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FUELING CONFLICTS IN NORTHEAST ASIA

AN INVESTIGATION INTO THE RELATIONSHIPS
BETWEEN ENERGY AND CONFLICT

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Abstract

The Purpose of this study was to determine what affects, if any exist, crude oil and natural gas supply and demand has on the international relations of Northeast Asia. This was done by answering the research question: does the need to for energy security override the desire to maintain the status quo regarding national policy toward controversial issues facing Northeast Asia.

The study uses the territorial dispute over the maritime boundary between China and Japan in the East China Sea, the controversies of the Sakhalin oil and gas development projects and the East Siberia Pipeline in the Russian Far East, and the nuclear crisis on the Korean Peninsula as case studies for analysis.

By statistically correlating empirical data on crude oil and natural gas pricing, consumption, and production to quantitative data derived from qualitative data regarding the chosen case studies by use of an original framework, the study finds that there is no conclusive relationship to support a statistical connection. The study also uses qualitative analysis compare the empirical data on crude oil and natural gas pricing, consumption, and production to qualitative data regarding the chosen case studies and finds that there likely are some correlations between them, but that they are not a driving force for political policy regarding the chosen cases.

Related keywords: energy security, conflicts, crude oil, natural gas, Northeast Asia.

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Abbreviations

ASEAN	Association of Southeast Asian Nations
CV	Conflict Value
DPRK	Peoples Democratic Republic of Korea (North Korea)
ECS	East China Sea
EEZ	Exclusive Economic Zone
LNG	Liquefied Natural Gas
NEA	Northeast Asia ¹
PRC	Peoples Republic of China (China)
RFE	Russian Far East ²
ROK	Republic of Korea (South Korea)
UA	Reliable Data Unavailable ³
US	United States of America
USD	US dollars
USSR	United Soviet Socialist Republics (Soviet Union) ⁴

¹ Northeast Asia refers to the geographically defined area of the Russian Far East, North Korea, South Korea, China, and Japan.

² The Russian Far East refers to the area of Russia boarding the Pacific Ocean and Eastern Siberia.

³ The abbreviation UA is found in the tables in the Appendix, and indicates that reliable data for the given item is unavailable.

⁴ All Russian oil and gas data prior to 1985 actually refers to that of the Soviet Union. Furthermore all Russian actions prior to the dissolving of the USSR also refer to actions under taken by the Soviet Union.

1 Introduction

With the global recession, energy prices have fallen radically (United States Energy Information Administration, 2009). Even the Iraq war which was the main driving force for the skyrocketing price of crude oil in 2008 (Flint, 2008) seems to play a lesser role than it did just one year ago. However, with OPEC's claim that they are intent on maintaining a crude oil price of 60 USD/barrel (Hoyas, 2006) we can be sure that costs will go back up.

What this means for NEA is that as one of the world's largest consumer regions of crude oil, surpassing even the EU 15, it finds itself in an unstable and unsecure situation regarding energy dependence. This is particularly true considering that the primary supplier for NEA, with the exception of Russia, is the Middle East (Kanekiyo, 2004a). While China relies on crude oil for only 25 percent of its energy needs (Kanekiyo, 2004b), giving it some added elasticity, the sheer size of its growing economy means that it is now the world's second largest consumer of crude oil (Lai, 2007; United States Energy Information Administration, 2009). Because much of the increased demand in the PRC is due increased demand in the transportation sector for use in automobiles, the rising need for oil is unlikely to change; transportation being where oil as a source of energy is virtually irreplaceable (Lai, 2007). Japan and South Korea also rely heavily on crude oil for energy dependence, roughly 50 percent of energy supply in both countries (Kanekiyo, 2004b), with neither nation having any real domestic production to speak of (BP, 2008a).

Natural gas also plays a significant role in NEA energy supply (Fujime, 2002). Japan's attempts to limit its reliance on crude oil have led to an increased use of natural gas (Koike, 2006; Oil & Gas Journal, 2005), and the ROK is also a major consumer (Fujime, 2002). In NEA natural gas is most often consumed in the form of LNG (Nicholls, 2003), with non-liquefied natural gas accounting for only around ten percent of trade. Together the ROK and Japan make up 70 percent of the global demand for LNG (Gavin & Lee, 2007). China is now a net exporter of natural gas (BP, 2008a); projects in the ECS and other areas helping them surpass their domestic demand.

Energy also plays a significant role in the nuclear proliferation of the Korean Peninsula. One of the demands that the DPRK has consistently made is for energy assistance in return for suspension of its nuclear program (Brooke, 2004; Watkins, 2007a). Indeed, one of the key items in the 1994 agreement that suspended the North Korean nuclear programs was the

promise to build 2 light water reactors to provide energy to North Korea; the delays, excuses and inaction of the US to live up to the agreement is one of the primary reasons they gave for recommencing their programs (Brooke, 2004; Watkins, 2007a).

The obvious solution to supplying the massive energy needs of NEA is the development of Russia's oil and gas deposits in Siberia and the RFE (Brooke, 2004; Kangas, 2007; The Economist, 2009). Many authors laud the implications that such agreements could have, but recent events such as Gazprom's hostile takeover of Sakhalin II (Turkeltaub & Bailey, 2007), have shown the dangers of relying on Russian Oil and Gas.

Gavin and Lee (2007) put forward that building a regional framework similar to that of Europe's Energy Charter Treaty could give China, Japan and South Korea enough leverage to deal with Russia on an even field. However there are stark differences though, in the supply logistics and structure on the European and Asian sides of Russia (Gavin & Lee, 2007). Therefore caution must be used when trying to apply any of the European lessons to the situation in NEA.

2 Purpose of the Study and Research Questions

The main purpose of this study is to understand the current international conflict environment in NEA as it relates to the oil and gas industry. In order to fulfill this purpose the study asks whether the countries of NEA more likely to take a cooperative or an uncooperative stance on disputes involving their neighbors when the supply of crude oil and/or natural gas is scarce (as represented by higher prices) and in high demand (as represented by the amount imported by a particular nation).

Put in a different way, this study asks whether the need to for energy security overrides the desire to maintain the status quo regarding national policy toward controversial issues facing NEA. The study uses the territorial dispute over the maritime boundary between China and Japan in the ECS, the controversies of the Sakhalin oil and gas development projects and the East Siberia Pipeline in the RFE, and the nuclear crisis on the Korean Peninsula.

The reasons behind the selection of these topics are numerous; suffice to say that personal interests in NEA, peace and conflict studies, and energy security play a key role. The hope is

also that an analysis of the impacts of oil and gas consumption, pricing and demand on the conflicts of NEA can at the very least further the understanding of the intricacies at work, and help in finding resolutions to the conflicts.

Because of the unique nature of each dispute, individual sub-questions are necessary in order to apply their unique lessons to NEA conflicts as a whole. In the case of the ECS territorial dispute the main question is to what extent the domestic demands for oil and gas in the PRC and in Japan has affected this dispute.

The controversies surrounding the RFE crude oil and natural gas projects imply that the Russian government is more likely to play hard ball and pit the buyers against each other when demand for Russian oil and/or gas is high, and also that they are more willing to risk losing cooperation for overseas investors (particularly in Japan and the PRC) in the same circumstances; this is the first question the study attempts to answer in regards to this dispute. A further question is whether the desire for Russian control of these projects is at all influenced by the prices of oil and gas, Russian energy needs, or the value or quantity of Russian exports.

Regarding the Korean nuclear crisis the primary question to answer is whether crude oil prices and/or gas prices are a factor in the DPRKs stance and their willingness to negotiate, or in the willingness of others to negotiate.

3 Delimitation

3.1 Selection of Conflicts

In order to fulfill the study's purpose and answer whether there is any correlation between hydrocarbon consumption and pricing, it is important to decide which conflicts to take into account. NEA has no small number of disputes (Lai, 2007), so selecting which ones to analyze must be given some thought.

The first conflict that this study will examine is the territorial dispute between Japan and the Peoples Republic of China in the East China Sea. This conflict is very appropriate as the territorial claims made by Japan and the PRC are motivated by the rich oil and gas reserves

found in the area (Koike, 2006). Furthermore this dispute has been a major international standoff between two of the most powerful nations in the region for many years.

The second area of examination are the large-scale RFE oil and gas projects where large investments have been made and/or promised by governments and/or corporations of NEA. Among these are included the Sakhalin I and Sakhalin II oil and gas projects and the East Siberia Pipeline. These projects are of great importance to NEA relations, as they are development projects, undisputed in Russian ownership of the territory, but sometimes controversial in the approaches the Russian government has taken in developing them.

The final conflict this study analyzes is the Korean nuclear issue, i.e. the continued research and expansion of nuclear capabilities in the DPRK. Just as energy security is still of vital concern for the DPRK, it can be seen as one of the major issues involved in the dispute. Indeed, nearly every agreement that has been made, where the North Koreans agreed to suspend research, or shut down the nuclear facilities has involved some form of energy trade-off, be it the building of light water reactors, or the supply of crude oil and heating oil (Rozman, 2007; Watkins, 2007a).

3.2 Defining Northeast Asia

For the purpose of this study the thesis poses that NEA is made up of The Russian Federation, The People's Democratic Republic of Korea, The Republic of Korea, The Peoples Republic of China and Japan. Mongolia is left out because of its lack of inclusiveness in regard to the particular disputes chosen, and its less conspicuous involvement in most disputes of the region. Though the US is highly involved in the region (Kim & Jones, 2007; Kim S. S., 2004; Rozman, 2007), it is also left out since it is not only geographically located elsewhere, but since it is also neither a primary consumer of NEA energy, nor a primary energy provider to the region. The Republic of China (Taiwan) is also omitted, in order to avoid opening the can of worms it represents in terms of Chinese sovereignty particularly in regards to the ECS.

4 Theoretical Framework

4.1 The Role Crude Oil and Natural Gas in Conflicts

According to Ross (2008) the number of internal conflicts occurring worldwide has dropped significantly since the fall of the Soviet Union. The ongoing number of major civil wars is less than a third of its previous value, and smaller scale conflicts have also decreased, albeit less drastically. Of these he claims that one third occurs in oil rich countries, and that a domestic oil supply tends to intensify the conflicts, even more so than do diamonds or other natural resources.

Lujala's (2009, p. 51) findings agree with this. Indeed her research correlating levels of violence to natural resource extraction has found that "Hydrocarbon production inside the conflict zone more than doubles the number of battle-related deaths." This can be partly explained in that the conflicts tend to last longer, however an extended duration of conflict can also be seen as an indicator of the severity to which it affects those involved. A hundred years war is likely to have a greater impact on a society, even if it is no more violent from year to year.

Interestingly enough Lujala (2009, p. 51) also finds that "the results show that hydrocarbon production outside the conflict zone, including offshore areas, is related to fewer combat deaths and less intensive conflicts." Thus when she looks at all nations as a whole she finds that oil and gas production has no quantifiable effect on the severity of conflicts (Lujala, 2009). Presumably Ross is using a different framework for determining conflict severity in oil rich countries, wherein lies the discrepancy.

Unlike Lujala, Ross (2008) also looks at the likelihood of a conflict developing within a given country and finds that oil rich developing nations are twice as likely to develop internal conflicts as those who have no oil resources. That doesn't mean that all nations rich in oil are likely to evolve conflict, just that developing countries which have oil are more likely to become involved in domestic turmoil than those which do not.

4.2 Why Crude Oil and Natural Gas Fuel Conflicts

Perhaps the most significant aspect of Ross's (2008) research is that he contextualizes his findings to identify three predominant reasons why oil production can make such a strong negative impact.

Oil, Ross (2008) claims, can create economic instability such as the Dutch disease, where oil exports drive up the value of the nation's currency, devaluing other important exports such as agriculture and manufacturing, leaving the nation's economy tied to the market forces that determine the price of oil. As an example he lists Nigeria where 1970s oil boom so devalued the nation's agricultural sector that the economy is still suffering from its effects today. In addition, oil wealth leads also to an increased level of corruption within the nation's government; here Russia is specifically mentioned as a nation suffering from these effects.

In the case of domestic production, presumably production within the conflict zone if we are to trust Lujala's findings, oil can be a major source of funding for insurgents and rebel groups (Ross, 2008). Even if the national government is in control of the production, Ross (2008) asserts that the insurgents and rebels can either steal and sell large volumes of the production, as in the case of the Sudan, or make deals with outside groups for funding in return for promises of preferential consideration once they have seized control, as in the case of Equatorial Guinea.

Even if the insurgents and rebels are unable to gain monetary value from the production of oil Ross (2008) shows that it can still create greater local support either through economic disparities that accompany its extraction, often through increased nationalist sentiment, whereby the local populace seeks autonomy in order to rectify these imbalances.

4.3 Crude Oil and Natural Gas Fueling Conflicts in Northeast Asia

At first glance most of these concerns do not seem to apply to NEA, presumably because of the remoteness of oil and gas production. As Lujala (2009) has shown, offshore hydrocarbon production decreases, rather than increases the volatility of an internal conflict. Contextualizing her framework in reference to the ECS conflict however, we see that the oil and gas reserves are located offshore; indeed they are at the heart of the territorial dispute

between Japan and the PRC (Koike, 2006). Therefore, Lujala's (2009) framework should apply, with access to hydrocarbons intensifying the conflict.

The next concern that applies to NEA is that of government corruption, where Russian oil and gas wealth has, according to Ross (2008), reduced the government officials' perceived need to serve the people instead of their own interests. Trenin (2006) further supports these findings, and further contextualizes them saying that the business climate in Russia, including the RFE, which is rife with crime and corruption is one of the major impediments for Japanese business cooperation in developing the RFE. Without the technological advancements, knowhow, and expertise, this is a major hurdle for development (Trenin, 2006). Following the progress of the RFE oil and gas projects we should be able to see these theories at work.

Further applying Ross' (2008) research to the NEA context we can hypothesize that North Korea must suffer from a kind of reverse Dutch disease caused by a failing economy and an energy infrastructure unable to support the country's needs. Instead of oil exports devaluing their other sectors of industry, their low value industries are unable to shoulder the costs of importing oil, leaving the country's energy supplies and thus much of the economy tied to market forces. The inability of North Korea to gain sufficient access to oil supplies has also been proposed as one of the major driving forces behind the Korean nuclear crisis (Brooke, 2004).

5 Methodological Design

This thesis has a strong foundation in neorealist theory. In contrast to realism, where states actions are determined by forces such as human nature, neorealism poses that existing structures, such as the economy, resources and international law are the driving forces that shape state behavior. Like realism, neorealism also looks at international relations as being anarchic, with all states pursuing first survival and then other goals. In addition neo-realism, like realism, looks at international relations as a zero sum game; in order for one nation to gain power, another must lose some (Steans & Pettiford, 2005). This approach is particularly useful in regards to energy, because even though the production of hydrocarbons may be increasing from year to year, the supply in any given year is finite, and thus nations must compete with each other to meet domestic demands; if there isn't enough someone will have

to do without. This means that by analyzing the actions of states in relation to other states and to economic factors, in this case crude oil and natural gas, we can determine if there is a corresponding relationship between them and whether crude oil and natural gas are driving forces in the states' policies.

To discover whether this is indeed the case, the study was designed with the specific intent that the results be objective and verifiable so that any results obtained will be as accurate as possible. To allow for this, the specific steps involved in the analysis of the data used for answering the research questions are included.

The first step is to provide a background for analysis through a comprehensive review of the character of NEA international relations and a discussion of NEA energy needs and security.

Second is the qualitative analysis of the conflicts and analytical interpretation of the findings in order to answer the specific research questions for each. Using a framework that presupposes energy security as a zero sum game at a global level, though not necessarily a regional level, this study will examine the actions undertaken by each nation, at different times regarding each conflict. Actions taken by independent corporations will be considered reflections of national agendas particularly in regards to Russia, as the highly regulatory nature of the petroleum industry implies little room for a national corporation to maneuver against its home state and the interests of national petroleum corporations often coincides with the interest of the state as well. These actions will be organized into timelines in order to attribute numeric values to each period. While it would be beneficial to use a shorter interval, say one month, thereby creating a larger array of data to analyze, data availability concerning oil and gas production, pricing and consumption is only readily available in annual amounts, thus necessitating an interval of one calendar year.

For each period of the dispute an analytic judgment call will be made to determine whether it qualifies as a period of positive cooperation, or of conflict. This judgment call will be based on a mixture of criteria, from offensive military action, to rhetoric, along with the responses of other nations to these actions. In order to quantify qualitative data that is otherwise useless for the purposes of statistical analysis a numeric scale has been created to assign a conflict value (CV) that ranges from -4 to 4. In this way periods that are cooperative or conflict-ridden can be statistically compared to the quantitative oil data in order to discover if they have any mathematical correlation. The timelines and their values, along with the reasons for

the values assigned, are located in the appendix for ease of reference and methodological transparency.

With regard to the quantification of qualitative data each numerical value is assigned for periods where particular types of actions are taken. Values for individual events are not so much added together to produce an annual rating as the events themselves are taken into consideration and an overall rating for the year is achieved. Regardless of the number or CV of events occurring in a given year, no period can receive a rating beyond its most extreme events. That is if one particular year contains five ratings of 1 and two of -3, its overall rating cannot fall below -3 or surpass 1. Furthermore, because not every year contains actions undertaken relative to the conflict, years where no relevant actions are taken will have no CV. This means that any year in which no events occurred, or in which a particular country had no events will not be used as a data set for the statistical analysis.

Yearly CVs will be assigned to nations in each conflict to represent actions taken in that year which are relevant to the development of the conflict. Because of the unique nature of the RFE oil and gas controversies, Russia will be assigned two CVs; one will be *Russia to PRC* and one will be *Russia to Japan*. Attributing two separate CVs to Russian actions is necessary because Russian policy and actions may apply differently to the interests of Japan and the PRC, and as such may render different values heating the conflict relative to one actor and cooling it relative to another. For each conflict an overall CV will also be assigned for each year where relevant actions by any nation(s) took place, reflecting the development of the conflict as a whole without regard to individual national interests.

The selection of CVs shall use the following criteria. A rating of 0 will be given for neutral actions or combined actions with a relatively neutral effect. ± 1 will mean declarations, rhetoric or other actions that lack a material effect. ± 2 will mean material actions of minor consequence, and ± 3 will mean material actions of major consequence. 4 will mean an end to the conflict either through positive resolution which ends the conflict to the agreement of all concerned parties (+) or war (-).

Examples for 0 are announcements or actions that do not really affect the conflict, such as suggesting a delay in negotiation. ± 1 could be announcing intent to negotiate, negotiating, or denouncing actions taken by others. ± 2 could be, as in the case of the Korean Nuclear Conflict, agreeing to shut down nuclear production in exchange for aid, or refusing to send

aid previously agreed upon. Two examples of a level ± 3 event are the test detonation of a nuclear warhead and test firing of missiles. On the positive side of the scale it could also be taking the first steps in shutting down nuclear production, if they are real and in good faith. Because all of the conflicts analyzed in this thesis are ongoing without having escalated to war a value of ± 4 is purely theoretical, except in the case of the Sakhalin oil projects, where periods of cooperative production are seen as periods without any conflict; a sort of temporary resolution.

Comprehensive tables for the prices and demands (globally, regionally and nationally) of oil and gas will then be created. As natural gas pricing varies remarkably depending on the gas hub and whether or not LNG is used, this study prices gas using the LNG Japan hub gas prices. This is done because as the two major consumers of natural gas in NEA the Republic of Korea and Japan both rely primarily on LNG (Vassiliouk, 2008). Furthermore LNG accounts for over 90 percent of international gas flows in the Asian Pacific (Nicholls, 2003), making it the logical pricing index to use.

Each dispute will use a different time period based upon the period from which it began. The ECS territorial dispute will be analyzed from 1969 to 2007. Because of difficulties associated with finding reliable data for gas prices prior to 1985, any analysis regarding gas prices or values will also be done starting then. That means gas prices, the value of natural gas consumption, the required import value of natural gas, the combined value of natural gas and oil consumption and the required value of natural gas and oil combined imports will be correlated to PRC, Japan and overall CVs only from 1985 to 2007. The disputes surrounding RFE oil and gas will be analyzed from 1975 to 2007, facing the same gas pricing restrictions as the ECS territorial dispute, and the Korean nuclear crisis from 1993 to through 2007.

Following the completion of the tables, statistical analysis will then be used to compare the timelines of the conflicts to those of the oil and gas; a Microsoft® Office Excel® 2007 spreadsheet will be used to compute the values and organize the data. This will be done in order to determine whether there is a correlation between the demand in the petroleum sector and the actions taken by the nations involved. Because of the limits of using statistical analysis, the correlation coefficients yielded will then be contextualized by the qualitative analysis done earlier, as well as being analyzed from a point of view of the original quantitative data itself. In this way an answer to the primary research question can be found; whether the demand, consumption or value of oil, natural gas, or oil and natural gas

combined effect the actions undertaken by individual actors and overall in regard to the three disputes analyzed.

5.1 Data Selection and Restrictions

5.1.1 Selection of Empirical and Qualitative Data

The data this thesis makes use of is a mixture of quantitative and qualitative. In regards to crude oil and natural gas, it relies primarily on BP's energy statistics as found in the *BP Statistical Review of World Energy June 2008*. The exception to this is in the case of the DPRK where, because of omission in BP's reports, the US Department of Energy-Energy Information Administration's data is used. This is done to ensure as common a point of departure as possible regarding this data.

The qualitative data used to build comprehensive event timelines consists of information gathered from a variety of sources including news agencies such as CNN and the BBC, as well as information gleaned from journals and texts. To ensure the information is as accurate and unbiased as possible sources of many different nationalities were consulted, including but not limited to Russian, Swedish, Finnish, Japanese, South Korean and United States sources.

5.1.2 Reliability of Empirical and Qualitative Data

The reliability of the thesis rests first and foremost on the data collected. Because of the impracticality of independently measuring all oil and natural gas statistics necessary, and the impossibility of personally observing all actions undertaken by actors in regards to the selected conflicts, this study relies upon various sources in academia, media and the petroleum industry. Where possible an attempt has been made to use multiple sources for each topic in order to corroborate their validity.

The other area of concern regarding the reliability of this study is regarding its analysis of the data collected. In order to nullify this concern the study tries to be as open and objective as possible regarding analyses and selections. Furthermore included in the appendix are all the numbers, timelines, trend lines and methods necessary to repeat and criticize the statistical analysis that has been done.

5.1.3 Criticism of Data Sources

For the most part a variety of sources have been used for the qualitative data regarding the three disputes central to the thesis topic. Because of the crosschecking involved in such a selection of the literature, reliability of the source data can be considered quite high.

For quantitative data regarding oil and gas pricing, supply and availability the study relies primarily on the *BP Statistical Review of World Energy June 2008*. Because the report includes contributions from many different agencies, organizations and companies, including the International Energy Agency, the Organization for Economic Co-operation and Development and the World Energy Council (BP, 2008b), there is little reason to believe that the physical measurements presented are any less valid than those of any other source for energy statistics.

In NEA studies there seems to be three standard outlooks regarding the future that the region will take; they are optimism, pessimism and skepticism. Because each of these carries with it certain implications for how different scholars interpret data, a variety of sources representing all three perspectives is important. The hope is that by making use of enough sources any bias held by previous researchers will be balanced out, and the study will be left with an objective analysis.

5.2 Ethical Considerations

The primary ethical considerations taken into account in the development of this thesis are as basic and simple as they are important. The first is to insure appropriate citation and reference to sources, not only to provide recognition to those from whose research the study has benefited, but also to allow for the reader to go back to the source to critique the study's analyses or to reproduce the study in order to verify or contradict its results.

The next consideration that has been taken is to follow the ethical guidelines set down by the Swedish Research Counsel, as they are a requirement for this thesis and a well thought out criteria for engaging in morally acceptable research behavior.

Finally the utmost attempt at transparent analysis and methodology has been taken to insure that the thesis contains no subterfuge in its results, so that any who would like to attempt to reproduce it will be able to do so, and so that there are no questions of motives or agenda

implied in the conclusion. In this spirit, the appendix of the thesis includes a copy of all the timelines and tables used for statistical purposes.

6 Disposition

The study itself begins with comprehensive analysis of NEA as a region. It looks into what defines NEA regionalism, its impediments and their solutions. The study then looks at the role of energy in international relations, particularly the role of energy security. NEA oil and gas statistics are also discussed.

From there the three conflicts are discussed individually and in depth, and the role of oil and natural gas in each is analyzed. Using statistical analysis it is determined whether the actions undertaken by the individual parties involved or the taken in regards to the conflict as a whole correlates with price, consumption, or needs of oil, natural gas, or oil and natural gas combined and the particular research sub-questions relevant to each conflict are answered.

The study concludes by summarizing its findings and drawing conclusions that answer the particular research questions, namely the effects that hydrocarbon pricing and demand have on the international relations of NEA, particularly in regard to the ECS territorial dispute, the RFE oil and gas projects, and the Korean nuclear crisis. Suggestions are then made for methods of modifying the study for further investigation into the role of energy in NEA international conflicts and the role of energy on international conflicts in general.

7 Regional Background of Northeast Asia

7.1 Defining Northeast Asian Regionalism

The concept of what characteristics define regionalism can vary significantly from region to the next. In regards to NEA Kim and Jones (2007, p. 1) claim that it is found in NEA's economic liberalization; "Northeast Asia's integration is regionalization without regionalism." What they mean is that as NEA developed the states looked toward building bilateral relationships in order to catch up with other world regions in such a way as to avoid threatening a destabilization of power. This was accomplished by many talks of FTAs and by

using agreements forged with one nation as leverage against another all the while attempting to avoid a situation that could result in Chinese and/or Japanese hegemony (Choi, 2003; Kim & Jones, 2007). Kim and Jones (2007, p. 1) call this “bilateral regionalism.” Effectively NEA is a region bound together by many small trade agreements, but without an all-encompassing agreement. This allows greater freedom to forge mutually beneficial agreements that act to tie the states together into what they call “An interconnected web bound by transnational production networks” (Kim & Jones, 2007, p. 1)

According to Choi (2003, p. 49) the period from the late 1980s the early 2000s experienced a “veritable explosion of regional trade agreements/.../the exception was Northeast Asia.” In the early years of the 21st century, China, Japan and the ROK did move towards expanding regionalism. In 2001 China and ASEAN agreed to establish a FTA within ten years. In 2002 Japan signed a FTA with Singapore, and the ROK finalized its first ever FTA in an agreement with Chile (Choi, 2003). While these moves do appear to create greater regional integration, albeit at a pan-Asian/pan-Pacific level, they are still following Kim and Jones’s (2007, p. 1) model of “bilateral regionalism.” Not only are the agreements involving Japan and the Republic of Korea bilateral agreements, but none of the three agreements reached involve other members of NEA.

This regional contextualization also represents well the conflicts and disputes facing NEA, with the exception of the Korean Nuclear issue, where states engage in negotiation bilaterally, and where agreements on the same subject with one nation play little or no role in negotiations with another except to be used as leverage. This can be seen in the ECS dispute where a resolution between Japan and the ROK was reached without the involvement of the PRC. Furthermore, that agreement has had little, if any effect upon the dispute between Japan and The PRC (Drifte, 2008). This is also evident in the case of the negotiations regarding the East Siberian Pipeline where Russia did its best to hold out making a decision as to which design to use, in an effort to garner better offers from Japan and the PRC.

7.2 Impediments to Northeast Asian Regionalism

Regarding NEA regionalism, Lambest (2003, p. 61) believes that “NEA can best be characterized as grudging coexistence, not dynamic cooperation;” meaning that NEA has many problems and challenges that need to be addressed before its states can fully integrate with each other. Lambest (2003) then goes on to list several areas he believes are key to fully

resolving NEA's problems. Among them are poor regional definition, World War II and Cold War legacies, Russian central authority limiting RFE growth, US involvement, cultural and language barriers, the partition of the Korean Peninsula and infrastructural problems caused by the scale and climatic extremes of NEA. In a way this thesis touches on all of these topics in that they all affect one or more of the disputes it analyzes.

US involvement has played a large role in the in the Korean nuclear crisis, as one of the DPRK's primary security concerns is the overwhelming presence of US troops on the Korean Peninsula (Kim S. S., 2004). US constant involvement in the dispute and in attempts to regionalize NEA also makes it harder for any resolutions to be reached, as the US will hamper efforts to reach goals not in its own interest (Lambert, 2003).

Infrastructural problems are also a key to these disputes. In the cases of the ECS and the Sakhalin I, II and Siberian pipeline disputes the remoteness of the resources means that a large investment must be made to extract the resources, creating a potential hurdle in the form of multilateral cooperation. Indeed Sakhalin II is the world's largest integrated oil and gas project with 20 billion USD invested so far; at a price of 34 USD/Barrel its value to Russia is over 50 billion USD (The Economist, 2009; Watkins, 2006). The cost of the entire project is estimated to be as much as 100 billion USD over a 40 year period (Clark, 2004). When the Russian government used underhanded tactics in an effort to force the foreign companies running the project to renegotiate their contracts or face revocation of permits on environmental grounds, they were understandably upset (Upson, 2006). The message is clear; Russia needs help to develop its infrastructure in the Far East but is reluctant to give up control to do so.

The issue of Russian central control has had a negative impact on the regionalization of NEA. Rozman, Togo and Ferguson (2006) claim that Russia is worried that building too much regionalism in NEA would threaten Russian central control, as the decentralized RFE would loosen its ties to Moscow, and strengthen its ties to its neighboring states. Thus it is no surprise that Russia has often been slow moving and even counterproductive when it comes to multilateral projects in NEA.

According to Kim and Jones (2007) the major threat to regional stability comes not from the great powers (the PRC, Japan or Russia) but from the middle powers, that is mainly the DPRK. While this is true in the extreme case of the Korean nuclear crisis, there are many

smaller conflicts with the potential to threaten regional stability, which do not include the middle powers. The territorial dispute between the PRC and Japan in the ECS is one such conflict (Drifte, 2008; Lai, 2007), and the issues with RFE oil and gas development also have the possibility to hinder regional stability by decreasing the likelihood of large scale cooperative development projects (Watkins, 2006).

The problems created by the DPRK, Kim and Jones (2007) assert, are based in the identity of its regime. When the cold war ended the identity of these regimes had to be rebuilt. The DPRK became a more extreme version of what it was, hoping to survive the transition, and cutting itself off further from the rest of the world.

Identity may be a factor, but Lambest (2003) claims that the legacies NEA has inherited from the Cold War and the Second World War are one of the major obstacles for regionalization. Lambest (2003) identifies Japanese expansionism, territorial disputes, the Juche mentality in the DPRK, and Chinese sovereignty issues as the chief concerns. Indeed it is the Juche mentality that has led to the close off of North Korea and helped build the distrust that fuels the nuclear issue today (Rozman, 2007). It is perceived Japanese expansionism, and memories of Japanese Imperial expansion that caused such an outrage when Japanese Prime Minister Shinzo Abe questioned the facts surrounding the Japanese Army's forcing women into sex-slavery to serve the soldiers during World War II (The Economist, 2007). It is territorial disputes between Russia and Japan over the Kurile Islands, which helps to fuel Japanese distrust over Russian projects in the RFE (Ouimet, 2006) and it is Chinese and Japanese claims to the ECS that lies at the center of the conflict (Drifte, 2008; Lai, 2007).

Together all these problems facing NEA show that examining the region through a purely realist, liberalist or constructivist perspective cannot work. Kim (2004) is right when he says that

All three analytical paradigms offer some insights into the various issue areas of NEA foreign policies, but none provides a completely satisfactory explanation of NEA's international politics as a whole. Regional and country-specific variations suggest that no one theory may be adequate./---/As Peter Katzenstein, and Muthia Alagappa, among others have argued 'analytical eclecticism,' not theoretical parsimony, is a more promising yet underexplored way of more fully capturing and explaining the complex links

and interactions between power, interests, and norms underlying Asian international relations.”⁵

7.2.1 The Tumen River Area Development Project

The problem with achieving an integrated economic system in NEA is shown by the fact that large scale cooperative projects in NEA tend not to work. The best example is that of the Tumen River Area Development Project, an ambitious plan to create a free trade zone in NEA on the mouth of the Tumen River. This was meant to be a major project involving all the nations of NEA plus Mongolia. The project was initially projected to last fifteen to twenty years and cost 30 billion USD. In the first nine years after the project was initialized in 1991, the total funding reached had only barely passed 1.5 billion USD, not nearly enough to make any substantial gains in development (Kim S. S., 2004).

Kim (2004) poses that the project failed for several reasons. The first is that the fall of the Soviet Union created a collapse in the Russian and North Korean economies that hampered the projects ability to begin. Furthermore political differences between Japan and its neighbors resulted in Japan’s refusal to take part, severely limiting the projects funding, as the majority of the financial investment was to be made by Japan and the Republic of Korea. The loss of Japan’s technological knowhow, marketing and bureaucratic skills did not help any either.

The failure of this project, which also involved the UN Development Program, highlights the difficulties in complicated multilateral negotiations. The more parties that become involved in a project the greater the number of cultural and historical tensions that can be stressed. Furthermore, the more complicated the project becomes the harder it becomes for each party to see the anticipated return it could provide, and the project suffers from lack of enthusiasm and rising costs (Kim S. S., 2004).

The case of the Tumen River Area Development Project teaches a valuable lesson regarding multilateral negotiations in NEA. The same setbacks that have plagued it are also plaguing the disputes discussed in this study; the Sakhalin II project faced rising costs that obscured Russia’s perceived returns (Wood, 2007), and the Korean nuclear crisis is riddled with

⁵ While this study takes a neorealist point of departure for analysis, it does not conflict with Kim’s statement as it goes beyond a purely theoretical neorealist framework to attempt to give a comprehensive view of the contributing factors involved in the conflicts discussed.

distrust and animosity because of historic tensions and suspicions of deceit (Brooke, 2004). In order to overcome these differences and difficulties sufficient motivation is necessary. It is one of the purposes of this study to determine if need for energy security is one of them.

7.3 Solutions for Building Northeast Asian Regionalism

Kim and Jones (2007) pose three sources of potential change for NEA to bring about stronger regionalization. They are a power transition (a recent trend of bottom up foreign policy in democracies), economic interdependence (clearly an energy based interdependence qualifies), and democratization. Haggard (2007) agrees with the second when he claims that “most empirical studies find an inverse relationship between interdependence and war” (p. 36). Nakano (2003) does as well stating that the key for NEA security is economic development; it functions as a type of preventative measure. If Kim and Jones, Haggard and Nakano are correct, then as the nations of NEA become further integrated, the conflicts which currently abound will decrease, that is if one can make the leap from a reduction in war to a reduction in other forms of conflict as well.

Haggard (2007, p. 37) is careful not to appear too optimistic however, as he states that “North Korea makes NEA fail the integration model, as it isn’t integrated, as exemplified by the 2006 missile and nuclear tests.” While this is correct in the strictest sense of integration, the DPRK does rely on the outside world for imports of oil. Because of the energy crisis they face, they are effectively integrated in the energy framework. The fact that they resort to threats of violence to insure energy supply, which if acted upon, would surely lead to larger problems, shows how necessary the region truly is in an energy context. This in turn implies that the integration model, as envisioned by Haggard, does not necessarily apply in regards to energy security and integration.

Another claim Haggard (2007, p. 36) makes in relation to integration is that “integration creates demand for better mechanisms that spills over into other areas of co-operation.” If this is true, then building stronger energy ties with the DPRK would surely lead to a demand for other projects that would lead to further integration and mitigation of the nuclear threat.

8 Energy

8.1 Energy Security

Energy security first entered into discourse during the oil shocks of the 1970s. During this period of sudden price jumps, scholars and bureaucrats began to realize that comprehensive plans for insuring energy supplies were designed and implemented. In its earliest form energy security was considered the ability to procure “reliable supplies of energy at reasonable costs” (Gavin & Lee, 2007, p. 403). Today the focus lies more on sustainability as well as costs and reliability (Gavin & Lee, 2007).

There are two basic approaches to energy security: strategic and market-based. The strategic approach involves insuring supply through development, investment, political relations, and physically protecting supplies and shipments. Market-based approaches seek equilibrium through diversification of energy sources and suppliers, efficiency and liberalizing energy markets. Both approaches are necessary for comprehensive energy security. Indeed they are complementary (Gavin & Lee, 2007).

By far, the simplest common way to insure energy security is through diversification. Another alternative is to build a pipeline. Nicholls (2003, p. 1) claims that “for importing countries, pipelines are an exclusive source of supply and represent energy security.” Kensuke Kanekiyo (2004a) has found that in terms of costs, an oil pipeline equals ten percent of the end price of the oil, less than one third the cost of rail transport, while a gas pipeline equals 50 percent of the end cost of the natural gas. In any case, building an oil pipeline is likely to make a favorable impact on the energy security of the importing country, but a gas pipeline requires a greater number of precise circumstances to provide the same benefit.

8.1.1 The Energy Security Context in Northeast Asia

In 2005 NEA alone accounted for 20 percent of world oil consumption (Gavin & Lee, 2007). In addition China, Japan, Russia and South Korea are the second, third, fourth and ninth largest consumers of crude oil in the world respectively (United States Energy Information Administration, 2009). Together Japan and the ROK account for 70 percent of global LNG demand (Gavin & Lee, 2007). Russia alone holds around six percent of global oil reserves and over 25 percent of global natural gas reserves, most of which is found in Siberia and the RFE (Kiesow, 2008) In essence NEA is a region desperately in need of crude oil and natural

gas, which coincidentally it can provide itself. The key will be working together to establish comprehensive energy plans that benefit all parties (Kanekiyo, 2004a).

8.2 Northeast Asian Energy Outlook

In order to understand the actual energy needs of NEA it is necessary to perform a time series analysis of energy production, consumption and value. When analyzing energy needs one can focus on a single commodity, a combination of commodities, the gross volume of consumption, the required yearly imports to meet consumption, the price value of commodities, or any other number of factors.

This study looks at the consumption of crude oil and natural gas in terms of volume and value, the necessary volume and value of imports of each to meet the year's consumption (demand) and the combined value of oil and natural gas in yearly consumption, and import requirements.

8.2.1 Yearly Consumption and Import of Crude Oil

Looking at the yearly crude oil consumption throughout NEA we can see that Japan and the DPRK have remained fairly stable in terms of total consumption, with Japanese consumption even declining from the mid 1990s. Overall demand in the PRC and the ROK however, has been steadily increasing. Russia has also shows drastically decreased total consumption in 1985. This is easily explained however, as data for Russian energy is only available from 1985 onwards, and we must rely on USSR statistics if we wish to go back farther. Beginning in the early 1990s Russia again shows decreased consumption, this time less dramatically and corresponding to the fall of the USSR (see Figure 8-1).

Figure 8-1—Yearly Crude Oil Consumption (Volume)

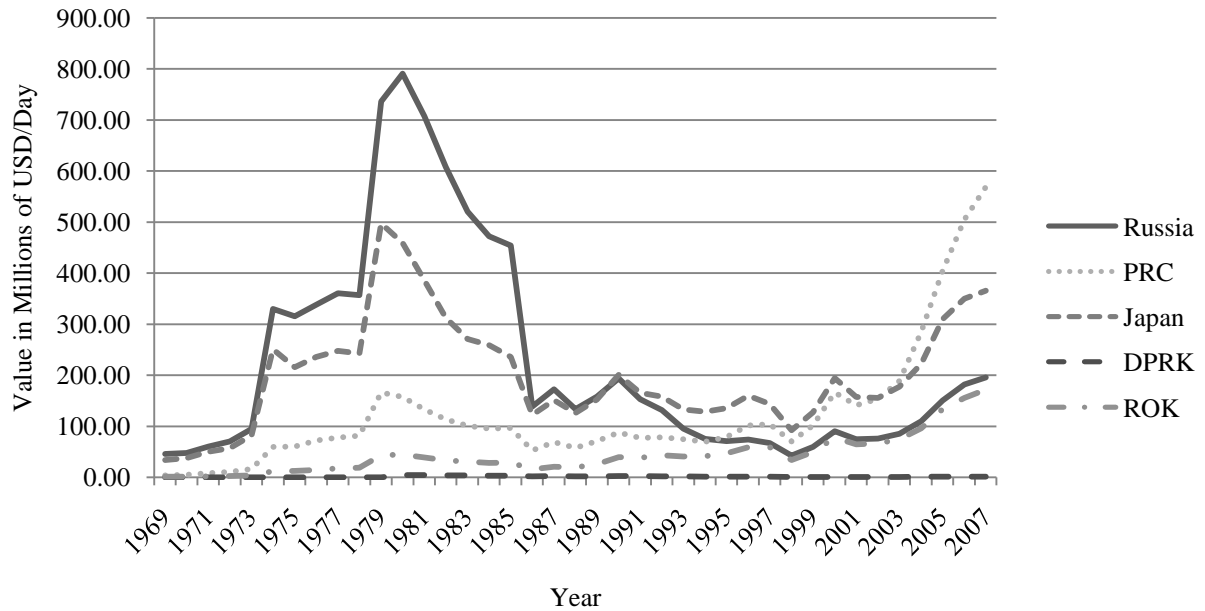
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



When examining the value of the crude oil however, one can see that there have been peaks and troughs, rising to a very high peak in recent years (see Figure 8-2). This is true regardless whether the country in question has been able to curb its rising need for oil or not; the recent increases in price have had a measured impact.

Figure 8-2—Yearly Crude Oil Consumption (Value)

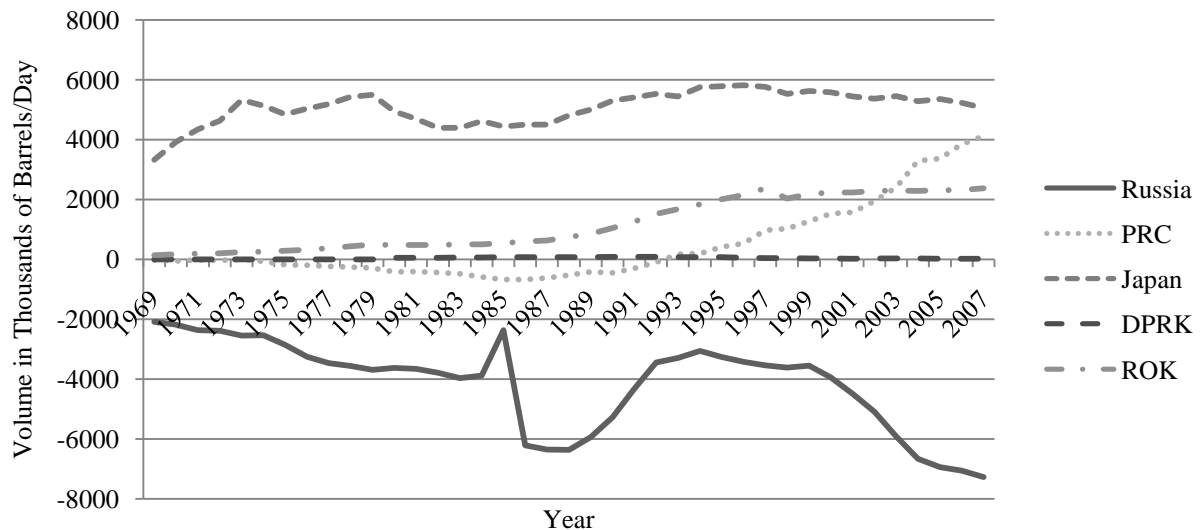
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



If we look at the net required imports to meet domestic demand, however, we can see that Russia is able to meet its entire domestic supply and is thus an oil exporter, while all others require foreign supplies (see Figure 8-3). In point of fact, only Russia and the PRC actually produce any crude oil domestically, meaning Japan, the DPRK and the ROK must rely entirely on oil extracted from foreign sources.

Figure 8-3—Yearly Required Imports of Crude Oil (Volume)

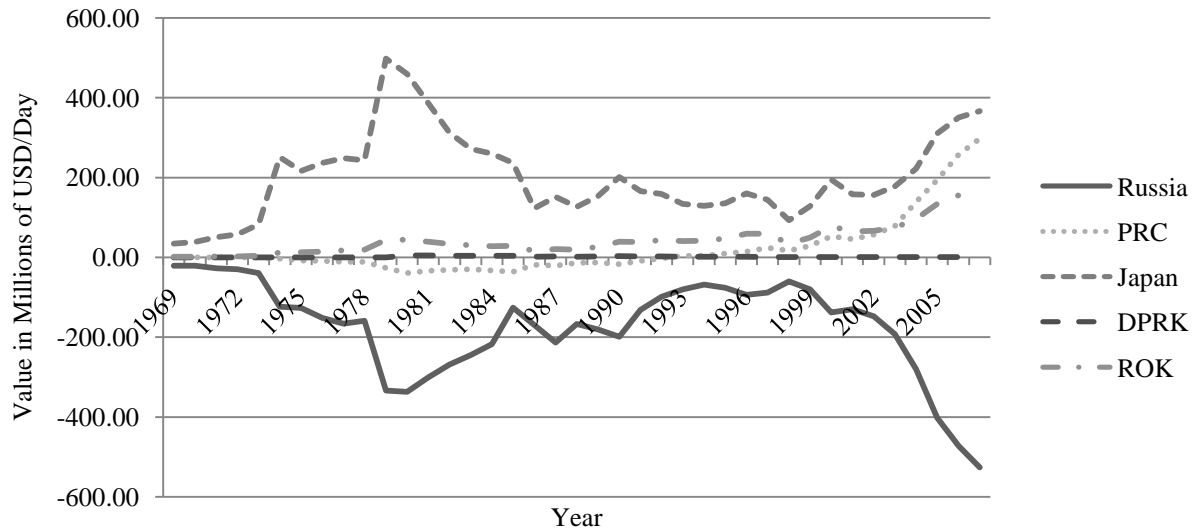
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



Once again, when we adjust for value of the required imports of oil, we find that Russia is making far more on its exports of oil than ever before, and that all the other nations are facing highly increased competition with one another for access (see Figure 8-4). By using statistical analysis we can see if the consumption or the price of oil in any way reflects the actions undertaken by these countries when they find themselves in conflict, particularly over issues that are directly related to the petroleum industry.

Figure 8-4— Yearly Required Imports of Crude Oil (Value)

Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*

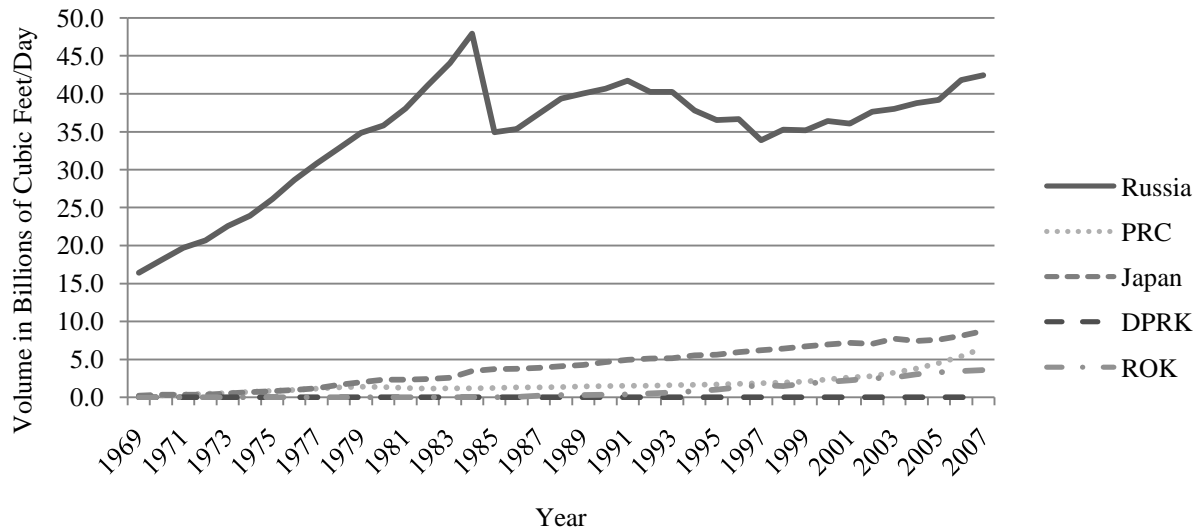


8.2.2 Yearly Consumption and Import of Natural Gas

Examining the consumption of natural gas since 1969, we find a similar trend as the one we found for oil. Once again Russia has a sharp dip 1985, again because of the data switch from the Soviet Union to Russia. Again in the early 1990s Russia's consumption falls again, likely due to the effects of the fall of the USSR. Japan, the PRC and the ROK all have a steadily increasing demand, and only the DPRK has zero reliance on natural gas. This is likely due to the economic closing off of the DPRK combined with a lack of resources and appropriate infrastructure (See Figure 8-5).

Figure 8-5—Yearly Natural Gas Consumption (Volume)

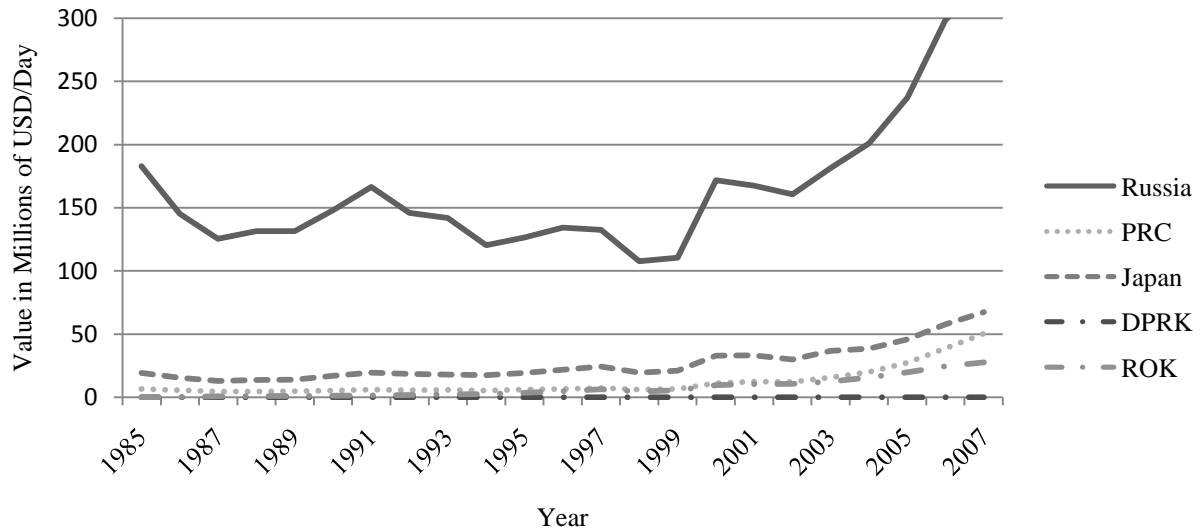
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



Because of the unavailability of reliable gas prices dating before 1885, the scale on the value of yearly natural gas consumption is slightly skewed. It retains for the most part, however a very similar trend to the volumetric consumption, with perhaps a faster incline in recent years. Overall the stability of natural gas prices in the long term mean that it is unlikely that there will be much statistical difference in correlation between a volumetric comparison and a value-based comparison (see Figure 8-6).

Figure 8-6—Yearly Natural Gas Consumption (Value)

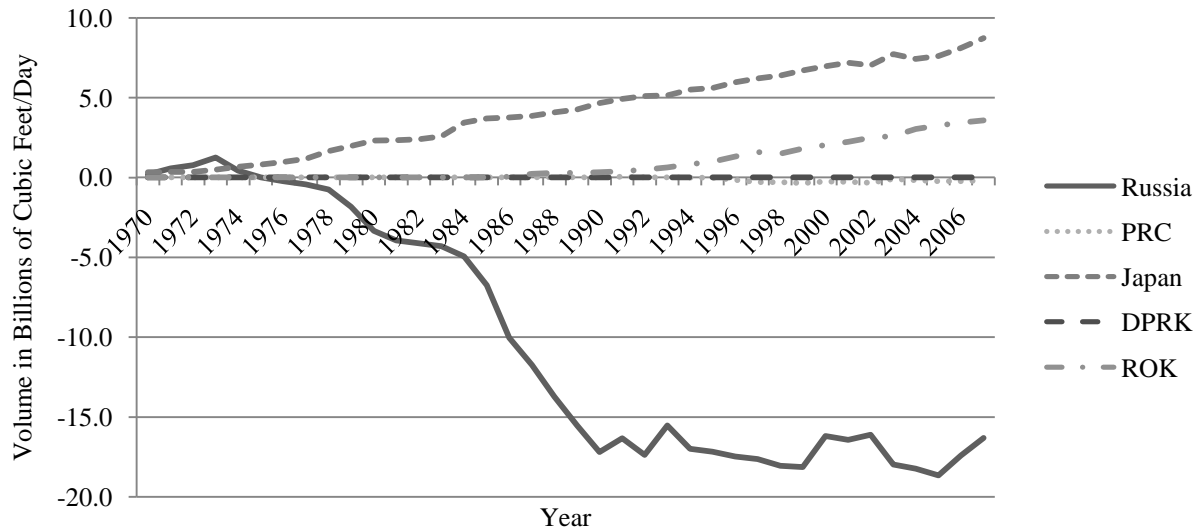
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



Examining the difference between the produced natural gas and the consumed natural gas we can make a few interesting conclusions. The first is that while Russia, as the Soviet Union, began the 1970s consuming more than it produced, it quickly began to produce so much more that by the end of the seventies it had a production surplus beyond the production deficit that it had experienced previously. The next is that Japan and the ROK, after they started using natural gas, have both steadily increased their domestic consumption. The PRC evidently consumed as much natural gas as they produced until the late 1990s. The interesting point here is that it conforms well to the timeline of gas discovery and extraction in the ECS. Once again the DPRK which consumes no gas also requires no imports (see Figure 8-7).

Figure 8-7—Yearly Required Imports of Natural Gas (Volume)

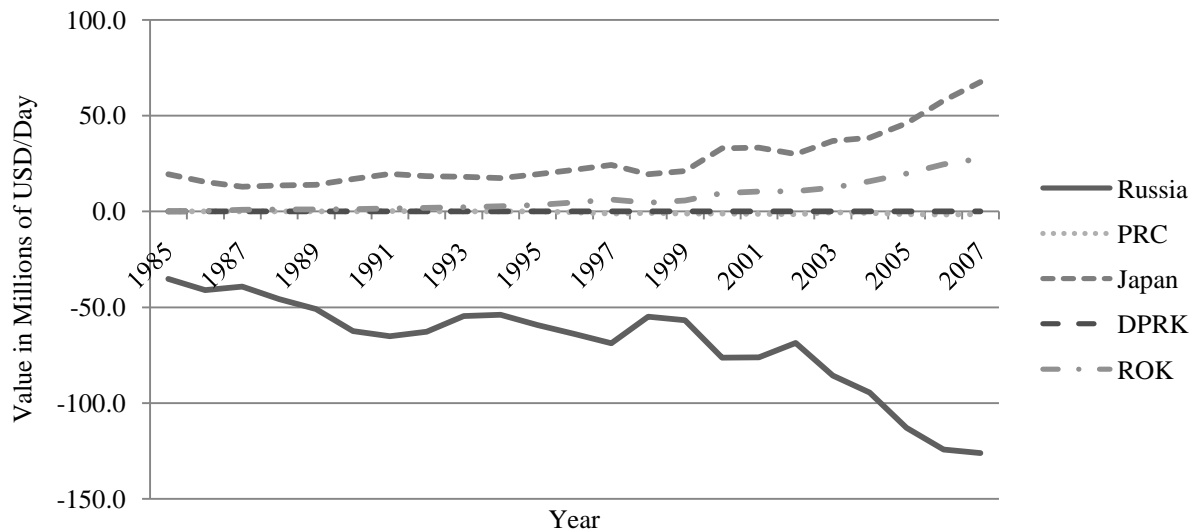
Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



Adjusting the yearly required imports to account for pricing makes little difference in the general trend. Again the scale is slightly different beginning in 1985. The apparent differences in slope can be accounted for primarily by differences in scale (see Figure 8-8).

Figure 8-8—Yearly Required Imports of Natural Gas (Value)

Source: *The BP Statistical World Review of Energy June 2008* and *EIA - International Energy Data and Analysis*



9 Empirical and Contextual Analysis

9.1 The East China Sea Territorial Dispute

9.1.1 Overview

In the ECS conflict, Japan and the PRC both claim ownership or rights to the sea bed between the Okinawa Islands and Taiwan. The ROK also has some claims to areas in the north, but as of yet little controversy has occurred in their regard since a deal was struck with Japan in 1977 and surveys done of the areas has yielded no signs of gas or oil (Drifte, 2008; Lai, 2007).

The controversy between the PRC and Japan stems from a UN survey which held that there were likely very large reserves of oil in the area. Following this the PRC and Japan both stated that they had rights to the area, based on differing interpretations of international maritime law. Japan has stated that median line between territorial lands should be used, and china claims that their rights extend all the way to the Okinawa trough. Even while the area was in dispute China started test drilling and developing the area, even going so far as to build pipelines, which strangely enough were partially funded by Japan via the Asian Development Bank and what at the time was known as Japan's Export-Import Bank.

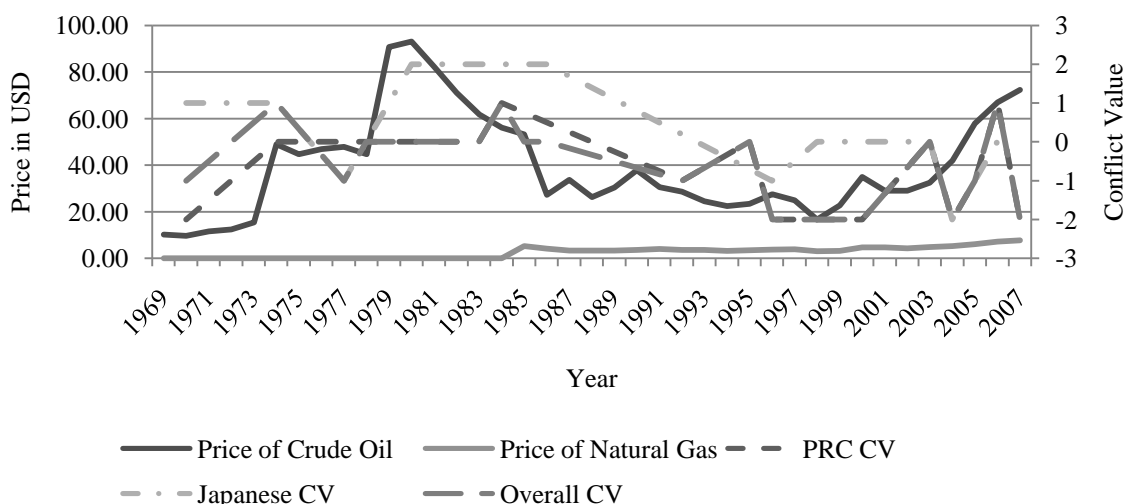
Whether this was intended as a strategic move toward joint development is unknown, but it is likely a case of separate entities working with separate agendas. The end result is that today, even after much rhetoric and posturing China holds practical ownership, while Japan engages in diplomatic measures to ensure access without angering China (Drifte, 2008).

9.1.2 The Role of Energy in the Dispute

Energy plays an obvious role in this dispute, residing in the fact that the dispute centers on access to natural gas. Examining Chinese and Japanese natural gas needs, and comparing them to the progress of the dispute one can very easily see that there is no correlation between the willingness of the Japanese or Chinese willingness to cooperate and any of the variables associated with the petroleum industry (see Figure 9-1 for a graphic example). Neither price, nor value of demand, nor volume of demand, nor export volume plays a role in determining the actions taken by the state. Not even the confrontational/cooperative actions taken by the opposing state can be seen as having a direct correlating impact to the actions taken by the other. The actions taken in each case can instead be seen as a logical progression of events. The previous actions of the other government, the desire to maintain national interests, and the desire for a peaceful resolution are all seen as primary factors.

Figure 9-1—Prices of Crude Oil and Natural Gas Overlaid with PRC, Japanese and Overall CVs

Sources: *The BP Statistical World Review of Energy June 2008* and original analyses



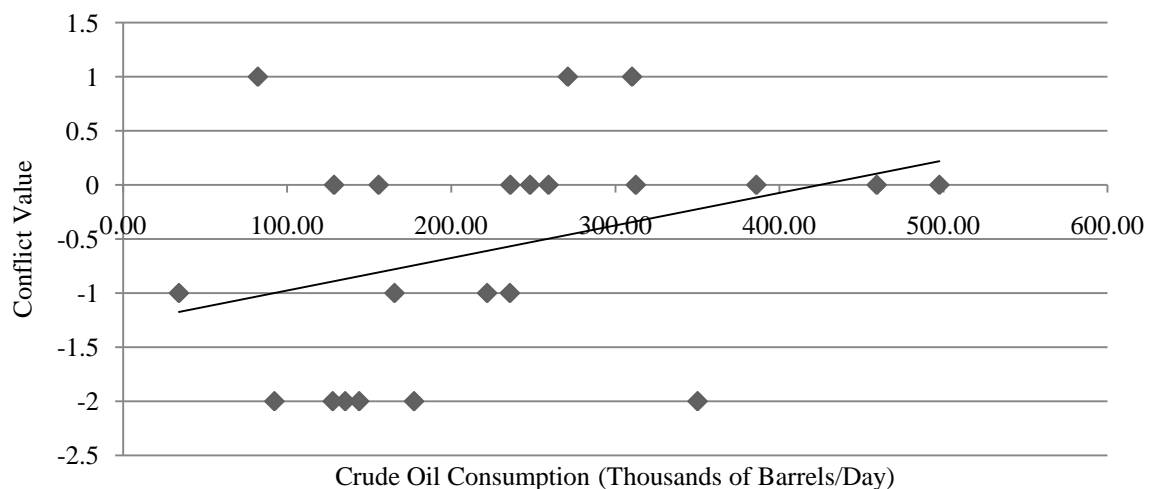
When the potential for oil and gas was discovered Japan and the PRC expanded their claims. When the opposing nation refused to cooperate there was posturing and rhetoric. It was not until China took the first step toward development (for whatever mix of reasons) that the balance shifted and Japan was left fighting for a more even resolution, as opposed to the one in their best interest; a blowout victory for Japan is no longer possible because of the establishment of Chinese Development in the region (Drifte, 2008).

9.1.3 Statistical Correlations

Statistically speaking the two most significant coefficients of correlation were both approximately -0.746; they were Japanese CV to Japanese oil consumption by volume and Japanese CV to Japanese required oil imports by volume (see appendix for timeline of the dispute including justification for selected CVs and comprehensive tables of the data used and results of the statistical correlations). As Japan does not produce any oil domestically we can then analyze these two correlations at the same time because they represent the same measurement. This is what can be described as a moderate linear correlation. Graphically representing the correlation reveals that while there is somewhat of a linear trend for the data points, it is because there are two main areas where points are grouped, implying a greater correlation than there really is, as can be deduced from the apparently random distribution of points (see Figure 9-2).

Figure 9-2—Correlation of Japanese CV to Japanese Oil Consumption

Sources: *The BP Statistical World Review of Energy June 2008* and original analyses



Examining the context of the original data however, yields a clearer picture. Because neither the Japanese CV nor Japanese oil consumption changes very much over the course of the conflict except in the last few years where Japanese oil consumption increases and the Japanese CV becomes more negative, it is hard to attribute much significance to value of the correlation coefficient in this case. The other coefficients that held moderate linear correlation also suffered from similar contextual limitations.

Referring back to the main sub-question asked in regards to this dispute, the study attempted to discover to what extent the domestic demands for oil and gas in the PRC and in Japan has affected the overall dispute. Statistically speaking there is no correlation between PRC or Japanese oil and/or gas consumption, production or value and the actions they have taken in regards to the ECS conflict.

9.2 The Russian Far East Crude Oil and Natural Gas Projects

9.2.1 Overview

9.2.1.1 Sakhalin I and II

In the early 1970s the Soviet Union began negotiations with Japan regarding the development of oil and natural gas in the RFE culminating in the Sakhalin Continental Shelf Oil and Gas Exploration Project Joint Agreement which was abandoned due to political pressures (Vassiliouk, 2008).

The project was re-launched in 1996 with the creation of the Sakhalin I and Sakhalin II oil and natural gas development projects lead by international consortiums which both included Japanese corporations (Campaign, 2007; Kalashnikov, 1999).

Sakhalin II Phase I began producing oil in 1999 and Sakhalin I began producing oil and natural gas in 2005. Phase II of Sakhalin II was approved in 2004 (Vassiliouk, 2008).

In 2005 Russian state-owned Gazprom began trying to buy controlling interests of Sakhalin II, when the proposed cost was projected to double to 20 billion USD for fears of delays in reaping returns. The companies involved in Sakhalin II were also left off the short list for developing the Shtokman gas field (Wood, 2007).

In 2006 Russia threatened to revoke Sakhalin II permits, on environmental grounds (Campaign, 2007; Watkins, 2006). Russia later backtracked, saying they had no desire to

revoke the permits (Watkins, "A softer tone on Sakhalin-2", 2006). In the end Russia won out, and the foreign companies that made up the Sakhalin II consortium agreed to sell controlling shares of the project to Gazprom (The Economist, 2006; Turkeltaub & Bailey, 2007). Afterward Russia assured Japan that the promised supplies of natural gas from Sakhalin II would be kept (Watkins, 2007b)

9.2.1.2 The East Siberia Pipeline

In 2003 then Russian President Vladimir Putin and President of the PRC Hu Jintao signed an agreement solidifying Russia and Chinese energy cooperation and finalizing a deal between Yukos Oil Company and the Chinese National Petroleum Corporation to ship 5 billion barrels of oil to China from 2005 to 2030 via a yet un-built pipeline from Angarsk in to Daqing (Gulick, 2007) (See Figure 9-3 for a detailed map of current and potential pipeline routes).

Figure 9-3—Potential Energy Flow from Eastern Russia

Source: (Vassiliouk, 2008, p. 6)



Even as Russia was expanding its oil exports to China (Gulick, 2007; Lai, 2007), Japan was offering of soft loans for the project if it was rerouted to the Pacific; 14 billion USD for the pipeline’s development and 2 billion USD for new explorations (Gulick, 2007). On the last

day of 2004 Russia unveiled its new East Siberian Pipeline route from Taishet to Nakhodka, instead of Angarsk to Daqing (Gulick, 2007).

Soon thereafter Russia announced the design of a branch to Daqing on the Taishet to Nakhodka route (Lai, 2007). Russia voiced ambitions to build a gas pipeline to South Korea, either across the Korean Peninsula or across the sea by running it through China (Brooke, 2004; Nicholls, 2003). Concurrently, Russia was further solidifying its energy relationship with the PRC (Gulick, 2007).

Later Russia unveiled the official blueprint of a new East Siberian Pipeline route stopping in Skovorodino, halfway to Nakhodka, with a possible spur to Daqing. Russia also cast doubts that the second half would be built saying it depended on oil extraction and regardless construction would not begin until at the earliest in 2012. Putin also declared that when the first half of the pipeline was complete two thirds of the oil would be sent by rail to China and one third to Nakhodka, to be shipped to Japan and other markets (Gulick, 2007).

Construction on the first section of the East Siberian Pipeline began in 2006 (Gulick, 2007). It is due to be finished this year; the second section was also given approval for construction in 2008 (Vassiliouk, 2008).

9.2.2 The Role of Energy in the Russian Far East Oil and Gas Projects

The energy projects in the RFE are by their very nature all about oil and gas. Despite political goings on that interject other complexities into the discussion, such as Japan's attempts to make their soft loans offers contingent on solving the Kurile Island dispute (Gulick, 2007), the economic aspect has prevailed.

Unsolved disputes between Japan and Russia of a political nature no longer seem to have the detrimental impact they used to (Vassiliouk, 2008); indeed Japan is now the single largest investor in the RFE in an effort to diversify energy sources (The Economist, 2004). Scarce domestic energy supply has become a weakness for Japanese diplomacy (Koike, 2006); energy issues are forcing Japan to be less assertive (The Economist, 2007).

Russia's relationship with China is no different, save that in 2004 they solved the territorial dispute that had been hindering their relations, allowing them to form a strategic partnership (Trenin, 2006). Indeed the agreement between Putin and Hu to make Russia China's

preferred supplier and China Russia's preferred customer, with energy as the top priority for relations (Gulick, 2007), supports the idea that energy security is fast becoming a priority NEA.

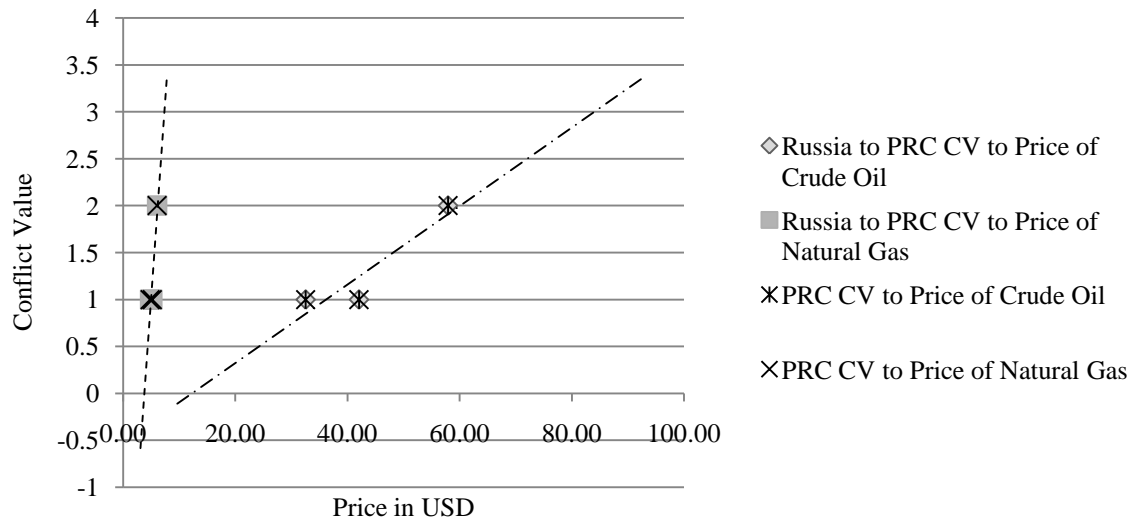
9.2.3 Statistical Correlations

Using statistical analysis to correlate the events of the RFE oil and gas projects to quantitative data regarding the oil and gas statistics relative to the nations involved in the projects and NEA as a whole yields some interesting results (see appendix for timeline of the dispute including justification for selected CVs and comprehensive tables of the data used and results of the statistical correlations).

The first is the multitude of high value correlation coefficients involving the Russia to PRC CV and the PRC CV. While these numbers are very high for statistical purposes, they are not very valid for drawing conclusions, as the Russia to PRC CV and the PRC CV have only three inputs (see Figure 9-4). The nature of Russian-Chinese cooperation in these areas is fairly recent, and an improving trend in relations does correspond very well with recent trends in the hydrocarbon industry. Using month to month oil and natural gas data would be a better way to determine if there are indeed any correlations, but for now we must be content to accept that while there very well may be a statistical correlation the results of this study in regards to these particular correlations are inconclusive.

Figure 9-4—Correlation of Russia to PRC and PRC CVs to Prices of Crude Oil and Natural Gas

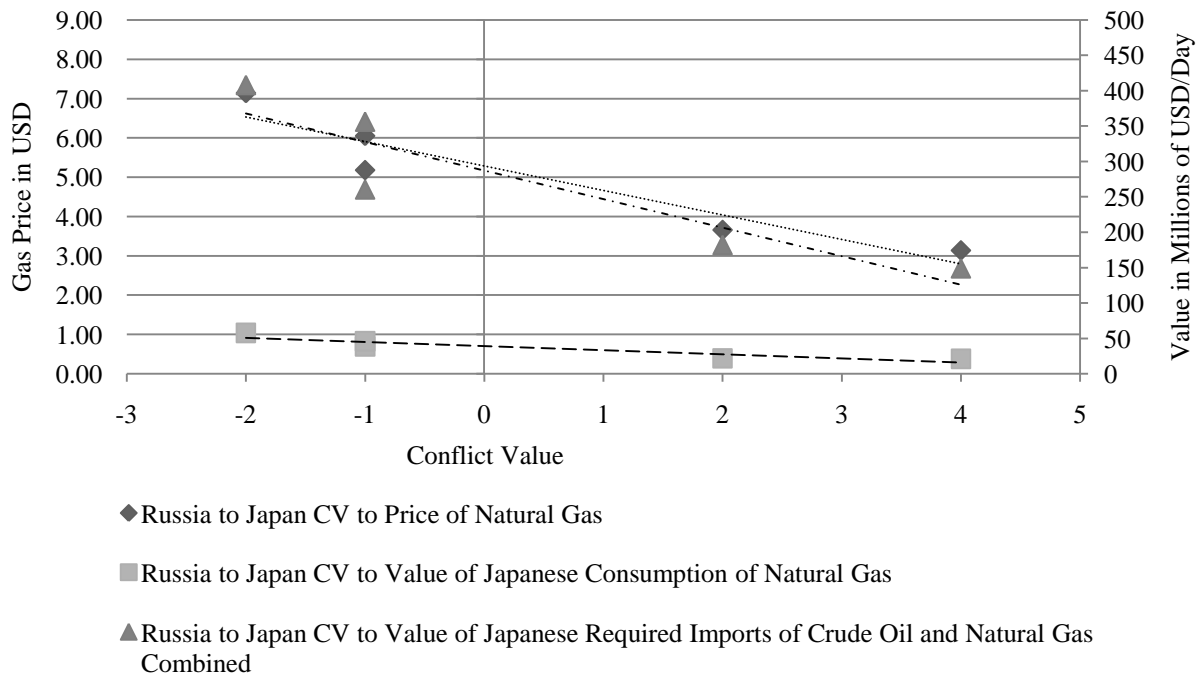
Sources: *The BP Statistical World Review of Energy June 2008* and original analyses



The Russia to Japan CV also has a high negative correlation to gas prices, to Japanese gas consumption by value and to combined Japanese oil and gas consumption by value. Even though the Russia to Japan CV contains more than twice that data points than either the Russia to PRC CV or PRC CV, the limits of analyzing gas prices from 1985 onwards means that there are only 5 points available. Graphically examining these points we can see that like the correlations involving the Russia to PRC and PRC CVs the points do fit very well along the trend line (See Figure 9-5). While this implies that there could very well be a true statistical correlation between the respective series, once again the low number of data points means that the results are fairly inconclusive.

Figure 9-5 Correlation of Russia to Japan CV to Price of Natural Gas, Japanese Consumption of Natural Gas by Value and Japanese Required Imports of Crude Oil and Natural Gas Combined Value

Sources: *The BP Statistical World Review of Energy June 2008* and original analyses



The correlations involving the Japan CV did yield several lower and upper medium level correlations, however as they were also correlations involving gas consumption they also suffer from a lack of inputs; again this means any implied correlations cannot be used to draw decisive conclusions.

In the case of correlations involving the Overall CV, no strong correlations were produced. It is therefore apparent that there is no correlation between the oil and natural gas statistics examined and the overall progress of the RFE oil and natural gas projects.

Answering the questions posed earlier regarding the RFE oil and gas projects we can see some indication that the Russian government is more likely to cooperate with China, but deal more harshly with Japan and risk losing Japanese investments when demand for Russian oil and gas is high. This only holds true if the implied correlations are correct, as all the significant correlations involved a low number of data points, however, it is impossible to say without further research.

Furthermore, contextual analysis implies that Russian desire for control of RFE oil and gas projects is influenced by the price of natural gas, as the actions taken to acquire controlling shares in the Sakhalin II project in 2006 correspond with rapid price increases and a near doubling in price from when the initial agreement was made in 1996 (BP, 2008a; Campaign, 2007).

9.3 The Korean Nuclear Crisis

9.3.1 Overview

The nuclear crisis traces its beginnings to the fall of the Soviet Union. In the early 1990s North Korea was no longer able to rely on much of the support and aid from the USSR that it had previously relied upon (Brooke, 2004). This sent the PDRK into an energy crisis, to which they responded by declaring their intent to withdraw from the Nuclear Non-Proliferation Treaty. After much negotiation the PDRK agreed to halt their nuclear program in exchange for energy aid from the US, South Korea and Japan. In addition, they were to receive two light water reactors for peaceful power generation (BBC NEWS, 2007; Brooke, 2004; CNN.com, 2004).

By the late 1990s little progress had been made in building the reactors and easing US sanctions (Brooke, 2004), and in 1998 North Korea began to conduct missile tests. An agreement was later reached to freeze the missile program in exchange for easing sanctions. By 2000 the light water reactors were still unfinished and the PDRK declared that unless compensation was made for the loss of energy resulting from the delays in construction, they would restart their nuclear program. The following year, they threatened to restart missile tests if the US continued to refuse to normalize relations (BBC NEWS, 2007; CNN.com, 2004).

In 2002 the PDRK admitted that they had secretly continued their nuclear program in violation of the 1994 agreement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007). Japan and the ROK respond by halting their shipments aid in the form of oil to the PDRK (BBC NEWS, 2007; CNN.com, 2004).

In 2003 North Korea tested two land-to-ship missiles into the Sea of Japan, withdrew from the Nuclear Non-Proliferation Treaty and announced that it had restarted its nuclear program. Later that year three way talks are held in Beijing between China, the US and the PDRK,

followed by the first round of six-party talks (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

From then on the six-party talks have been the primary method of negotiation used to seek a solution to the problem. Even as diplomatic relations have unfolded, North Korea still decided to take several offensive actions that have hampered the ability of the involved parties to negotiate. In 2006 they test fired seven missiles, including a Taepodong-2 rocket believed capable of reaching the United States, and they engaged in an underground test of a nuclear weapon, both of which lead to UN Security Council sanctions (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

9.3.2 The Role of Energy in the Crisis

From these events it is clear that the major concern of North Korea is energy security. Every time negotiations have occurred, the PDRK insists in energy aid as a stipulation of disarmament and disbandment of their nuclear program (Watkins, 2007a). Eric Watkins (2007a, p. 30), senior correspondent for Oil & Gas Journal, even sees this as trend whereby North Korea will continue to demand more oil and energy aid packages in exchange for compliance, even going so far as to suggest that the amount of aid demanded will go up “bomb by bomb.”

9.3.3 Statistical Correlations

Examining the results of the statistical correlations, we can see that no correlations exist between the actions undertaken by the five nations of NEA and the consumption or value of hydrocarbons (see appendix for timeline of the crisis including justification for selected CVs and comprehensive tables of the data used and results of the statistical correlations). The only possible exceptions are in the cases of Japan and the ROK where correlation coefficients of approximately .844, .804 and .745 were yielded between the Japanese CV and the volume of gas import requirements of China, the Japanese CV and the value of North Korean oil consumption and the ROK CV and the value of North Korean oil consumption respectively.⁶

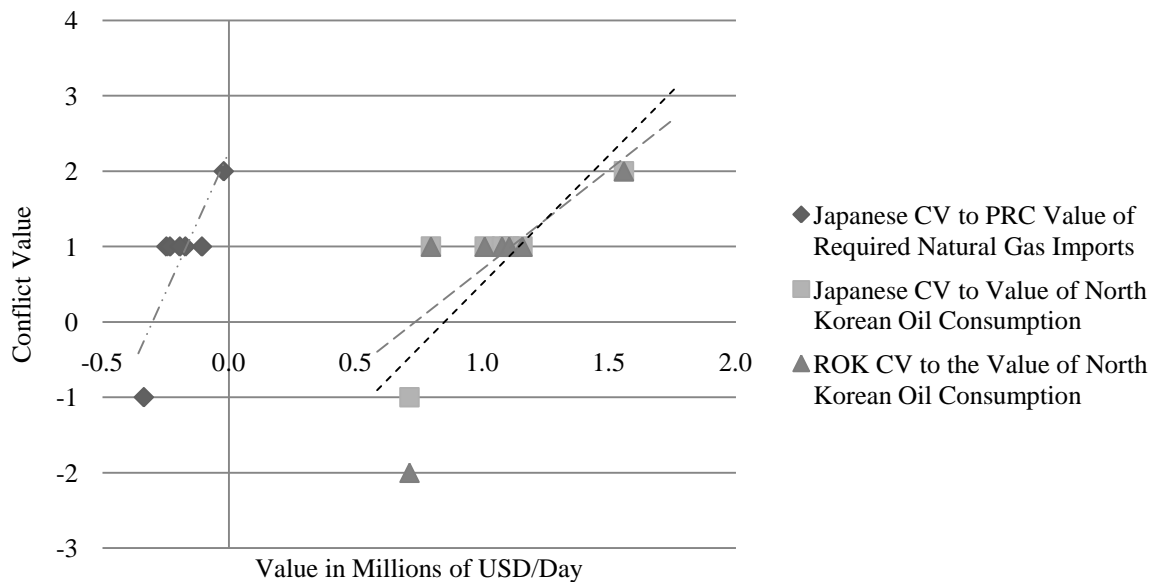
⁶ The same correlation coefficient values are yielded for the Japanese and South Korean CVs and the value of North Korean oil consumption, the value of North Korean required oil imports and North Korean and the value of North Korean combined oil and gas consumption and required imports. As the PDRK produces no oil and consumes no natural gas, these values are effectively the same, i.e. they all represent the correlation between the Japanese and South Korean CVs and the value of North Korean oil consumption.

In the cases of correlations involving the Russian and Chinese CVs and North Korea's natural gas consumption, no correlation coefficient can be obtained. This is because all three of these series have no change over the course of the time period analyzed (1993-2007). This shows us that regardless of energy statistics, both Russia and the PRC have maintained the exact same level of cooperation, i.e. they have attempted to negotiate with the DPRK and have engaged in multilateral negotiations such as the six-party talks. Neither country has reached any agreements of any value with North Korea, however, nor has either country issued threats or taken actions that could result in worsening the conflict.

By examining the three most significant correlations in graphical form, it is possible to better contextualize whether this is indeed a true correlation, or an anomalous one (See Figure 9-6). In the case of PRC natural gas import requirements, we can see that because the value of the imported gas is negative, the PRC was actually exporting natural gas. This means that there is an apparent negative correlation between PRC natural gas exports, and the willingness of Japan to cooperate with North Korea in regards to the nuclear crisis. Examining the trend of just PRC natural gas exports, we can see that while the volume has been steadily increasing, the value of the exports peaked around the year 2000. Because there is no correlation between the natural gas price index and the Japanese CV, this is most likely an anomalous correlation, caused in part by the large grouping of points where the value of PRC gas exports was hovering around 200,000 USD/day, and Japan was engaging in the six-party talks without taking any other actions relevant to the crisis.

Figure 9-6—Correlation of Japanese and Korean CVs to Select Hydrocarbon Data

Sources: *The BP Statistical World Review of Energy June 2008*, *EIA - International Energy Data and Analysis* and original analyses



Examining the apparent correlation between North Korean oil consumption and the Japanese and ROK CVs, also yields a similar grouping of points, where the Japanese and South Korean governments were engaging in the six-party talks and the value of North Korean oil consumption was being held relatively stable by rising oil prices even as the volume of consumption was falling, implying a coincidental correlation, as opposed to a causal correlation (see Figure 9-6). In addition the value of the oil consumed in North Korea from 1998-2001, a period during which neither South Korea nor Japan took any actions of consequence, was much lower than in 2002 where both the ROK and Japan have a negative CV.

Going deeper into the context of the crisis, however, we can see that the volume North Korean oil consumption has been decreasing every year since the fall of the USSR, with significant yearly decline from 1994-2000. Even though PDRK actions do not statistically correlate with oil consumption, it can be seen that the deal they struck in 1994 provided them little energy benefit and it wasn't until they began to make demands and threats regarding restarting their nuclear program that the consumption leveled off again. However, once they

began taking overtly violent actions, such as test firing missiles the consumption of oil began to significantly decline once again. In terms of actions taken the Japanese and ROK governments, the decision to stop the energy aid they had been providing in the form of fuel oil seems to have had little immediate effect on the overall consumption of oil in North Korea.

Recalling the specific sub-question asked in reference to this crisis, the analysis shows that crude oil and natural gas prices have little apparent affect on the willingness of any party to negotiate. Furthermore, while hydrocarbons do play an intricate role in the crisis, there is no real statistical connection between their empirical values and the unfolding of the crisis.

10 Conclusion

This study set out to discover what connections the oil and gas industry has to the current international conflict environment in NEA, if any at all. Particularly this study asked whether the countries of NEA are more likely to take a cooperative or an obstinate stance on regional disputes when the supply of crude oil and/or natural gas is scarce and/or in high demand.

Taking into consideration the correlation coefficients yielded by the study's method of analysis, it is evident that there is little if any statistical correlation between the crude oil and natural gas empirical data and the conflicts analyzed. In the cases of the RFE oil and gas projects and the Korean nuclear crisis, however there were several correlations that looked promising and very well could yield a statistical connection if more data points were available. Unfortunately the only correlations that yielded strong coefficients suffered from a lack of data points, making the correlations themselves inconclusive.

Examining the statistical data in context of NEA and the individual disputes also implied that there is a connection between the numerical values associated with the hydrocarbon industry and aspects of several conflicts in NEA. One such example is the possible connection between the volume of North Korean crude oil consumption and actions undertaken by Japan and South Korean; namely the decision to stop the export of aid in the form of fuel oil. Another is the potential connection between natural gas prices and consumption and the actions undertaken by Russia in regards to Japan and the PRC in the RFE oil and gas projects.

In summary this study has found no significant statistical correlations between the oil and gas industry and the conflicts facing NEA. Nevertheless, qualitative analysis has indicated that some connections may exist, though not strictly empirical in nature, nor are they predominant. For the most part, political policy still drives much of the decision making process, and energy security is not the primary concern for NEA countries when attempting to resolve disputes, controversies and crises.

11 Suggestions for Improvements and Further Research

The main obstacle encountered in this study involved statistical analysis where too low a number of data points were available to be conclusive. In order to provide for a greater and more varied data selection it could be helpful to use a monthly analysis as opposed to one done at yearly intervals.

Selecting more or different conflicts could also yield new results, as could a comprehensive analysis of all the conflicts and all actions undertaken by all the nations of NEA in their regards. Selecting a different region could also yield different connections than those found in NEA, and further understanding in the fields of peace and conflict studies and energy security.

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13 Appendix

13.1 Comprehensive Timelines of Conflicts Including Conflict Values

13.1.1 The East China Sea Territorial Dispute

1970

- Overall CV -1
- PRC CV -2
 - China makes claims to Senkaku Islands previously claimed by Japan (Drifte, 2008).
- Japanese CV +1
 - Japan agrees to joint development in principle, though the agreement is with the ROK and the Republic of China (Taiwan) instead of the PRC. Japan refuses to issue drilling permits in the ECS so as not to offend China (Drifte, 2008).

1974

- Overall CV +1
- PRC CV 0
 - The PRC objects to the Japanese agreement for joint development with the ROK because it does not include them (Drifte, 2008).
- Japanese CV +1
 - Japanese refuses to ratify the agreement for joint development with the ROK based on PRC objections (Drifte, 2008).

1977

- Overall CV -1
- PRC CV N/A
- Japanese CV -1
 - Japanese ratifies the agreement for joint development with the ROK despite Chinese objections (Drifte, 2008).

1978

- Overall 0
- PRC CV 0
 - The PRC suggests shelving the dispute for a period of 10 years (Drifte, 2008).
- Japanese CV 0
 - Japan begins joint development with the ROK, but the PRC is left out (Drifte, 2008).

1980-86

- Overall CV 0
- PRC CV N/A
- Japanese CV +2
 - Japanese/ROK exploration continues but only on the Japanese side of the median line so as not to anger the PRC (Drifte, 2008).

1983

- Overall CV 0
- PRC CV 0
 - China discovers Pinghu oil and gas field on their side of the median line (Drifte, 2008).
- Japanese CV +2
 - Continued joint exploration with the ROK (Drifte, 2008).

1984

- Overall CV +1
- PRC CV +1
 - China considers joint development as a means to solve the sovereignty dispute (Drifte, 2008).
- Japanese CV +2
 - Continued joint exploration with the ROK (Drifte, 2008).

1992

- Overall CV -1
- PRC CV -1
 - China prepares for explorations of Pinghu oil and gas field (Drifte, 2008).
- Japanese CV N/A

1995

- Overall CV 0
- PRC CV 0
 - China finds oil at Chunxiao field group (Drifte, 2008).
- Japanese CV N/A

1996

- Overall CV -2
- PRC CV -2

- China suggests joint development, then starts drilling within Japan's claimed EEZ 570 meters from the median line. The PRC also patrols the area with naval vessels (Drifte, 2008).
- Japanese CV -1
 - Japan insists on resolution to sovereignty issue before any joint development can be undertaken (Drifte, 2008).

1998

- Overall CV -2
- PRC CV -2
 - The PRC begins full operations in disputed oil and gas field, including building pipelines to the Chinese mainland (Drifte, 2008).
- Japanese CV +1
 - Japan helps finance pipelines to the Chinese mainland via the Asia Development Bank and the then Export-Import Bank; may have been an issue of left hand not knowing what the right is doing (Drifte, 2008).

1999

- Overall CV -2
- PRC CV -2
 - China conducts naval warship maneuvers in the disputed waters (Drifte, 2008).
- Japanese CV N/A

2000

- Overall CV -2
- PRC CV -2
 - PRC continues anti-submarine maneuvers in the disputed waters (Drifte, 2008).
- Japanese CV N/A

2003

- Overall CV 0
- PRC CV 0
 - China refuses to hand over data on the Chunxiao field group to Japan (Drifte, 2008).
- Japanese CV 0
 - Japan asks China to hand over data on the Chunxiao field group (Drifte, 2008).

2004

- Overall CV -2

- PRC CV -2
 - China tries to chase away Japanese the survey vessel with warships, but also proposes joint development (Drifte, 2008).
- Japanese CV -2
 - Japan tries to survey areas near Chinese held oil and gas fields, refuses to discuss joint development until China hands over geological data on Chunxiao field group, and insists China stop development until a compromise is made (Drifte, 2008).

2005

- Overall CV -1
- PRC CV -1
 - The PRC makes proposals for joint development in bad faith, and announces it will not recognize Senkaku's EEZ as it is uninhabited (Drifte, 2008).
- Japanese CV -1
 - Japan announces intention to drill and award permits in the ECS. Furthermore they disagree with all proposals for joint development made by the PRC (Drifte, 2008).

2006

- Overall CV +1
- PRC CV +1
 - China makes an offer for joint development that meets Japan's previous demands. In addition they agree to a panel of experts and a hotline to prevent incidents (Drifte, 2008; Lai, 2007).
- Japanese CV 0
 - Japan refuses the Chinese offer for joint development that meets their previous demands, but agrees to a panel of experts and a hotline to prevent incidences. Also suggests joint development instead of resolving the EEZ dispute (Drifte, 2008; Lai, 2007).

2007

- Overall CV -2
- PRC CV -2
 - China pursues continued expansion of Chunxiao group, and makes a proposal for joint development in bad faith that is less agreeable than their previous offer (Drifte, 2008).
- Japan N/A

13.1.2 The Russian Far East Crude Oil and Natural Gas Projects

1975

- Overall CV +2
 - Sakhalin Continental Shelf Oil and Gas Exploration Project Joint Agreement is signed by Japan and USSR (Vassiliouk, 2008).
- Russia to PRC CV N/A
- Russia to Japan CV +2
 - Sakhalin Continental Shelf Oil and Gas Exploration Project Joint agreement is signed by Japan and USSR (Vassiliouk, 2008).
- PRC CV N/A
- Japanese CV +2
 - Sakhalin Continental Shelf Oil and Gas Exploration Project Joint agreement is signed by Japan and USSR (Vassiliouk, 2008).

1979

- Overall CV -2
- Political tensions cause the Sakhalin Continental Shelf Oil and Gas Exploration Project Joint agreement to fall through (Vassiliouk, 2008).
- Russia to PRC CV N/A
- Russia to Japan CV -2
- Political tensions cause the Sakhalin Continental Shelf Oil and Gas Exploration Project Joint agreement to fall through (Vassiliouk, 2008).
- PRC CV N/A
- Japanese CV -2
 - Political tensions cause the Sakhalin Continental Shelf Oil and Gas Exploration Project Joint agreement to fall through (Vassiliouk, 2008).

1996

- Overall CV +2
 - Sakhalin I & II agreements reached between Russia and overseas partners, including Japanese corporations (Campaign, 2007).
- Russia to PRC CV N/A
- Russia to Japan CV +2
 - Sakhalin I & II agreements reached between Russia and overseas partners, including Japanese corporations (Campaign, 2007).

- PRC CV N/A
- Japanese CV +2
 - Sakhalin I & II agreements reached between Russia and overseas partners, including Japanese corporations (Campaign, 2007).

1999

- Overall CV +4
 - Sakhalin II Phase I oil production begins (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008).
- Russia to PRC CV N/A
- Russia to Japan CV +4
 - Sakhalin II Phase I oil production begins (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008).
- PRC CV N/A
- Japanese CV +4
 - Sakhalin II Phase I oil production begins (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008).

2003

- Overall CV +2
 - Continued Sakhalin II Phase I production (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008). Agreements reached between Russia and China, but Russian leaders near Russian President Vladimir Putin continually voice the necessity of taxing windfall natural resource export rents so that they would be invested in Russia rather than built up overseas in wealth havens of oligarchs (Gulick, 2007).
- Russia to PRC CV +1
 - Russian President Vladimir Putin and President of the PRC Hu Jintao sign a document solidifying Russia and Chinese energy cooperation. Russia is to be China's trusted oil and gas supplier and China is to be Russia's preferred customer; this is to be the top priority between the two countries. Putin and Hu also finalize a deal between Yukos Oil Company of Russia and the Chinese National Petroleum Corporation agreeing to ship five billion barrels of oil to China from 2005 to 2030 via a yet un-built pipeline from Angarsk in to Daqing. Yukos owner Mikhail Kordovsky is later arrested in Russia for tax evasion,

embezzlement and fraud; this embarrasses China in light of their recent deal (Gulick, 2007)

➤ Russia to Japan CV N/A

➤ PRC CV +1

- Russian President Vladimir Putin and President of the PRC Hu Jintao sign a document solidifying Russia and Chinese energy cooperation. Russia is to be China's trusted oil and gas supplier and China is to be Russia's preferred customer; this is to be the top priority between the two countries. Putin and Hu also finalize a deal between Yukos Oil Company of Russia and the Chinese National Petroleum Corporations agreeing to ship five billion barrels of oil to China from 2005 to 2030 via a yet un-built pipeline from Angarsk in to Daqing (Gulick, 2007).

➤ Japanese CV N/A

2004

➤ Overall CV +2

- Even in light of Russian back and forth between China and Japan for the final route of the East Siberian Pipeline, Sakhalin II Phase I is still producing (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008), and Sakhalin II Phase II is approved (Clark, 2004).

➤ Russia to PRC CV +1

- Russia pledges to expand oil exports to China; 10 million tons in 2005 and 15 million tons in 2006 (Lai, 2007). Putin announces support for doubling rail sent oil to China within a year and to increase the deliveries to 300,000 barrels a day by 2006 (Gulick, 2007) Russia declares that it has decided on a new East Siberian Pipeline route from Taishet to Nakhodka, instead of Angarsk to Daqing (Gulick, 2007).

➤ Russia to Japan CV -1

- Russia's foreign ministry responds to Japanese Prime Minister Koizumi's visit of the disputed Kurile Islands by saying that it will not add "a constructive element in bilateral Russian-Japanese relations" (The Economist, 2004, p. 61) Russia approves of Sakhalin II Phase II (Clark, 2004) Russia declares that it has decided on a new East Siberian Pipeline route from Taishet to Nakhodka, instead of Angarsk to Daqing (Gulick, 2007).

➤ PRC CV +1

- Chinese Premier Wen Jiabao visits Moscow in pledging to invest \$12 billion in Russia's infrastructure and energy sector by 2020 and announcing official support for Russia's bid to join the World Trade Organization (Lai, 2007).
- Japanese CV -1
 - Japanese Prime Minister Koizumi sails past the four disputed Kurile Islands without landing highlighting the dispute with Russia (The Economist, 2004). Japan offers soft loans of 14 billion USD for the East Siberian Pipeline's development and 2 billion USD for explorations in east Siberia initially demanding all oil through pipeline be sent to Japan until the loans are repaid, later retracting the demand (Gulick, 2007)

2005

- Overall CV +3
 - Sakhalin I and II are both producing, even as Russia makes and breaks deals with Japan and the PRC (Clark, 2004; Petroleum Economist, 2003; Vassiliouk, 2008).
- Russia to PRC CV +2
 - Russia announces the start of the design of a branch to Daqing in China on the Taishet to Nakhodka design of the East Siberia Pipeline (Lai, 2007). The rail supply of oil from Russia to the PRC dramatically increases and Russia encourages the Chinese National Petroleum Company to purchase 20 percent of Russian oil company Rosneft which had taken over Yukos' assets (Gulick, 2007). Russia shows the first official blueprint of the new East Siberian Pipeline route stopping in Skovorodino, halfway to proposed end in Nakhodka, with the possibility of a spur to Daqing. Russia also casts doubts that the second half would be built saying it depends on oil extraction and regardless construction on the second half would not begin until at least 2012. Russian President Putin declares that when the first half of the pipeline is complete two thirds of the oil transported will be sent by rail to China and one third to Nakhodka, to be shipped to Japan and other markets (Gulick, 2007).
- Russia to Japan CV -1
 - Japan's Ministry of Economy, Trade and Industry's Agency for Natural Resources and Energy signs a memorandum of understanding with Russian gas giant Gazprom to set stage for energy cooperation (The Economist, 2006; Vassiliouk, 2008). Gazprom begins trying to buy controlling interests of Sakhalin II when the proposed cost is project to double to 20 billion USD which would delay Russian

returns as the investors get to subtract costs from profits used to determine Russian royalties until their costs are paid off. The companies involved in Sakhalin II are left off the short list for developing the Shtokman gas field (Wood, 2007). Russia shows the first official blueprint of the new East Siberian Pipeline route stopping in Skovorodino, halfway to proposed end in Nakhodka, with the possibility of a spur to Daqing. Russia also casts doubts that the second half would be built saying it depends on oil extraction and regardless construction on the second half would not begin until at least 2012. Russian President Putin declares that when the first half of the pipeline is complete two thirds of the oil transported will be sent by rail to China and one third to Nakhodka, to be shipped to Japan and other markets (Gulick, 2007).

- PRC CV +2
 - Chinese National Petroleum Company to purchase 20 percent of Russian oil company Rosneft which had taken over Yukos' assets (Gulick, 2007).
- Japanese CV +1
 - Japan's Ministry of Economy, Trade and Industry's Agency for Natural Resources and Energy signs a memorandum of understanding with Russian gas giant Gazprom to set stage for energy cooperation (The Economist, 2006; Vassiliouk, 2008).

2006

- Overall CV -2
 - Construction on the first section of the East Siberian Pipeline begins (Gulick, 2007). Threats and effective revocations of Sakhalin II permits make investors wary of other projects and threaten to inflate the price of natural gas (Campaign, 2007; The Economist, 2006; The Economist, 2007; Turkeltaub & Bailey, 2007; Watkins, 2006; Watkins, 2007b; Wood, 2007). Japanese attempts to tie funding to other conflicts (Gulick, 2007).
- Russia to PRC CV N/A
- Russia to Japan CV -2
 - Russia threatens to revoke permits for Sakhalin II on the basis of environmental infractions (Campaign, 2007; Watkins, 2006). Russia backtracks declaring no intent to revoke the permits a few weeks later (Watkins, "A softer tone on Sakhalin-2", 2006) Gazprom announces it will develop the Shtokman gas field on its own after spending years tantalizing foreign companies (The Economist, 2006;

Wood, 2007). Russian Foreign Minister Victor Khistenko assures Japanese Foreign Minister Taro Aso that Russian promises made to Japan regarding the supply of natural gas from Sakhalin II would be kept (Watkins, "Japan voices gas concerns", 2007b).

➤ PRC CV N/A

➤ Japanese CV -1

- Then Chief Cabinet Secretary Shinzo Abe said the decision to revoke Sakhalin II permits could have a negative impact on overall Japanese-Russian relations (Watkins, "A softer tone on Sakhalin-2", 2006). The companies involved in the Sakhalin II development project sell controlling stakes to Gazprom (The Economist, 2006; The Economist, 2007; Turkeltaub & Bailey, 2007; Watkins, 2007b). Japanese Foreign Minister Taro Aso asks Russian Energy Minister Victor Khistenko to verify that Sakhalin II gas supply promises made to Japan would still be kept (Watkins, 2007b). Japan tries to make soft loans for the East Siberian Pipeline contingent on solving the Kurile Island dispute (Gulick, 2007).

13.1.3 The Korean Nuclear Crisis

1993

- Overall CV -1
- Russian CV N/A
- PRC CV N/A
- Japanese CV N/A
- PDRK CV -1
 - North Korea says they will withdraw from the Nuclear Nonproliferation Treaty, but then reverses (CNN.com, 2004) (BBC NEWS, 2007; CNN.com, 2004).
- ROK CV N/A

1994

- Overall CV +2
- Russian CV N/A
- PRC CV N/A
- Japanese CV +2
 - Japan agrees to supply the aid stipulated in the PDRK-US agreement (BBC NEWS, 2007; Brooke, 2004; CNN.com, 2004).
- PDRK CV +2
 - North Korea signs an agreement with the US to freeze and dismantle their nuclear program in exchange for aid to build 2 nuclear power reactors and heavy fuel aid. (BBC NEWS, 2007; Brooke, 2004; CNN.com, 2004)
- ROK CV +2
 - The ROK agrees to supply the aid stipulated in the PDRK-US agreement (BBC NEWS, 2007; Brooke, 2004; CNN.com, 2004).

1998

- Overall CV -3
- Russian CV N/A
- PRC CV N/A
- Japanese CV N/A
- PDRK CV -3
 - North Korea fires a missile over Japan into the ocean to show their ability to hit anywhere in Japan. They also begin the first round of talks with the US over their suspected underground nuclear facility (BBC NEWS, 2007; CNN.com, 2004).

➤ ROK CV N/A

1999

➤ Overall CV +1

➤ Russian CV N/A

➤ PRC CV N/A

➤ Japanese CV N/A

➤ PDRK CV +1

- North Korea agrees to freeze missile tests in exchange for easing of US sanctions (BBC NEWS, 2007; CNN.com, 2004)

➤ ROK CV N/A

2000

➤ Overall CV -1

➤ Russian CV N/A

➤ PRC CV N/A

➤ Japanese CV N/A

➤ PDRK CV -1

- North Korea declares they will restart their nuclear program if the US doesn't compensate them for the loss of electricity caused by delays in building the nuclear power plants (BBC NEWS, 2007; CNN.com, 2004).

➤ ROK CV N/A

2001

➤ Overall CV -1

➤ Russian CV N/A

➤ PRC CV N/A

➤ Japanese CV N/A

➤ PDRK CV -1

- North Korea declares they might resume missile tests if the US refuses to normalize relations (BBC NEWS, 2007; CNN.com, 2004).

➤ ROK CV N/A

2002

➤ Overall CV -2

➤ Russian CV N/A

➤ PRC CV N/A

➤ Japanese CV -1

- Japan alts shipments of oil to PDRK for having violated the 1994 agreement to stop their nuclear program, Koizumi travels to Pyongyang for a summit with Kim Jong-Il (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PDRK CV -2
 - North Korea admits to having operated a secret nuclear program since 1994, removes inspectors and seals cameras in nuclear facilities, and kicks out International Atomic Energy Agency inspectors (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- ROK CV -2
 - South Korea halts shipments of oil to PDRK for having violated the 1994 agreement to stop their nuclear program (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

2003

- Overall CV -2
- Russian CV +1
 - Russian Foreign Minister Losyukov visits Pyongyang to mediate on behalf of Russia, and takes part in first round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PRC CV +1
 - China hosts three-way talks in Beijing with US and PDRK, and takes part in first round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- Japanese CV -1
 - Japan takes part in first round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PDRK CV -3
 - North Korea test fires 2 land-to-ship missiles into the Sea of Japan, withdraws from Nuclear Nonproliferation Treaty, declares they have reactivated their nuclear power plants, takes part in three-way talks in Beijing with US and PRC, and takes part in first round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- ROK CV +1
 - South Korea takes part in first round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

2004

- Overall CV +1
 - Further 6 party talks postponed indefinitely as US and PDRK blame each other for refusing to cooperate (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- Russian CV +1
 - Russia takes part in second round of 6 party talks in Beijing which ends in little progress other than agreeing to meet again, and takes part in third round of six party talks (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PRC CV +1
 - China takes part in second round of 6 party talks in Beijing which ends in little progress other than agreeing to meet again, and takes part in third round of six party talks (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- Japanese CV +1
 - Japan takes part in second round of 6 party talks in Beijing which ends in little progress other than agreeing to meet again, and takes part in third round of six party talks (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PDRK CV +1
 - North Korea takes part in second round of 6 party talks in Beijing which ends in little progress other than agreeing to meet again, takes part in third round of six party talks, refuses to attend working meeting in preparation of the fourth round of six party talks, and offers to freeze its nuclear program in exchange for reduced sanctions and removal from US list of state supporters of terrorism (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- ROK CV +1
 - South Korea takes part in second round of 6 party talks in Beijing which ends in little progress other than agreeing to meet again, and takes part in third round of six party talks (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

2005

- Overall CV +1
- Russian CV +1
 - Russia takes part in fourth round of 6 part talks in Beijing which ends in a joint statement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PRC CV +1

- China takes part in fourth round of 6 part talks in Beijing which ends in a joint statement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- Japanese CV +1
 - Japan takes part in fourth round of 6 part talks in Beijing which ends in a joint statement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PDRK CV 0
 - North Korea declares that they will increase its nuclear weapons arsenal in response to its claims that the US is attempting to topple its regime, claims to have finished extracting 80,000 fuel rods from its Yongbyon reactor and that it has a stockpile of nuclear weapons which they are increasing. Also takes part in fourth round of 6 part talks in Beijing during which it says it is willing to work towards denuclearization of the Korean Peninsula and ends in a joint statement, but releases an interpretive statement following a US release of their interpretive statement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- ROK CV +1
 - South Korea takes part in fourth round of 6 part talks in Beijing which ends in a joint statement (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

2006

- Overall CV -3
- Russian CV +1
 - Russia takes part in fifth round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PRC CV +1
 - China takes part in fifth round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- Japanese CV +1
 - Japan takes part in fifth round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).
- PDRK CV -3
 - North Korea test fires 7 missiles in defiance of international warnings including a long-range Taepodong-2 rocket believed capable of reaching the US, leading to UN Security Council sanction against them, and tests a nuclear weapon leading to UN Security Council call for states to block supply of major weapons, hardware

or technology for WMDs and of luxury goods. Also takes part in the fifth round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

- ROK CV +1
 - South Korea takes part in fifth round of 6 party talks in Beijing (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007).

2007

- Overall CV +1
- Russian CV +1
 - Russia takes part in fifth round of 6 party talks in Beijing which ends in Joint agreement of 3 phases and 5 working groups to end the conflict, and takes part in first and second sessions of sixth round of 6 party talks in Beijing after working groups have met (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007; Watkins, 2007a).
- PRC CV +1
 - China takes part in fifth round of 6 party talks in Beijing which ends in Joint agreement of 3 phases and 5 working groups to end the conflict, and takes part in first and second sessions of sixth round of 6 party talks in Beijing after working groups have met (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007; Watkins, 2007a).
- Japanese CV +1
- Japan takes part in fifth round of 6 party talks in Beijing which ends in Joint agreement of 3 phases and 5 working groups to end the conflict, and takes part in first and second sessions of sixth round of 6 party talks in Beijing after working groups have met (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007; Watkins, 2007a).
- PDRK CV +1
 - North Korea takes part in fifth round of 6 party talks in Beijing which ends in Joint agreement of 3 phases and 5 working groups to end the conflict, and announces plans for second nuclear test if a financial dispute with the US is not resolved. Also takes part in first and second sessions of sixth round of 6 party talks in Beijing after working groups have met and during which it agrees to take first steps toward disarmament and shut down its nuclear reactor within 60 days before eventually dismantling its nuclear weapons program in exchange for oil (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007; Watkins, 2007a).
- ROK CV +1

- South Korea takes part in fifth round of 6 party talks in Beijing which ends in Joint agreement of 3 phases and 5 working groups to end the conflict, and takes part in first and second sessions of sixth round of 6 party talks in Beijing after working groups have met (BBC NEWS, 2007; CNN.com, 2004; Rozman, 2007; Watkins, 2007a).

13.2 Comprehensive Tables of Crude Oil and Natural Gas Statistics

Table 13-1—Crude Oil Prices

Year	Price
1969	10.23
1970	9.65
1971	11.53
1972	12.36
1973	15.42
1974	48.92
1975	44.64
1976	46.84
1977	47.83
1978	44.77
1979	90.68
1980	93.08
1981	82.25
1982	71.08
1983	61.73
1984	56.14
1985	53.21
1986	27.22
1987	33.64
1988	26.24
1989	30.47
1990	37.82
1991	30.57
1992	28.65
1993	24.52
1994	22.37
1995	23.40
1996	27.54
1997	24.97
1998	16.69
1999	22.74
2000	34.92
2001	29.03
2002	29.06
2003	32.51
2004	42.02
2005	57.90
2006	67.03
2007	72.39

Table 13-2—Crude Oil Consumption (Thousands of Barrels/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	4480	404	3323	UA	130	8337
1970	4940	559	3922	UA	163	9583
1971	5245	759	4336	UA	184	10523
1972	5675	871	4625	UA	191	11362
1973	6119	1067	5324	UA	236	12745
1974	6736	1226	5127	UA	244	13333
1975	7065	1353	4840	UA	278	13535
1976	7217	1546	5033	UA	310	14107
1977	7538	1638	5185	UA	371	14733
1978	7969	1825	5425	UA	426	15645
1979	8117	1833	5487	UA	480	15917
1980	8494	1694	4936	48.00	475	15647
1981	8600	1616	4693	51.00	473	15434
1982	8545	1601	4396	52.00	471	15066
1983	8428	1642	4391	57.00	497	15016
1984	8414	1700	4619	60.00	500	15293
1985	8535	1825	4435	64.46	537	15397
1986	5086	1941	4495	67.91	588	12178
1987	5131	2062	4503	68.58	620	12385
1988	5080	2211	4804	64.70	739	12899
1989	5192	2340	5005	63.92	854	13456
1990	5129	2323	5304	73.21	1038	13867
1991	4999	2524	5411	76.48	1254	14266
1992	4597	2740	5522	73.97	1518	14450
1993	3875	3051	5441	71.66	1675	14114
1994	3359	3116	5746	69.65	1840	14130
1995	3025	3395	5784	63.15	2009	14277
1996	2686	3702	5813	47.84	2144	14392
1997	2689	4179	5762	40.41	2373	15043
1998	2554	4228	5525	35.00	2030	14373
1999	2625	4477	5618	29.99	2178	14928
2000	2583	4772	5577	25.38	2229	15186
2001	2566	4872	5435	22.51	2235	15130
2002	2606	5288	5359	24.53	2282	15559
2003	2622	5803	5455	24.52	2300	16204
2004	2619	6772	5281	24.02	2283	16978
2005	2601	6984	5358	18.62	2308	17270
2006	2709	7530	5224	16.50	2318	17797
2007	2699	7855	5051	16.000	2371	17992

Table 13-3—Crude Oil Consumption (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	45.83	4.13	33.99	UA	1.33	85.28
1970	47.67	5.39	37.85	UA	1.57	92.49
1971	60.48	8.75	50.00	UA	2.12	121.34
1972	70.15	10.77	57.17	UA	2.36	140.45
1973	94.36	16.45	82.11	UA	3.64	196.57
1974	329.50	59.99	250.79	UA	11.94	652.21
1975	315.37	60.38	216.05	UA	12.39	604.20
1976	338.07	72.43	235.74	UA	14.54	660.77
1977	360.57	78.34	248.02	UA	17.76	704.70
1978	356.72	81.69	242.85	UA	19.07	700.33
1979	736.07	166.25	497.56	UA	43.55	1443.43
1980	790.64	157.70	459.39	4.47	44.26	1456.46
1981	707.38	132.93	386.01	4.19	38.92	1269.44
1982	607.43	113.83	312.51	3.70	33.47	1070.94
1983	520.28	101.38	271.08	3.52	30.65	926.91
1984	472.33	95.41	259.29	3.37	28.08	858.47
1985	454.13	97.09	236.00	3.43	28.58	819.23
1986	138.42	52.84	122.35	1.85	16.00	331.46
1987	172.61	69.37	151.49	2.31	20.87	416.64
1988	133.31	58.03	126.08	1.70	19.38	338.50
1989	158.22	71.32	152.51	1.95	26.04	410.03
1990	193.98	87.84	200.61	2.77	39.28	524.48
1991	152.82	77.16	165.42	2.34	38.34	436.07
1992	131.70	78.50	158.21	2.12	43.50	414.03
1993	95.01	74.81	133.41	1.76	41.07	346.06
1994	75.15	69.72	128.56	1.56	41.17	316.16
1995	70.79	79.43	135.35	1.48	47.00	334.06
1996	73.98	101.96	160.10	1.32	59.06	396.42
1997	67.14	104.33	143.84	1.01	59.25	375.57
1998	42.62	70.56	92.21	0.58	33.88	239.85
1999	59.69	101.79	127.74	0.68	49.52	339.42
2000	90.19	166.63	194.72	0.89	77.82	530.25
2001	74.50	141.44	157.78	0.65	64.89	439.26
2002	75.72	153.66	155.72	0.71	66.32	452.13
2003	85.24	188.65	177.34	0.80	74.78	526.81
2004	110.02	284.54	221.88	1.01	95.92	713.37
2005	150.62	404.36	310.22	1.08	133.61	999.88
2006	181.57	504.75	350.16	1.11	155.37	1192.96
2007	195.38	568.58	365.64	1.16	171.67	1302.43

Table 13-4—Crude Oil Production (Thousands of Barrels/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	6566.00	435.99	0.00	0.00	0.00	7001.99
1970	7126.75	614.68	0.00	0.00	0.00	7741.43
1971	7610.46	790.36	0.00	0.00	0.00	8400.82
1972	8064.13	913.40	0.00	0.00	0.00	8977.53
1973	8664.42	1075.14	0.00	0.00	0.00	9739.56
1974	9270.41	1300.55	0.00	0.00	0.00	10570.96
1975	9915.98	1545.42	0.00	0.00	0.00	11461.41
1976	10465.60	1743.20	0.00	0.00	0.00	12208.80
1977	11009.91	1877.93	0.00	0.00	0.00	12887.85
1978	11530.75	2086.70	0.00	0.00	0.00	13617.46
1979	11805.42	2128.82	0.00	0.00	0.00	13934.24
1980	12116.41	2119.00	0.00	0.00	0.00	14235.41
1981	12260.25	2029.95	0.00	0.00	0.00	14290.20
1982	12329.79	2048.00	0.00	0.00	0.00	14377.78
1983	12403.43	2127.21	0.00	0.00	0.00	14530.65
1984	12296.68	2292.20	0.00	0.00	0.00	14588.88
1985	10904.15	2504.84	0.00	0.00	0.00	13408.99
1986	11305.51	2620.96	0.00	0.00	0.00	13926.48
1987	11483.72	2690.15	0.00	0.00	0.00	14173.87
1988	11444.04	2741.00	0.00	0.00	0.00	14185.04
1989	11134.50	2760.34	0.00	0.00	0.00	13894.85
1990	10404.56	2773.78	0.00	0.00	0.00	13178.34
1991	9326.30	2827.53	0.00	0.00	0.00	12153.83
1992	8038.17	2840.80	0.00	0.00	0.00	10878.97
1993	7172.73	2888.49	0.00	0.00	0.00	10061.22
1994	6419.07	2929.60	0.00	0.00	0.00	9348.68
1995	6288.24	2988.57	0.00	0.00	0.00	9276.81
1996	6113.77	3170.40	0.00	0.00	0.00	9284.17
1997	6226.87	3211.37	0.00	0.00	0.00	9438.24
1998	6168.52	3212.38	0.00	0.00	0.00	9380.90
1999	6177.86	3213.18	0.00	0.00	0.00	9391.04
2000	6536.02	3252.40	0.00	0.00	0.00	9788.42
2001	7056.07	3305.63	0.00	0.00	0.00	10361.71
2002	7698.16	3346.46	0.00	0.00	0.00	11044.63
2003	8544.18	3400.99	0.00	0.00	0.00	11945.17
2004	9287.06	3481.02	0.00	0.00	0.00	12768.08
2005	9552.00	3626.69	0.00	0.00	0.00	13178.69
2006	9769.39	3683.58	0.00	0.00	0.00	13452.97
2007	9978.02	3743.37	0.00	0.00	0.00	13721.39

Table 13-5—Yearly Required Imports of Crude Oil (Thousands of Barrels/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	-2086	-32	3323	UA	130	1335
1970	-2187	-56	3922	UA	163	1841
1971	-2366	-31	4336	UA	184	2123
1972	-2390	-42	4625	UA	191	2384
1973	-2546	-9	5324	UA	236	3006
1974	-2535	-74	5127	UA	244	2762
1975	-2851	-193	4840	UA	278	2073
1976	-3248	-197	5033	UA	310	1898
1977	-3472	-240	5185	UA	371	1845
1978	-3562	-262	5425	UA	426	2027
1979	-3688	-296	5487	UA	480	1983
1980	-3622	-425	4936	48	475	1412
1981	-3660	-414	4693	51	473	1143
1982	-3784	-447	4396	52	471	688
1983	-3975	-485	4391	57	497	485
1984	-3883	-593	4619	60	500	704
1985	-2369	-680	4435	64	537	1988
1986	-6220	-680	4495	68	588	-1749
1987	-6353	-628	4503	69	620	-1789
1988	-6364	-530	4804	65	739	-1286
1989	-5942	-420	5005	64	854	-439
1990	-5276	-451	5304	73	1038	689
1991	-4327	-303	5411	76	1254	2112
1992	-3442	-101	5522	74	1518	3571
1993	-3298	163	5441	72	1675	4052
1994	-3060	186	5746	70	1840	4781
1995	-3263	406	5784	63	2009	5000
1996	-3428	531	5813	48	2144	5108
1997	-3537	967	5762	40	2373	5605
1998	-3614	1016	5525	35	2030	4992
1999	-3553	1264	5618	30	2178	5537
2000	-3953	1520	5577	25	2229	5397
2001	-4490	1566	5435	23	2235	4768
2002	-5093	1941	5359	25	2282	4514
2003	-5922	2402	5455	25	2300	4259
2004	-6668	3291	5281	24	2283	4210
2005	-6951	3357	5358	19	2308	4091
2006	-7061	3846	5224	17	2318	4344
2007	-7279	4111	5051	16	2371	4271

Table 13-6—Yearly Required Imports of Crude Oil (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	-21.33	-0.33	33.99	UA	1.33	13.66
1970	-21.11	-0.54	37.85	UA	1.57	17.77
1971	-27.28	-0.36	50.00	UA	2.12	24.48
1972	-29.54	-0.52	57.17	UA	2.36	29.47
1973	-39.26	-0.13	82.11	UA	3.64	46.36
1974	-124.00	-3.64	250.79	UA	11.94	135.09
1975	-127.29	-8.60	216.05	UA	12.39	92.55
1976	-152.15	-9.23	235.74	UA	14.54	88.89
1977	-166.05	-11.48	248.02	UA	17.76	88.25
1978	-159.45	-11.72	242.85	UA	19.07	90.74
1979	-334.47	-26.80	497.56	UA	43.55	179.84
1980	-337.15	-39.54	459.39	4.47	44.26	131.43
1981	-301.05	-34.04	386.01	4.19	38.92	94.04
1982	-269.00	-31.75	312.51	3.70	33.47	48.93
1983	-245.38	-29.93	271.08	3.52	30.65	29.94
1984	-217.95	-33.27	259.29	3.37	28.08	39.51
1985	-126.06	-36.18	236.00	3.43	28.58	105.77
1986	-169.29	-18.50	122.35	1.85	16.00	-47.60
1987	-213.71	-21.13	151.49	2.31	20.87	-60.17
1988	-167.01	-13.90	126.08	1.70	19.38	-33.75
1989	-181.06	-12.80	152.51	1.95	26.04	-13.37
1990	-199.54	-17.07	200.61	2.77	39.28	26.05
1991	-132.26	-9.28	165.42	2.34	38.34	64.55
1992	-98.61	-2.89	158.21	2.12	43.50	102.32
1993	-80.86	3.99	133.41	1.76	41.07	99.36
1994	-68.48	4.17	128.56	1.56	41.17	106.98
1995	-76.35	9.50	135.35	1.48	47.00	116.99
1996	-94.42	14.64	160.10	1.32	59.06	140.70
1997	-88.31	24.15	143.84	1.01	59.25	139.94
1998	-60.32	16.95	92.21	0.58	33.88	83.31
1999	-80.77	28.73	127.74	0.68	49.52	125.90
2000	-138.03	53.06	194.72	0.89	77.82	188.46
2001	-130.35	45.47	157.78	0.65	64.89	138.44
2002	-147.99	56.41	155.72	0.71	66.32	131.18
2003	-192.54	78.08	177.34	0.80	74.78	138.46
2004	-280.19	138.28	221.88	1.01	95.92	176.90
2005	-402.42	194.39	310.22	1.08	133.61	236.87
2006	-473.30	257.82	350.16	1.11	155.37	291.16
2007	-526.92	297.60	365.64	1.16	171.67	309.15

Table 13-7—Natural Gas Prices

Year	Price (USD/1000 Cubic feet)
1969	UA
1970	UA
1971	UA
1972	UA
1973	UA
1974	UA
1975	UA
1976	UA
1977	UA
1978	UA
1979	UA
1980	UA
1981	UA
1982	UA
1983	UA
1984	UA
1985	5.23
1986	4.10
1987	3.35
1988	3.34
1989	3.28
1990	3.64
1991	3.99
1992	3.62
1993	3.52
1994	3.18
1995	3.46
1996	3.66
1997	3.91
1998	3.05
1999	3.14
2000	4.72
2001	4.64
2002	4.27
2003	4.77
2004	5.18
2005	6.05
2006	7.14
2007	7.73

Table 13-8—Natural Gas Consumption (Billions of Cubic Feet/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	16.4	0.2	0.2	0	0.0	17
1970	18.1	0.3	0.3	0	0.0	19
1971	19.7	0.4	0.4	0	0.0	20
1972	20.7	0.5	0.4	0	0.0	22
1973	22.6	0.6	0.5	0	0.0	24
1974	23.9	0.7	0.7	0	0.0	25
1975	26.1	0.9	0.8	0	0.0	28
1976	28.7	1.0	1.0	0	0.0	31
1977	30.8	1.2	1.2	0	0.0	33
1978	32.8	1.3	1.7	0	0.0	36
1979	34.9	1.4	2.0	0	0.0	38
1980	35.8	1.4	2.3	0	0.0	40
1981	38.0	1.2	2.3	0	0.0	42
1982	41.1	1.2	2.4	0	0.0	45
1983	44.0	1.2	2.6	0	0.0	48
1984	47.9	1.2	3.4	0	0.0	53
1985	34.9	1.3	3.7	0	0.0	40
1986	35.4	1.3	3.8	0	0.1	41
1987	37.4	1.3	3.9	0	0.2	43
1988	39.4	1.4	4.1	0	0.3	45
1989	40.0	1.5	4.3	0	0.3	46
1990	40.7	1.5	4.7	0	0.3	47
1991	41.7	1.5	4.9	0	0.4	49
1992	40.3	1.5	5.1	0	0.5	47
1993	40.3	1.6	5.1	0	0.6	48
1994	37.8	1.7	5.5	0	0.8	46
1995	36.6	1.7	5.6	0	1.0	45
1996	36.7	1.8	6.0	0	1.3	46
1997	33.9	1.9	6.2	0	1.6	44
1998	35.3	2.0	6.4	0	1.5	45
1999	35.2	2.1	6.7	0	1.8	46
2000	36.4	2.4	7.0	0	2.0	48
2001	36.1	2.7	7.2	0	2.2	48
2002	37.6	2.8	7.0	0	2.5	50
2003	38.0	3.3	7.7	0	2.6	52
2004	38.8	3.8	7.4	0	3.0	53
2005	39.2	4.5	7.6	0	3.3	55
2006	41.8	5.4	8.1	0	3.4	59
2007	42.5	6.5	8.7	0	3.6	61

Table 13-9—Natural Gas Consumption (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	UA	UA	UA	UA	UA	UA
1971	UA	UA	UA	UA	UA	UA
1972	UA	UA	UA	UA	UA	UA
1973	UA	UA	UA	UA	UA	UA
1974	UA	UA	UA	UA	UA	UA
1975	UA	UA	UA	UA	UA	UA
1976	UA	UA	UA	UA	UA	UA
1977	UA	UA	UA	UA	UA	UA
1978	UA	UA	UA	UA	UA	UA
1979	UA	UA	UA	UA	UA	UA
1980	UA	UA	UA	UA	UA	UA
1981	UA	UA	UA	UA	UA	UA
1982	UA	UA	UA	UA	UA	UA
1983	UA	UA	UA	UA	UA	UA
1984	UA	UA	UA	UA	UA	UA
1985	182.937	6.5486	19.3844	0	0	209
1986	145.016	5.46103	15.4562	0	0.2051	166
1987	125.264	4.50204	12.9456	0	0.75772	143
1988	131.433	4.6278	13.6521	0	0.97326	151
1989	131.35	4.76974	13.9641	0	0.92736	151
1990	147.968	5.37073	16.9301	0	1.18293	171
1991	166.409	6.13421	19.6222	0	1.50213	194
1992	145.743	5.54668	18.4579	0	1.77787	172
1993	141.692	5.70793	18.1218	0	2.16564	168
1994	120.257	5.33566	17.5083	0	2.60428	146
1995	126.473	5.93904	19.3877	0	3.42686	155
1996	134.163	6.52897	21.822	0	4.77611	167
1997	132.547	7.39354	24.2647	0	6.21761	170
1998	107.633	5.97774	19.4997	0	4.53725	138
1999	110.468	6.52994	21.0842	0	5.68753	144
2000	171.804	11.1593	32.9222	0	9.57605	225
2001	167.302	12.3142	33.3379	0	10.3688	223
2002	160.667	12.0569	30.0154	0	10.6033	213
2003	181.332	15.6489	36.8159	0	12.4064	246
2004	200.856	19.8284	38.4892	0	15.7445	275
2005	237.144	27.3728	45.981	0	19.7426	330
2006	298.43	38.7746	57.8359	0	24.5601	420
2007	328.175	50.3324	67.4839	0	27.6558	474

Table 13-10—Natural Gas Production (Billions of Cubic Feet/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	17.9	0.3	0	0	0	18
1971	19.2	0.4	0	0	0	20
1972	19.9	0.5	0	0	0	20
1973	21.3	0.6	0	0	0	22
1974	23.5	0.7	0	0	0	24
1975	26.1	0.9	0	0	0	27
1976	28.9	1.0	0	0	0	30
1977	31.2	1.2	0	0	0	32
1978	33.6	1.3	0	0	0	35
1979	36.7	1.4	0	0	0	38
1980	39.2	1.4	0	0	0	41
1981	42.0	1.2	0	0	0	43
1982	45.2	1.2	0	0	0	46
1983	48.3	1.2	0	0	0	50
1984	52.9	1.2	0	0	0	54
1985	41.7	1.3	0	0	0	43
1986	45.4	1.3	0	0	0	47
1987	49.1	1.3	0	0	0	50
1988	53.1	1.4	0	0	0	54
1989	55.6	1.5	0	0	0	57
1990	57.9	1.5	0	0	0	59
1991	58.0	1.5	0	0	0	60
1992	57.6	1.5	0	0	0	59
1993	55.8	1.6	0	0	0	57
1994	54.8	1.7	0	0	0	57
1995	53.7	1.7	0	0	0	55
1996	54.1	1.9	0	0	0	56
1997	51.5	2.2	0	0	0	54
1998	53.3	2.3	0	0	0	56
1999	53.3	2.4	0	0	0	56
2000	52.6	2.6	0	0	0	55
2001	52.5	2.9	0	0	0	55
2002	53.7	3.2	0	0	0	57
2003	56.0	3.4	0	0	0	59
2004	57.0	4.0	0	0	0	61
2005	57.9	4.8	0	0	0	63
2006	59.2	5.7	0	0	0	65
2007	58.8	6.7	0	0	0	65

Table 13-11—Yearly Required Imports of Natural Gas (Billions of Cubic Feet/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	0.2	0.0	0.3	0.0	0.0	1
1971	0.6	0.0	0.4	0.0	0.0	1
1972	0.8	0.0	0.4	0.0	0.0	1
1973	1.2	0.0	0.5	0.0	0.0	2
1974	0.4	0.0	0.7	0.0	0.0	1
1975	0.0	0.0	0.8	0.0	0.0	1
1976	-0.2	0.0	1.0	0.0	0.0	1
1977	-0.4	0.0	1.2	0.0	0.0	1
1978	-0.8	0.0	1.7	0.0	0.0	1
1979	-1.8	0.0	2.0	0.0	0.0	0
1980	-3.3	0.0	2.3	0.0	0.0	-1
1981	-3.9	0.0	2.3	0.0	0.0	-2
1982	-4.1	0.0	2.4	0.0	0.0	-2
1983	-4.3	0.0	2.6	0.0	0.0	-2
1984	-4.9	0.0	3.4	0.0	0.0	-2
1985	-6.8	0.0	3.7	0.0	0.0	-3
1986	-10.0	0.0	3.8	0.0	0.1	-6
1987	-11.7	0.0	3.9	0.0	0.2	-8
1988	-13.7	0.0	4.1	0.0	0.3	-9
1989	-15.5	0.0	4.3	0.0	0.3	-11
1990	-17.2	0.0	4.7	0.0	0.3	-12
1991	-16.3	0.0	4.9	0.0	0.4	-11
1992	-17.4	0.0	5.1	0.0	0.5	-12
1993	-15.5	0.0	5.1	0.0	0.6	-10
1994	-17.0	0.0	5.5	0.0	0.8	-11
1995	-17.2	0.0	5.6	0.0	1.0	-11
1996	-17.5	-0.2	6.0	0.0	1.3	-10
1997	-17.6	-0.3	6.2	0.0	1.6	-10
1998	-18.1	-0.3	6.4	0.0	1.5	-10
1999	-18.1	-0.4	6.7	0.0	1.8	-10
2000	-16.2	-0.3	7.0	0.0	2.0	-7
2001	-16.4	-0.3	7.2	0.0	2.2	-7
2002	-16.1	-0.3	7.0	0.0	2.5	-7
2003	-18.0	-0.1	7.7	0.0	2.6	-8
2004	-18.2	-0.2	7.4	0.0	3.0	-8
2005	-18.7	-0.2	7.6	0.0	3.3	-8
2006	-17.4	-0.2	8.1	0.0	3.4	-6
2007	-16.3	-0.2	8.7	0.0	3.6	-4

Table 13-12—Yearly Required Imports of Natural Gas (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	UA	UA	UA	UA	UA	UA
1971	UA	UA	UA	UA	UA	UA
1972	UA	UA	UA	UA	UA	UA
1973	UA	UA	UA	UA	UA	UA
1974	UA	UA	UA	UA	UA	UA
1975	UA	UA	UA	UA	UA	UA
1976	UA	UA	UA	UA	UA	UA
1977	UA	UA	UA	UA	UA	UA
1978	UA	UA	UA	UA	UA	UA
1979	UA	UA	UA	UA	UA	UA
1980	UA	UA	UA	UA	UA	UA
1981	UA	UA	UA	UA	UA	UA
1982	UA	UA	UA	UA	UA	UA
1983	UA	UA	UA	UA	UA	UA
1984	UA	UA	UA	UA	UA	UA
1985	-35.3	0.0	19.4	0.0	0.0	-16
1986	-41.2	0.0	15.5	0.0	0.2	-26
1987	-39.3	0.0	12.9	0.0	0.8	-26
1988	-45.9	0.0	13.7	0.0	1.0	-31
1989	-50.9	0.0	14.0	0.0	0.9	-36
1990	-62.6	0.0	16.9	0.0	1.2	-45
1991	-65.1	0.2	19.6	0.0	1.5	-44
1992	-62.9	0.0	18.5	0.0	1.8	-43
1993	-54.6	0.0	18.1	0.0	2.2	-34
1994	-54.0	-0.1	17.5	0.0	2.6	-34
1995	-59.5	-0.1	19.4	0.0	3.4	-37
1996	-64.0	-0.6	21.8	0.0	4.8	-38
1997	-68.9	-1.2	24.3	0.0	6.2	-40
1998	-55.1	-0.9	19.5	0.0	4.5	-32
1999	-56.9	-1.1	21.1	0.0	5.7	-31
2000	-76.4	-1.2	32.9	0.0	9.6	-35
2001	-76.2	-1.3	33.3	0.0	10.4	-34
2002	-68.8	-1.4	30.0	0.0	10.6	-30
2003	-85.7	-0.5	36.8	0.0	12.4	-37
2004	-94.5	-0.9	38.5	0.0	15.7	-41
2005	-112.9	-1.5	46.0	0.0	19.7	-49
2006	-124.3	-1.7	57.8	0.0	24.6	-44
2007	-126.1	-1.5	67.5	0.0	27.7	-32

Table 13-13—Yearly Consumption of Oil and Gas Combined (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	UA	UA	UA	UA	UA	UA
1971	UA	UA	UA	UA	UA	UA
1972	UA	UA	UA	UA	UA	UA
1973	UA	UA	UA	UA	UA	UA
1974	UA	UA	UA	UA	UA	UA
1975	UA	UA	UA	UA	UA	UA
1976	UA	UA	UA	UA	UA	UA
1977	UA	UA	UA	UA	UA	UA
1978	UA	UA	UA	UA	UA	UA
1979	UA	UA	UA	UA	UA	UA
1980	UA	UA	UA	UA	UA	UA
1981	UA	UA	UA	UA	UA	UA
1982	UA	UA	UA	UA	UA	UA
1983	UA	UA	UA	UA	UA	UA
1984	UA	UA	UA	UA	UA	UA
1985	637.1	103.6	255.4	3.4	28.6	1028.1
1986	283.4	58.3	137.8	1.8	16.2	497.6
1987	297.9	73.9	164.4	2.3	21.6	560.1
1988	264.7	62.7	139.7	1.7	20.4	489.2
1989	289.6	76.1	166.5	1.9	27.0	561.0
1990	341.9	93.2	217.5	2.8	40.5	695.9
1991	319.2	83.3	185.0	2.3	39.8	629.7
1992	277.4	84.1	176.7	2.1	45.3	585.6
1993	236.7	80.5	151.5	1.8	43.2	513.7
1994	195.4	75.1	146.1	1.6	43.8	461.9
1995	197.3	85.4	154.7	1.5	50.4	489.3
1996	208.1	108.5	181.9	1.3	63.8	563.7
1997	199.7	111.7	168.1	1.0	65.5	546.0
1998	150.3	76.5	111.7	0.6	38.4	377.5
1999	170.2	108.3	148.8	0.7	55.2	483.2
2000	262.0	177.8	227.6	0.9	87.4	755.7
2001	241.8	153.8	191.1	0.7	75.3	662.6
2002	236.4	165.7	185.7	0.7	76.9	665.5
2003	266.6	204.3	214.2	0.8	87.2	773.0
2004	310.9	304.4	260.4	1.0	111.7	988.3
2005	387.8	431.7	356.2	1.1	153.3	1330.1
2006	480.0	543.5	408.0	1.1	179.9	1612.6
2007	523.6	618.9	433.1	1.2	199.3	1776.1

Table 13-14—Yealy Required Import of Oil and Gas Combined (Millions of USD/Day)

Year	Russia	PRC	Japan	DPRK	ROK	NEA
1969	UA	UA	UA	UA	UA	UA
1970	UA	UA	UA	UA	UA	UA
1971	UA	UA	UA	UA	UA	UA
1972	UA	UA	UA	UA	UA	UA
1973	UA	UA	UA	UA	UA	UA
1974	UA	UA	UA	UA	UA	UA
1975	UA	UA	UA	UA	UA	UA
1976	UA	UA	UA	UA	UA	UA
1977	UA	UA	UA	UA	UA	UA
1978	UA	UA	UA	UA	UA	UA
1979	UA	UA	UA	UA	UA	UA
1980	UA	UA	UA	UA	UA	UA
1981	UA	UA	UA	UA	UA	UA
1982	UA	UA	UA	UA	UA	UA
1983	UA	UA	UA	UA	UA	UA
1984	UA	UA	UA	UA	UA	UA
1985	-161.4	-36.2	255.4	3.4	28.6	89.8
1986	-210.5	-18.5	137.8	1.8	16.2	-73.1
1987	-253.0	-21.1	164.4	2.3	21.6	-85.8
1988	-212.9	-13.9	139.7	1.7	20.4	-65.0
1989	-232.0	-12.8	166.5	1.9	27.0	-49.4
1990	-262.2	-17.1	217.5	2.8	40.5	-18.5
1991	-197.4	-9.1	185.0	2.3	39.8	20.7
1992	-161.5	-2.9	176.7	2.1	45.3	59.7
1993	-135.5	4.0	151.5	1.8	43.2	65.0
1994	-122.5	4.1	146.1	1.6	43.8	73.0
1995	-135.8	9.4	154.7	1.5	50.4	80.3
1996	-158.4	14.1	181.9	1.3	63.8	102.7
1997	-157.2	23.0	168.1	1.0	65.5	100.3
1998	-115.4	16.1	111.7	0.6	38.4	51.4
1999	-137.7	27.6	148.8	0.7	55.2	94.6
2000	-214.4	51.8	227.6	0.9	87.4	153.3
2001	-206.6	44.2	191.1	0.7	75.3	104.6
2002	-216.8	55.0	185.7	0.7	76.9	101.6
2003	-278.3	77.6	214.2	0.8	87.2	101.5
2004	-374.7	137.4	260.4	1.0	111.7	135.7
2005	-515.3	192.9	356.2	1.1	153.3	188.2
2006	-597.6	256.2	408.0	1.1	179.9	247.6
2007	-653.0	296.1	433.1	1.2	199.3	276.7

Table 13-15—ECS Conflict to Oil and Natural Gas Correlations

Year	PRC CV	Japanese CV	Overall CV
1969			
1970	-2	1	-1
1971			
1972			
1973			
1974	0	1	1
1975			
1976			
1977		-1	-1
1978	0	0	0
1979			
1980		2	0
1981		2	0
1982		2	0
1983	0	2	0
1984	1	2	1
1985		2	0
1986		2	0
1987			
1988			
1989			
1990			
1991			
1992	-1		-1
1993			
1994			
1995	0		0
1996	-2	-1	-2
1997			
1998	-2	0	-2
1999	-2		-2
2000	-2		-2
2001			
2002			
2003	0	0	0
2004	-2	-2	-2
2005	-1	-1	-1
2006	1	0	1
2007	-2		-2

Correlation	Coefficient
PRC CV to Oil Prices	0.46
PRC CV to Japanese Oil Consumption (Volume)	-0.15
PRC CV to Japanese Oil Consumption (Value)	0.43
PRC CV to Required Japanese Oil Imports (Volume)	-0.15
PRC CV to Required Japanese Oil Imports (Value)	0.43
PRC CV to PRC Oil Consumption (Volume)	-0.20
PRC CV to PRC Oil Consumption (Value)	0.02
PRC CV to Required PRC Oil Imports (Volume)	-0.20
PRC CV to Required PRC Oil Imports (Value)	-0.10
PRC CV to Gas Prices	0.26
PRC CV to Japanese Gas Consumption (Volume)	-0.25
PRC CV to Japanese Gas Consumption (Value)	0.22
PRC CV to Required Japanese Gas Imports (Volume)	-0.25
PRC CV to Required Japanese Gas Imports (Value)	0.22
PRC CV to PRC Gas Consumption (Volume)	-0.07
PRC CV to PRC Gas Consumption (Value)	0.21
PRC CV to Required PRC Gas Imports (Volume)	0.50
PRC CV to Required PRC Gas Imports (Value)	0.08
PRC CV to Japanese Oil and Gas Combined Consumption (Value)	0.26
PRC CV to Japanese Oil and Gas Combined Required Imports (Value)	0.26
PRC CV to PRC Oil and Gas Combined Consumption (Value)	0.23
PRC CV to PRC Oil and Gas Combined Required Imports (Value)	0.22
Japanese CV to Oil Prices	0.38
Japanese CV to Japanese Oil Consumption (Volume)	-0.75
Japanese CV to Japanese Oil Consumption (Value)	0.23
Japanese CV to Required Japanese Oil Imports (Volume)	-0.75
Japanese CV to Required Japanese Oil Imports (Value)	0.23
Japanese CV to PRC Oil Consumption (Volume)	-0.67
Japanese CV to PRC Oil Consumption (Value)	-0.43
Japanese CV to Required PRC Oil Imports (Volume)	-0.70
Japanese CV to Required PRC Oil Imports (Value)	-0.63
Japanese CV to Gas Prices	-0.11
Japanese CV to Japanese Gas Consumption (Volume)	-0.54
Japanese CV to Japanese Gas Consumption (Value)	-0.50
Japanese CV to Required Japanese Gas Imports (Volume)	-0.54
Japanese CV to Required Japanese Gas Imports (Value)	-0.50
Japanese CV to PRC Gas Consumption (Volume)	-0.58
Japanese CV to PRC Gas Consumption (Value)	-0.41
Japanese CV to Required PRC Gas Imports (Volume)	0.66

Correlation	Coefficient
Japanese CV to Required PRC Gas Imports (Value)	0.63
Japanese CV to Japanese Oil and Gas Combined Consumption (Value)	-0.27
Japanese CV to Japanese Oil and Gas Combined Required Imports (Value)	-0.27
Japanese CV to PRC Oil and Gas Combined Consumption (Value)	-0.46
Japanese CV to PRC Oil and Gas Combined Required Imports (Value)	-0.56
Overall CV to Oil Prices	0.40
Overall CV to Japanese Oil Consumption (Volume)	-0.40
Overall CV to Japanese Oil Consumption (Value)	0.35
Overall CV to Required Japanese Oil Imports (Volume)	-0.40
Overall CV to Required Japanese Oil Imports (Value)	0.35
Overall CV to PRC Oil Consumption (Volume)	-0.40
Overall CV to PRC Oil Consumption (Value)	-0.13
Overall CV to Required PRC Oil Imports (Volume)	-0.37
Overall CV to Required PRC Oil Imports (Value)	-0.26
Overall CV to Gas Prices	0.23
Overall CV to Japanese Gas Consumption (Volume)	-0.25
Overall CV to Japanese Gas Consumption (Value)	0.03
Overall CV to Required Japanese Gas Imports (Volume)	-0.46
Overall CV to Required Japanese Gas Imports (Value)	0.03
Overall CV to PRC Gas Consumption (Volume)	-0.07
Overall CV to PRC Gas Consumption (Value)	0.06
Overall CV to Required PRC Gas Imports (Volume)	0.62
Overall CV to Required PRC Gas Imports (Value)	0.29
Overall CV to Japanese Oil and Gas Combined Consumption (Value)	0.16
Overall CV to Japanese Oil and Gas Combined Required Imports (Value)	0.16
Overall CV to PRC Oil and Gas Combined Consumption (Value)	0.06
Overall CV to PRC Oil and Gas Combined Required Imports (Value)	0.00
Japanese CV to PRC CV	0.55

Table 13-16—Sakhalin I, II and Siberian Pipeline Conflicts to Oil and Natural Gas Correlations

Year	Russia to PRC CV	Russia to Japan CV	PRC CV	Japanese CV	Overall CV
1975		2		2	2
1876		-2		-2	-2
1977					
1978					
1979					
1980					
1981					
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996		2		2	2
1997					
1998					
1999		4		4	4
2000					
2001					
2002					
2003	1		1		2
2004	1	-1	1	-1	2
2005	2	-1	2	1	3
2006		-2		-1	-2
2007					

Correlation	Coefficient
Russia to PRC CV to Required Total NEA Gas Imports (Value)	-0.94
Russia to PRC CV to Total NEA Oil and Gas Combined Consumption (Value)	0.92
Russia to PRC CV to Total NEA Oil and Gas Combined Required Imports (Value)	0.92
Russia to Japan CV to Oil Prices	-0.82
Russia to Japan CV to Gas Prices	-0.94
Russia to Japan CV to Russian Oil Consumption (Volume)	-0.09
Russia to Japan CV to Russian Oil Consumption (Value)	-0.40
Russia to Japan CV to Required Russian Oil Imports (Volume)	0.62
Russia to Japan CV to Required Russian Oil Imports (Value)	0.73
Russia to Japan CV to Russian Gas Consumption (Volume)	-0.28
Russia to Japan CV to Russian Gas Consumption (Value)	-0.93
Russia to Japan CV to Required Russian Gas Imports (Volume)	-0.08
Russia to Japan CV to Required Russian Gas Imports (Value)	0.95
Russia to Japan CV to Russian Oil and Gas Combined Consumption (Value)	-0.93
Russia to Japan CV to Russian Oil and Gas Combined Required Imports (Value)	0.93
Russia to Japan CV to PRC Oil Consumption (Volume)	-0.36
Russia to Japan CV to PRC Oil Consumption (Value)	-0.61
Russia to Japan CV to Required PRC Oil Imports (Volume)	-0.47
Russia to Japan CV to Required PRC Oil Imports (Value)	-0.57
Russia to Japan CV to PRC Gas Consumption (Volume)	-0.51
Russia to Japan CV to PRC Gas Consumption (Value)	-0.90
Russia to Japan CV to Required PRC Gas Imports (Volume)	-0.28
Russia to Japan CV to Required PRC Gas Imports (Value)	0.53
Russia to Japan CV to PRC Oil and Gas Combined Consumption (Value)	-0.91
Russia to Japan CV to PRC Oil and Gas Combined Required Imports (Value)	-0.91
Russia to Japan CV to Japanese Oil Consumption (Volume)	0.43
Russia to Japan CV to Japanese Oil Consumption (Value)	-0.82
Russia to Japan CV to Required Japanese Oil Imports (Volume)	0.43
Russia to Japan CV to Required Japanese Oil Imports (Value)	-0.82
Russia to Japan CV to Japanese Gas Consumption (Volume)	-0.08
Russia to Japan CV to Japanese Gas Consumption (Value)	-0.92
Russia to Japan CV to Required Japanese Gas Imports (Volume)	-0.08
Russia to Japan CV to Required Japanese Gas Imports (Value)	-0.92
Russia to Japan CV to Japanese Oil and Gas Combined Consumption (Value)	-0.91
Russia to Japan CV to Japanese Oil and Gas Combined Required Imports (Value)	-0.91
Russia to Japan CV to Total NEA Oil Consumption (Volume)	-0.56
Russia to Japan CV to Total NEA Oil Consumption (Value)	-0.80
Russia to Japan CV to Required Total NEA Oil Imports (Volume)	0.40
Russia to Japan CV to Required Total NEA Oil Imports (Value)	-0.50

Correlation	Coefficient
Russia to Japan CV to Total NEA Gas Consumption (Volume)	-0.09
Russia to Japan CV to Total NEA Gas Consumption (Value)	-0.81
Russia to Japan CV to Required Total NEA Gas Imports (Volume)	-0.42
Russia to Japan CV to Required Total NEA Gas Imports (Value)	0.69
Russia to Japan CV to Total NEA Oil and Gas Combined Consumption (Value)	-0.77
Russia to Japan CV to Total NEA Oil and Gas Combined Required Imports (Value)	-0.70
PRC CV to Oil Prices	0.93
PRC CV to Gas Prices	0.95
PRC CV to Russian Oil Consumption (Volume)	-0.99
PRC CV to Russian Oil Consumption (Value)	0.93
PRC CV to Required Russian Oil Imports (Volume)	-0.71
PRC CV to Required Russian Oil Imports (Value)	-0.91
PRC CV to Russian Gas Consumption (Volume)	0.77
PRC CV to Russian Gas Consumption (Value)	0.94
PRC CV to Required Russian Gas Imports (Volume)	-0.92
PRC CV to Required Russian Gas Imports (Value)	-0.95
PRC CV to Russian Oil and Gas Combined Consumption (Value)	0.93
PRC CV to Russian Oil and Gas Combined Required Imports (Value)	-0.91
PRC CV to PRC Oil Consumption (Volume)	0.64
PRC CV to PRC Oil Consumption (Value)	0.90
PRC CV to Required PRC Oil Imports (Volume)	0.55
PRC CV to Required PRC Oil Imports (Value)	0.86
PRC CV to PRC Gas Consumption (Volume)	0.90
PRC CV to PRC Gas Consumption (Value)	0.94
PRC CV to Required PRC Gas Imports (Volume)	-0.88
PRC CV to Required PRC Gas Imports (Value)	-0.92
PRC CV to PRC Oil and Gas Combined Consumption (Value)	0.90
PRC CV to PRC Oil and Gas Combined Required Imports (Value)	0.86
PRC CV to Japanese Oil Consumption (Volume)	-0.06
PRC CV to Japanese Oil Consumption (Value)	0.94
PRC CV to Required Japanese Oil Imports (Volume)	-0.06
PRC CV to Required Japanese Oil Imports (Value)	0.94
PRC CV to Japanese Gas Consumption (Volume)	0.10
PRC CV to Japanese Gas Consumption (Value)	0.99
PRC CV to Required Japanese Gas Imports (Volume)	0.10
PRC CV to Required Japanese Gas Imports (Value)	0.99
PRC CV to Japanese Oil and Gas Combined Consumption (Value)	0.95

Correlation	Coefficient
PRC CV to Japanese Oil and Gas Combined Required Imports (Value)	0.95
PRC CV to Total NEA Oil Consumption (Volume)	0.71
PRC CV to Total NEA Oil Consumption (Value)	0.92
PRC CV to Required Total NEA Oil Imports (Volume)	-0.96
PRC CV to Required Total NEA Oil Imports (Value)	0.92
PRC CV to Total NEA Gas Consumption (Volume)	0.87
PRC CV to Total NEA Gas Consumption (Value)	0.94
PRC CV to Required Total NEA Gas Imports (Volume)	-0.75
PRC CV to Required Total NEA Gas Imports (Value)	-0.94
PRC CV to Total NEA Oil and Gas Combined Consumption (Value)	0.92
PRC CV to Total NEA Oil and Gas Combined Required Imports (Value)	0.92
Japanese CV to Oil Prices	-0.65
Japanese CV to Gas Prices	-0.82
Japanese CV to Russian Oil Consumption (Volume)	-0.24
Japanese CV to Russian Oil Consumption (Value)	-0.47
Japanese CV to Required Russian Oil Imports (Volume)	0.42
Japanese CV to Required Russian Oil Imports (Value)	0.51
Japanese CV to Russian Gas Consumption (Volume)	-0.11
Japanese CV to Russian Gas Consumption (Value)	-0.82
Japanese CV to Required Russian Gas Imports (Volume)	-0.23
Japanese CV to Required Russian Gas Imports (Value)	0.81
Japanese CV to Russian Oil and Gas Combined Consumption (Value)	-0.80
Japanese CV to Russian Oil and Gas Combined Required Imports (Value)	0.78
Japanese CV to PRC Oil Consumption (Volume)	-0.17
Japanese CV to PRC Oil Consumption (Value)	-0.39
Japanese CV to Required PRC Oil Imports (Volume)	-0.27
Japanese CV to Required PRC Oil Imports (Value)	-0.36
Japanese CV to PRC Gas Consumption (Volume)	-0.30
Japanese CV to PRC Gas Consumption (Value)	-0.77
Japanese CV to Required PRC Gas Imports (Volume)	-0.45
Japanese CV to Required PRC Gas Imports (Value)	0.31
Japanese CV to PRC Oil and Gas Combined Consumption (Value)	-0.77
Japanese CV to PRC Oil and Gas Combined Required Imports (Value)	-0.78
Japanese CV to Japanese Oil Consumption (Volume)	0.48
Japanese CV to Japanese Oil Consumption (Value)	-0.63
Japanese CV to Required Japanese Oil Imports (Volume)	0.05
Japanese CV to Required Japanese Oil Imports (Value)	-0.63
Japanese CV to Japanese Gas Consumption (Volume)	0.09

Correlation	Coefficient
Japanese CV to Japanese Gas Consumption (Value)	-0.80
Japanese CV to Required Japanese Gas Imports (Volume)	0.09
Japanese CV to Required Japanese Gas Imports (Value)	-0.80
Japanese CV to Japanese Oil and Gas Combined Consumption (Value)	-0.75
Japanese CV to Japanese Oil and Gas Combined Required Imports (Value)	-0.75
Japanese CV to Total NEA Oil Consumption (Volume)	-0.36
Japanese CV to Total NEA Oil Consumption (Value)	-0.60
Japanese CV to Required Total NEA Oil Imports (Volume)	0.49
Japanese CV to Required Total NEA Oil Imports (Value)	-0.27
Japanese CV to Total NEA Gas Consumption (Volume)	-0.09
Japanese CV to Total NEA Gas Consumption (Value)	-0.81
Japanese CV to Required Total NEA Gas Imports (Volume)	-0.42
Japanese CV to Required Total NEA Gas Imports (Value)	0.69
Japanese CV to Total NEA Oil and Gas Combined Consumption (Value)	-0.77
Japanese CV to Total NEA Oil and Gas Combined Required Imports (Value)	-0.70
Overall CV to Oil Prices	-0.60
Overall CV to Gas Prices	-0.74
Overall CV to Russian Oil Consumption (Volume)	-0.41
Overall CV to Russian Oil Consumption (Value)	-0.59
Overall CV to Required Russian Oil Imports (Volume)	0.08
Overall CV to Required Russian Oil Imports (Value)	0.36
Overall CV to Russian Gas Consumption (Volume)	0.07
Overall CV to Russian Gas Consumption (Value)	-0.77
Overall CV to Required Russian Gas Imports (Volume)	-0.41
Overall CV to Required Russian Gas Imports (Value)	0.67
Overall CV to Russian Oil and Gas Combined Consumption (Value)	-0.75
Overall CV to Russian Oil and Gas Combined Required Imports (Value)	0.66
Overall CV to PRC Oil Consumption (Volume)	0.09
Overall CV to PRC Oil Consumption (Value)	-0.24
Overall CV to Required PRC Oil Imports (Volume)	0.01
Overall CV to Required PRC Oil Imports (Value)	-0.20
Overall CV to PRC Gas Consumption (Volume)	-0.10
Overall CV to PRC Gas Consumption (Value)	-0.75
Overall CV to Required PRC Gas Imports (Volume)	-0.44
Overall CV to Required PRC Gas Imports (Value)	0.39
Overall CV to PRC Oil and Gas Combined Consumption (Value)	-0.69
Overall CV to PRC Oil and Gas Combined Required Imports (Value)	-0.68
Overall CV to Japanese Oil Consumption (Volume)	0.46

Correlation	Coefficient
Overall CV to Japanese Oil Consumption (Value)	-0.57
Overall CV to Required Japanese Oil Imports (Volume)	0.46
Overall CV to Required Japanese Oil Imports (Value)	-0.57
Overall CV to Japanese Gas Consumption (Volume)	0.28
Overall CV to Japanese Gas Consumption (Value)	-0.74
Overall CV to Required Japanese Gas Imports (Volume)	0.28
Overall CV to Required Japanese Gas Imports (Value)	-0.74
Overall CV to Japanese Oil and Gas Combined Consumption (Value)	-0.69
Overall CV to Japanese Oil and Gas Combined Required Imports (Value)	-0.69
Overall CV to Total NEA Oil Consumption (Volume)	-0.09
Overall CV to Total NEA Oil Consumption (Value)	-0.52
Overall CV to Required Total NEA Oil Imports (Volume)	0.49
Overall CV to Required Total NEA Oil Imports (Value)	-0.21
Overall CV to Total NEA Gas Consumption (Volume)	0.11
Overall CV to Total NEA Gas Consumption (Value)	-0.76
Overall CV to Required Total NEA Gas Imports (Volume)	-0.54
Overall CV to Required Total NEA Gas Imports (Value)	0.38
Overall CV to Total NEA Oil and Gas Combined Consumption (Value)	-0.71
Overall CV to Total NEA Oil and Gas Combined Required Imports (Value)	-0.75
Overall CV to ROK Oil Consumption (Volume)	0.35
Overall CV to ROK Oil Consumption (Value)	-0.57
Overall CV to Required ROK Oil Imports (Volume)	0.35
Overall CV to Required ROK Oil Imports (Value)	-0.09
Overall CV to ROK Gas Consumption (Volume)	0.13
Overall CV to ROK Gas Consumption (Value)	-0.67
Overall CV to Required ROK Gas Imports (Volume)	0.13
Overall CV to Required ROK Gas Imports (Value)	-0.67
Overall CV to ROK Oil and Gas Combined Consumption (Value)	-0.68
Overall CV to ROK Oil and Gas Combined Required Imports (Value)	-0.68

Table 13-17—Korean Nuclear Crisis to Oil and Natural Gas Correlations

Year	Russian CV	PRC CV	Japanese CV	DPRK CV	ROK CV	Overall CV
1993				-1		-1
1994			2	2	2	2
1995						
1996						
1997						
1998				-3		-3
1999				1		1
2000				-1		-1
2001				-1		-1
2002			-1	-2	-2	-2
2003	1	1	1	-3	1	-2
2004	1	1	1	1	1	1
2005	1	1	1	0	1	1
2006	1	1	1	-3	1	-3
2007	1	1	1	1	1	1

Correlation	Coefficient
Russian CV to Oil Prices	No Value (Flat Line)
Russian CV to Gas Prices	No Value (Flat Line)
Russian CV to Russian Oil Consumption (Volume)	No Value (Flat Line)
Russian CV to Russian Oil Consumption (Value)	No Value (Flat Line)
Russian CV to Required Russian Oil Imports (Volume)	No Value (Flat Line)
Russian CV to Required Russian Oil Imports (Value)	No Value (Flat Line)
Russian CV to Russian Gas Consumption (Volume)	No Value (Flat Line)
Russian CV to Russian Gas Consumption (Value)	No Value (Flat Line)
Russian CV to Required Russian Gas Imports (Volume)	No Value (Flat Line)
Russian CV to Required Russian Gas Imports (Value)	No Value (Flat Line)
Russian CV to Russian Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
Russian CV to Russian Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
Russian CV to PRC Oil Consumption (Volume)	No Value (Flat Line)

Correlation	Coefficient
Russian CV to PRC Oil Consumption (Value)	No Value (Flat Line)
Russian CV to Required PRC Oil Imports (Volume)	No Value (Flat Line)
Russian CV to Required PRC Oil Imports (Value)	No Value (Flat Line)
Russian CV to PRC Gas Consumption (Volume)	No Value (Flat Line)
Russian CV to PRC Gas Consumption (Value)	No Value (Flat Line)
Russian CV to Required PRC Gas Imports (Volume)	No Value (Flat Line)
Russian CV to Required PRC Gas Imports (Value)	No Value (Flat Line)
Russian CV to PRC Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
Russian CV to PRC Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
Russian CV to Japanese Oil Consumption (Volume)	No Value (Flat Line)
Russian CV to Japanese Oil Consumption (Value)	No Value (Flat Line)
Russian CV to Required Japanese Oil Imports (Volume)	No Value (Flat Line)
Russian CV to Required Japanese Oil Imports (Value)	No Value (Flat Line)
Russian CV to Japanese Gas Consumption (Volume)	No Value (Flat Line)
Russian CV to Japanese Gas Consumption (Value)	No Value (Flat Line)
Russian CV to Required Japanese Gas Imports (Volume)	No Value (Flat Line)
Russian CV to Required Japanese Gas Imports (Value)	No Value (Flat Line)
Russian CV to Japanese Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
Russian CV to Japanese Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
Russian CV to DPRK Oil Consumption (Volume)	No Value (Flat Line)
Russian CV to DPRK Oil Consumption (Value)	No Value (Flat Line)
Russian CV to Required DPRK Oil Imports (Volume)	No Value (Flat Line)
Russian CV to Required DPRK Oil Imports (Value)	No Value (Flat Line)
Russian CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)

Correlation	Coefficient
Russian CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
Russian CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)
Russian CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
Russian CV to DPRK Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
Russian CV to DPRK Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
Russian CV to ROK Oil Consumption (Volume)	No Value (Flat Line)
Russian CV to ROK Oil Consumption (Value)	No Value (Flat Line)
Russian CV to Required ROK Oil Imports (Volume)	No Value (Flat Line)
Russian CV to Required ROK Oil Imports (Value)	No Value (Flat Line)
Russian CV to ROK Gas Consumption (Volume)	No Value (Flat Line)
Russian CV to ROK Gas Consumption (Value)	No Value (Flat Line)
Russian CV to Required ROK Gas Imports (Volume)	No Value (Flat Line)
Russian CV to Required ROK Gas Imports (Value)	No Value (Flat Line)
Russian CV to ROK Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
Russian CV to ROK Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
PRC CV to Oil Prices	No Value (Flat Line)
PRC CV to Gas Prices	No Value (Flat Line)
PRC CV to Russian Oil Consumption (Volume)	No Value (Flat Line)
PRC CV to Russian Oil Consumption (Value)	No Value (Flat Line)
PRC CV to Required Russian Oil Imports (Volume)	No Value (Flat Line)
PRC CV to Required Russian Oil Imports (Value)	No Value (Flat Line)
PRC CV to Russian Gas Consumption (Volume)	No Value (Flat Line)
PRC CV to Russian Gas Consumption (Value)	No Value (Flat Line)

Correlation	Coefficient
PRC CV to Required Russian Gas Imports (Volume)	No Value (Flat Line)
PRC CV to Required Russian Gas Imports (Value)	No Value (Flat Line)
PRC CV to Russian Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
PRC CV to Russian Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
PRC CV to PRC Oil Consumption (Volume)	No Value (Flat Line)
PRC CV to PRC Oil Consumption (Value)	No Value (Flat Line)
PRC CV to Required PRC Oil Imports (Volume)	No Value (Flat Line)
PRC CV to Required PRC Oil Imports (Value)	No Value (Flat Line)
PRC CV to PRC Gas Consumption (Volume)	No Value (Flat Line)
PRC CV to PRC Gas Consumption (Value)	No Value (Flat Line)
PRC CV to Required PRC Gas Imports (Volume)	No Value (Flat Line)
PRC CV to Required PRC Gas Imports (Value)	No Value (Flat Line)
PRC CV to PRC Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
PRC CV to PRC Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
PRC CV to Japanese Oil Consumption (Volume)	No Value (Flat Line)
PRC CV to Japanese Oil Consumption (Value)	No Value (Flat Line)
PRC CV to Required Japanese Oil Imports (Volume)	No Value (Flat Line)
PRC CV to Required Japanese Oil Imports (Value)	No Value (Flat Line)
PRC CV to Japanese Gas Consumption (Volume)	No Value (Flat Line)
PRC CV to Japanese Gas Consumption (Value)	No Value (Flat Line)
PRC CV to Required Japanese Gas Imports (Volume)	No Value (Flat Line)
PRC CV to Required Japanese Gas Imports (Value)	No Value (Flat Line)
PRC CV to Japanese Oil and Gas Combined Consumption (Value)	No Value (Flat Line)

Correlation	Coefficient
PRC CV to Japanese Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
PRC CV to DPRK Oil Consumption (Volume)	No Value (Flat Line)
PRC CV to DPRK Oil Consumption (Value)	No Value (Flat Line)
PRC CV to Required DPRK Oil Imports (Volume)	No Value (Flat Line)
PRC CV to Required DPRK Oil Imports (Value)	No Value (Flat Line)
PRC CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)
PRC CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
PRC CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)
PRC CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
PRC CV to DPRK Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
PRC CV to DPRK Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
PRC CV to ROK Oil Consumption (Volume)	No Value (Flat Line)
PRC CV to ROK Oil Consumption (Value)	No Value (Flat Line)
PRC CV to Required ROK Oil Imports (Volume)	No Value (Flat Line)
PRC CV to Required ROK Oil Imports (Value)	No Value (Flat Line)
PRC CV to ROK Gas Consumption (Volume)	No Value (Flat Line)
PRC CV to ROK Gas Consumption (Value)	No Value (Flat Line)
PRC CV to Required ROK Gas Imports (Volume)	No Value (Flat Line)
PRC CV to Required ROK Gas Imports (Value)	No Value (Flat Line)
PRC CV to ROK Oil and Gas Combined Consumption (Value)	No Value (Flat Line)
PRC CV to ROK Oil and Gas Combined Required Imports (Value)	No Value (Flat Line)
Japanese CV to Oil Prices	0.10
Japanese CV to Gas Prices	0.01
Japanese CV to Russian Oil Consumption (Volume)	0.60
Japanese CV to Russian Oil Consumption (Value)	0.18

Correlation	Coefficient
Japanese CV to Required Russian Oil Imports (Volume)	0.14
Japanese CV to Required Russian Oil Imports (Value)	-0.08
Japanese CV to Russian Gas Consumption (Volume)	0.18
Japanese CV to Russian Gas Consumption (Value)	0.04
Japanese CV to Required Russian Gas Imports (Volume)	-0.41
Japanese CV to Required Russian Gas Imports (Value)	-0.08
Japanese CV to Russian Oil and Gas Combined Consumption (Value)	0.10
Japanese CV to Russian Oil and Gas Combined Required Imports (Value)	-0.08
Japanese CV to PRC Oil Consumption (Volume)	-0.14
Japanese CV to PRC Oil Consumption (Value)	0.07
Japanese CV to Required PRC Oil Imports (Volume)	-0.13
Japanese CV to Required PRC Oil Imports (Value)	0.06
Japanese CV to PRC Gas Consumption (Volume)	0.00
Japanese CV to PRC Gas Consumption (Value)	0.06
Japanese CV to Required PRC Gas Imports (Volume)	0.84
Japanese CV to Required PRC Gas Imports (Value)	0.53
Japanese CV to PRC Oil and Gas Combined Consumption (Value)	0.07
Japanese CV to PRC Oil and Gas Combined Required Imports (Value)	0.07
Japanese CV to Japanese Oil Consumption (Volume)	0.33
Japanese CV to Japanese Oil Consumption (Value)	0.12
Japanese CV to Required Japanese Oil Imports (Volume)	0.33
Japanese CV to Required Japanese Oil Imports (Value)	0.12
Japanese CV to Japanese Gas Consumption (Volume)	-0.20
Japanese CV to Japanese Gas Consumption (Value)	-0.01
Japanese CV to Required Japanese Gas Imports (Volume)	-0.20
Japanese CV to Required Japanese Gas Imports (Value)	-0.01
Japanese CV to Japanese Oil and Gas Combined Consumption (Value)	0.10
Japanese CV to Japanese Oil and Gas Combined Required Imports (Value)	0.10
Japanese CV to DPRK Oil Consumption (Volume)	0.47
Japanese CV to DPRK Oil Consumption (Value)	0.80
Japanese CV to Required DPRK Oil Imports (Volume)	0.47
Japanese CV to Required DPRK Oil Imports (Value)	0.80
Japanese CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)
Japanese CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
Japanese CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)

Correlation	Coefficient
Japanese CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
Japanese CV to DPRK Oil and Gas Combined Consumption (Value)	0.80
Japanese CV to DPRK Oil and Gas Combined Required Imports (Value)	0.80
Japanese CV to ROK Oil Consumption (Volume)	-0.49
Japanese CV to ROK Oil Consumption (Value)	0.05
Japanese CV to Required ROK Oil Imports (Volume)	-0.49
Japanese CV to Required ROK Oil Imports (Value)	0.05
Japanese CV to ROK Gas Consumption (Volume)	-0.28
Japanese CV to ROK Gas Consumption (Value)	-0.05
Japanese CV to Required ROK Gas Imports (Volume)	-0.28
Japanese CV to Required ROK Gas Imports (Value)	-0.05
Japanese CV to ROK Oil and Gas Combined Consumption (Value)	0.04
Japanese CV to ROK Oil and Gas Combined Required Imports (Value)	0.04
DPRK CV to Oil Prices	0.07
DPRK CV to Gas Prices	-0.03
DPRK CV to Russian Oil Consumption (Volume)	0.23
DPRK CV to Russian Oil Consumption (Value)	0.11
DPRK CV to Required Russian Oil Imports (Volume)	0.08
DPRK CV to Required Russian Oil Imports (Value)	-0.04
DPRK CV to Russian Gas Consumption (Volume)	0.06
DPRK CV to Russian Gas Consumption (Value)	-0.01
DPRK CV to Required Russian Gas Imports (Volume)	-0.03
DPRK CV to Required Russian Gas Imports (Value)	0.03
DPRK CV to Russian Oil and Gas Combined Consumption (Value)	0.04
DPRK CV to Russian Oil and Gas Combined Required Imports (Value)	-0.03
DPRK CV to PRC Oil Consumption (Volume)	-0.07
DPRK CV to PRC Oil Consumption (Value)	0.05
DPRK CV to Required PRC Oil Imports (Volume)	-0.05
DPRK CV to Required PRC Oil Imports (Value)	0.04
DPRK CV to PRC Gas Consumption (Volume)	0.02
DPRK CV to PRC Gas Consumption (Value)	0.04
DPRK CV to Required PRC Gas Imports (Volume)	0.21
DPRK CV to Required PRC Gas Imports (Value)	0.17
DPRK CV to PRC Oil and Gas Combined Consumption (Value)	0.05
DPRK CV to PRC Oil and Gas Combined Required Imports (Value)	0.04
DPRK CV to Japanese Oil Consumption (Volume)	0.13
DPRK CV to Japanese Oil Consumption (Value)	0.07
DPRK CV to Required Japanese Oil Imports (Volume)	0.13

Correlation	Coefficient
DPRK CV to Required Japanese Oil Imports (Value)	0.07
DPRK CV to Japanese Gas Consumption (Volume)	-0.14
DPRK CV to Japanese Gas Consumption (Value)	-0.03
DPRK CV to Required Japanese Gas Imports (Volume)	-0.14
DPRK CV to Required Japanese Gas Imports (Value)	-0.03
DPRK CV to Japanese Oil and Gas Combined Consumption (Value)	0.06
DPRK CV to Japanese Oil and Gas Combined Required Imports (Value)	0.06
DPRK CV to DPRK Oil Consumption (Volume)	0.26
DPRK CV to DPRK Oil Consumption (Value)	0.39
DPRK CV to Required DPRK Oil Imports (Volume)	0.26
DPRK CV to Required DPRK Oil Imports (Value)	0.39
DPRK CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)
DPRK CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
DPRK CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)
DPRK CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
DPRK CV to DPRK Oil and Gas Combined Consumption (Value)	0.39
DPRK CV to DPRK Oil and Gas Combined Required Imports (Value)	0.39
DPRK CV to ROK Oil Consumption (Volume)	-0.14
DPRK CV to ROK Oil Consumption (Value)	0.05
DPRK CV to Required ROK Oil Imports (Volume)	-0.14
DPRK CV to Required ROK Oil Imports (Value)	0.05
DPRK CV to ROK Gas Consumption (Volume)	-0.10
DPRK CV to ROK Gas Consumption (Value)	-0.03
DPRK CV to Required ROK Gas Imports (Volume)	-0.10
DPRK CV to Required ROK Gas Imports (Value)	-0.03
DPRK CV to ROK Oil and Gas Combined Consumption (Value)	0.04
DPRK CV to ROK Oil and Gas Combined Required Imports (Value)	0.04
ROK CV to Oil Prices	0.19
ROK CV to Gas Prices	0.11
ROK CV to Russian Oil Consumption (Volume)	0.50
ROK CV to Russian Oil Consumption (Value)	0.26
ROK CV to Required Russian Oil Imports (Volume)	0.02
ROK CV to Required Russian Oil Imports (Value)	-0.17
ROK CV to Russian Gas Consumption (Volume)	0.25
ROK CV to Russian Gas Consumption (Value)	0.13
ROK CV to Required Russian Gas Imports (Volume)	-0.47

Correlation	Coefficient
ROK CV to Required Russian Gas Imports (Value)	-0.18
ROK CV to Russian Oil and Gas Combined Consumption (Value)	0.18
ROK CV to Russian Oil and Gas Combined Required Imports (Value)	-0.17
ROK CV to PRC Oil Consumption (Volume)	-0.03
ROK CV to PRC Oil Consumption (Value)	0.16
ROK CV to Required PRC Oil Imports (Volume)	-0.02
ROK CV to Required PRC Oil Imports (Value)	0.16
ROK CV to PRC Gas Consumption (Volume)	0.10
ROK CV to PRC Gas Consumption (Value)	0.15
ROK CV to Required PRC Gas Imports (Volume)	0.80
ROK CV to Required PRC Gas Imports (Value)	0.46
ROK CV to PRC Oil and Gas Combined Consumption (Value)	0.16
ROK CV to PRC Oil and Gas Combined Required Imports (Value)	0.16
ROK CV to Japanese Oil Consumption (Volume)	0.23
ROK CV to Japanese Oil Consumption (Value)	0.21
ROK CV to Required Japanese Oil Imports (Volume)	0.23
ROK CV to Required Japanese Oil Imports (Value)	0.21
ROK CV to Japanese Gas Consumption (Volume)	-0.09
ROK CV to Japanese Gas Consumption (Value)	0.09
ROK CV to Required Japanese Gas Imports (Volume)	-0.09
ROK CV to Required Japanese Gas Imports (Value)	0.09
ROK CV to Japanese Oil and Gas Combined Consumption (Value)	0.19
ROK CV to Japanese Oil and Gas Combined Required Imports (Value)	0.19
ROK CV to DPRK Oil Consumption (Volume)	0.36
ROK CV to DPRK Oil Consumption (Value)	0.75
ROK CV to Required DPRK Oil Imports (Volume)	0.36
ROK CV to Required DPRK Oil Imports (Value)	0.75
ROK CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)
ROK CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
ROK CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)
ROK CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
ROK CV to DPRK Oil and Gas Combined Consumption (Value)	0.75
ROK CV to DPRK Oil and Gas Combined Required Imports (Value)	0.75
ROK CV to ROK Oil Consumption (Volume)	-0.38
ROK CV to ROK Oil Consumption (Value)	0.14
ROK CV to Required ROK Oil Imports (Volume)	-0.38

Correlation	Coefficient
ROK CV to Required ROK Oil Imports (Value)	0.14
ROK CV to ROK Gas Consumption (Volume)	-0.16
ROK CV to ROK Gas Consumption (Value)	0.05
ROK CV to Required ROK Gas Imports (Volume)	-0.16
ROK CV to Required ROK Gas Imports (Value)	0.05
ROK CV to ROK Oil and Gas Combined Consumption (Value)	0.13
ROK CV to ROK Oil and Gas Combined Required Imports (Value)	0.13
Overall CV to Oil Prices	0.11
Overall CV to Gas Prices	0.01
Overall CV to Russian Oil Consumption (Volume)	0.19
Overall CV to Russian Oil Consumption (Value)	0.14
Overall CV to Required Russian Oil Imports (Volume)	-0.01
Overall CV to Required Russian Oil Imports (Value)	-0.10
Overall CV to Russian Gas Consumption (Volume)	0.08
Overall CV to Russian Gas Consumption (Value)	0.02
Overall CV to Required Russian Gas Imports (Volume)	-0.14
Overall CV to Required Russian Gas Imports (Value)	-0.04
Overall CV to Russian Oil and Gas Combined Consumption (Value)	0.07
Overall CV to Russian Oil and Gas Combined Required Imports (Value)	-0.09
Overall CV to PRC Oil Consumption (Volume)	0.00
Overall CV to PRC Oil Consumption (Value)	0.09
Overall CV to Required PRC Oil Imports (Volume)	0.01
Overall CV to Required PRC Oil Imports (Value)	0.08
Overall CV to PRC Gas Consumption (Volume)	0.06
Overall CV to PRC Gas Consumption (Value)	0.07
Overall CV to Required PRC Gas Imports (Volume)	0.24
Overall CV to Required PRC Gas Imports (Value)	0.18
Overall CV to PRC Oil and Gas Combined Consumption (Value)	0.09
Overall CV to PRC Oil and Gas Combined Required Imports (Value)	0.08
Overall CV to Japanese Oil Consumption (Volume)	0.12
Overall CV to Japanese Oil Consumption (Value)	0.12
Overall CV to Required Japanese Oil Imports (Volume)	0.12
Overall CV to Required Japanese Oil Imports (Value)	0.12
Overall CV to Japanese Gas Consumption (Volume)	-0.08
Overall CV to Japanese Gas Consumption (Value)	0.01
Overall CV to Required Japanese Gas Imports (Volume)	-0.08
Overall CV to Required Japanese Gas Imports (Value)	0.01
Overall CV to Japanese Oil and Gas Combined Consumption (Value)	0.11

Correlation	Coefficient
Overall CV to Japanese Oil and Gas Combined Required Imports (Value)	0.11
Overall CV to DPRK Oil Consumption (Volume)	0.21
Overall CV to DPRK Oil Consumption (Value)	0.38
Overall CV to Required DPRK Oil Imports (Volume)	0.21
Overall CV to Required DPRK Oil Imports (Value)	0.38
Overall CV to DPRK Gas Consumption (Volume)	No Value (Flat Line)
Overall CV to DPRK Gas Consumption (Value)	No Value (Flat Line)
Overall CV to Required DPRK Gas Imports (Volume)	No Value (Flat Line)
Overall CV to Required DPRK Gas Imports (Value)	No Value (Flat Line)
Overall CV to DPRK Oil and Gas Combined Consumption (Value)	0.38
Overall CV to DPRK Oil and Gas Combined Required Imports (Value)	0.38
Overall CV to ROK Oil Consumption (Volume)	-0.08
Overall CV to ROK Oil Consumption (Value)	0.12
Overall CV to Required ROK Oil Imports (Volume)	-0.08
Overall CV to Required ROK Oil Imports (Value)	0.10
Overall CV to ROK Gas Consumption (Volume)	-0.03
Overall CV to ROK Gas Consumption (Value)	0.02
Overall CV to Required ROK Gas Imports (Volume)	-0.03
Overall CV to Required ROK Gas Imports (Value)	0.02
Overall CV to ROK Oil and Gas Combined Consumption (Value)	0.09
Overall CV to ROK Oil and Gas Combined Required Imports (Value)	0.09