

A GRI SPECIAL REPORT

RUSSIA'S ENERGY SECTOR:

EVALUATING
PROGRESS ON IMPORT
SUBSTITUTION AND
TECHNOLOGICAL
SOVEREIGNTY



KNOW YOUR WORLD

APRIL 2018

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- Kerim Derhalli, CEO & Founder of Invstr, Former Head of Equity Trading at Deutsche Bank

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INTRODUCTION

3 YEARS OF IMPORT SUBSTITUTION: WHAT NOW?

Russia represents a large import market for oil and gas field equipment. The country is the 6th largest equipment importer in the world and its market amounts to \$25 billion annually.

Before 2014, Germany and Italy were Russia's main EU sources for oil and gas equipment, taking 16% and 11% of Russia's market respectively.

Western oil services firms Schlumberger, Baker Hughes and Halliburton provided over 50% of technologies for technically advanced projects.

After Western sanctions, Russian energy companies were banned from using Western technology for deepwater, Arctic offshore and shale exploration.

Lacking homegrown technologies, the Russian energy sector pivoted to Asia and started using equipment and services from China, South Korea and Japan.

At the same time, the government launched a localisation programme that aimed to replace Western technology and develop domestic manufacturing.

After three years, the success of the import substitution programme is mixed.

Although some companies succeeded in developing homegrown technologies, equipment for deepwater, Arctic offshore and shale exploration has not been produced.

Russian energy companies are still reliant on cooperation with foreign manufacturers.

In light of strengthening sanctions from the US, it will be risky for Western companies to continue cooperation. China remains Russia's main alternative.

This makes Russia not only dependent on Chinese funding and energy demand, but also on their technologies.

The report will look at Russian energy companies' response to Western sanctions and their pivot to the Asia-Pacific and it will analyse the progress of import substitution over the last three years.

Dr Maria Shagina



IMPACT OF SANCTIONS IN THE ENERGY SECTOR

After the Ukraine crisis, the US and EU imposed sanctions on the Russian energy sector by limiting its debt financing and the import of Western technology.

In 2015, US exports of oil and gas equipment decreased from \$674 million to \$409 million in comparison with 2014. Under US sanctions, the Russian energy sector was prohibited from the provision, exportation, or re-exportation of goods, services, or technology in support of oil exploration or production for deepwater (more than 152 metres), Arctic offshore, or shale projects. These restrictions apply to state-owned and largest energy companies such as Gazprom, Gazprom Neft, LUKOIL, Surgutneftegaz, Rosneft and subsidiaries owned by more than 50% by these companies.

EU restrictions targeted the export or sale of certain energy-related equipment and technology destined for Russia's oil exploration and production in deepwater (more than 150 metres), Arctic offshore and shale projects. Services such as hydraulic fracturing, drilling, well testing, and logging were prohibited. In addition, completion services and the supply of specialized floating vessels were banned.



The combination of technological and financial sanctions hit the Russian energy sector the hardest. The ban on Western equipment limited the development of technically advanced and capital-intensive shale and offshore projects. Further, limited access to Western capital cut off Russia's sources of money for its long-term and high-cost projects. Whereas technological sanctions proved their effectiveness mainly in Western Siberia where the extraction needs are greater, financial sanctions worked in Eastern Siberia where larger investments are needed to explore the potential of resource deposits.

New US sanctions, known as the Countering America's Adversaries Through Sanctions Act (CAATSA), were passed by Congress on 2 August 2017. The newer sanctions targeted Russia's oil and gas export pipelines and entities which support or invest in those projects and have more than a 33% stake in them. Strong opposition from EU countries resulted in the dilution of the new legislation. Since many European energy companies are currently involved in the Russia-led Nord Stream 2 pipeline, this caused an outrage in Germany, Austria, and France as the main supporters of the pipeline. Later, US State Department issued guidance, specifying that foreign investment or loans related to Russia's export pipelines will not be targeted if the projects and agreements were initiated before 2 August 2017, de facto exempting Nord Stream 2 and similar pipeline projects. The amended text now also includes the application of secondary sanctions "in coordination with allies of the US", however, it is unclear how this will be implemented.

On 6 April 2018, an abridged version of CAATSA was implemented after a long delay. It targeted 5 oligarchs and 2 companies from the oil & gas sector among others. Adding them to the SDN List, OFAC prohibits any significant transactions for or on behalf of listed persons and entities and of their extended family. This puts cooperation with international partners under a substantial reputational risk.

JOINT PROJECTS DELAYED OR CANCELLED DUE TO SANCTIONS



ROSNEFT



9 projects, including tight oil production in West Siberia, geological research in the Black Sea, offshore oil project in the Okhotsk Sea (Sakhalin-1) as well as test-drilling in the Kara Sea



Cooperation with North Atlantic Drilling, Seadrill and Northern Offshore in Russia's Arctic



Cooperation with Eni on Black Sea shelf



Joint venture for Bazhenov tight oil exploration



Cooperation between Oracle and Gazprom, Rosneft, Surgutneftegaz and LUKOIL



Oil and gas exploration in the Yuzhno-Kirinskoye field (Sakhalin-3) in the Okhotsk Sea



HALLIBURTON



Multi-stage hydraulic fracturing in the Bazhenov formation in West Siberia



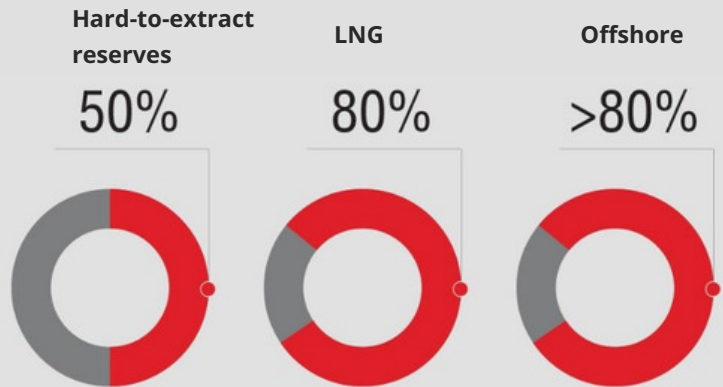


RUSSIA'S DEPENDENCE ON FOREIGN TECHNOLOGIES

Although both US and EU sanctions fail to target the gas sector and apply only to Russia's unconventional projects, Western restrictions identified one of Russia's vulnerabilities – high dependency on foreign technology in the energy sector.

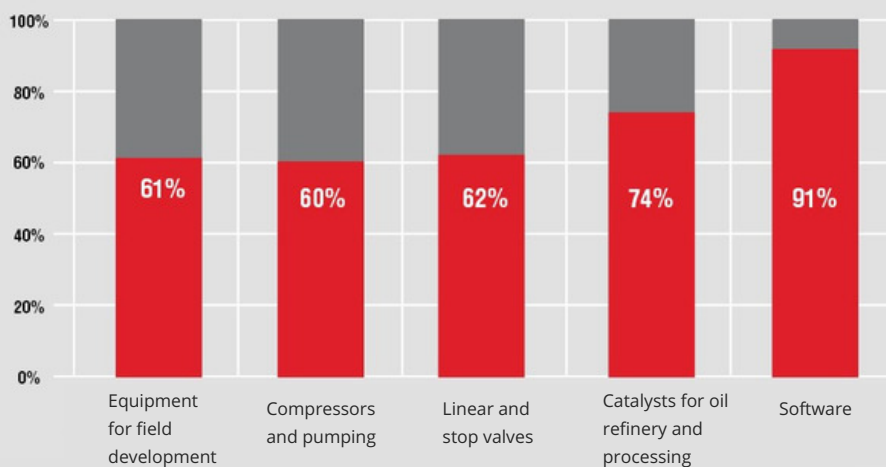
Prior to the sanctions, Russia's energy sector was 70% dependent on Western technology. While dependency in conventional projects was low, unconventional projects were highly reliant on foreign technology. The share of foreign technology in LNG and offshore projects reached 80%, while in the projects for hard-to-extract reserves it was up to 50%. Western oilfield services such as Schlumberger, Baker Hughes and Halliburton provided technologies for technically advanced projects.

Share of imported equipment in the oil and gas sector in Russia



Source: Ministry of Energy of the Russian Federation

Share of imported equipment in the oil extraction sector in Russia



Source: Ministry of Industry and Trade of the Russian Federation

In particular cases which required the technologies of horizontal drilling, hydraulic fracturing, pumping equipment, catalysts for oil refining, and software programming, the dependency was up to 90%. The sanctions hit Russian energy companies disproportionately. The damage depended on the field type and technologies required.

Gazprom's licensed field in the Pechora Sea is closer to the shoreline which meant that the company could adapt Western technologies to the Russian Arctic conditions and localise production by commissioning construction and services from Russian companies.

In contrast, Rosneft's fields are generally further away from the coast, in the Barents, Pechora and Kara Seas deepwaters. As a result, it needed more high-quality technologies, infrastructure and investments than Gazprom.

Technical resilience of Russia's energy projects

Field type	Company	Extraction technology	Dependence on foreign technology
Arctic offshore	Gazprom, Rosneft	Drilling rigs	High
Prirazlomnoye	Gazprom Neft	Offshore platform	Low
Black Sea	Rosneft	Subsea processing equipment	High
Kara Sea	Rosneft	Semi-submersible platform	High
Caspian Sea	Rosneft, LUKOIL	Floating drilling rig	Low
Tight oil in Western Siberia	Surgutneftegaz, Rosneft, Gazprom Neft, LUKOIL	Hydraulic fracturing	High
Okhotsk Sea	Gazprom, Rosneft	Subsea processing equipment	High

Source: Adapted from the Government of Russia's Analytical Centre

PIVOT TO ASIAN TECHNOLOGY

To reduce dependency on Western technology, Russian energy companies quickly pivoted to the Asian market. Countries such as China, South Korea, India, and Vietnam that did not impose sanctions became Russia's main alternatives.

The evidence is stark: in 2014, the import of Western technology fell by 10% - and increased by the same proportion from China and South Korea. In late 2014, Gazprom Neft agreed on joint operations with PetroVietnam and Indian ONGC for exploration and development in the Pechora Sea and the Kara Sea.

CHINA

China's Yantai Jereh Oilfield Services Group and Shaanxi Aipu Machinery replaced Western companies, delivering technology and equipment for drilling wells. In cooperation with Gazprom Neft, the China Oilfield Services are doing the drilling in the Kara Sea. South Korea's Daewoo Shipbuilding Marine Engineering received an order for the building of 15 ice-class LNG vessels to serve Novatek's Yamal LNG project.

The quality of Chinese drilling equipment does not meet necessary requirements and is usually costlier. Due to hazardous environmental conditions, the equipment is often unsuitable for the Russian Arctic and Eastern Siberia. China does not yet possess the advanced technology for subsea and hard-to-extract resources. For example, the global market for equipment for subsea tiebacks is divided between four Western companies. This makes the expansion of Sakhalin-2 and the exploration of Sakhalin-3 hardly possible since both require special equipment only produced in the US and Norway. On the other hand, the import of Chinese technologies is complicated by the fact that they use spare parts produced in the West. Despite the fact that parallel importation would allow such technology to be acquired, technical support is impossible.



SOUTH KOREA

South Korea is Russia's other strategic partner for import substitution. Its technologies are considered to be of higher quality than those from China. But due to perceived reputational risks, there is no binding agreement between South Korea and Russia for the import of necessary equipment.

Hyundai Heavy Industries signed an agreement with Rosneft to establish an Engineering and Project Management Centre in the Russian shipbuilding sector. Cooperation with the Korean partner aimed to embrace the world's cutting-edge shipbuilding technologies such as eco-friendly gas-powered tankers.



JAPAN

Despite its symbolic sanctions, Japan forged a strategic partnership with Russia, including cooperation on energy projects. Japan's Mitsui O.S.K. Lines (MOL) and China's COSCO Shipping split the ownership of Yamal LNG vessels. By 2020, MOL and COSCO will co-own the total number of 17 LNG carriers. The Japan Bank for International Cooperation (JBIC) invested a symbolic amount of \$200 million in Novatek's \$27 billion capacity project, while Japan's JGC Corporation and Chiyoda Corporation, in partnership with France's Technip, won a tender, covering "engineering, procurement, supply, construction and commissioning" of Yamal LNG.

Japan continues to carefully navigate sanctions loopholes in an attempt to reinvigorate its energy cooperation with Russia. In 2016, Marubeni Corporation and Mitsubishi Heavy Industries signed a cooperation agreement with Rosneft on a joint feasibility study for a project to build a gas chemical complex in the Russian Far East.

However, due to strong US pressure, another joint venture between the Japanese companies and Rosneft failed. In 2017, a preliminary deal between Rosneft and a Japanese consortium of JOGMEC, Inpex Corp. and Marubeni for offshore oil exploration near Sakhalin was blocked by the US. Seen as backfilling, OFAC objected the project which could provide equipment and services for Russian deepwater oil exploration.



OUTLOOK

The participation of the Asian players will be limited by strengthening sanctions from the US. Having implemented CAATSA, the White House introduced de facto extraterritorial sanctions against some Russian energy companies such as Gazprom Burenie. Although the main energy companies are not included, new US sanctions will deter potential partners from cooperation due to huge reputational risks.

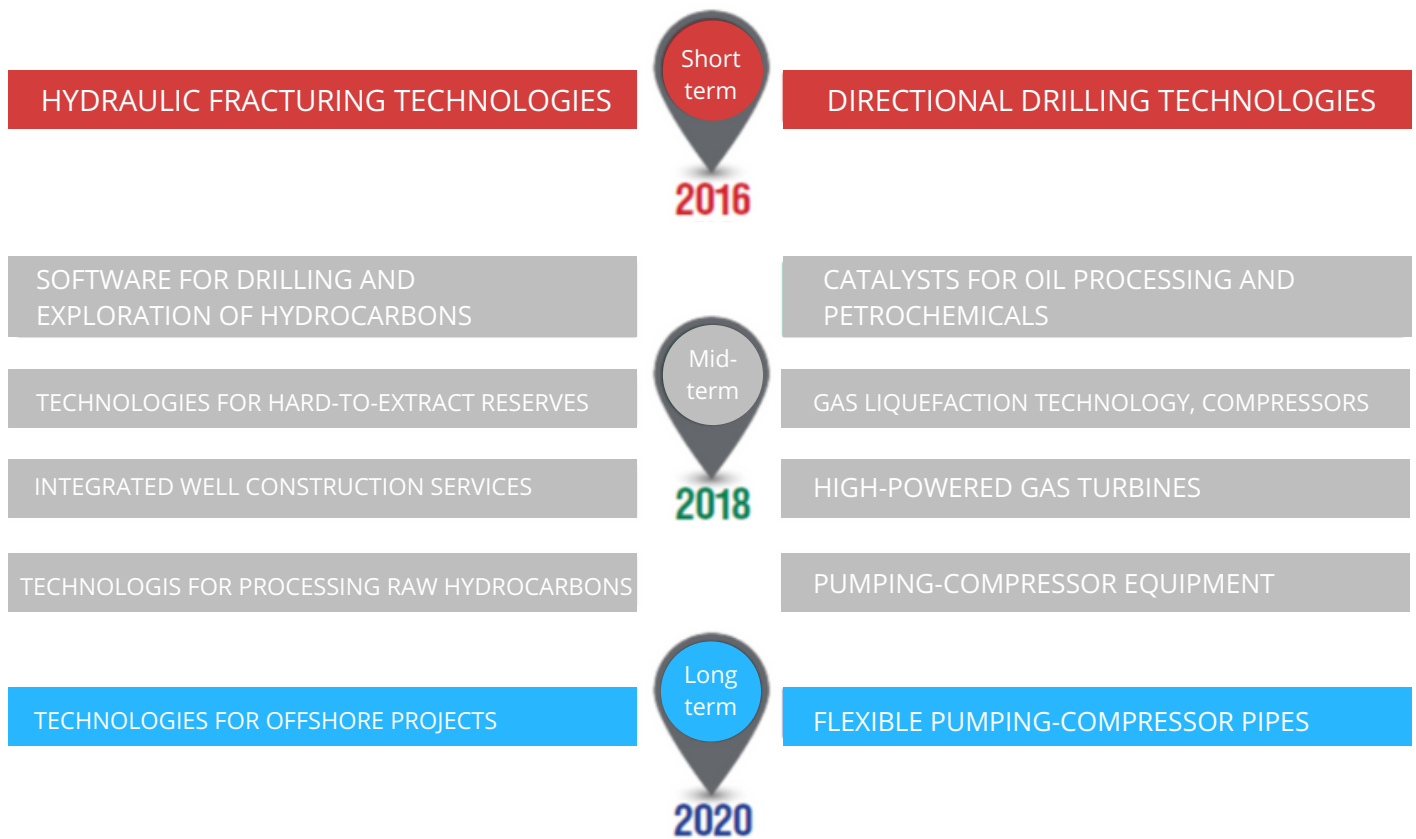
In addition, Asian companies may be hit by another US move. In 2019, the White House is planning to target the shipping industry involved in the delivery of resources from the Russian Arctic via the Northern Sea Route.

In anticipation, the Russian Ministry of Industry and Trade already drafted a new bill which would prohibit the usage of foreign vessels to transport oil, gas and coal. Once implemented, the bill will be detrimental to South Korean, Japanese and Chinese shipping companies, which cooperate with Novatek and Gazprom Neft.



RUSSIA'S STRATEGY FOR IMPORT SUBSTITUTION

Whereas diversification towards Asian countries was an emergency measure, the policy of import substitution is meant to be a long-term strategy.



Source: Ministry of Energy of the Russian Federation

The legal basis of this programme was enshrined in the Federal Law “On the Industrial Policy in the Russian Federation”, implemented in December 2014. Later, Russian President Vladimir Putin instructed the officials of the Government Commission on the Fuel and Energy Sector to draft an import substitution programme.

The Ministry of Industry and Trade submitted a programme with 45 import substitution sections. At the same time, the Industrial Development Fund was created with the aim to provide a 5%-interest-rate loans for 7-10 years to companies in the import-substituting industries. In 2015, the government allocated 20 billion rubles with the plan to increase the fund up to 70 billion rubles by 2019.

Based on the Industrial Policy Law, preference schemes ranging from subsidies to taxes and customs exemptions were introduced. To stimulate demand for domestic equipment, the Ministry announced that it will compensate 50% of the costs for pilot industrial studies and subsidize 10% for the heavy industry sector.

In order to protect sanctioned companies, the Ministry of Energy also supported classifying information about purchases of financial, mining and exploration services for oil and gas companies.

In 2015, the Ministry of Energy identified from short to long-term priorities for import substitution for the oil and gas sector. By 2020, the Ministry planned to reduce the overall dependency from 60% to 43%. By 2035, it expected to fully substitute foreign technology in the LNG sector.

The programme did not aim to replace all foreign technologies and services, but only those that could be developed and produced by Russian manufacturers. Next, Russian energy companies quickly identified the most urgent items subjected to import substitution previously delivered from the West:

Items	Previous producers
Subsea processing equipment	FMC Technologies (US), Cameron (US), One Subsea (US), Aker Solutions (Norway)
Horizontal, controlled-angle and directional drilling	Weatherford (US), Schlumberger (France), Halliburton (US), Baker Hughes (US)
Geological and seismic services	Paradigm (US), Roxar (Norway), Halliburton (US), Schlumberger (France)
Catalysts for oil processing and petrochemicals	Air Products & Chemicals (US), Linde (Germany)
Electric motors/engines	Siemens (Germany), ABB (Switzerland)
High-pressure pumps	FMC Technologies (US), Yokogawa (Japan), Maloney (Canada), Aker Solutions (Norway)
Compressors and expanders	BORSIG (Germany), Zahroof (US)

Source: The Ministry of Industry and Trade of the Russian Federation

In 2015, the Ministry of Industry and Trade and the Ministry of Energy jointly created the Scientific and Technical Council for the Development of Oil and Gas Equipment.

The Council included 14 expert groups in key areas such as Equipment for Offshore Projects, Subsea Production Complexes, Gas Transportation Technologies and Equipment, and Natural Gas Liquefaction Technologies.

It aimed to help energy companies communicate with each other and to synchronise investment projects and explore the potential use of national manufacturers. About 300 Russian companies joined the import substitution programme.

Since 2016, additional centres have been created to stimulate the programme - the Information Centre "Technologies and Projects of Import Substitution", the Center of Reverse Engineering, The Single Centre for Oil and Gas Substitution.

These centers are meant to collect data about necessary replacement items and to match them with the Russian manufacturers, as well as to enhance information exchange and cooperation.

In 2015, the government commission announced that 423 projects were planned within the import substitution programme. They amounted to 300 billion rubles, including 73 billion rubles to be invested by the government.



HOMEGROWN TECHNOLOGY

Paradoxically, despite Western sanctions Russia's oil production set a record for footage drilling in 2016. In comparison with 2015, production and exploration drilling increased by 12% and 20% respectively. Rosneft alone boosted its exploration activity by 80%. How did this happen?

Russia's energy sector avoided a steep decline in production and exploration due to the currency devaluation. It discouraged imports and made domestic production cheaper. Mineral extraction tax and export duties exemptions kept projects profitable under low oil prices. Large financial reserves helped energy companies to offset their debt. All together it kept Russian energy companies afloat and helped them to develop their own technologies and services. Each company elaborated their own import substitution programme which they included in their long-term strategies. Since 2014, there have been several successful examples of Russian import substitution:

GAZPROM NEFT

Gazprom Neft developed a full-cycle technology for shale oil fracking in the Bazhenov formation. Currently, it is the only Russian energy company involved in the oil extraction in the Arctic. The company also managed to design a high-seas ice-resistant stationary platform in the Prirazlomnaya field, which was built in Severodvinsk, and GeoMate system, an IT product for the analysis of geological data.

GAZPROM



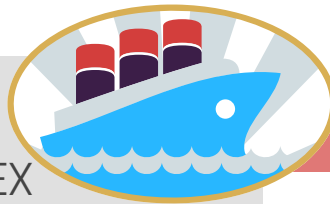
Gazprom localised key aspects of LNG storage manufacturing with Russian producers. While PJSC Severstal developed and produced low carbon cryogenic steel, JSC LGM produced an industrial prototype of the cryogenic LNG pump. Russian building contractor JSC Teplokhimmontazh is constructing the LNG storage reservoir within the "Terminal for LNG Production and Loading in the Port of Vysotsk" facility. In addition, Gazprom's Arkticheskaya self-docking floating drilling rig was built in Severodvinsk.

LUKOIL

LUKOIL's corporate plant developed drilling platforms for the Caspian Sea in Astrakhan, and those for the Baltic Sea at its Kaliningrad plant. A high-seas ice-resistant oil terminal for the Varandei field in the Pechora Sea was also built there. The United Shipbuilding Corporation is completing the ice-resistant stationary platform IRP-1 for the Filanovsky field in the Caspian Sea under contract with LUKOIL.

NOVATEK

Novatek developed a proprietary natural gas liquefaction technology called “Arctic Cascade”. Using equipment produced by Russian manufacturers, the patented LNG technology is based on a two-stage liquefaction process to maximize energy efficiency in the Arctic climate. The company is also planning to build a centre for assembling high tonnage ocean structures in the town of Belokamenka.



LEADING BY EXAMPLE ROSNEFT'S ZVEZDA COMPLEX

The Zvezda shipbuilding complex is a leading example of Russia's import substitution and localisation programme. Initiated by Rosneft in 2013, Zvezda is to be constructed on top of the existing Far Eastern Shipbuilding and Ship Repair Center which aims to boost the domestic civil shipbuilding industry. The shipyard will be Russia's first facility to build hi-tech, large-capacity vessels, offshore drilling rigs, exploration and production platforms, and fleet-support ships designed for offshore oil and gas development in the Arctic.

Zvezda is co-owned by Rosneft, Rosneftegaz and Gazprom. In 2018, joint investments amounted to 200 billion rubles instead of the originally-planned 92 billion rubles. While Gazprom Bank will provide a 40-billion-ruble loan, the government budget for 2019-2020 will give another 800 million rubles in subsidies.

To provide Zvezda with world-class equipment and technologies, Rosneft teamed up with General Electric to construct local manufacturing facilities for steerable thrusters, marine electronics and wellhead fittings.

In August 2016, Zvezda Marine Technology was established as a joint venture of the Dutch Damen Shipyards Group, Rosneft and Nord Marine Engineering. The consortium will design and build service vessels and ice-class cargo vessels. In 2016, Rosneft signed an agreement with Italy's Fincantieri to increase Zvezda's technical capabilities and lay the groundwork for designing innovative products.

Rosneft has also provided a strong pipeline of orders. In 2016, Rosnefteflot signed a contract with Zvezda to design, build and supply five ice-class tankers with gas-powered engines. By 2030, Zvezda plans to build 41 vessels, 12 offshore platforms and 153 drilling rigs, with the first delivery scheduled for 2019.

ROSNEFT

Rosneft developed offshore and high-seas drilling rigs for drilling operations on the Sakhalin shelf.

The Yastreb ground-based drilling rig can perform drilling in non-vertical patterns, while the Orlan high-seas platform includes a steel-and-concrete structure with drilling and habitation modules.

The company is to develop competitive proprietary software which would enable in-house capabilities for geological and hydrodynamic modeling. In efforts to address information security issues and to replace foreign software products with local counterparts, in 2016 Rosneft launched a project to develop its own 3D geological modeling suite.



SUCCESS OF IMPORT SUBSTITUTION?

The results of import substitution are mixed; the localisation of equipment production has been stalled by several developments.

On the one hand, Russian energy companies did actively undertake measures to reduce their dependency on Western technology. As the previous examples have shown, some companies succeeded in developing homegrown technology. The most successful direction of import substitution is the domestic production of pipelines. In 2016, Gazprom and Transneft announced a nearly 100% domestic production of pipes. Currently, 99,5% of pipes at Gazprom are produced domestically. However, this is an exception. In contrast to other companies, Gazprom introduced the strategy of import substitution in 2012 before sanctions.

On the other hand, the targets identified by the Ministry of Industry and Trade have not been met. The pace of import substitution laid out in the strategy is overly optimistic. It was expected that by 2016-2018, technologies of horizontal drilling, hydraulic fracturing and software would be substituted. In reality, the energy sector is still reliant on Chinese technologies, whereas the domestic production of oil and gas equipment is lagging behind.

HIGH COSTS, LOW QUALITY

Due to high reliance on Western technology, Russian research institutes had been underfunded and practically obsolete for a long time. After sanctions, R&D departments were expected to develop required technologies from scratch in a very short period. For some areas, however, import substitution requires time and substantial investments. For example, Rosgeologia, the Russian company involved in seismic exploration, acknowledged that the import substitution program does not work (see inset). In the short and medium-term, it is not economically beneficial to develop domestic equipment for geological exploration. It would cost Rosgeologia 70-80 million rubles to buy a French-made seismic station, while a Russian-made system takes two-three years to develop and costs between 300-400 million rubles.

The prospects for Russia-made equipment are unclear, as this requires long-term and high-cost investments. In 2016, 55% of the representatives in the oil & gas sector acknowledged that sanctions have a negative impact on the access to Western technology, yet only 9% were planning to increase investments in R&D. Sixty-eight per cent of the respondents did not plan to completely abandon foreign technology, as the locally developed technologies would impair the competitiveness of the companies' production.

"For mineral extraction companies, it is far more efficient to acquire import equipment for geological exploration than to themselves engage in scientific development as part of the import substitution program."

"Basically, the companies limit their use of domestic hardware and prefer to work with imported equipment and instruments...for them it is simply hopeless to work with our [domestic] equipment."

Sergey Kostyuchenko

Director of Science and Technology, Rosgeologia

Quoted in [Tass.ru](https://tass.ru)



LOOPHOLES IN SANCTIONS

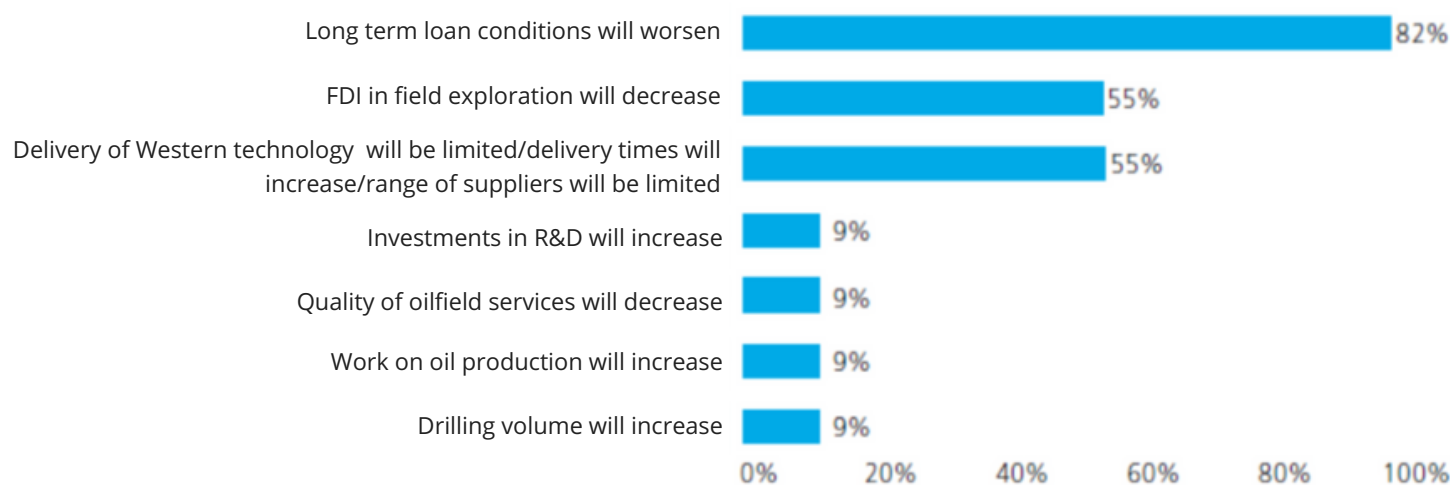
The transatlantic misalignment between US and EU sanctions in the energy sector made it easier for Russian companies to mitigate the impact of sanctions. EU sanctions proved to have less stringent effects. For example, EU provisions included a so-called “grandfathering” clause that allowed continued cooperation with Western companies for projects under way before sanctions. In cooperation with Rosneft, Italy’s Eni is yet to start drilling in the Barents Sea in Russia’s Arctic.

Norway’s Statoil obtained permission for oil exploration, involving advanced drilling in the Samara region near Moscow and in North Komsomolsoye in Siberia. In addition, due to the high dependency of certain EU member states on Russian gas, it was excluded from Western sanctions, allowing Russian liquified and pipeline gas to still be delivered to the US and EU.

Western oilfield services companies continued their activities in the Arctic despite sanctions through another loophole. Since measures did not apply to subsidiaries of Western companies, the United States’ Baker Hughes and France’s Schlumberger used their Russian subsidiaries to subcontract for Gazprom Neft and LUKOIL.

Thus, despite the claim that Gazprom Neft’s drilling platform in the Prirazlomnoye field is Russia-made, 90% of its spare parts are foreign. The secondary use of the equipment also allowed Russian energy companies to access Western technology. For example, the platforms in Sakhalin-1, Sakhalin-2 and the Prirazlomnoye field were re-used from previous projects after being modernised.

How might sanctions affect Russia's oil and gas sector in the near term?



Source: Deloitte's Outlook Survey in the Oil & Gas Sector in Russia, 2016



INTERNATIONAL PARTNERSHIPS

In order to obtain expertise in LNG and offshore projects, energy companies turned to countries that abstained from joining Western sanctions. For unsanctioned equipment and services, companies still looked to their old partners from the West. Thus, dependencies have been maintained in some areas. Ironically, to advance their Russian localisation programmes, energy companies signed a number of agreements with international partners for the production of components locally. Rosneft established cooperation with Schneider Electric in energy management and automation to lower energy consumption. The company also signed an agreement with Siemens to enhance energy efficiency. In 2014, Rosneft acquired eight firms of the Weatherford Group in Venezuela for \$398 million. This allowed the company to acquire assets for building in-house drilling and workover services.

Transneft engaged Italian Nidec ASI for the production of high-voltage electric motors for its new plant. Gazprom established a joint venture with German Linde AG, a leader in large-scale LNG production equipment, for the production of spiral heat exchangers. Designed and started by Linde Power Machines, the facilities plan to use as many domestic parts as possible to localise the manufacturing.

DOMESTIC COMPETITION

Russian energy companies failed to cooperate domestically. New centres were created for the exchange of know-how and long-term, low-interest loans were given for the development of homegrown technology. Nonetheless, due to fierce internal competition, the willingness to share technological know-how and expertise has been rather low.

For example, Rosneft and Novatek refused to join a single engineering centre for LNG projects, initiated by Gazprom. The initiative would become a single EPC center, which would encompass the whole production cycle such as engineering, procurement, and construction. As Novatek and Rosneft are the leading companies in LNG development in Russia, they were reluctant to share their technology and expertise with Gazprom. Instead, Novatek announced that it will independently develop its own engineering capacities, together with French Technip. Rosneft supported the idea of a single competence centre, but on a voluntary basis - the services of the centre should not be compulsory for the company.

The competition carries on in the shipping industry. The aforementioned draft bill on the prohibition of the use of foreign vessels in the Arctic divided energy companies. Whereas Novatek and Gazprom Neft will be the main losers, Rosneft will significantly profit from this ban. In contrast to Rosneft, Novatek and Gazprom Neft are not only involved in the oil and gas exploration in the Arctic, but also in shipping. The ban will put Novatek's Yamal LNG and Arctic LNG-2 in question, as both LNG projects rely on carriers built in South Korea. The Korea-made vessels could be replaced with the ones built at Rosneft's "Zvezda" shipyard, but the cost will be 80% higher without quality guarantees. Such a divisive policy undermines the government's efforts to shield the energy sector from Western sanctions.

Instead of expected cooperation, the large energy players continue to compete with each other. Despite a lack of technologies and low oil prices, Rosneft and Gazprom are actively obtaining licenses for large offshore fields in the Arctic to mark their territories. The large companies also continue to dominate the market, as small and medium-size companies are still excluded from the Russian localisation programme despite their potential.



FOUR REASONS TO BE SKEPTICAL

Despite official statements, Russia's oil and gas firms depend on foreign equipment for 70% of their needs. Using various loopholes, Russian companies continue to use Western technologies.

1. LOW R&D INVESTMENT

The reluctance of energy companies to invest in their R&D slows down switching to local technologies. The potential of domestic capacities has not been fully used, as Russian companies are concerned with the low quality of local manufacturing. Until now, Russian manufacturers still have critical issues with the production of certain gas liquefaction and offshore equipment units, LNG storage, shipping systems and software.

2. DEPENDENCE ON CHINA

The failure to develop these homegrown technologies made Russian energy companies more dependent on Chinese equipment and services. Currently, China's energy companies can only provide equipment and services for less technologically complex projects under friendlier climatic and geological conditions such as those in Western Siberia. In the long-run, however, the turn to China will be detrimental to Russia's local manufacturing. China's financial support often comes with a binding condition to use Chinese equipment, services and management. In the future, it will force Russia's local companies out of business and make the energy sector overly dependent on Chinese technologies and prices thereof.

3. PROJECT DELAYS

Some offshore and shale technologies are still only available on the Western market. Thus, Gazprom, Rosneft, Novatek and Gazprom Neft officially postponed their projects in the Arctic until 2018-2030 due to the lack of knowledge on horizontal drilling and shale fracking to access hard-to-extract reserves. Coupled with declining oil prices, weak currency and slow economic growth, long-term and high-cost projects in the Arctic are economically unprofitable. So sanctions gave an excuse to postpone long-term projects that require financial, management and technical skills and are profitable with oil prices north of \$100. However, to meet their production targets, Russian energy companies will need to continue to focus their efforts on maximizing the development of conventional deposits and brownfields.

4. LACK OF TRANSPARENCY

Being generously funded, the import substitution programme opened up a Pandora's box of competition for resources amid a lack of transparency. The large energy companies do not trust each other enough to share expertise and know-how. Moreover, the government's plan to classify purchases of financial, mining and exploration services will only ossify opaque procurement deals and reduce the quality of local production.



YOUR GRI EXPERTS



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