Energy Integration and Cooperation in Northeast Asia

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Summary
Russia's energy potential, growing Chinese, Japanese and Korean energy demand, and the priority placed by regional governments on increasing consumption of natural gas, all suggest that energy markets in Northeast Asia will integrate over the next decade. Before this can happen, however, questions over Russia's own ability to provide competitive long-term gas supplies, inadequate domestic gas infrastructures in Northeast Asian states, and the technical and financial challenges of large-scale energy transportation projects, will have to be addressed.

Introduction

In the 10 years since the dissolution of the former Soviet Union, ideological and political obstacles to regional cooperation in the North Pacific region have disappeared. Increased diplomatic and political ties have opened the door for new business and trade opportunities between Russia and its eastern neighbors—China, Japan, and South Korea. While many of these opportunities have been found in consumer goods and raw materials trading, over the next several decades energy resources may come to dominate economic and political relations among the Northeast Asian states. The development of new oil and gas fields in Russia and increasing demand for energy from the growing economies of China and its neighbors point to the possibility that a new set of relations will emerge, based on evolving transportation networks and the integration of regional energy markets.

Global energy developments and demand in Northeast Asia

In terms of global energy developments, oil remains the dominant fuel source, but natural gas is increasing in importance, now accounting for about 25% of world energy consumption. Natural gas will soon displace coal in world energy markets, and a global trade in natural gas is also emerging. With increased use of liquefied natural gas, or LNG, and improvements in pipeline technology, gas has evolved from a local commodity into an international business. According to (BP) Petroleum's 2001 *Statistical Review of World Energy*, 27% of gas consumed globally now crosses international borders, and LNG produced in Southeast Asia is regularly transported as far as Western Europe. These developments put Russia, with more than 30% of proven world gas reserves and just under 5% of proven oil reserves, in an extremely important position in global as well as regional markets.

Northeast Asia, with its growing economies, already accounts for about 20% of world energy consumption and over the next 20 years, it may account for one-third of the world's total energy demand. As a result, over the medium-long term, concerns about energy security in China, Japan and South Korea, and Russia's energy potential are likely to push a series of regional energy projects forward—at least to the planning stage. However, significant infrastructure costs on both sides of the supply-demand chain will have to be addressed to maximize the potential economic benefits of full regional energy integration. Efforts to realize energy projects in Northeast Asia

must also be placed in the context of broader regional developments, including: the continued division of the Korean peninsula, the recent conclusion of the Russian-Chinese Friendship Treaty, and persistent tensions in Russia's relations with Japan with the continued failure to conclude a post-World War II peace treaty and to resolve their territorial dispute over the Kuril Islands.

The need for energy diversification in Northeast Asia

One of the most important current policy goals for Northeast Asian countries, including Japan, China, and South Korea, is to diversify their energy supply. The states both need to reduce their dependence on oil by increasing consumption of natural gas and other alternative energy sources, and to broaden the geographic range of energy imports to mitigate their growing dependence on supplies from the Middle East and Persian Gulf.

The policy of diversification is particularly important for Japan and South Korea, which have limited domestic energy reserves. Japan currently imports almost all of its fossil fuel needs, and is dependent on OPEC, mostly Persian Gulf, suppliers for 75-80% of its oil, which accounts for over 50% of its current energy usage. Likewise, for South Korea, oil represents 60% of its total energy consumption, and more than 70% of South Korea's current oil imports come from the Middle East. In contrast, China relies primarily on coal from its own significant domestic reserves. In 1990, coal accounted for 80% of China's energy consumption although this has now been reduced to 64%. Since 1993, however, China has become a net oil importer and in 2000, China's oil consumption growth of just under 10% accounted for 2/3 of the growth in world oil consumption. Oil now accounts for almost 30% of Chinese energy consumption, and like its neighbors, China is becoming increasingly dependent on Middle East and Persian Gulf supplies. (See illustrative charts below).

Total energy consumption (in %)

	Oil	Gas	Nuclear	Coal
Japan	52	13 (all in the form of LNG)	15	15
Korea	60	8	13	19
China	28	3	.4	62

*Source: U.S. Energy Information Administration's Country Reports

Origin of Supply

	Oil	Gas
Japan	75-80% dependent on OPEC	36% from Indonesia and 19% from Malaysia. Some imports from Australia. Used primarily for electric power generation or as feedstock for petrochemical plants
Korea	More than 70% from the Middle East	Indonesia and Malaysia, smaller volumes from Brunei, Qatar, and Oman. Natural gas for electricity sector and residential heating sector

China	60% from the Middle East (estimate)	used for feedstock for fertilizer plants

In the next two decades, projections indicate that China could become up to 90% dependent on Middle Eastern suppliers for its oil imports and Japan could become up to 85% dependent.

In sum, in looking forward to the next decade, there are two major trends for Northeast Asian countries: increasing demand for energy, especially oil, and increasing dependence on one supply source, the Middle East and Persian Gulf, where there is already considerable competition with European countries and the United States for access to supply. Given tight oil and gas markets in the region, competition for resources among the Northeast Asian countries themselves seems likely to increase.

Table 1: Asia's Rising Number of Oil Importers

Importing Nation	Share of Total Asian Oil Imports (%)		
	1992	2000	2010
Japan	77.4	53.2	36.5
China	--	10.9	19.4
Taiwan & Hong Kong	10.0	9.7	9.0
Korea	21.0	20.3	18.3
ASEAN	--	5.9	16.9

Notes: Based on 1995 national energy supply-demand projections, in metric tons of oil equivalent (Mtoe), for Japan, China, Taiwan & Hong Kong, South Korea, and ASEAN; 8.4 percent of net 1992 imports to the states listed were from China and ASEAN countries.
Source: Ministry for International Trade and Industry forecasts, from APEC International Advisory Committee for Energy Intermediate Report, June 1, 1995.
*Source: From Kent Calder, "Japan's Energy Angst and the Caspian Great Game," *NBR Analysis*: Vol. 12, No. 1: March 2001.

The common denominator for all countries is thus the need to diversify energy supply to ensure energy security. And, Japan, South Korea and China have already taken considerable steps to address this issue, investing in oil and gas fields outside the Middle East. Japan's Mitsui, for example, has secured a 15% share of Azerbaijan's Kur Dashi oil field, and Inpex (JNOC) has a 7% stake in Kazakhstan's new Kashagan field. Japan is also considering importing natural gas either via pipeline or LNG from Russia's fields in Sakhalin. South Korea's KNOC (Korean National Oil Corporation) has 4 producing fields in Yemen, Argentina, Peru, and North Sea, as well as over one dozen other exploration projects worldwide. China is diversifying by securing oil concessions in Kazakhstan, Venezuela, and Peru, as well as Sudan, Iraq and Iran. In addition, in March 2001, British Petroleum unveiled a project to construct China's first LNG import terminal in Guangdong, which is expected to be operational by 2006 (although the source of LNG has yet to be determined).

A shift to natural gas?

In line with this move toward diversification, regional states are beginning to shift to natural gas in their energy consumption. Natural gas has the benefit of being the most environmentally

friendly fossil fuel, which is of some importance to Northeast Asian states. For China alone, the World Bank estimates that the effects of excessive pollution have cost $54 billion a year, or 8% of GDP. Japan has also recognized the detrimental effects of pollution, and has become particularly active in recent years in the Kyoto negotiations to reduce global carbon emissions. In addition, recent accidents involving nuclear power in Japan have reduced public support for the further development of nuclear energy facilities. This leaves natural gas as an alternative fuel source without the costs and risks associated with coal, oil, and nuclear energy. Japan and South Korea have already moved to increase their liquefied gas consumption, and in 1996, Japan and South Korea imported 75% of total world LNG trade. If its government's plans are realized, China's consumption of natural gas, although only 3% of total energy consumption today, could triple over the next 20 years.

There are considerable sources of natural gas and LNG in Asia, including in Australia, Bangladesh, Indonesia and Malaysia. But, given its location, Russia clearly offers a potentially major source of supply for its neighbors in Northeast Asia—if it achieves sufficient increases in gas production and ensures the development of an adequate regional transportation infrastructure. Probably the most crucial question for the future of Russia as an energy supplier to Northeast Asia, however, is whether or not international investors in Russian fields and Russian companies will be able to make competitive deals with other Northeast Asian countries, or whether Australia and other Southeast Asian suppliers will offer better contract deals. In this regard, the question of transportation becomes particularly salient when the costs of overcoming the vast territories, cold temperatures, and rugged terrain between Siberian gas fields and Northeast Asian markets are taken into consideration.

Supply options from Russia

In turning to focus on Russia, energy is central to the Russian economy. Energy exports are Russia's greatest source of foreign currency earnings and high oil and gas prices have kept Russia's economy fueled since 2000. According to Brookings Institution Economist Clifford Gaddy, in 2000, energy exports accounted for around 90% of Russia's growth in GDP, an increase in budgetary revenues of about 30% compared to 1999, and gave Russia a budget surplus for the very first time. As Gaddy noted during a recent conference at Washington DC's Carnegie Endowment for International Peace, "Russia exports such large quantities of crude oil and various oil products that every dollar's increase in the price of a barrel of petroleum translates into roughly $1.5-$2.0 billion of additional yearly export revenues." Russian policymakers have thus laid particular emphasis on the expansion of Russian energy exports and have also tried to chart a new role for Russia as an "energy superpower."

To date, most discussions of Russian energy have focused on its exports to Europe, but in the last 5 years, Russia's interest in developing energy relations with its eastern neighbors and potential energy partners have grown. There are also three main regions in Russia, which could be potential suppliers to the Northeast Asian energy markets—and which are considered too remote from Europe for exports west—Sakhalin Island, Yakutsk, and Irkutsk near Lake Baikal.

Two additional factors have played a role in Russian policies to develop Siberian and Far Eastern resources for Asian export. First, the evolution of Production Sharing Agreements (PSAs), which have provided the basic legal and contract arrangements with the Russian government for outside

(non-domestic) companies to invest in energy projects in Russia. These have brought a number of international energy companies into regions like Sakhalin. Second, a change in the export orientation of Russia's huge natural gas monopoly, *Gazprom*, with the appointment of Alexei Miller, who has close ties with Northeast Asia, as its new head.

However, these very same factors that have promoted an eastern energy focus may in the short-term hinder the realization of the Russian energy industry's full potential in Northeast Asia. As far as PSAs are concerned, although the foreign investment they have brought has benefited Russia's regions (including Sakhalin, where local people have secured a new power station, airport upgrades and pension payments, supported in part by contributions from Sakhalin energy development projects), since early 2000 there has been a backlash against them from Moscow-based politicians with close ties to the energy industry. Recent growth in the Russian economy boosted by energy revenues, combined with anti-Western sentiment inflamed by a decade of jarring economic reforms in the 1990s, has led to ambivalence towards foreign investment. This has in turn been exploited by domestic oil producers, such as Mikhail Khodorkovsky, Chairman of Yukos, one of Russia's largest oil companies, who, over the course of the 1990s, engaged in protracted struggles with foreign oil companies trying to invest in Russian oil production.

In spite of support for PSAs from Russian President Vladimir Putin, influential figures such as Anatoly Chubais, former Vice Prime Minister and current head of Russia's electricity monopoly, Unified Energy Systems, German Gref, Russia's Minister for Economic Development and Trade, and Aleksei Kudrin, Russian Deputy Premier and Finance Minister have all spoken out against them, asserting that neither these mechanisms nor the involvement of multinational energy companies are necessary for the future development of Russia's oil and gas industry.

As a result, Russian energy companies and Moscow politicians have pushed for an end to PSAs. This would deprive Russian regions of economic decisionmaking authority, and could potentially hinder the integration of Siberia and the Russian Far East into new Northeast Asian energy markets, if international energy companies (including Japanese and South Korean companies) are forced or pull out of regional energy consortia.

Russia's integration with Asian energy markets also rests largely on Gazprom's future potential. Gazprom controls more than 90% of Russian gas production, operates the country's 150,000 km gas pipeline grid, its 43 compressor stations, and a range of trading houses and marketing joint ventures in many European countries. It also controls one-fifth of the world's natural gas reserves. In addition, Gazprom is Russia's single largest generator of hard currency, and its tax payments alone account for around 25% of federal tax revenues. With Gazprom at the helm, Russia is the world's largest gas exporter.

2001 ushered in a new direction for the company with the appointment of Aleksei Miller to replace Chairman Rem Vyakhirev, a holdover from the Soviet era. Miller's close political relationships center around the influential group of Russian politicians from St. Petersburg that includes President Vladimir Putin, and his appointment marked the culmination of efforts behind the scenes to reassert state control over the gas monopoly as well as to forge deals with Northeast Asian that had previously been blocked by Vyakhirev.

Although Gazprom announced a formal "Gazprom East" strategy in 1997, and Vyakhirev declared that he saw "a prime market for Gazprom's growth in Asia where the gas market is absolutely empty or devoid of competition," the former Chairman focused almost exclusively on Gazprom's expansion to the West and its penetration of European markets. Vyakhirev did initiate some modest plans to build a new gas production center in the eastern Irkutsk region (which could eventually be linked by pipelines to China, North and South Korea, and Japan) and created an eastern subsidiary in Tomsk, Vostokgazprom, which acquired companies holding licenses to gas fields in East and West Siberian fields. But, these efforts were undertaken largely to placate critics in the industry and government. Vyakhirev's removal, and Miller's appointment underscored a new determination in the Russian government and the energy industry to move aggressively east as well as west. This determination has been bolstered by Russia's developing relationship with China and the conclusion in 2001 of a friendship treaty between the two countries that lays emphasis on future close cooperation in the energy sector.

In assessing these plans, however, industry analysts have questioned Gazprom's ability to continue and increase its current supply of natural gas to Europe (Russia supplies Europe with 25% of its natural gas and seeks to double this amount over the next 20 years) as well as to conclude new contracts with Northeast Asian countries. To increase even European exports, Gazprom will have to upgrade its existing infrastructure and explore and develop new fields, as current reserves in Western Siberia are beginning to decline. One solution to this dilemma may lie in the Caspian Basin region, where the Central Asian states of Kazakhstan, Turkmenistan, and Uzbekistan have their own substantial gas reserves (in the case of Turkmenistan, the fifth largest reserves in the world) and have relied on the Russian and Gazprom pipeline networks for transportation to regional markets. Since the late 1990s, there have been increasing signs that Gazprom is attempting to exert control over gas resources in these former Soviet republics as part of Russia's broader export-driven strategy for Europe and Asia.

Russia's energy strategy for Asia indeed began to move ahead in 2001. Representatives of Gazprom's eastern subsidiary, Vostokgazprom, concluded a deal in May 2001 with three of China's largest oil companies to create a series of joint ventures, and several serious options were put forward to construct overland pipeline routes to serve the Chinese, and possibly South Korean and Japanese, markets from Russian oil and gas fields.

One proposed 4,000 km gas pipeline from the Kovykta field near Irkutsk would supply both China and South Korea at a cost of around $12 billion. Although a pipeline on this scale would undoubtedly pose technological and financial challenges, British Petroleum—which owns a 30% stake in the Russian company that has the license for the Kovykta field—is conducting a feasibility study for the project, which should be completed in early 2002. South Korea's Kogas also joined the feasibility study in November 2000. Beyond the technical and financial difficulties of building such a long pipeline, this project faces potential conflicts between BP and Gazprom over the ultimate control of the Kovytka gas field, and the particular challenge of the continued division of the Korean peninsula—which would eventually have to be addressed in extending the proposed pipeline from China to South Korea.

Other regional projects discussed over the course of 2001 have included the construction of an oil pipeline from Russia to China that would stretch 2,400 km across Mongolia from the Siberian city of Angarsk, near Irkutsk, to Beijing, at a cost of $1.7 billion; and gas pipelines from Tomsk

to China, as well as Yakutia to China along the route of the China Eastern Railway to Shanghai. Projects crossing Russia directly into China bypassing Mongolia seem more likely to be pursued at this stage, given the underdevelopment of the Mongolian gas market and network and the country's inability to put forward its own financing for large-scale projects.

Sakhalin Island, which has a more optimal location than Siberia, given its access to world sea routes and its close proximity to the Chinese, Korean and Japanese coasts, has become increasingly central to Russia's energy strategy in Northeast Asia. Since 1996, there have been two major international projects on Sakhalin—conveniently called Sakhalin 1 and Sakhalin 2—both of which were initially created on the basis of PSAs that brought in international oil giants such as ExxonMobil and Shell and a number of Asian companies. All, Sakhalin fields, however, face considerable challenges because of extreme winter temperatures in the north of the island, rough terrain, a high level of seismic activity, and the possibility of serious environmental damage, especially to the region's rich fisheries. Over the last 5 years, in conjunction with the uncertainties over the future of PSAs, these challenges have delayed investment decisions and progress in developing the concessions.

In 2001, new regulatory instruments and fixed tax rates passed by the Russian government of Vladimir Putin, have helped to create a more stable and attractive environment for large-scale foreign investments in the Russian energy sector, including in Sakhalin. At the end of October 2001, encouraged by the new regulatory and tax legislation and a general improvement in Russia's political and economic relations with the United States, ExxonMobil announced that it would commit $4 billion over the next five years to its Sakhalin concerns. This would represent Russia's largest single foreign investment to date in any economic sector.

ExxonMobil is the leader of Sakhalin 1 with a 30% stake, but Japanese energy and trading companies (through Sodeco or Sakhalin Development Corp, Ltd.) also have a 30% share. ONGC Videsh of India and Russia's Rosneft both own 20%. The Sakhalin 1 fields are being explored and developed for both oil and gas production by 2005, with the construction of a pipeline to Japan projected for 2008.

Sakhalin 2, headed by Royal Dutch/Shell, is somewhat further behind the Sakhalin 1 project. This consortium also includes Japan's Mitsui with a 25% stake and Mitsubishi with a 20% stake. The project itself includes the construction of an LNG plant, "Molikpaq"—Russia's first and only offshore production platform, which has now been pumping oil since 1999—and two additional offshore production platforms. An eventual pipeline from Sakhalin 2 would run 650 km from the inhospitable north of the island to the more temperate south, where energy exports can continue through the winter months. Three international consortia are currently bidding to design and build the LNG plant and the necessary oil infrastructure for Sakhalin 2, but, by June 2002, a decision must be taken on the future of the project and whether or not to continue or increase the current level of investment. This decision will hinge on Shell's ability, as the consortium leader, to offer a competitive deal to Northeast Asian countries, such as South Korea for long-term LNG supplies. In this context, Sakhalin LNG will clearly have to compete with other Asian suppliers for the Korean market.

Obstacles posed by domestic infrastructure for natural gas

Although these ambitious projects seem to be underway, the domestic infrastructure of Japan, China and South Korea still needs considerable improvement to allow energy markets to develop and to permit their integration with a supplier like Russia.

In Japan, the investment climate is gradually becoming more favorable due to the deregulation of the electric power and gas industries. But, Japan still lacks a domestic natural gas pipeline network, and is in the midst of a financial crisis. In addition, with the development of a global gas market, there are more supply options available to Japan than ever before, and Russia, in the short-medium term, may not be the most competitive source.

In China, the natural gas market is constrained by government regulations, including near total price controls for gas production, transportation, and wholesale and retail sales. Like Japan, China lacks the infrastructure for major domestic gas usage and the country still needs natural gas transportation and urban distribution networks. The Chinese government has, however, made the expansion of its gas network a major priority in its current 5-year plan, especially the development of gas pipelines around Beijing. In addition, the government has announced the construction, beginning in 2001, of a $14 billion gas pipeline that will extend more than 4,000 km to link domestic gas fields in the western province of Xianjiang with Shanghai in the east by the end of 2003. Future political decisionmaking on deregulation and the lifting of price controls, may also push the more rapid solution of some of China's other obstacles to the development of a fully-functioning gas market.

For South Korea, while it already has substantial gas infrastructure in place, including a transmission network and two (soon three) LNG receiving terminals, the overall size of the market is too small at present to justify the construction of overland pipelines from Russia through China. As noted earlier, the geopolitical situation on the Korean peninsula, and still fragile relations between North and South Korea, also complicate the construction of an overland gas pipeline in the short-medium term.

Conclusion

In sum, although Russia's desire to expand its oil and gas export markets coincides with increasing energy demand among its Northeast Asian neighbors, the preconditions for future cooperation in energy must still be developed. Questions over Russia's ability to provide long-term supply, the large-scale and costly nature of energy production and transportation projects, and the under-development of domestic gas infrastructure in Northeast Asian states will pose considerable obstacles to the integration of regional energy markets in the next decade.

However, over the longer-term, political, rather than economic or market-driven, decisions may bring Russian supply and Chinese, South Korean and Japanese demand together in Northeast Asia. This may be the result of increasing concerns about the stability of the Middle East and the future security if oil supplies there; the priority placed both by Russia and China on a closer bilateral relationship; the domestic energy priorities of regional governments like China; changes on the Korean peninsula; or an increasing rapprochement between Japan and Russia. As in any other region of the world, developments in Northeast Asia do not take place in a vacuum, and, as we have seen in the events of September 11, 2001 in the United States, a major crisis can force an equally major shift in global economic as well as political developments.