Order Code RL33212

Russian Oil and Gas Challenges

Updated August 4, 2006

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Summary

Russia is a major player in world energy markets. It has more proven natural gas reserves than any other country, is among the top ten in proven oil reserves, is the largest exporter of natural gas, the second largest oil exporter, and the third largest energy consumer. Energy exports have been a major driver of Russia's economic growth over the last five years, as Russian oil production has risen strongly and world oil prices have been very high. This type of growth has made the Russian economy dependent on oil and natural gas exports and vulnerable to fluctuations in oil prices.

The Russian government has moved to take control of the country's energy supplies. It broke up the previously large energy company Yukos and acquired its main oil production subsidiary. In Central Europe, Russian firms with close links to the Russian government have used leverage to buy energy companies to gain control over energy supply. In East Asia, Russia is contemplating a pipeline destination that would allow it to decide to whom its oil gets sold. Also, Russia briefly cut off gas supply to Ukraine because the latter did not agree to greatly increase what it pays for the gas. Russia restored supply after other European countries, which were affected, complained. Much of Russia's gas exports to Europe pass through Ukraine. The dispute has been resolved temporarily by a few compromise agreements.

Russia's ability to maintain and expand its capacity to produce and to export energy faces difficulties. Russia's oil and gas fields are aging. Modern western energy technology has not been fully implemented. There is insufficient export capacity in the crude oil pipeline system controlled by Russia's state-owned pipeline monopoly, Transneft. And, there is insufficient investment capital for improving and expanding Russian oil and gas production and pipeline systems. Moreover, Russia's cutting off gas supply to Ukraine and subsequent actions and events damaged its reputation as a reliable energy supplier.

A number of proposals would build new or expand existing Russian oil and natural gas export pipelines. Some are contentious, and although the Russian government is faced with a perceived need to expand its oil and gas export capacity, it also has limited resources. This report discusses several different major proposals.

Given that the United States, as well as Russia, is a major energy producer and user, Russian energy trends and policies affect U.S. energy markets and economic welfare in general. An increase in Russia's energy production and its ability to export that energy westward and eastward may tend to ease the supply situation in energy markets in the Atlantic and Pacific Basins. On the other hand, the Russian government's moves to take control of the country's energy supplies noted earlier may have the effect of making less oil available. Possibly important is the potential for U.S. suppliers of oil and gas field equipment and services to increase sales and investment in Russia. However, while the investment climate in Russia had been considered to be improving, it arguably is now worsening, as investors complain that it is inhospitable with respect to factors such as poor property rights protection, burdensome tax laws, inefficient government bureaucracy, and a reported move to limit foreign investor participation. This report will be updated as events warrant.

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The Russian Federation is a major player in world energy markets. It has more proven natural gas reserves than any other country and is among the top ten countries in proven oil reserves.[1] It is the world's largest exporter of natural gas, the second largest oil producer and exporter, and the third largest energy consumer. Given that the United States also is a major energy producer and user, Russian energy trends and policies affect U.S. energy markets and U.S. welfare in general.

Oil and Gas Reserves and Production

Most of Russia's 60-74 billion barrels of proven oil reserves (**Table 1**) are located in Western Siberia, between the Ural Mountains and the Central Siberian Plateau. This ample endowment of this region made the Soviet Union a major world oil producer in the 1980s, reaching production of 12.5 million barrels per day (bbl/d) in 1988.[2] Roughly 25% of Russia's oil reserves and 6% of its gas reserves are on Sakhalin Island in the far eastern region of the country, just north of Japan.

Russian oil production, which had begun to decline before the Soviet Union dissolved in 1991, fell more steeply afterward — to less than six million bbl/d in 1997 and 1998.[3] State-mandated production surges had accelerated depletion of the large Western Siberian fields and the Soviet central planning system collapsed. Russian oil output started to recover in 1999. Many analysts attribute this to privatization of the industry, which clarified incentives and shifted activity to less expensive production. Increases in world oil prices, application of technology that was standard practice in the West, and rejuvenation of old oil fields helped boost output. After-effects of the 1998 financial crisis and subsequent devaluation of the ruble may well have contributed. After reaching about nine million bbl/d in 2004 depending upon the estimating source, Russian oil production continued to rise in 2005, but slowly.

Several consortia have begun producing and exporting oil (mainly to East Asia at present) from Sakhalin island (**Figure 4**). They also plan to export gas to the United States via pipelines to the Siberian mainland and then from liquefied natural gas (LNG) terminals.

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[1] *Oil and Gas Journal*, December 19, 2005. Estimates of proven oil and/or gas reserves by country can differ widely, depending partly on what types of resources are included. Thus, Russia's ranking of reserve holdings may differ among organizations that compile such data.

[2] BP. *BP Statistical Review of World Energy*, June 1992. Data for Russia only are not available for 1988.

[3] BP. BP *Statistical Review of World Energy 1997*, June 1997.

Figure 1. Russia

Source: Energy Information Administration. *Russia Country Analysis Brief*, February 2005 [http://www.eia.doe.gov/emeu/cabs/Region_ni.html], viewed December 3, 2005.

With about 1,700 trillion cubic feet (tcf), Russia has the world's largest natural gas reserves. In 2004, it was the world's largest natural gas producer and the world's largest exporter. However, its natural gas industry has not done well in recent years, as production has increased only a little and exports only have re-attained their level of the late 1990s.

Table 1. Oil and Natural Gas Reserves and Production

Country or Region		Proved Reserves (billion bbls of oil/trillion cu. ft. of gas)		Production[a] (mil. bbls/day of oil/ trillion cu. ft. of gas
		BP (End of 2005)	O & G Journal (1/1/06)	BP (2005)
Russian Federation		74/1,688	60/1,680	9.6/21.1
Reference Areas	United States	29/193	21/192	6.8/18.9
	North Sea[b]	n.a./n.a.	14/177	5.9[c]/n.a.
	Saudi Arabia	264/244	264/241	11.0/2.5
	WORLD	1,200/6,348	1,292/6,112	80.0/97.5

n.a. - Not available.
a. Includes natural gas liquids.
b. Includes Denmark, Germany, Netherlands, Norway, and United Kingdom.
c. Energy Information Administration estimate.

Sources: *BP Statistical Review of World Energy June 2006*; Energy Information Administration, *Country Analysis Briefs*, North Sea, "Oil", August 2005 [http://www.eia.doe.gov/emeu/cabs/North_Sea/Oil.html]; Penwell Publishing Company. Oil & Gas Journal, December 19, 2005.

Growth of Russia's natural gas sector has been impaired by ageing fields, near monopolistic domination over the industry by Gazprom (with substantial government holdings), state regulation, and insufficient export pipelines. Gazprom, Russia's 51%-owned state-run natural gas monopoly, holds more than one-fourth of the world's natural gas reserves, produces nearly 90% of Russia's natural gas, and operates the country's natural gas pipeline network. The company's tax payments account for around 25% of Russian federal tax revenues. Gazprom is heavily regulated, however. By law, it must supply the natural gas used to heat and power Russia's domestic market at government-regulated below-market prices.

Potential growth of both oil and natural gas production in Russia is limited by the lack of full introduction of the most modern western oil and gas exploration, development, and production technology. However, while the investment climate in Russia had been considered to be improving, arguably there are reasons to posit that it is now worsening. As discussed later, a reported proposal to tighten restrictions on the extent to which foreign companies can participate in Russian oil and natural gas production would seem to discourage investment. An unsettled judicial system provides limited and uncertain protection of property rights and rights of minority shareholders. Also, investors complain that the climate is inhospitable with respect to factors such as burdensome tax laws and inefficient government bureaucracy.

Exports

Energy exports have been a major driver of Russia's economic growth over the last five years, as Russian oil production has risen strongly and world oil and gas prices have been relatively high. This type of growth has made the Russian economy very dependent on oil and natural gas exports, and vulnerable to fluctuations in world oil prices. Based upon an International Monetary Fund study, a $1 per barrel increase in the price of Urals blend crude oil for a year results in a $3 billion increase in Russia's nominal Gross Domestic Product.[4]

Petroleum

Almost three fourths of Russian crude oil production is exported; the rest is refined in the country, with some refined products being exported. Of Russia's 6.7 million bbl/d of crude oil exports in 2004 went to Belarus, Ukraine, Germany, Poland, and other destinations in Central and Eastern Europe. The remaining 2¼ million bbls/d went to maritime ports and was sold in world markets. Recent high oil prices have enabled as much as 40% of Russia's oil exports to be shipped via railroad and river barge routes — more costly modes than pipelines. Most of Russia's exports of refined petroleum products to Europe are distillate oil used for heating and by trucks.

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[4] Antonio Spilimbergo, *Measuring the Performance of Fiscal Policy in Russia*, IMF Working Paper WP/05/241, International Monetary Fund, December 2005, p. 7. CRS has applied the IMF sensitivity factor to Russia's Gross Domestic Product for 2005 at the official exchange rate, $740.7 billion, as given in *The World Fact Book* of the Central Intelligence Agency [http://www.cia.gov/cia/publications/factbook/geos/rs.html#econ].

Russia's capacity to export oil faces difficulties, however. One stems from the fact that crude oil exports via pipeline are under the exclusive jurisdiction of Russia's state-owned pipeline monopoly, Transneft. Bottlenecks in the Transneft system prevent its export capacity from meeting oil producers' export ambitions. Only about four million bbl/d can be transported in major trunk pipelines; the rest is shipped by rail and river routes. Most of what is transported via alternative transport modes is refined petroleum. The rail and river routes could become less economically viable if oil prices fall sufficiently. The Russian government and Transneft are striving to improve the export infrastructure.

Unless significant investment flows into improving the Russian oil pipeline system, non-pipeline transported exports probably will grow. For example, rail routes presently are the only way to transport Russian crude oil to East Asia. Russia is exporting about 200,000 bbl/d via rail to the northeast China cities of Harbin and Daqing and to central China via Mongolia. Since Yukos was the leading Russian exporter of oil to China, there was concern that the breakup of Yukos by the Russian government (see below under "Energy Policy") might affect rail exports to China. However, Lukoil now is the chief supplier of Russian oil to China.

Oil transportation in the Black Sea region may be in flux. Much of Russia's oil now is shipped by tankers from the Black Sea to the Mediterranean and to Asia, mostly from the port of Novorossiysk. However, transit through the shallow and congested Bosporus Straits is limited by Turkey for environmental and safety reasons, limiting the effective capacity of pipelines to Novorossiysk.[5] Oil shipped through the Baku-Tbilisi-Ceyhan (BTC) pipeline will be from Azerbaijan and Kazakhstan, posing competition to Russian oil.[6] If Azerbaijan and Kazakhstan oil shipments via BTC are large enough, exports from Novorossiysk will decrease.

Eastward, Russia faces competition for China's oil market from Kazakhstan, which, with China, completed in late 2005 the construction of a pipeline from Atasu in central Kazakhstan to Alaskankou on China's western border. Eventual capacity will be 190,000 bbl/d.[7]

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[5] See, for example, Yigal Schleifer, "Russian oil ships stuck in Bosporus strait traffic jam," *Christian Science Monitor*, January 25, 2005. Limited depth, heavy traffic, and environmental considerations have resulted in restrictions by Turkish authorities on travel through the Bosporus. Supporters of the Baku to Ceyhan pipeline assert that Ceyhan, a Turkish Mediterranean Sea port, can handle very large carriers, while the Novorossisk and Supsa (in Georgia) ports are restricted to smaller tankers that can transit the Bosporus straits. Also, Ceyhan can remain open all year, whereas Novorossiysk is closed up to two months per year.

[6] It is reported that Kazakhstan and Azerbaijan have agreed to allow Kazakh oil to flow through the BTC pipeline. See "Kazakhstan Inks BTC Deal," *The Oil Daily*, June 19, 2006, p. 7.

[7] Martin Clark. "Beijing Triumphs with Inauguration of Kazakhstani Crude Pipe," *FSU Oil & Gas Monitor*, December 21, 2005.

Natural Gas

Historically, most of Russia's natural gas exports went to Eastern Europe and to customers in countries that were part of the Soviet Union. But, in the mid-1980s, Russia began trying to diversify its export options. Gazprom has shifted some of its exports to meet the rising demand of Turkey, Japan, and other Asian countries. For Gazprom to attain its long-term goal of increasing its European sales, it will have to boost production as well as secure more reliable export routes to the region.

Issues have arisen with the growth of Russia's sales to Europe. EU trade representatives have criticized Gazprom's abuse of its dominant market position and two-tiered pricing system, which charged higher prices on exports than on domestic sales. Russia agreed to grant domestic independent natural gas producers access to Gazprom's pipelines, and, in response to calls for fair pricing, the Russian government doubled prices to Russian industrial consumers. But the new price level still is less than half of the prices charged at the German and Ukrainian borders.

As a major supplier of natural gas to European countries, Russia has some ability to set prices. For example, it could withhold supply from customer counties and attempt thereby to elicit policies more favorable to it. In 2003, Russian gas accounted for 100% of Slovakia's gas consumption, 97% of Bulgaria's consumption, 79% of the Czech Republic's consumption, and 68% of Hungary's consumption.[8] Arguably, Gazprom, Russia's largest earner of hard currency, appears to be one of Moscow's main foreign policy instruments.

U.S. markets could benefit from a proposed pipeline, which would carry crude oil from Russia's West Siberian Basin and Timan-Pechora basin westward to a deepwater tanker terminal at Murmansk on the Barents Sea. This could allow for between 1.6 and 2.4 million bbl/d of Russian oil exports to reach the United States via tankers within only nine days, much faster than shipping from the Middle East or Africa. LNG facilities at Murmansk and Arkhangelsk (to the southeast) also have been suggested, possibly allowing for gas exports to American markets.

However, Russia's natural gas exports to Europe declined markedly in January 2006 as a result of severely cold weather in Russia that greatly increased Russian gas consumption, and also reduced oil exports somewhat. The cold conditions lasted through the month.[9]

As with oil, Russia faces competition for Asian gas markets from Kazakhstan, which, with China, is working on a feasibility study for building a pipeline from the former to the latter.[10] Given the proximity of gas producers Turkmenistan and

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[8] Energy Information Administration (EIA). *Russia Country Analysis Brief*, February 2005, Table 1, several sources cited: EIA, BP, *CIS and East European Energy Databook, 2004*.

[9] "Cold spell cuts Russian gas to Europe," *Financial Times*, FT.com, January 18, 2006; "Cold weather cutting Russian gas exports," *Oil & Gas Journal online*, January 23, 2006.

[10] "Kazakhstan, China Consider Gas Pipeline Construction," *FSU Oil & Gas Monitor*, Dec.

(continued...)

Uzbekistan to Kazakhstan, it is possible that their gas also would go to China via that route.

Energy Policy[11]

The Russian government has moved to take control of the country's energy supplies, and to try to use that control to exert influence elsewhere. It is arguable that the push for control was partly the motivation behind the government's prosecution of Mikhail Khodorkovski, CEO of Yukos, who acquired state-owned assets during privatization and adopted open and "transparent" business practices while transforming Yukos into a major global energy company. Yukos is being broken up, with its principal assets being sold off to meet alleged tax debts. Yuganskneftegaz, Yukos' main oil production subsidiary, was sold at a state-run auction to the Baikal Finans Group (previously unheard of), the sole bidder, for $9.4 billion, about half its market value according to western industry specialists. That group soon after sold the unit to Rosneft, the state oil company.[12] Another government takeover followed when Gazprom bought 75% of Sibneft — Russia's fifth largest oil company.[13] Yukos' creditors voted to liquidate the company on July 25, 2006; and the Moscow arbitration court confirmed the vote.[14]

A possible change to a less aggressive policy was hinted at when President Putin announced on January 31, 2006, that Russia will not seek control of more oil companies.[15] However, the Duma has voted to give Gazprom the exclusive right to export natural gas,[16] and, as described below, Russia moved to limit participation by foreign companies in oil and gas production.

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[10] (...continued)
7, 2005.

[11] Much of the material in this section is from: CRS Report RL33407, *Russia*, by Stuart D. Goldman; CRS Report RL32087, *Russian Oil and Gas Companies and Central and Eastern Europe*, by Steven Woehrel; and CRS Report RL32466, *Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy*, by Emma Chanlett-Avery.

[12] It subsequently was revealed that Baikal Finans was a group of Kremlin insiders headed by Igor Sechin, Deputy Head of the Presidential Administration and close associate of President Putin. Sechin has been Chairman of Rosneft's board of directors since July 2004. The de-facto nationalization of Yuganskneftegaz was declared "the fraud of the year" by Andrei Illarionov, President Putin's chief economic advisor. [http://www.mosnews.com/money/2004//12/28//illarionov.shtml].

[13] "New takeover to make Russia's giant Gazprom one of the world's largest oil and gas companies," *Pravda*, October 1, 2005 [http://english.pravda.ru/print/Russia/economics/8997-gazprom-0] viewed February 6, 2006.

[14] "Yukos: The Final Curtain," *FSU Oil & Gas Monitor*, 26 July 2006, p. 5; Ben Aris. "Death of Yukos," *FSU Oil & Gas Monitor*, August 2, 2006, p. 4.

[15] "Putin: Private Oil Companies to Remain Private," *FSU Oil & Gas Monitor*, Feb. 1, 2006.

[16] Tobias Buck and Neil Buckley, "Russian Parliament vote Backs Gazprom Export Monopoly," *Financial Times*, June 16, 2006, p. 8.

In Central Europe, Russian firms with close links to the Russian government have used leverage to buy energy companies to gain control over energy supply. For example, Yukos obtained majority control of a Lithuanian refinery (the only one in the Baltic states) by slowing oil supply to it, and buying it at a reduced price. The Transneft pipeline monopoly diverted the flow of oil shipments to Primorsk, a Russian port, stopping flow to the Latvian port of Ventspils. Some see Transneft's action as a move to obtain control of the firm that operates the Ventspils terminal.[17] Also, Transneft refused to finalize an agreement to transport Kazakhstani oil to Lithuania, undermining Kazakhstan's KazMunaiGaz's attempt to buy the refinery. After several developments, an agreement was reached for Yukos to sell the refinery to a Polish firm.[18]

Another example of Russia's efforts to maintain or increase control over energy supplies is the routing of new and planned export pipelines. For example, Russia has agreed with Germany, with the support of the United Kingdom (UK), to supply Germany and, eventually, the UK directly by building a natural gas pipeline under the Baltic Sea, thus bypassing Ukraine and Poland. In late January 2006, Gazprom was negotiating with Uzbekistan to obtain control of three of that country's gas fields.[19] Russia also is hoping to participate in the venture that is constructing a gas pipeline between Turkey and Greece.[20]

Some have said that Gazprom may have overreached in its aggressiveness. A large share of Russia's natural gas exports to Western Europe pass through Ukraine, which withdraws a certain amount of gas from the pipelines for its own use. In 2005, Gazprom wanted to raise Ukraine's price, originally a fraction of the world market price in return for its transmission of the gas to the market level. When negotiations failed, Gazprom reduced gas pressure and flow through the Ukrainian network on January 1, 2006. Ukraine compensated by using some gas intended for West Europe. Gazprom restored supply very shortly after, when those countries complained and pointed out that Russia was risking its reputation as a reliable energy supplier.[21] The dispute was resolved temporarily on January 4, 2006. Gazprom would sell gas at its asking price to a trading company that would mix Russian gas with less expensive gas from Central Asia and sell the mixture to Ukraine at the higher price that Ukraine had indicated it was willing to pay, but much lower than Gazprom's price. Gazprom would pay cash instead of gas in kind to Ukraine's pipeline business for increased

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[17] Ariel Cohen, "Don't Punish Latvia," *Washington Times*, May 5, 2003.

[18] "Poland's PKN Buys Lithuania Refinery for $2.6 Billion," *Reuters*, May 26, 2006.

[19] Vladimir Kovalev. "Gazprom Secures Uzbekistan Gas through Politics and Pipelines," *FSU Oil & Gas Monitor*, January 23, 2006.

[20] Kerin Hope. "Russia to discuss Gazprom role in Aegean pipeline," *FT.com*, February 5, 2006. [http://search.ft.com/search/quickSearch_Run.html], viewed February 6, 2006.

[21] "Russia Turns up the Gas,"*Guardian Weekly*, December 23, 2005-January 5, 2006, p. 41; Peter Finn. "Russia Reverses Itself on Gas Cuts," *The Washington Post*, January 3, 2006, p. A12; Andrew E. Kramer. "Russia Restores Most of Gas Cut to Ukraine Line," *The New York Times*, January 3, 2006. [http://www.nytimes.com/2006/01/03/international/europe/03ukraine.html?pagewanted=print], viewed January 3, 2006.

transit fees.[22] One report stated that Gazprom wanted to gain at least some ownership of Ukraine's pipeline system.[23] Later in January 2006, through no fault of Russia, the apparent reliability of its natural gas supplies suffered further when severely cold weather boosted Russian demand for gas and cut exports below contracted volumes.[24] The most recent of temporary Russia-Ukraine follow-up gas price agreements was reached on July 13, 2006.[25]

Russia cut off gas to Moldova also in an early January 2006 in a price dispute. The countries reached an interim agreement after Moldova had been without Russian gas for two weeks.[26] The cutoffs to Ukraine and Moldova in price-dispute contexts have led several former Soviet Union as well as West European countries to investigate non-Russian gas.

Russia initially opposed western investment in Caspian Sea energy projects, insisted that oil from the region be transported through Russian territory to Black Sea ports, and argued for equal sharing of Caspian Sea oil and gas. This attitude partly reflected the extensive energy ties between Russia and Central Asian countries stemming from the numerous transportation routes from that area through Russia. But Russia has become more agreeable, and even cooperative with, western projects; and it has signed an agreement with Azerbaijan and Kazakhstan on Caspian seabed borders essentially based upon shore mileage.

In East Asia, China, Japan, and South Korea, are trying to gain access to the largely undeveloped energy resources of eastern Siberia, as those countries strive to meet their increasing energy needs while reducing dependence on the Middle East. China and Japan appear to be engaged in a bidding war over Russian projects and are contesting access to Russian rival oil pipeline routes.

Many observers believe that, Russia tried to use potential participation by American firms in development of the large Shtokmanovskoye gas field as leverage

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[22] Graeme Smith. "Russia, Ukraine settle gas dispute," GlobeandMail.com, January 5, 2006 [http://www.theglobeandmail.com/international], type "Russia" in search box, viewed January 5, 2006; Peter Finn. "Russia and Ukraine Reach Deal on Gas, Ending Dispute," *The Washington Post*, January 5, 2006, p. A12; Mark Smedley and Mitchell Ritchie. "Russia, Ukraine Settle Gas Pricing Dispute, *Oil Daily*, January 5, 2006, p. 1.

[23] *Oil Daily*, January 5, 2006.

[24] For fuller discussion and analysis of the Russia-Ukraine gas dispute, see CRS Report RS22378, *Russia's Cutoff of Natural Gas to Ukraine: Context and Implications*, by Jim Nichol, Steven Woehrel, and Bernard A. Gelb.

[25] "Ukraine, Gazprom set deal on gas price," United Press International, July 13, 2006 [http://www.upi.com/Energy/view.php?StoryID=20060713-013205-4159r] viewed July 28, 2006. "Ukraine, Russia, Turkmenistan Dispute Pauses for Thought," *FSU Oil & Gas Monitor*, 5 July 2006.

[26] Neil Buckley and Sarah Laitner. "Moldova reaches gas deal with Gazprom," *FT.com*, Jan. 17, 2006. [http://search.ft.com/search/quickSearch_Run.html] viewed February 6, 2006.

in the negotiations to gain entry into the World Trade Organization (WTO).[27] Another recent development, the July 2006 initial public offering (IPO) in which 13-14% of state-owned oil company Rosneft was sold, has been seen by some as an attempt by Russia to attract investments by major oil companies. Presumably, the latter hope that investing in the Rosneft IPO would gain them easier access to participation in Russian oil and gas projects.[28] [29]

Given foreign companies' technological capabilities and Russia's need for the most modern oil and gas extraction technology, a reported proposal to tighten restrictions on the extent to which foreign oil companies can participate in Russian oil and natural gas production and other ventures is potentially significant and perhaps a move against Russia's own interests. Foreign companies or companies with 50% foreign participation would not be allowed to develop fields with more than 513 million barrels of oil and 1.77 billion cubic feet of natural gas.[30]

Major Proposed New or Expanded Pipelines[31]

Because Russia's export facilities have limitations of location and size, there are a number of proposals to build new or to expand existing Russian oil and natural gas export pipelines and related facilities. Some proposals are contentious and, while the Russian government perceives a need to expand its oil and gas export capacity, it has limited resources. Several selected proposals are discussed below.

With a 1.2-1.4 million bbl/d capacity, the 2,500-mile Druzhba line is the largest of Russia's oil pipelines to Europe. It begins in southern Russia, near Kazakhstan, where it collects oil from the Urals and the Caspian Sea. In Belarus, it forks at Mozyr, from which one branch runs through Belarus, Poland, and Germany; and the other through Belarus, Ukraine, Slovakia, the Czech Republic, and Hungary (**Figure 2**). Work has begun to increase capacity between Belarus and Poland. An extension to Wilhelmshaven (Germany) would reduce Baltic Sea tanker traffic and allow Russia to export oil to the United States via Germany.

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[27] Ed Reed, Shtokmnanovskoye: the Wait Continues," *NewsBase CIS Oil & Gas Special Report*, July 2006; "G8 Adopts Energy Plan; Shtokman Slipping Away from U.S. Firms?" *Oil Daily*, July 18, 2006; "Russian State Interference" and "Test Drilling on Shtokmanovskoye Begins," *FSU Oil & Gas Monitor*, 26 July 2006.

[28] Steven Mufson, "Russian Oil Firm IPO Ends Early," *The Washington Post*, July 13, 2006, p. D5; Gregory L. White and Alistair MacDonald, "Demand Allows Rosneft to Price IPO at High End," *The Wall Street Journal*, July 14, 2006, p. C1.

[29] Selling was stopped when 13-14% of the stock had been sold, yielding about $10.4 billion. Joanna Chung and Arkady Ostrovsky, "Rosneft IPO fails to attract big players," *Financial Times*, July 15-16, 2006, p. 9.

[30] Arkady Ostrofsky, "Russia may tighten foreign oil groups' access to reserves," Financial Times, June 14, 2006, p. 8.

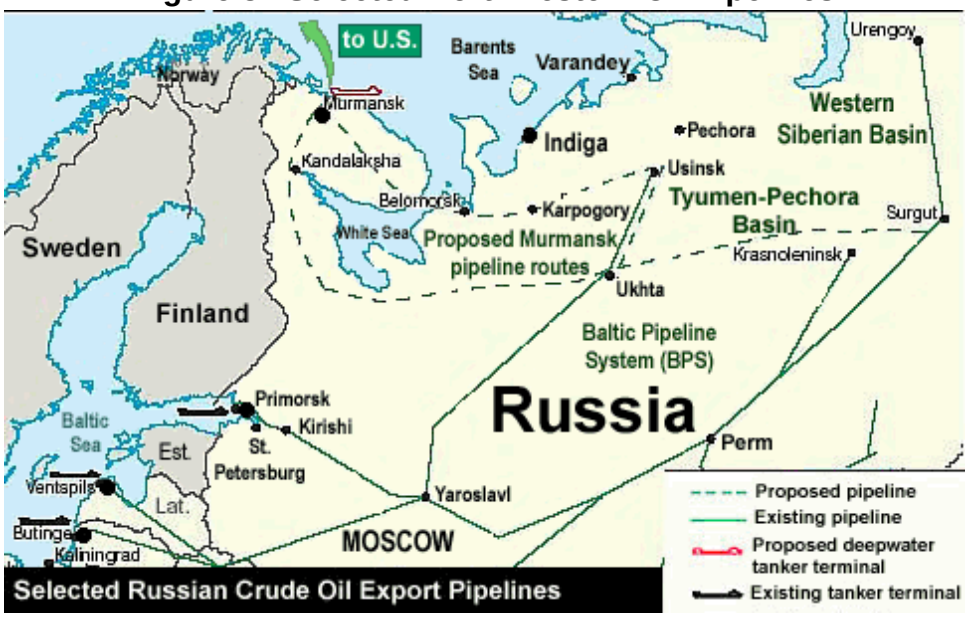
[31] Much of the discussion of Russian oil and gas pipelines is taken from the *Russia Country Analysis Brief* of February 2005, prepared by the Energy Information Administration.

Figure 2. Druzhba and Adria Oil Pipelines

Source: Energy Information Administration. *Russia Country Analysis Brief.*

The Baltic Pipeline System (BPS) carries crude oil from Russia's West Siberian and Tyumen-Pechora oil provinces westward to the newly completed port of Primorsk on the Russian Gulf of Finland (**Figure 3**). Throughput capacity at Primorsk has been raised to around one million bbl/d, and, pending government approval, will be expanded to 1.2 million bbl/d. The BPS gives Russia a direct outlet to northern European markets, reducing dependence on routes through the Baltic countries. The re-routing of Russian crude through the BPS has incurred considerable cost to those countries. Russian authorities have stated that precedence will be given to sea ports in which Russia has a stake over foreign ones. But the waterways through which tankers leaving from Primorsk and most other Russian export ports must transit limit tanker size, and therefore the price competitiveness of their cargoes.

Figure 3. Selected Northwestern Oil Pipelines



Source: Energy Information Administration. *Russia Country Analysis Brief.*

Proposed lines would carry oil from Russia's West Siberian and Tyumen-Pechora basins west and north to a deepwater terminal at Murmansk or Indiga on the Barents Sea (**Figure 3**). This would enable 1.6-2.4 million bbl/d of Russian oil to reach the United States via tankers in only nine days, much quicker than from the Middle East or Africa. Liquefied natural gas facilities at Murmansk and Arkhangelsk also have been suggested, possibly allowing for gas exports to American markets. The Indiga route would be closer to the Tyumen-Pechora oil fields and shorter; also Transneft's CEO has said that the Murmansk project is not economically feasible. However, in contrast with Murmansk, the port of Indiga ices over during the winter, a disadvantage that may be reduced or eliminated if Arctic ice melting continues.

The Adria oil pipeline runs between Croatia's Adriatic Sea port of Omisalj and Hungary (**Figure 2**). Originally designed to load Middle Eastern oil at Omisalj and pipe it northward to Yugoslavia and then to Hungary, the pipeline's operators and transit states have been considering reversing the flow — a relatively simple step — giving Russia a new export outlet on the Adriatic Sea. Connecting the pipeline to Russia's Southern Druzhba system requires the agreement of Russia, Belarus, Ukraine, Slovakia, Hungary, and Croatia. These countries signed a preliminary agreement on the project in December 2002; however, negotiations over the details (including tariffs and environmental issues) have been slow. Some analysts expect that the Adria pipeline could transport about 100,000 bbl/d of Russian crude oil in the first year of reversal, with an ultimate capacity of about 300,000 bbl/d.

The prospective large Chinese market for oil has led to serious consideration of building a pipeline from the Russian city of Taishet (northwest of Angarsk) to Nakhodka (near the Sea of Japan) or to Daqing, China (**Figure 4**). Both routes pass close to Lake Baikal — a site with environment-related obstacles. The Nakhodka route, which is longer, would provide a new Pacific port from which Russian oil could be shipped by tanker to Japan and other Asian markets and possibly to North America. Japan has offered $5 billion to finance construction and $2 billion for oil field development.[32] The Daqing option is favored by China, although China could obtain exports via the Nakhodka route. China has pledged to invest US$12 billion in Russia's infrastructure and energy sector by 2020.[33] From Russia's point of view, the Nakhoda route would offer access to multiple markets, whereas a terminus at Daqing would give China control. However, Russia's environmental safety supervisory body rejected the shorter route because it would pass too close to Lake Baikal, a United Nations world heritage site.[34]

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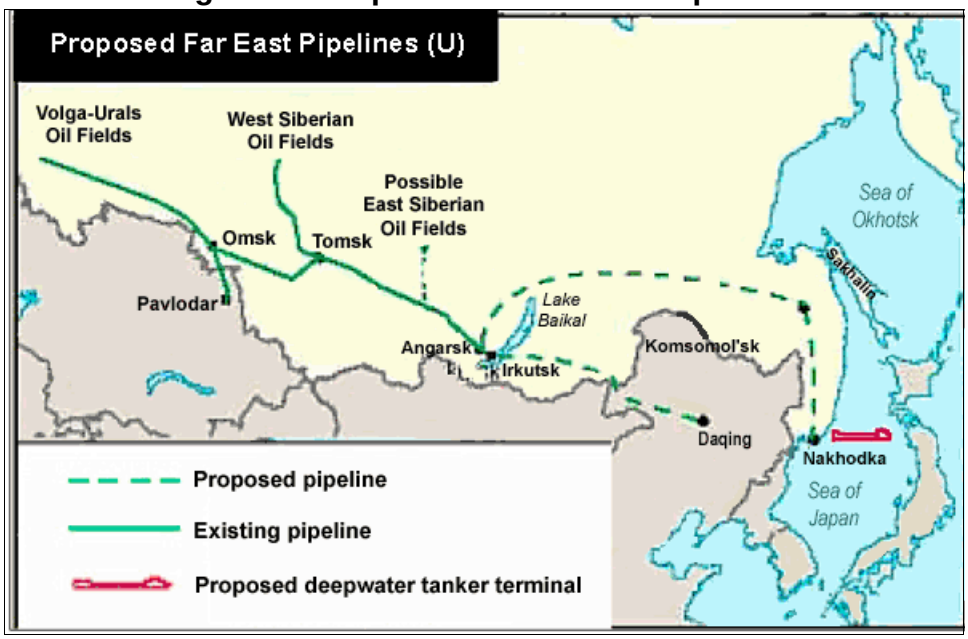
[32] Mark Katz. "Don't dismiss China's Daqing oil pipeline," *Asia Times Online*, October 1, 2004.

[33] Sergei Blagov, "China's Russian pipe dream," *Asia Times OnLine*, September 28, 2004.

[34] Eric Watkins. "Russia nixes East Siberia pipeline route," *Oil & Gas Journal Daily Update*, February 6, 2006.
[http://ogj.pennet.com/articles/article_display.cfm?article_id=247386], viewed Feb. 7, 2006.

Figure 4. Proposed Far East Oil Pipelines



Source: Energy Information Administration *Russia Country Analysis Brief.*

The 750-mile Blue Stream natural gas pipeline, 246 miles of which is underneath the Black Sea, connects the Russian system to Turkey. In February 2003, natural gas began flowing through the pipeline, which has a design capacity of 565 billion cubic feet annually. In March 2003, Turkey halted deliveries, invoking a contract clause allowing either party to stop deliveries for six months. Turkish leaders reportedly were unhappy with the price structure.[35] Other factors may have come into play, including Turkey's commitment to receive more supplies than its near term domestic consumption and agreements to transship gas to other countries. An agreement was reached in November 2003 and the flow resumed in December 2003.

The Yamal-Europe I pipeline (**Figure 5**, unidentified northern route in Russia), which carries 1 tcf of gas from Russia to Poland and Germany via Belarus, would be expanded under one proposal by another tcf per year. However, Poland and Gazprom disagree on the route of the branch that goes through Poland. Poland wants a route entirely through its own country and then to Germany (Yamal-Europe on the map), while Gazprom is seeking a route via southeastern Poland and Slovakia (Yamal II).

[35] Mevlut Katik. "Blue Stream's Pipeline's Future in Doubt Amid Russian Turkish Pricing Dispute," Business & Economics, June 2, 2003. Eurasianet.org [http://www.eurasianet.org /departments/business/articles/eav060203a_pr.shtml], viewed December 18, 2005.

Figure 5. Natural Gas Pipelines to Europe

Source: Energy Information Administration, *Russia Country Analysis Brief*.

A North Trans-Gas pipeline, or North European Gas Pipeline (NEGP), extending over 2,000 miles from Russia through the Gulf of Finland to Denmark and, ultimately, to the United Kingdom, via the Baltic and North Seas was proposed in June 2003 by Russia and the United Kingdom.[36] Gazprom and Germany's BASF and E.ON agreed on September 8, 2005, to set up a joint venture to build the pipeline. Originating in the St. Petersburg region, about 700 miles of the pipeline is to pass under the Baltic Sea. The first leg of the pipeline, which is under construction, is scheduled to come on stream in 2010.[37] Russia sees a gain by no longer having to negotiate transit fees with intermediary countries or pay them in natural gas. The pipeline agreement is criticized by some Europeans who object to the fact that it was reached without consultation with them, and see the pipeline as an unfair bypass with

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[36] Mark A. Smith. *The Russian, German, and Polish Triangle*, Russian Series 05/61, Conflict Studies Research Centre, October 2005, p. 2.

[37] Ria Novosti. "Factbox: North European Gas Pipeline," December 9, 2005. [http://en.rian.ru/russia/20051209/42408722.html] viewed December 28, 2005. BASF is mainly a chemical manufacturer, but has a subsidiary that explores for and produces oil and natural gas. E.ON is an electric power generator and distributor and a distributor of natural gas.

political motivation and environmental risk. Perhaps to supplement or substitute for the NEGP, Gazprom is planning to build an LNG plant in the St. Petersburg area.

Rusia Petroleum — a consortium of TNK-BP, South Korea's state-owned Korea Gas Corporation, and the Chinese National Petroleum Company — has announced plans to construct a pipeline connecting Russia's Kovykta natural gas field (2 trillion cubic meters of gas reserves) to China's northeastern provinces and across the Yellow Sea to South Korea.[38] The plan calls for a pipeline that ultimately would have a capacity of 40 billion cubic meters per year, delivering roughly half of its natural gas to China and the rest to South Korea and the domestic market en route.[39]

Implications for the United States[40]

Given that the United States as well as Russia is a major energy producer and user, Russian energy trends and policies affect U.S. energy markets and U.S. economic welfare in general in a broad sense.

Other things being equal, should Russia considerably increase its energy production and its ability to export that energy both westward and eastward, it may tend to ease the supply situation in energy markets in both the Atlantic and Pacific Basins. In the Atlantic arena, more Russian oil could be available to the United States. In the Pacific area, there would tend to be more supply available to countries trying to assure themselves energy supplies, such as China and Japan. This may ease the global competition for Persian Gulf oil.

On the other hand, the Russian government's moves to take control of the country's energy supplies noted earlier may have the effect of making less oil available on the world market.

Possibly as important as Russian oil and gas industry developments is the associated potential for U.S. suppliers of oil and gas field equipment and services to increase their sales in Russia. Although U.S.-Russian economic relations have expanded since the collapse of the Soviet Union, as successive Russian leaders have been dismantling the central economic planning system, including the liberalization of foreign trade and investment, the flow of trade and investment remains very low. U.S. suppliers of oil and gas field equipment have established a modest beachhead in Russia, however. U.S. exports of oil field machinery and equipment accounted for 9% of U.S. all goods exports to Russia in the first 10 months of 2005, one of the largest export categories. As noted earlier, potential growth of both oil and natural

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[38] TNK-BP. "Kovykta Project," [http://www.tnk-bp.com/operations/exploration-production/projects/kovykta]. Viewed December 28, 2005.

[39] Selig S. Harrison. "Gas and Geopolitics in Northeast Asia," *World Policy Journal*, Winter 2002/2003, pp. 22-36.

[40] For more discussion and analysis of U.S.-Russian economic relations, see CRS Report RS21123, *Permanent Normal Trade Relations (PNTR) Status for Russia and U.S.-Russian Economic Ties*, by William H. Cooper.

gas production in Russia is limited by the lack of full introduction of the most modern western oil and gas exploration, development, and production technology.

Similar to U.S. trade with Russia, U.S. investments there, especially direct investments, have increased since the dissolution of the Soviet Union, but the levels are far below their expected potential. Even so, as of the end of 2003, the United States was Russia's second largest source of foreign direct investment, largely concentrated in energy, communications, engineering, and transportation.[41]

In this context, however, Russian economic policies and regulations have been a source of concerns. The United States and the U.S. business community have asserted that structural problems and inefficient government regulations and policies have been a major cause of the low levels of trade and investment with the United States. While they consider the climate to be improving, potential investors complain that the climate for investment in Russia remains inhospitable. They point to lack of effective intellectual property rights protection, burdensome tax laws, jurisdictional conflicts among Russian federal, regional and local governments, inefficient and corrupt government bureaucracy, and the lack of a market-friendly commercial code as impediments to trade and foreign investments. And, more specifically, the forced breakup of Yukos has clouded prospects for private investment.

In addition, Russian energy trends and policies have possible implications for U.S. energy security. In its oversight role, Congress may have an interest in Russia's large role as a supplier to world energy markets in general, in Russia's role as a possible major exporter of energy to the United States, and in the changed patterns of world energy flows that could result from the completion of new Russian oil and natural gas export pipelines and related facilities or the expansion of existing export pipelines and related facilities.

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[41] CRS Report RS21123, *Permanent Normal Trade Relations (PNTR) Status for Russia and U.S.-Russian Economic Ties*, by William H. Cooper.