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COUNTRY ANALYSIS BRIEFS

Russia

Last Updated: November 2010

Background

Russia holds the world's largest natural gas reserves, the second largest coal reserves, and the eighth largest crude oil reserves.

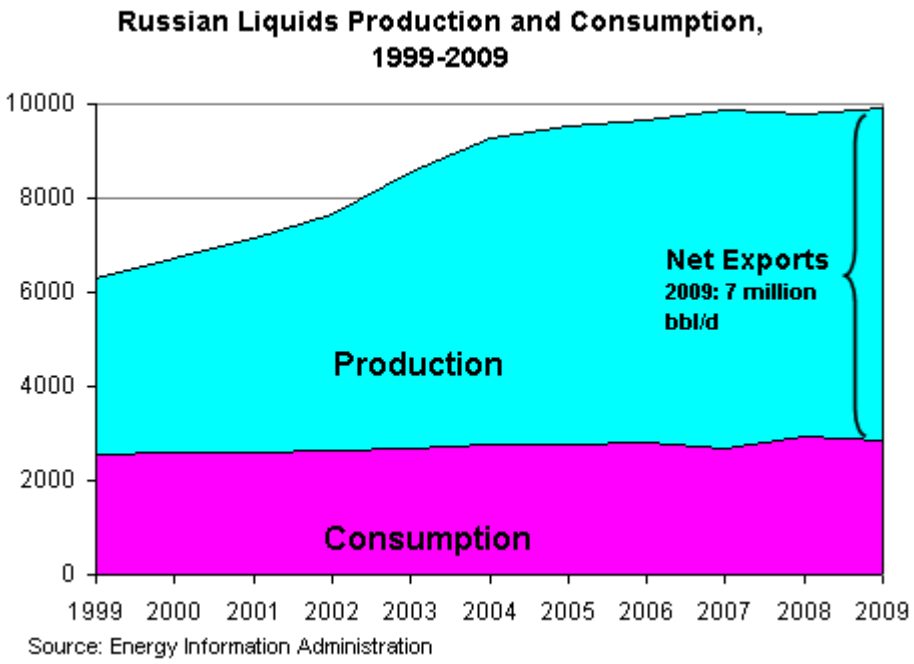
Russia is a major exporter of oil and natural gas and its economic growth over the past decade has been driven primarily by energy exports, given the increase in Russian oil production and relatively high world oil prices during the period. Internally, Russia gets over half of its domestic energy needs from natural gas.

Oil

Russia was the largest producer of crude oil in 2009, surpassing Saudi Arabia .

According to the *Oil and Gas Journal*, Russia's proven oil reserves were 60 billion barrels as of the beginning of 2010. Most of Russia's resources are located in Western Siberia, between the Ural Mountains and the Central Siberian Plateau. Eastern Siberia holds some reserves, but the region has had little exploration.

In 2009 Russia produced an estimated 9.9 million bbl/d of oil, and consumed roughly 2.9 million bbl/d. Russia exported around 7 million bbl/d in 2009 including roughly 4.0 million bbl/d of crude oil and the remainder in products. Russia's oil exports fall under the jurisdiction of the state-owned pipeline monopoly, Transneft.



Source: Energy Information Administration

Exploration and Production

Most of Russia's oil production comes from Western Siberia, more specifically from Priobskoye, Prirazlomnoye, Mamontovskoye, Malobalykskoye, and Surgut group of fields. The Sakhalin group of fields in the Far East is expected to contribute to most of Russia's oil production in the near term. In the longer-term, untapped oil reserves in Eastern Siberia, the Caspian Sea, and Sahkalin are expected to play a larger role and several international oil companies, including ExxonMobil, Shell, and BP are actively working in this area.

	2009 Production Volumes (Thousand bbl/d)
Production by Region	
Western Siberia	6570
Urals-Volga	2030
Northern Caucasus	800
Arkhangelsk	370
Sakhalin	310
Komi Republic	270
Krasnoyarsk	70
Yakutiya	60
Irkutsk	30
Kaliningrad	30

Source: Eastern Bloc Research

Sector Organization

Most of Russia's production remains dominated by domestic firms. Following the collapse of the Soviet Union, Russia undertook privatization of the oil industry, however the consolidation that followed transformed the sector into one dominated by a few privately-owned companies that drove the growth in the sector starting in the late 1990s. In 2003, BP invested in TNK, forming TNK-BP, one of country's major oil producers. This was followed by the entrance of ConocoPhillips into the Russian oil exploration and production. Subsequent attempts by foreign firms to increase their investment in Russia were unsuccessful. The state-run Rosneft acquired most or the Yukos assets, and became the largest oil producer in Russia. While foreign companies can invest in Russia, this is generally done with a Russian company, usually Rosneft.

Refinery Sector

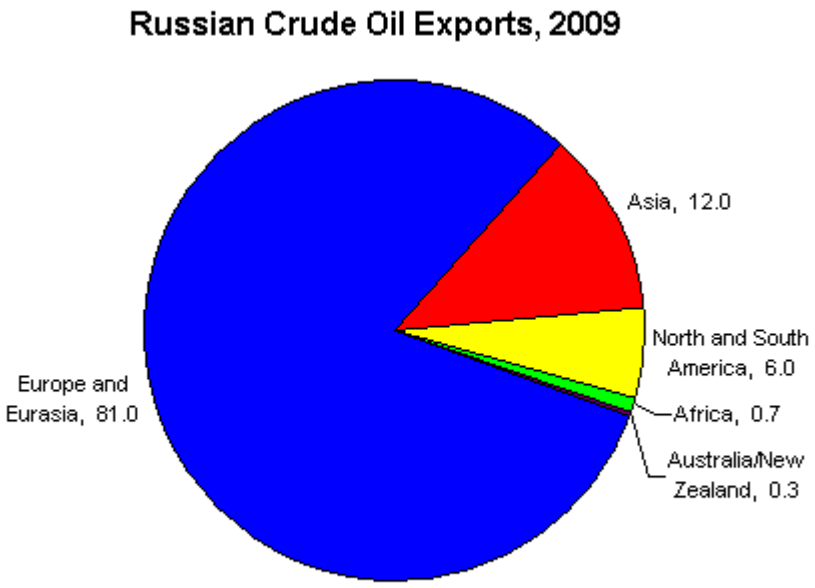
Russia has 40 oil refineries with a total crude oil processing capacity of 5.4 million bbl/d, according to OGJ. Rosneft, the largest refinery operator controls 1.3 million bbl/d and operates Russia's largest refinery, the 385,176-bbl/d Angarsk facility. Other companies with sizeable refining

capacity in Russia include Lukoil (975,860 bbl/d), and TNK-BP (690,000 bbl/d).

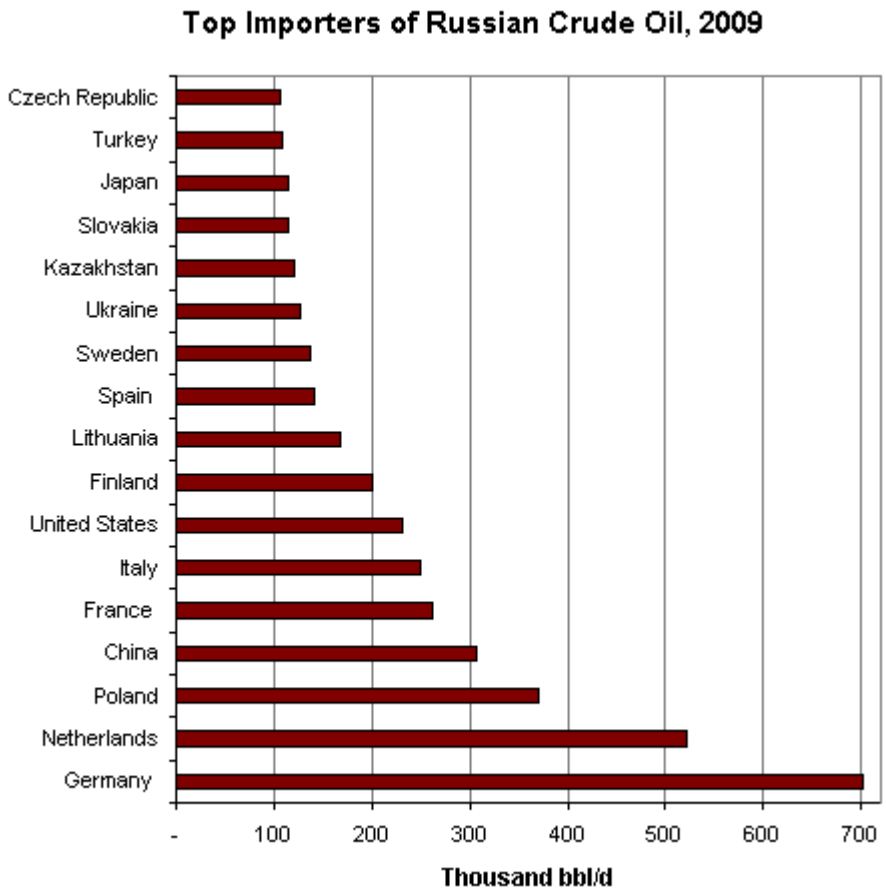
Oil Exports

Russia's Transneft currently has a monopoly over Russia 's pipeline network.

During 2009, Russia exported 7 million bbl/d of oil. The majority of Russian exports (80 percent) are destined for European markets, particularly Germany and Netherlands. Around 12 percent of Russia's oil exports go to Asia, while 6 percent are exported to North and South America, with the majority of those exports going to the United States (5 percent of total exports).



Source: Global Trade Atlas, FACTS, and EIA.



Note: Data discrepancies can be attributed to definitions and conversion factors used to define Russian crudes.
Source: Global Trade Atlas, FACTS, and EIA.

Pipelines

Russia has an extensive domestic distribution and export pipeline network. Russia's entire pipeline network is dominated by the state-run Transneft, which transports 90 percent of all oil produced in Russia, according to IHS Global Insight. These include a number of domestic pipeline networks, pipelines that transport oil to export terminals such as Novorossiisk on the Black Sea and Primorsk on the Baltic Sea, as well as a number of export pipelines that deliver oil to western European markets. Russian export pipelines include Druzhba, Baltic Pipeline System, North-Western Pipeline System, Tengiz-Novorossiisk, and Baku-Novorossiisk. All of these pipelines with the exception of the Tengiz-Novorossiisk are Transneft-controlled pipelines. Druzhba is Russia's largest pipeline, transporting oil to European markets on two routes, (1) northern via Belarus, Poland, and Germany, and (2) southern via Belarus, Ukraine, Slovakia, Czech Republic, and Hungary. Druzhba is more than 2,300 miles long and has the capacity to carry up to 1.4 million bbl/d of oil.

Proposed Oil Pipeline Routes and Pipeline Expansion Projects

Tengiz to NovorossiiskExpansion: The Tengiz to Novorossiisk pipeline, operated by the Caspian Pipeline Consortium (CPC), was commissioned in November 2001. This pipeline transports crude oil from the western Kazakh oilfield Tengiz to the Russian Black Sea port Novorossiisk. CPC shareholders in late 2008 approved an expansion of the pipeline, which would increase its peak design throughput to 1.34 million bbl/d by 2013. The pipeline's current capacity is 565,000 bbl/d.

EasternSiberia-PacificOcean (ESPO): Taishet - Skovorodino - KozminoBay: Transneft is building the Eastern Siberia-Pacific Ocean pipeline in two stages, with the first phase (1,491-mile, 600,000 bbl/d) completed in September 2010. ESPO blend is a high-quality light (34.8 API) and sweet (0.54 percent sulphur) mix of crude oil from 22 different Russian oilfields. Eventually this pipeline will deliver crude oil from Eastern Siberia to Russia's Pacific Coast, giving Russia's crude oil easier access to Asia-Pacific markets. Once completed, this pipeline will be able to transport

1.6 million bb/d of crude oil and it will be approximately 2,610 miles long.

Source: Centre for Global Energy Studies/Market Watch

Kharyaga-Indiga Pipeline: Transneft's proposed Kharyaga-Indiga pipeline would serve as an export line for crude oil produced in the Timan-Pechora region and oilfields in northern Russia. If built, the 267-mile pipeline is expected to transport 240,000 bbl/d. No timeline has been set for construction. Oil from Timan-Pechora has a lower sulfur content and is lighter than the rest of the Urals blend.

Ports

There are eight ports in Russia serving as export outlets for Russian oil to various markets, including Europe, North and South America, as well as Asia. The largest Russian port is Primorsk with a capacity of 1.5 million bbl/d. Other ports include DeKastri, Kozmino Bay, and Prigorodnoye (located in the Far East), as well as Novorossiysk, Yuzhny, and Tuapse (Black Sea).

Currently, there are a few proposals for expansions and new terminal constructions in Russia. These include the proposed expansion to Primorsk, where throughput capacity has steadily increased, with additional capacity being added once the Baltic Pipeline System II (BPS-II) comes online. The construction on BPS-II began in June 2009.

An export terminal in the Gulf of Finland, Ust-Luga, is also under construction. Once completed, the terminal will be mainly served by rail and will have the capacity to export up to 500,000 bbl/d.

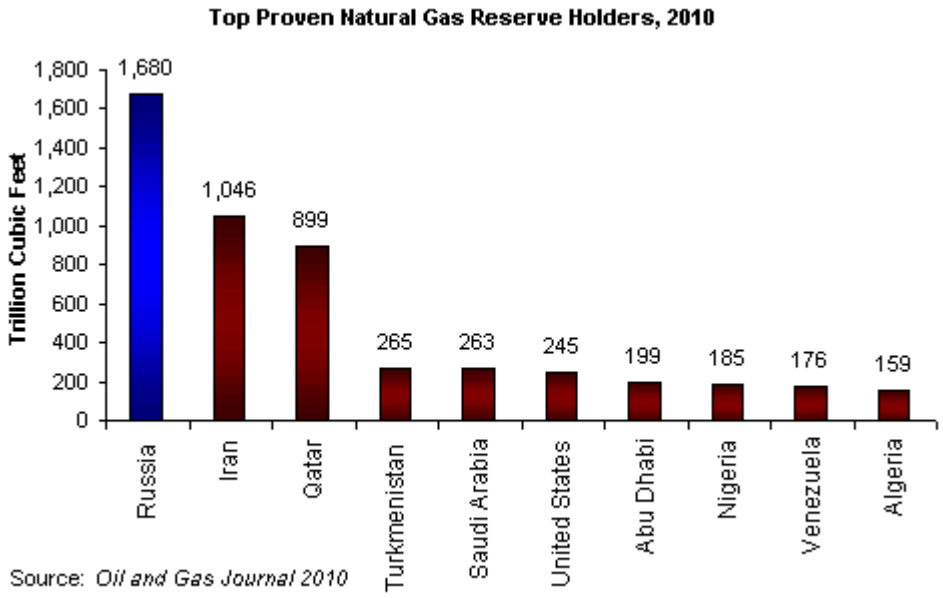
Rail Export Routes

Rail exports comprise roughly 5 percent of Russian oil exports. Rail is generally used as an alternative to Transneft's pipeline network, although rail shipments generally are costlier than pipeline exports. Russia exports crude oil and petroleum products by rail through Estonia and Latvia. Additionally, crude oil is transported to China via rail to the northeast cities of Harbin and Daqing and to central China via Mongolia. In 2009, Russia exported an average of 306,000 bbl/d to China via rail, however Russia plans on increasing exports to China significantly in the future. The planned ESPO pipeline will stretch from Eastern Siberia to the Pacific Ocean, with a planned spur allowing significant increase in export volumes to China.

Natural Gas

Russia has the largest natural gas reserves in the world and it is the second-largest producer of natural gas.

According to the *Oil and Gas Journal*, Russia holds the world's largest natural gas reserves, with 1,680 trillion cubic feet (Tcf), and Russia's reserves account for about a quarter of the world's total proven reserves. The majority of these reserves are located in Siberia, with the Yamburg, Urengoy, and Medvezh'ye fields alone accounting for about 45 percent of Russia's total reserves. More than half of all reserves are located in Siberia. Significant reserves are also located in northern Russia.



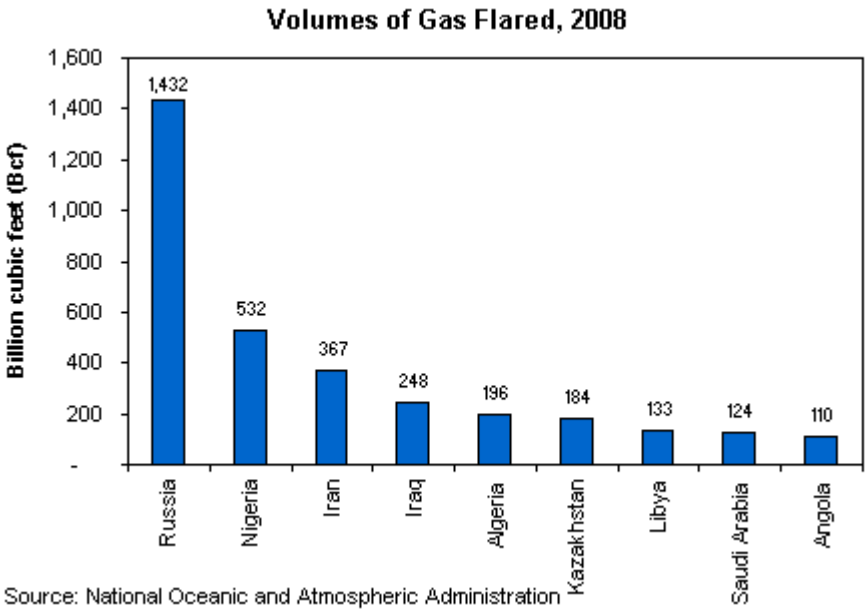
Exploration and Production

In 2009 Russia was the world's second-largest natural gas producer (19.3 Tcf), second only to the United States (21Tcf), however, Russia was the world's largest exporter (7.3 Tcf). Russia's production decreased in 2009, falling by more than 4 Tcf or 17 percent year over year. The decrease in production led to a lower natural gas exports during the year, as well. At 19.3 Tcf, Russia's production reached the lowest level since 1992.

The largest concentration of production is located in Siberia, where about 95 percent of Russia's natural gas is produced. Some of the most prolific fields in this area include Yamburg, Urengoy, and Medvezh'ye, all of which are licensed to Gazprom, Russia's state-run natural gas exploration and production company. These three fields have seen output declines in recent years. In response, the company launched the Yamal Megaproject in late 2008. Additionally, the Zapolyarnoye field, commissioned in 2001, is expected to offset some of the declines of Gazprom's big three fields.

Gas Flaring

Natural gas associated with oil production is often flared. According to the U.S. National Oceanic and Atmospheric Administration, Russia flared an estimated 1,432 Bcf of natural gas in 2008, the highest of any country in the world. The Russian government has taken steps to reduce natural gas flaring and setting a target of 95 percent utilization or associated gas by 2012.



Source: National Oceanic and Atmospheric Administration

Sector Organization

The state-run Gazprom dominates Russia's upstream, with 90 percent of the total natural gas output produced by Gazprom. Gazprom also controls most of the Russian gas reserves, with more than 65 percent of proven reserves being directly controlled by the company, with additional reserves being controlled by Gazprom in joint ventures with other companies.

While independent producers have gained importance, with producers such as Novatek and LUKoil contributing increasing volumes to Russia's production in recent years, the upstream remains fairly limited to independent producers and other companies, including Russian oil majors. Gazprom's position is further cemented by its legal monopoly on Russian gas exports.

Natural Gas Exports

Russia exports significant amounts of natural gas to customers in the Commonwealth of Independent States (CIS). In addition, Gazprom (through its subsidiary Gazexport) has shifted much of its natural gas exports to serve the rising demand in countries of the EU, as well as Turkey, Japan, and other Asian countries.

Destination	2009 Export Volumes (Bcf)
CIS Countries	2239
Western Europe	3267
Eastern Europe	1275

Source: Eastern Bloc Research

According to Eastern Bloc Research data, Russia exported more than 6.5 Tcf of natural gas in 2009, which includes 4.5 Tcf to Eastern and Western Europe and 2.2 Tcf to CIS countries. Included in Russian export estimates are volumes mixed with Central Asian gas exports.

Export Disputes

Russia's natural gas exports to Eastern and Western Europe shipped on pipelines traversing Ukraine and Belarus have in the past been affected by political and economic disputes between Russia and these natural gas hubs. The disputes with Ukraine and Belarus were centered around natural gas prices in 2006 and 2007, respectively. Disputes between Russia and its immediate neighbors resulted in natural gas being cut off to much of Europe. European countries are seeking out alternate sources of natural gas and alternate pipeline routes to ensure security of natural gas supplies.

Pipelines

In addition to dominating the upstream, Gazprom dominates Russia's natural gas pipeline system as well. There are currently nine major pipelines in Russia, seven of which are export pipelines. The Yamal-Europe I, Northern Lights, Soyuz, and Bratrstvo pipelines all carry Russian gas to Eastern and Western European markets via Ukraine and/or Belarus. These four pipelines have a combined capacity of 4 Tcf. Three other pipelines, Blue Stream, North Caucasus, and Mozdok-Gazi-Magomed connect Russia's production areas to consumers in Turkey and FSU republics in the east.

Proposed Natural Gas Pipelines

Yamal-Europe II: The Yamal-Europe I pipeline (1 Tcf), which carries natural gas from Russia to Poland and Germany via Belarus, would be expanded another 1 Tcf under this proposal. Gazprom and Poland currently disagree on the exact route of the second branch as it travels through Poland. Gazprom is seeking a route via southeastern Poland to Slovakia and on to Central Europe, while Poland wants the branch to travel through its own country and then on to Germany.

South Stream: The first component of the South Stream project plans to send natural gas from the same starting point as the Blue Stream pipeline at Beregovaya for 560 miles under the Black Sea, achieving a maximum water depth of over 6,500 feet. The second, onshore component will cross Bulgaria with two alternatives: one directed towards the northwest, crossing Serbia and Hungary and linking with existing gas pipelines from Russia; and the other directed to the southwest through Greece and Albania, linking directly to the Italian network. As a result of the Russia-Ukraine disputes, the pipeline will be constructed through Turkey's waters, avoiding Ukraine's territory altogether. Gazprom expects the pipeline to be completed by 2015.

Nord Stream Pipeline: A northern pipeline extending over 2,000 miles from Russia to Germany via the Baltic Sea, was initially approved in 2005. Once completed, the pipeline will be the longest sub-sea pipeline, with a capacity to transport 1.9 Tcf of natural gas. Environmental concerns have resulted in delays, and the expected completion date has been moved to 2013 from its original start-up date of 2010.

Electricity

Russia is one of the top producers and consumers of electric power in the world, with more than 220 million kilowatts of installed generation capacity.

Economic expansion contributed to an increase in total electricity consumption from 675 billion KWh (kilowatt hours) in 1998, to roughly 983 billion kWh in 2008. Thermal power (oil, natural gas, and coal-fired) accounts for roughly 68 percent of Russia's electricity generation, followed by hydropower (16 percent) and nuclear (16 percent). Russia's power sector includes over 440 thermal (approximately 77 of which are coal-fired) and hydropower plants as well as 31 nuclear reactors.

Sector Organization

There are eight separate regional power systems in the Russian electricity sector, seven of which are connected to an integrated power system. These systems are: Northwest, Center, South, Volga, Urals, Western Siberia, Siberia, and Far East. The Far East region is the only one not connected to an integrated power system. Federal Grid Company (FGC), which is more than 70 percent owned by the Russian government, controls most of the transmission and distribution in Russia. The grid comprises almost 2 million miles of power lines, 73,000 miles of which are high-voltage cables over 220 kilovolts (Kv).

The Russian power sector was recently restructured and much of it was privatized. The reform divided the electricity sector into wholesale companies that participate in a new wholesale market. The country's transmission grid remains mostly under state control, however the government continues to try and attract private investment into the wholesale and regional generating companies. As part of the market reform, most of Russia's thermal power was also privatized, however nuclear and hydropower remain under state control.

Nuclear Power

The Russian government has stated that it intends to expand the role of nuclear and hydropower generation in the future to allow for greater export of fossil fuels, calling for a doubling of the country's power generation from nuclear plants. In fact, the government has outlined plans for nuclear power to account for up to 25 percent of electric power generation by 2030. Russia has an installed nuclear capacity of 23.2 million kilowatts, distributed across 31 operational nuclear reactors at 10 locations, all west of the Ural Mountains. However, Russia's nuclear power facilities are aging. Roughly half of the country's 31 nuclear reactors use the RBMK design employed in Ukraine's ill-fated Chernobyl plant. The working life of a reactor is considered to be 30 years and

15 of Russia's plants are 30 or more years old. Some of the older reactors likely will be replaced in the near future, as there are 10 nuclear units currently under construction. Russia's newest reactor, the 950-MW Rostov 2 reactor was connected to the grid in March 2010.

Coal

With 173 billion short tons, Russia holds the world's second largest recoverable coal reserves, behind the United States, which holds roughly 263 billion short tons. Russia produced 323 million short tons in 2009, less than a third of U.S. coal production. The country consumed roughly 223 million short tons, leaving about 100 million short tons for export.

Following Russia's restructuring a few years ago, more than 80 percent of domestic coal production comes from independent producers. Russian coal production increased substantially in 2008, reaching the highest production level since 1996. However, in 2009 the production declined somewhat. The Russian government's strategy to increase coal production and build more coal-fired plants will help reduce demand for natural gas, thus allowing for more natural gas exports.

Maps

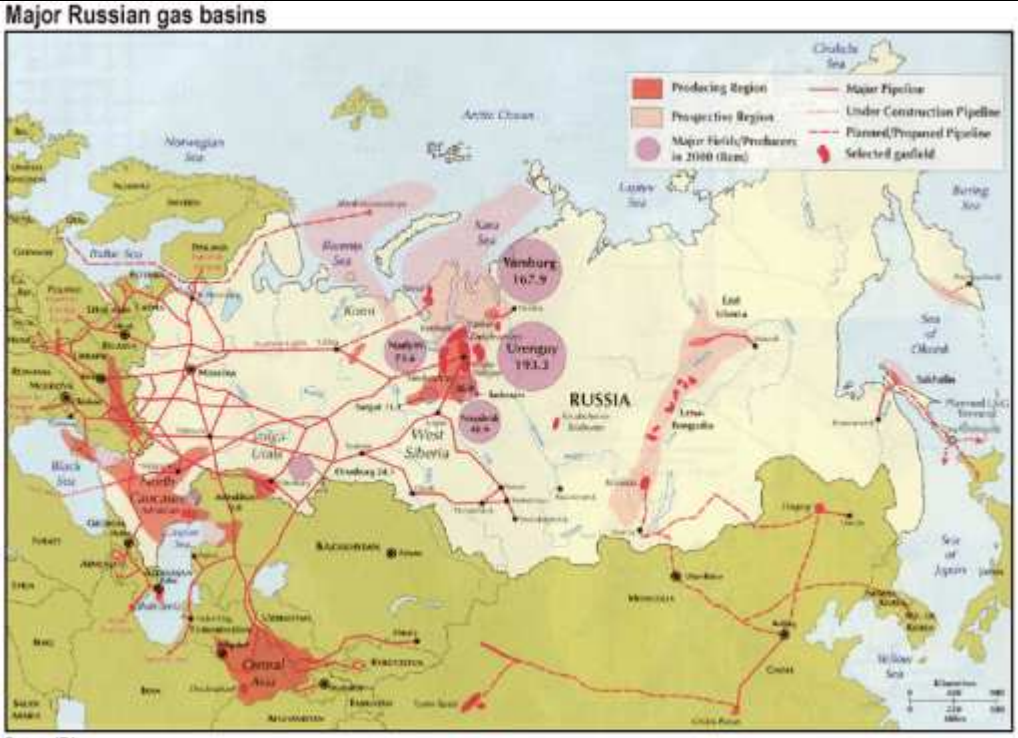
Major Pipelines to Europe

Russian Proposed Oil and Natural Gas Pipelines to China

Major Russian Oil and Natural Gas Basins:

Source: IEA

Major Russian gas basins



Source: IEA

Bosporus Bypass Options

Other Non-U.S. Government Maps:

Oil and Capital (www.oilcapital.ru): Gas pipelines and production in Central Asia and Western China.

University of Texas: Perry-Castaneda Map Collection: Link to Detailed Map of Caspian Sea (North Region)
University of Texas: Perry-Castaneda Map Collection: Link to Detailed Map of Caspian Sea (South Region)
University of Texas: Perry-Castaneda Map Collection: Link to Detailed Map of Caspian Sea (Legend)

Profile

Energy Overview

Proven Oil Reserves (January 1, 2010)	60 billion barrels (Oil and Gas Journal)
Oil Production (2009E)	9,930 thousand barrels per day, of which 96% was crude oil
Oil Consumption (2009)	2,850 thousand barrels per day
Crude Oil Distillation Capacity (2010E)	5,300 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2010)	1,680 trillion cubic feet (Oil and Gas Journal)
Natural Gas Production (marketed 2008)	23.4 Trillion cubic feet (Tcf)
Natural Gas Consumption (2009)	12.9 Tcf
Recoverable Coal Reserves (2005)	173,000 million short tons
Coal Production (2009)	322 million short tons
Coal Consumption (2009)	222,600 million short tons
Electricity Installed Capacity (2008)	224.2 gigawatts
Electricity Generation (2008)	984.5 billion kilowatt hours
Electricity Consumption (2008)	857.6 billion kilowatt hours
Total Energy Consumption (2008)	29.2 quadrillion Btus*, of which Natural Gas (58%), Oil (14%), Coal (16%), Hydroelectricity (6%), Nuclear (6%), Other Renewables (0%)
Energy Intensity (2007E)	15,312 Btu per $2005-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2008E)	1,729 million metric tons, of which Natural Gas (52%), Coal (26%), Oil (22%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2008E)	12.29 metric tons
Carbon Dioxide Intensity (2008E)	1.84 Metric tons per thousand $2005-PPP**

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power.
**GDP figures from Global Insight estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links

EIA - Russia Country Energy Profile
U.S. Agency for International Development (Europe and Eurasia)
U.S. Department of Commerce, International Trade Administration: Energy Division
CIA World Factbook
National Oceanic and Atmospheric Administration (NOAA) Gas Flaring
Statements and Speeches Concerning Official U.S. Government Policy on Russia
U.S. Department of State, Office of Europe and Eurasia
U.S. Embassy in Moscow

General Information

Bellona - Publication on Russian Nuclear Industry and other Environmental Information
Center for Strategic and International Studies – Russia and Eurasia
Gazprom
Global Insight
International Atomic Energy Agency (IAEA) Power Reactor Information System
International Energy Agency
Transparency International

The Moscow Times
Prime-Tass
Rosneft
Sakhalin Energy
World Bank- Russian Federation
World Energy Council

Sources

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Caspian News Agency, Caspian Business Report
CIA World Factbook
The Economist
The Financial Times
FSU Oil and Gas Monitor
Nefte Compass (Energy Intelligence)
CIS and Eastern European Energy Databook
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