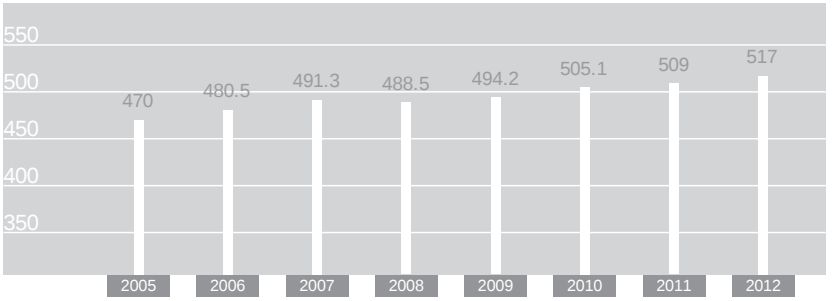
Oil Industry

Upstream

Russia is the largest holder of oil and gas reserves in the world and the second largest oil producer with 12% of total global oil output. The oil upstream industry is a backbone of the economy with an impact on the country's international balance of payments, exchange rate and formation of investment resources of the economy.

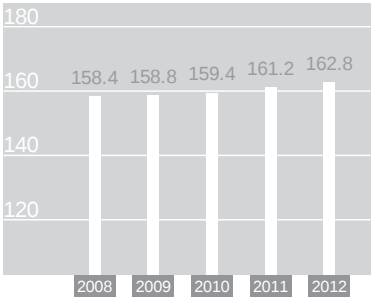
Following its post-Soviet collapse, Russian oil production has been growing and rebounded from its low of 5.8 million barrels per day to the level of 10.4 million barrels per day in 2012, with around 7.2 million tons exported as either crude or oil product. According to the Russian Energy Ministry, oil output in Russia grew by 1.6% to 517m tonnes, supported by tax legislation incentives and the launch of new pipelines and oil exploration projects.

Oil production in Russia, mln tonnes

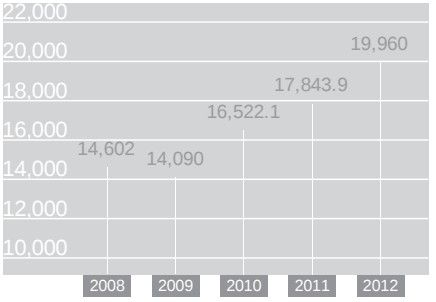


The well stock reached 162.8 thousand versus 159 thousand in 2010 while more than 138.8 thousand (~85%) of them are actively producing. Russia aims to maintain annual oil production at the current level, or just over 10mn bpd, over the next 10 years.

Russian Well Stock, ths itms



Production drilling rate, km



Capital expenditures of the oil upstream sector grew from RUB 596 bln in 2011 to approximately RUB 700 bln in 2012. Oil prices continued to support favorable conditions in the industry. Following strong performance in 2011 driven by unstable political situations in key oil producing regions as well as the monetary policy of the developed countries, average oil price continued to demonstrate moderated growth supported by ongoing monetary expansion of the key Central Banks and prolonged instability in some producing countries. Average oil price reached 111.7 USD in 2012 versus 111.2 in 2011.

Midstream

Having more than 50 th. km of oil pipelines and more than 400 installed pump stations, Russia has the largest oil pipeline system in the world. More than 90% of produced crude oil in Russia is transferred through the existing trunk pipeline system.

Transneft, the operator of the pipeline system, has significantly reformed the pipeline in the past 10 years to meet the needs of the post-Soviet oil boom and transports around 460 ml tonnes of oil annually. When the system was created in Soviet times, it was primarily designed to supply the domestic market: the refineries located in European Russia and the nearby republics, with only some excess volumes destined for exports. With the collapse of the Soviet economy, oil producers redirected crude oil flows to more profitable markets in non-CIS countries, which resulted in export capacity bottlenecks in 2002-04. This was resolved by adding new pipeline capacity.

The existing pipeline system is constantly expanding through the following projects:

East-Siberia — Pacific Ocean (ESPO). The second stage of the project of the East Siberia — Pacific Ocean pipeline system which implied construction of a main trunk pipeline at the section named Skovorodino — Kozmino SMNP (ESPO-2) was successfully completed and launched in December 2012. The subsequent increase of the existing capacity of the Taishet GNPS — Skovorodino NPS (ESPO-1) line up to 50 million tons of oil per year (extension of ESPO-1) is currently under way with HMS continuing to work on the installation of 3 pumping stations.

The construction of the Zapolyarye-Purpe oil pipeline with its overall capacity of 45 million tons per year is planned in order to transport oil from the green fields of Yamalo-Nenets Autonomous District and the North of Krasnoyarsk District. The overall length of the pipeline is estimated to be 500km. In 2012, Transneft conducted most of the surveying, design and planning for the project.

The construction of the Tihoretsk-Tuapse-2 oil pipeline is to increase oil volumes delivered to the Tuapse oil

refining plant. The estimated length of the oil pipeline is 247km with a capacity of 12 million tons per year.

The amplification of CPC: The oil pipeline Tengiz-Novorossiysk of the Caspian Pipeline Consortium (CPC) is intended for the transportation of Russia's and Kazakhstan's oil exports through the sea terminal of CPC.

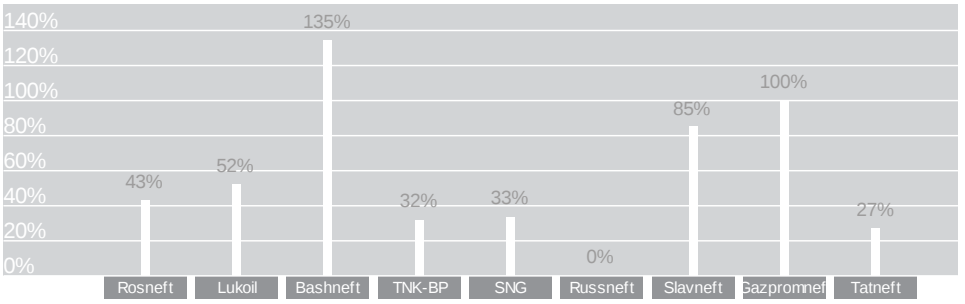
The South construction project is the oil product pipeline linking Syzran-Saratov-Volgograd- Novorossiysk.

The length of the Samsun—Ceyhan oil pipeline will be 550 km with an estimated capacity of 50 million tons per year. The project is to create a competitive route for oil transportation and solve the problem of the overloaded straits of Bosphorus and Dardanelles.

The total capital expenditure by Transneft in 2012 was RUB 167 bln.

Downstream

Refinery capacity to oil production, 2012, %



The Russian refining system is the third largest in the world, ranked only behind the U.S. and China, with approximately 275 mnt of total capacity. In 2012, the volume of primary processing hit a record level of 270 mnt, up 4.9% year-on-year. Production growth has been driven by the transition to the European emission standards Euro-3 effected in 2013, an increase in internal demand and expansion of gasoline exports.

The majority of refineries still require upgrading, with a current Nelson complexity index of just over 5 compared to the European level of 6.5 and 9.6 for the U.S. The strategic goal set by the government is to reach processing depth of 83% by 2015.

According to investment plans announced by oil companies, capital expenditures of the sector exceeded RUB 300 bn in 2012.

Industry growth could be driven by new projects in 2013:

- The second stage of the TANEKO oil refining complex is to be put into operation and could lead to processing volume growth up to 5 mn tons.
- Gaspromneft has several large projects on the agenda; construction of the Nakhodka refinery plant (20 million t.) and modernization of the Omsk and Moscow refineries.
- Rosneft has announced plans to increase oil refining volumes by 11.5% to 64.6 million t. Under the programme, the Tuapse and Novokuybyshevsk refineries ought to be upgraded.
- Surgutneftegaz has started to implement the project on the designed capacity of deep oil refining at Kirishinefteorgsintez This will allow the company to increase production of light oil products by 3.5 million tons.
- Lukoil is to launch the hydrocracker complex under the program of the Volgograd refinery modernization.

Gas pipeline projects

The Unified Gas Supply System of Russia operated by Gazprom is the world's largest gas transmission system and represents a unique engineering complex encompassing gas production, processing, transmission, storage and distribution facilities. It assures continuous gas supply from the wellhead to the ultimate consumer. The system includes 161.7 thousand kilometers of gas trunklines and laterals, 215 line compressor stations with gas compressor units totaling 42 thousand MW in capacity, 6 gas and gas condensate treatment facilities and 25 underground gas storages locations.

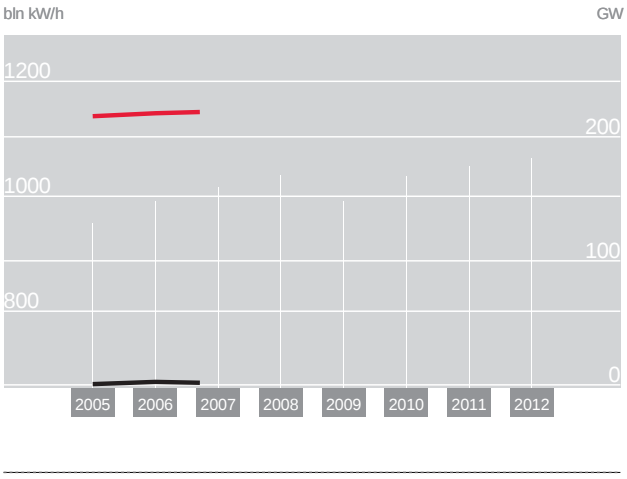
Among the important projects on gas transmission, South Stream (estimated CAPEX of 510 bn RUB), Yakutiya-Khabarovsk-Vladivostok (Power of Siberia) (estimated CAPEX of 770 bn RUB), Sakhalin-Khabarovsk-Vladivostok (estimated CAPEX 467 bn RUB) should be mentioned.

Power generation

Russia remains one of the largest electricity producers in the world, lagging only behind China and the USA. Strong electricity demand is driven by the relatively low energy efficiency of national industries. This demand consequently challenges the limited and ageing energy producing capacity and explains permanent tariff growth and why this is one of the sources for high investment programs by the power generator companies.

In 2012, electricity output in Russia grew by 1.3% year on year and reached 1,053,900 mln KW/h.

Power generation in Russia



Russia's power complex includes about 600 power plants with individual capacity of over 5 MW. In 2012, the total capacity of Russian power plants amounted to 223.1 GW, exceeding the 2011 level by 5 GW. Growth was driven by the construction of new power facilities and modernization of existing infrastructure.

The power industry has the following structure of generation: 68.1% — thermal plants, hydraulic — 20.6%, nuclear — about 11.3%.

Long-term perspectives of the Russian power industry are shaped by the 'General scheme of energy development for the period till 2020'.

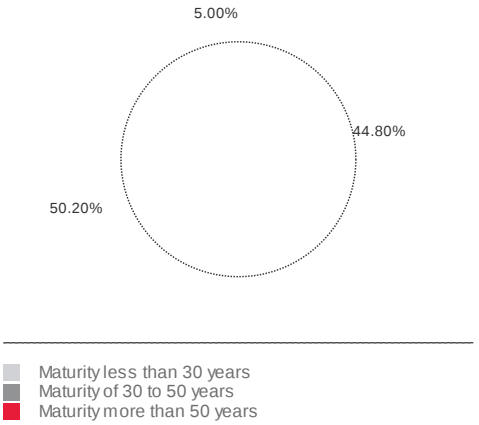
Thermal power plants

For the most part, thermal power stations in Russia work on organic fuel like gas or coal and basically consist of steam-turbine power stations. In 2012, Russia's overall thermal power plant capacity installed was 162 GW, up 5% compared to the previous year.

The infrastructure in the thermal power sector is quite outdated — almost 55% of the installed capacities have a maturity of more than 30 years. As such, the Russian plants have an efficiency ratio of 37%, lower than the 41% level for the developed economies. This discrepancy dictates the necessity for equipment upgrades by all the major power generating companies. This is the reason why the technical modernization and reconstruction of the existing power stations is a primary development goal of the Russia thermal power sector as well as the start-up of new modern generating capacities. Around 20 projects have been executed over 2012 with a total capacity of 4.5 GW.

The sector's investment grew by 6% year-on-year and reached RUB 318 bn.

Thermal capacity maturity



Nuclear power plants

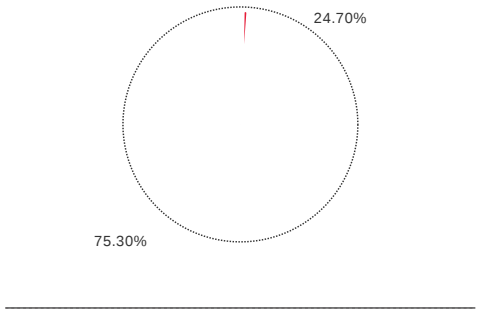
Russia has a full-cycle technology for the nuclear industry — from the extraction of uranium ore to electric power generation. Currently, 33 nuclear power units with the overall installed capacity of 25.2 GW are operated at 10 sites by Rosenergoatom. They account for 16% of domestic electricity generation. The share of nuclear generation in the European part of Russia reaches 30%, in the North-West part of the country — 37%.

Currently, there is an ongoing process of large-scale NPPs construction in Russia. The construction is underway on sites of Novovoronezh NPP Phase II, Leningrad NPP Phase II, Baltic NPP, and the world's first floating nuclear co-generation plant Akademic Lomonosov. Another nuclear power unit — the fourth reactor of Beloyarsk NPP — is close to completion. Nuclear power plants are being built abroad as well. These are Kudankulam (India), Bushehr (Iran), Akkuyu (Turkey), Ostrovets (Belarus), and Tianwan Second Stage (China).

In 2012, Russia has 33 nuclear operating reactors with a capacity of 25.2 GW. Most of them are ageing; 80%

of capacity has a maturity of 20-40 years. This led to the development of a large-scale investment programme by the state operator Rosatom, under which several initial actions have already been taken.

Nuclear capacity maturity



Estimated investments of the sector increased by 29% year-on-year and reached Rub 258 bn.

Water

Having more than 20% of the world's water reserves, Russia is one of the richest countries in terms of its water resources with almost 30 thousands m^3 per head annually. This significantly exceeds the minimum level of 1.7 thousands set by United Nations Organization. One of the historical issues for the Russian water sector was high water intensity in the economy and relatively large losses in water transportation. Annual water losses amount to 7.5 km^3, mainly driven by housing, public utilities and agriculture. A low technical level and outdated infrastructure are among the main reasons for such losses. For instance, according to Rosvodokanal, a wear ratio of water-supply network is more than 65% for water supply pipelines, approximately 63% for drainage networks, around 65% for water pumping stations, around 60% for sewer pumping stations, 64% for wastewater facilities and 56% for sewage treatment facilities.

A main source of capital expenditure of municipal utilities companies has been tariffs that have been growing higher than the average inflation level. The water component of tariffs grew up to 15% in 2012 while GDP growth was 3.4% Aside from the tariffs, the government approved several federal programmes to ensure the sectors development. Under the "Clean Water" federal programme, around Rub 276 bn is to be invested over the period from 2013 to 2017. Next Rub 290.6 bn will be invested under the federal state program "Development of the water utilities in Russia in 2013- 2017".

There are also a number of ongoing regional projects financed from all three levels of the state budget — federal, regional and municipal. On the regional level, Kalinigrad, Far East, Transbaikal, Kurily Island, and the Chechen Republic are expected to invest more than Rub 50 bn focusing on the development of the water utilities segment.