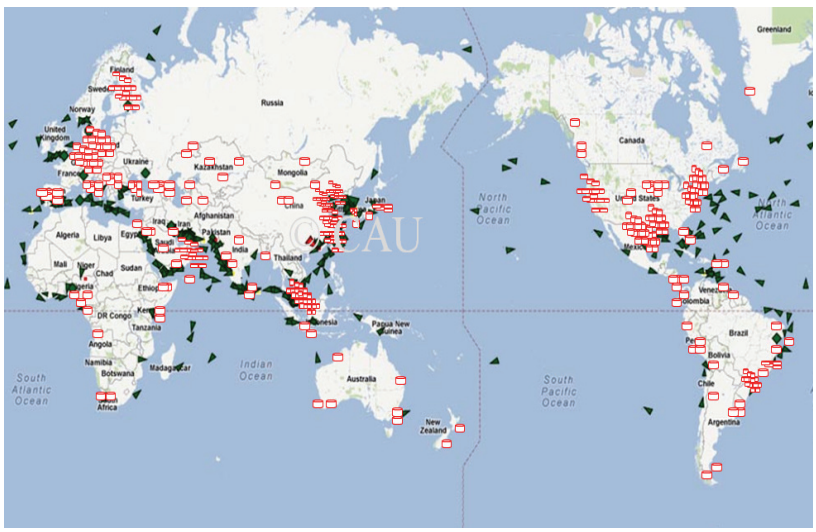
Country(*)	Capacity (m^3)	Share (%)	Number of Tanks	Average Tank Size (m^3)
Canada (23)	10,246,697	1.6	650	15,764
U.S. (295)	123,233,752	19.8	12,831	9,604
China (181)	165,195,399	26.5	6,346	26,031
Japan (8)	3,219,287	0.5	269	11,968
Korea (16)	4,625,754	1.7	1,004	4,607
Malaysia (18)	11,620,249	1.9	915	12,700
Singapore (17)	12,565,651	2.0	861	14,594
India (17)	3,470,368	0.6	751	4,621
Belgium (17)	6,948,368	1.1	1,926	3,608
Netherlands (36)	23,319,835	3.7	2,899	8,044
Russia (33)	12,360,600	2.0	968	12,769
Sub Total	376,805,960	61.1	29,420	12,808
Rest	240,082,023	38.9	27,351	8,778
World	616,887,983	100.0	56,771	10,866

*: The number in parenthesis is the number of tank terminals.
Source: Tankstorage Magazine (2012).

China has the largest storage capacity of 165 million cubic meters which takes up about 27% of world's total storage capacity for petroleum. The Unites States comes next to China with storage capacity of 123 million cubic meters. However, the number of terminals of the U.S. exceeds that of China. Korea has 16 independent tank terminals with 4.7 million cubic meters of storage capacity.

Demand for oil tank storage derives from the inter-regional movements of petroleum. To investigate these movements, we used recently introduced software called cTrack by Platts (a division of McGraw-Hill). cTrack allows us to track the movements of all registered cargos. It enables us to see how much tonnage of a commodity is being transported into or out of a zone on a real time basis. We can see the amount of petroleum product cargo coming into and going out of the Northeast Asian region.

Figure 1. Movements of Petroleum Products by Platts's cTrack



Note: For August 23, 2012; this figure is constructed by the author using Platts' cTrack software; Triangles represent ships carrying petroleum product cargo. Cylinders represent tank terminals which were drawn using Tankstorage Magazine data.

Global tankage companies such as Vopak and Oiltanking render positive forecasts regarding the world tankage market for the coming years. Their forecasts are based on several factors: 1) increases in oil demand from non-OECD countries such as China, India and oil producers in the Middle East,

2) the distance for oil transportation becomes longer creating increased demand for storages, 3) the influence of national oil corporations (NOCs) is becoming more apparent in the oil markets, and 4) the differences in required specifications for petroleum products among different countries lead to increased demand for storage facilities. However, the global financial crises and fiscal restrictions may delay the full recovery of the world oil markets in near future.

2. Key Developments in Asia's Petroleum Storage Market and Korea

Singapore's storage market is very crucial to the future of the Northeast Asia oil hub because the newly developing NEA oil hub will be both competing with and complementary to Singapore's storage market. The tankage market in Singapore is experiencing relatively tight conditions at present due to the overall sluggish tankage market business worldwide. The level of storage fees for tanks is around $5.0 per cubic meters per month which is equivalent to $0.79 per barrel. However, global traders like Glencore or Trafigura believe that the actual storage fee that they can command as big players in the market will be far less than this.

In spite of recent legislation adopted by the Japanese government to increase the portion of upgraded product in its refineries total crude oil distillation unit (CDU), the imbalances in the Japanese oil market may continue to exist and will create favorable conditions for the Korean tankage market. Korea is considered logistically advantageous to Japanese traders for supplying kerosene and other petroleum products to their market.

Although China is increasing the number of petroleum storages, there is about 20% shortage for storage capacity in China which will provide another business opportunity for Korea. In order for Korea to reap the benefits from this favorable business environment, stringent rules and regulations dealing with storages, especially blending and mixing of products, should be modified.

III. The NEA Energy Corridor for Regional Collaboration

1. Theoretical Framework for Regional Cooperative Scheme

Few studies examine how international energy cooperation can actually achieve high levels of business cooperation because energy markets have unique features different from non-energy markets (Vaitsos 1978 & Obydenkova 2011).

Regional energy cooperation requires a process which can enable multiple nations to closely work together for a common policy framework and environment in order to 1) create commitments and policy coordination for mutual benefits in the energy field, and to 2) pursue an integrated regional energy market (REI).

The REI process is a long-term process having different stages. Paik (2010) suggested five stages in REI: 1) pre-legalization, 2) legalization, 3) harmonization, 4) interconnection, and 5) the internal energy market.

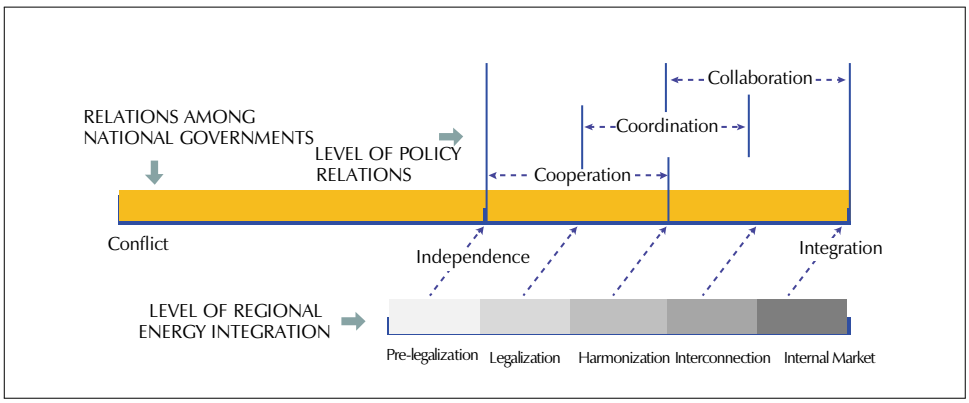
Paik (2010) points out that the European Union has achieved the final stage of REI and that it has created an effective internal energy market among its members. The Association of Southeast Asian Nations (ASEAN) is approaching the third stage where members harmonize their technical standards and allow entry to third-parties. On the other hand, REI is limited in North America since the North America Free Trade Agreement (NAFTA) nations, namely, the United States, Canada, and Mexico, are not aiming at more subtle integration in the energy field. In fact, NAFTA countries have no plan to develop their economic ties further than the free trade agreement. The NEA region is in the embryonic stage of pre-legalization.

We also need to distinguish between different levels of policy coordination among different countries to contemplate how energy cooperative schemes can bring about meaningful outcomes. Carbaugh (2009) defined various types of inter-governmental relations having *conflict* at one end and *integration* at the other end of a spectrum. Conflict represents a situation where each government has its own policy without consultation with other governments. In this case, countries ought to experience conflicts with other countries in various policy areas. In contrast, integration means policy agreements among different countries. The EU is a case of such policy integration.

Carbaugh also positioned *independency* in between *conflict* and *integration.* Independency implies a situation where countries neither conflict with each other nor depend on each other. Carbaugh then adds two levels of inter-governmental cooperation to his descriptions of government relations: *cooperation* and *coordination*. Cooperation here means a lower level of policy relations which includes inter-governmental meetings and discussions of policy issues, joint studies and projects. A more developed level than cooperation is coordination. In the coordination level of policy relations, governments may incorporate a set of common rules for monetary policy, fiscal policy, and/or foreign exchange rate policy.

Paik (2010) added one more level of policy relations to Carbaugh's definition: *collaboration*. Paik defined collaboration as a policy relation that goes beyond governmental level, and it incorporates commercial and business efforts to provide interconnections among pipelines, storages, and financial markets by businesses and government. We can apply this theoretical framework to investigate a proper cooperative scheme for the Northeast Asia oil hub project for Korea.

Figure 2. Governmental Relations, Policy Relations, and REI



Source: Paik (2010).

2. *Perspective for the NEA Oil Hub Project*

During the past decade the Korean government has pursued numerous NEA projects. Unfortunately, most of those efforts did not produce concrete results due to lack of consensus between China and Japan. China and Japan tend to participate in these occasions mostly as observers. For these reasons, calls from the Korean government for any regional energy cooperation are welcomed solely by Russia. North Korea and Mongolia are participating in these events because in most cases they are beneficiaries of these proposals. Hence, Korea and Russia are in bilateral dialogues.

However, some grass-root developments in terms of a joint project between the government and the private sector are noticeable. For the past five years the Korea National Oil Corporation (KNOC), which is a state company for oil exploration and stockpiling, has invited domestic and foreign companies to form a joint venture named Oilhub Korea-Yeosu Co., Ltd. Some investors in the

joint venture are China Aviation Oil (CAO) Corporation, Samsung C&T, and LG International. Furthermore, a pilot project having 8 million barrel storage capacity in Yeosu in southern Korea starts it operation in 2013. Meanwhile, the Korean government is undertaking a feasibility study on building a 30 million barrel storage depot in Ulsan.

Table 3 shows that in 2011 China consumed 9,758 thousand barrels of oil per day. Chinese refining capacity exceeds its oil consumption by 1,077 thousand barrels per day which is second after the Russian Federation. Japan showed refining capacity shortage of 144 thousand barrels per day in the same year caused by the Japan Earthquake in March 2011. Korea has a surplus in its refining capacity of 385 thousand barrels per day which positions it as one of the world's largest petroleum exporting countries.

Table 4 lists Korea as one of the world's leading exporters of petroleum products. China, on the other hand, is a major importer of petroleum products

Table 3. Oil Consumption and Refining Capacity (2011)

Rank	Country	Consumption 1,000 bbls per day (A)	Refining Capacity 1,000 bbls per day (B)	(B-A)
1	US	18,835	17,730	-1,105
2	China	9,758	10,834	1,077
3	Japan	4,418	4,274	-144
4	India	3,473	3,804	331
5	Russian Federation	2,961	5,663	2,702
6	Saudi Arabia	2,856	2,110	-746
8	South Korea	2,397	2,783	385
9	Germany	2,362	2,077	-285
10	Canada	2,293	2,046	-247
12	Iran	1,824	1,860	36
13	France	1,724	1,610	-114
14	United Kingdom	1,542	1,757	215
15	Italy	1,486	2,331	845
16	Indonesia	1,430	1,141	-289
18	Singapore	1,192	1,395	203
19	Thailand	1,080	1,298	218
20	Netherlands	1,052	1,276	224

Source: Computed using BP, *Statistical Review of World Energy 2012*.

in spite of its large refining capacity. This indicates that Korea can be an important location for the newly developing Asian oil market which is caused by the growing Chinese oil market. These figures render strong support for the feasibility of the NEA oil hub project.

Table 4. Net Exports of Petroleum Product (2011)

Country	Million Tonnes		Thousand barrels daily		
	Imports	Exports	Imports	Exports	Net exports
US	114.8	122.1	2,400.2	2,552.5	152.3
Canada	12.7	26.8	265.3	560.9	295.6
Mexico	32.7	6.2	683.5	130.6	-552.9
S. & Cent. America	62.6	46.5	1,308.2	972.4	-335.9
Europe	132.2	86.4	2,763.8	1,806.2	-957.6
Former Soviet Union	5.1	108.9	107.1	2,275.5	2,168.5
Middle East	11.4	100.0	238.6	2,090.5	1,851.9
North Africa	20.6	22.9	430.4	478.3	47.9
West Africa	11.8	7.4	246.2	154.1	-92.1
E. & S. Africa	11.6	0.3	242.6	6.5	-236.2
Australasia	16.6	8.0	346.3	167.7	-178.6
China	75.2	29.8	1,571.2	623.1	-948.1
India	8.2	41.8	171.1	873.2	702.1
Japan	44.5	13.9	930.4	289.9	-640.4
Singapore	97.6	87.1	2,040.2	1,821.6	-218.6
South Korea	24.8	55.3	518.4	1,156.0	637.6

Source: Computed using BP, *Statistical Review of World Energy 2012*.

3. The NEA Energy Corridor for Regional Collaboration

As a way to further scrutinize the feasibility of the Northeast Asia oil hub project, we need to compare Europe's oil hub ARA with the current situation of Northeast Asia. ARA provides important implications for understanding how an oil hub can be an effective instrument for regional integration. ARA is the world's second largest oil hub having a storage capacity of 90 million barrels. The refining capacity of the ARA region is 2 million barrels per day. The ARA region has reached the internal market stage from a historical perspective.

The ARA region was developed in the 17th century by the Dutch East Indies Company which traded coffee, tea, and spices. The rapid rate of growth of the region necessitated smooth and effective trans-shipment and storage infrastructure at various harbor ports. At that time, certain groups of weigh-house porters joined forces to offer necessary services including weighing, sorting and storage (Vopak, 2010). Historically, the Netherlands and Belgium joined the European Coal and Steel Community inaugurated by the 1951 Treaty of Paris. The 1957 Treaty of Rome was aimed at creating a common market of among its six founding members within twelve years, and it was accomplished ahead of schedule. The 'four freedoms'[2] defined by a common market treaty, however, would not be achievable if members did not guarantee a common system of taxation and standards. Here lies the difference between a 'common market' and an 'internal market' (Coffey, 1995).

In this regard, the EU passed the Single European Act (1987) which legalized the internal market for the EU members. However, the energy sector was not included in this initial passage of the internal market. This happened because the energy sector consists of public companies that monopolize industries and regulations to protect domestic energy markets. With the EU's 1988 Directive of 'the Internal Energy Market' (IEM), which promoted an IEM in the EC, it was made possible to adopt another directive for gas transit (Kim et al, 2007).

Unlike the ARA region, without a history to develop an oil hub the NEA is in the pre-legalization stage. Accordingly, it is important at this point to understand how ARA became an oil hub in comparison to NEA in terms of the levels of government relations and policy relations (Figure 2). First, ARA has achieved integrated government relations, but NEA has not passed the independence level. The NEA region reveals policy conflicts in many energy issues. Secondly, in terms of the level of policy relations, ARA is in the collaboration level in the sense that Belgium and the Netherlands work closely together to facilitate oil hub functions. On the other hand, NEA shows an underdeveloped level of cooperation in the energy policy areas.

The NEA region has not yet achieved success in government relations nor policy relations, and as mentioned above it remains underdeveloped in the stages of REI. In fact, the NEA region has no agreement among country members in energy issues. Also, there is no strong impetus to create any type of REI institution within NEA, and it remains in the earliest stage of REI. NEA countries have their own legal and taxation systems, and technical standards. Therefore,

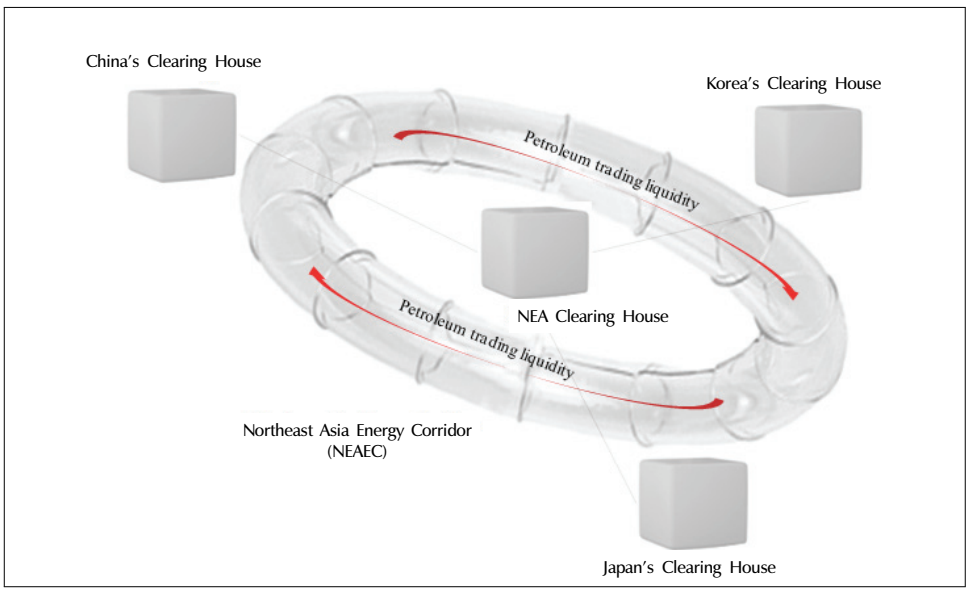
[2] "Four Freedoms" imply free movements of goods, services, people and capital.

the NEA must look into how it can enhance the level of regional collaboration in order to facilitate the oil hub project.

This paper suggests a *Northeast Asia Energy Corridor (NEAEC) Initiative* (see Figure 3) as a method to facilitate regional energy collaboration among Korea, Japan and China - all of which are in favor of having a more efficient regional oil market. An energy corridor is a means to achieve a high level of collaboration and generate liquidity for the Northeast Asia oil hub project. A corridor can serve as a conduit to carry liquidity among the countries and also as a channel through which market surveillance and price schemes can work effectively.

The NEAEC Initiative is driven by an electronically-integrated OTC market consisting of three components. First, an integrated clearing house for OTC market transactions should be designed. This common clearing house can be electronically interconnected among the clearing houses of Korea, Japan, and China to provide simultaneous clearings for traders in the region. Singapore's AsiaClear can be a benchmark model.

Figure 3. The Integrated OTC Market of the NEAEC Initiative



Second, the integrated OTC market also needs a regional pricing mechanism. Korea, Japan and China currently use MOPS (Mean of Platts Singapore) which

quotes oil prices from the Singapore market. The pricing mechanism could adopt a bulletin type price quotation for trade originating from within the NEA region. The most important factor for this kind of price quotation is that there must be sufficient regional trade volume. The NEAEC Initiative will generate this. Third, a common system of surveillance for speculative transactions in oil trading can be helpful for setting a collaborative framework. A regulated clearing process having transparency is critical for building an effective integrated OTC market. The roles and functions of the U.S. Commodity Futures Trading Commission can be studied as a model case.

Table 5 outlines how the NEAEC will be different from the oil hub approach as well as from govornment-initiated cooperation as it tries to create liquidity for the NEA oil hub project. A *government-initiated cooperation* scheme may be difficult to bring about political consensus for energy cooperation and it will take some time to produce any meaningful outcome. An *oil hub approach* is better than the governmental approach in creating a regional energy cooperative scheme, but it does not guarantee liquidity. The *NEAEC Initiative* will function as a platform for oil trading whereas the oil hub project is usually considered as a logistic hub project. The NEAEC Initiative is a new approach to regional energy collaboration. It is especially crucial to the Northeast Asia oil hub project because it can create liquidity for the project. Liquidity is also important for an independent pricing scheme in the oil market.

Table 5. Comparison of Regional Energy Cooperative Schemes

	Governmental cooperation	Oil hub approach	NEAEC Initiative
Participants	Government officials	Government and private sectors (Korea case)	Private sector with supports of the governments
Policy relation level	Cooperation	Collaboration	Collaboration
Political consensus	Difficult	Moderately difficult	Possible
Time duration for outcomes	15~20 years	10~15 years	5 years
Liquidity	-	Not guaranteed	Liquidity guaranteed
Regional Expandability	Limited	Limited	Unlimited
Function	Meetings and forums	Logistic hub	Trading platform

Korea, Japan, and China are major consumers of oil. At the same time they

have large refining capacities. Hence, NEA has tremendous potential to become a key regional oil hub and oil market (Maycroft 2008). Japan and China have tried separately to develop their own price indices for oil trading, but they have so far not succeeded. The NEAEC Initiative is a viable opportunity for NEA countries to teamwork towards creating a regional oil hub and a new Asian energy market independent of the Singapore market. It is a positive-sum project for all three countries.

The Northeast Asia oil hub project provides a rare opportunity for Korea to become a collaborative leader in the region with its capacity to produce and to facilitate a new model for regional collaboration via the Asian oil market. For that purpose, Korea, Japan and China need to develop more in-depth studies in these areas.

IV. CONCLUSION

The world tankage market is going through tremendous changes now. The world oil market has turned itself from a rising *contango* market to a falling *backwardation* market in recent years. The Korean government's Northeast Asia oil hub project is one of the most important regional energy projects for Korea. If successfully implemented, it can contribute to realizing Korea's pivotal role in the regional oil market. However, it is more important to guarantee liquidity for the project. Without liquidity an oil market cannot be effectively established.

The ARA region is a unique case study for the Northeast Oil hub project to follow because it is a three-area, two-nation, and one-region oil hub model. Hence, it is a crucial question whether the NEA region can adopt the ARA concept. With regard to this question, different levels of policy relations, that is, cooperation, coordination, and collaboration, can be applied to the cases of regional energy cooperative schemes. Regional cooperation is the level of policy relations where governments exchange policy ideas, pursue common projects, and/or initiate inter-governmental policies. Regional coordination is a more advanced level of policy relations in which governments adopt common fiscal, monetary, and foreign exchange rate policies based on the idea that policy coordination can lead to mutual benefits. Regional collaboration is accomplished when different nations in a region have interconnected pipelines, electricity grid systems, storage facilities, and financial markets all linked together to create an integrated internal market.

The ARA region has developed into a very effective oil hub through a

collaborated and integrated trading system of facilities, commercial arrangements, and inter-governmental commercial policies. These components are being promoted based on the institutional foundations provided by the internal energy market legislations of the EU. The NEA region, which lacks those institutional frameworks, needs to adopt a collaborative system such as the NEAEC Initiative. The NEAEC Initiative can serve as a conduit to carry liquidity among the member countries, and also serve as a channel through which market surveillance and price schemes can work effectively.

Another key to the success of Korea's oil hub project is to create an environment conducive to petroleum product trading and tankage business. Therefore, the Korean government needs to work on revising customs laws and regulations that are currently hindering business operations of tankage companies in Korea. Most of all, it is critical for the Korean government to start round-table discussions with the governments of Japan and China regarding the collaborative scheme of the NEAEC Initiative.

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