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Russia Energy Market Report

Oil & Gas

2019 Edition

MIOGE Moscow

ITE

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OIL AND GAS RESERVES

Russia's oil and gas reserves have been expanding over the past decade as exploration activity has increased and been successful. In 2015, Russia added more reserves than any other country.

Oil — Russia jumped up the ranks of the global proven reserves league table — overtaking Kuwait and UAE for the first time to rank sixth behind Venezuela, Saudi Arabia, Canada, Iran and Iraq — and has kept this position since 2015.[1] Its ranking remained unchanged in 2018 even though proven reserves increased year-on-year: from 102.4 billion barrels in 2015 to 106.2 billion at the end of 2017, compared to 93 billion in 2013.[2]

Gas — Russia increased its proven gas reserves in 2015 by 1.35 trillion cubic metres (TCM) or 48 TCF and the total subsequently increased from 34.8 TCM (1,229 TCF) in 2016 to 35.0 TCM (1,234 TCF) in 2017. It therefore regained its lead in the world's reserves league table from Iran whose reserves were 33.2 TCM (1,172 TCF) at the end of 2017 according to BP.

BP's methodology makes use of various sources including official government data which requires a note of caution. While the accuracy of official Middle East government reserve data is seen as contentious among some Western industry circles, a key issue with the Russian classification is its failure to account for economic factors.

Russian versus Western Reserves Classification Methodologies

Russia has been using a 'temporary' hydrocarbons reserves classification methodology since 2001.[3] This is an almost exact replica of the Soviet classification methodology that was adopted in 1983 — after being initially introduced in 1928 by the Soviet government — which differs significantly from Western standards because it is based solely on the analysis of the geological attributes of reserves. It focuses on the physical presence of hydrocarbons in geological formations or the probability of such physical presence. Unlike Western classifications — such as the Securities and Exchange Commission (SEC) and Petroleum Resources Management System (PRMS) — the Russian system does not account for economic, commercial, or even technological, factors.

1 BP Statistical Review of World Energy 2015
2 BP Statistical Review of World Energy 2018
3 Order of Ministry of Natural Resources of the Russian Federation, 7 February 2001, No. 126.

The Russian classification is divided into A, B, C1, C2, C3, D1 and D2 categories:

A | B | C1

Explored reserves are represented by the following categories. Category A reserves are those that have been fully ascertained through drilling and production. Category B are those that have been established through pilot drilling. Category C1 are reserve estimates for established fields, based on the obtained commercial flows of oil or gas including parts that may not yet have been drilled and tested but for which geophysical information is available.

C2 | C3

Preliminary inferred reserves are represented by Category C2. These are based on data collected through geological and geophysical studies. Category C3 resources are used to plan exploration work in existing production basins or which contain proven reserves of, oil and gas.

D1 | D2

Prospective resources are denoted by Category C3, while forecasted resources by categories D1 and D2. Category D1 resources are calculated based on the results of regional geological, geophysical and geochemical research and by analogy with explored fields within the region that it being evaluated. Category D2 resources are estimated using assumed parameters on the basis of general geological concepts and by analogy with other better studied regions with explored fields. The prospects for these to become reserve-bearing are evaluated based on geological, geophysical and geochemical research.

Gas reserves in categories A, B and C1 are considered to be fully extractable. For oil and gas condensate reserves in the A, B and C1 categories a predicated coefficient of extraction is calculated based on geological and technical factors.

The Russian classification system is not recognised under the rules of the London Stock Exchange (LSE). Therefore, in addition to having their reserves audited by Russian state bodies — a requirement to obtain a licence — most Russian oil and gas companies also have their reserves assessed by independent auditors. Gazprom and Rosneft have, for example, have been respectively audited by DeGolyer & MacNaughton since 1997 and 1998, while Gazprom Neft is evaluated by Miller and Lents.

There is no direct correspondence between the Russian classification and Petroleum Resources Management System (PRMS). The disparity in reserves assessment can therefore be stark. In 2013, for example, Rosneft reported that it held 6.1 TCM of ABC1 gas reserves under the Russian classification but this only equated to 1.3 TCM under PRMS.[4]

4 rosneft.com - It should be mentioned that significant disparity exists even between Western classification systems, as demonstrated by the example of Rosneft whose 2015 reserves differed by 8.4 billion of oil equivalent (b.o.e.) — or nearly 25% — depending on whether SEC or PRM1 (proven scenario) was used (Mohamed A. Ramady, Saudi Aramco 2030: Post-IPO Challenges (Springer, 2017), p.107.)

For comparison purposes, it is often assumed that ABC1 reserves in the Russian system lie between proven, and proven and probable, reserves in the Western classification. Category A and B — because they are based on an approved development plan — are normally technically and economically recoverable. C1 and C2 correspond to probable and possible reserves being typically technically recoverable but not necessarily economically recoverable. On the basis of International Energy Agency (IEA) estimates, only 30% of reserves classified as C1 will increase to categories B and then A. This is corroborated by evidence from Russian industry sources, many of whom have long acknowledged the need for an update of the classification system to bring it in line with international standards and make it more reflective of economic and commercial realities.

The Federal Agency for Subsoil Use (Rosnedra) has therefore worked with Russian oil and gas companies to introduce a new classification system. It was approved by the Ministry of Natural Resources and Environment on 1 November 2005 and was due to come into force on 1 January 2009.[5] It was delayed, however, which resulted in additional work and another ministerial decree — 1 November 2013 (No. 477) — according to which the new classification was expected to be implemented from January 2016. This deadline was also missed and the implementation of the new system is still awaited. The reclassification will lead to an apparent decline in reserves but this could be partly compensated for by increased exploration activity.

Exploration and Reserves Replenishment

As early as 2004 the then Natural Resources Minister Yuri Trutnev warned the government about the seriousness of the reserves replenishment problem for all mineral resources. The oil and gas reserves recovery ratio had exceeded production until 1992 but the increase in reserves had been steadily declining since the mid-1980s. The principal reason was the reduction of state-funded geological exploration in the years immediately preceding and following the collapse of the Soviet Union. This process was accompanied by a 'brain-drain' — when Russia lost thousands of specialists throughout the 1990s — and the collapse of indigenous companies producing specialist equipment for the oil industry.

The overall situation has been better for gas than it has been for oil because the former is relatively more abundant and its large-scale production and export did not begin until the 1970s. Russia inherited the ageing Soviet scientific research fleet — with an average age of around 25 years — and there were only 84 vessels by 2010. During the first eight years of President Vladimir Putin's Administration only one small hydrographic survey vessel was built.

The situation has improved over the past five years. The Ministry of Energy announced that RUB1.2 trillion Roubles (US$20.9 billion) would be invested in exploration activities between 2013 and

5 Neft' i Kapital [Oil and Capital], #12, 2005

2020. Meanwhile, the Ministry of Natural Resources intensified pressure on companies to fulfil their exploration activity commitments as defined by their licences.[6]

Average crude oil production has increased by 4.6% over the last year from 10.53 million b/d in October 2017 to 11.01 million b/d in October 2018. It should be noted that Russia's total oil production has been rising steadily in the last few years. More specifically, crude oil production grew by 10.4% between January 2013 and October 2018. Meanwhile, gas production in 2018 increased compared to the previous year. During the first eight months of 2018, 474 bcm of gas was produced, representing a 5.6% increase in annual terms.[7]

The role of licence holders in ensuring reserves replenishment — and reserves migration from Category C1 (preliminary inferred) into the upper categories — has been increasing but more is necessary if Russia is to maintain healthy production-to-reserves ratios. After the initial increase in state funding exploration investment has been falling and is due to decrease further year-on-year, while private investment remains robust.

OIL

Production and key players

West Siberia — which was traditionally the Soviet Union's main oil and gas producing region — is being steadily replaced with production from other regions, most notably:

- Yamal;
- East Siberia;
- and the Russian Far East.

West Siberia's share of crude output fell from 71% in 2004–2005 to 57% in 2017. This trend has continued in 2018, with the focus in the older fields being to control the decline production rates. With these the West Siberia oil fields would naturally decline at around 10%–15% per annum. Yet — thanks to the emphasis on the maintenance of existing fields — the average depletion rate for the five largest producers, which control 60% of Russia's liquids output, has been around 1.5%–2% since 2013.[8] This emphasis has been encouraged by the government as it responds to falling oil prices and the need to maintain tax revenues.

6 Rosnedra's 2006 proposal to introduce amendments to the Law on Subsoil that would have allowed it to issue licences for exploration activities that were longer than five years was met with criticism. The Ministry of Natural Resources, for example, accused Rosnedra of being too lenient with licence holders, which has subsequently led the Agency to toughen its position on exploration activities, while the provision specifying the period of licensing for geological exploration has remained limited to five years (Law 'On Subsoil', Article 10 (unchanged from the Federal Law 02.01.2000 #20-FZ); rosnedra.com)

7 CDU TEK 2018

8 reuters.com

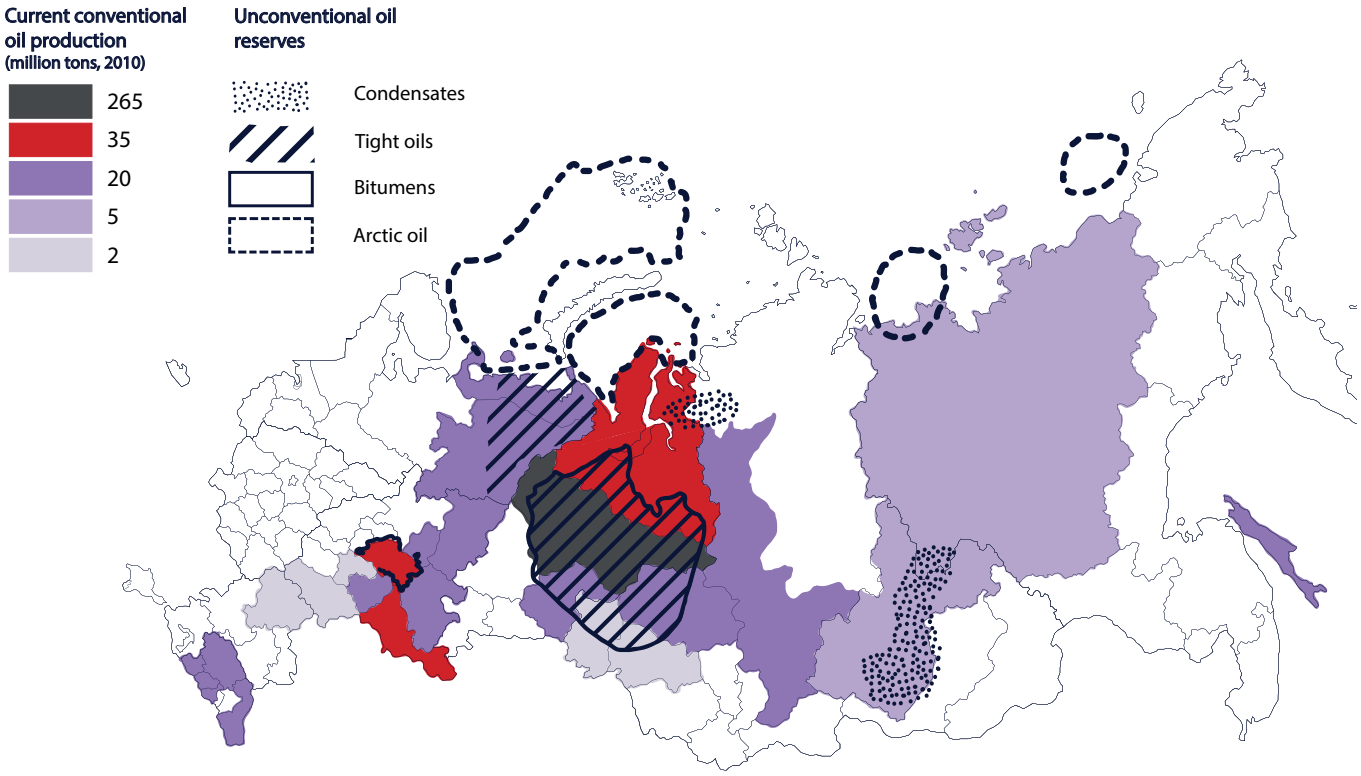
For Russia, the structure and implementation of domestic taxation are among the key determinants of future production and exports. The main taxation instruments in the oil sector are the Mineral Extraction Tax (MET) and export duties on crude oil and petroleum products. The taxation regime was designed to generate high revenues for government when oil prices were high. Conversely, when global prices are low, companies pay less in taxes. Once the international oil price falls to US$15 per barrel, MET and export taxes fall to zero.

When originally designed, the MET and the many applicable discounts to it were meant to ensure that funds were invested to prolong the lifecycle of important fields and to develop new fields. Within the MET formula, companies are eligible for numerous and substantial tax reductions. Oil fields classed as 'difficult to recover' receive discounts and new fields in Russia's frontier oil provinces are MET exempt.

Changes to the tax code were designed to stimulate the development of brownfield sites while maximising budgetary income. Commonly known as the 'tax manoeuvre', this package of changes has seen Export Tax reduced and MET increased. From 2019, oil export duties will be reduced gradually year-on-year from 30% to 0% by January 2024, while MET will gradually increase for oil and gas condensate. Additional changes have also altered the balance of upstream and downstream taxes in favour of the former. Thus, a principal element of the tax manoeuvre was to reduce export duties on higher-value petrol, light and mid-distillates, while increasing duty on low-value fuel oil to discourage exports.

However, the key element of the tax system has remained: namely that companies are largely protected as the oil price falls because of the high marginal rate and the sliding scale. As a result, company cash flow has changed much less than government revenue.

At US$100 per barrel — the price at which the 'tax manoeuvre' was designed — economists calculated that the net financial effect of increasing MET and reducing most crude and distillate export duties was more or less neutral for Russian companies.

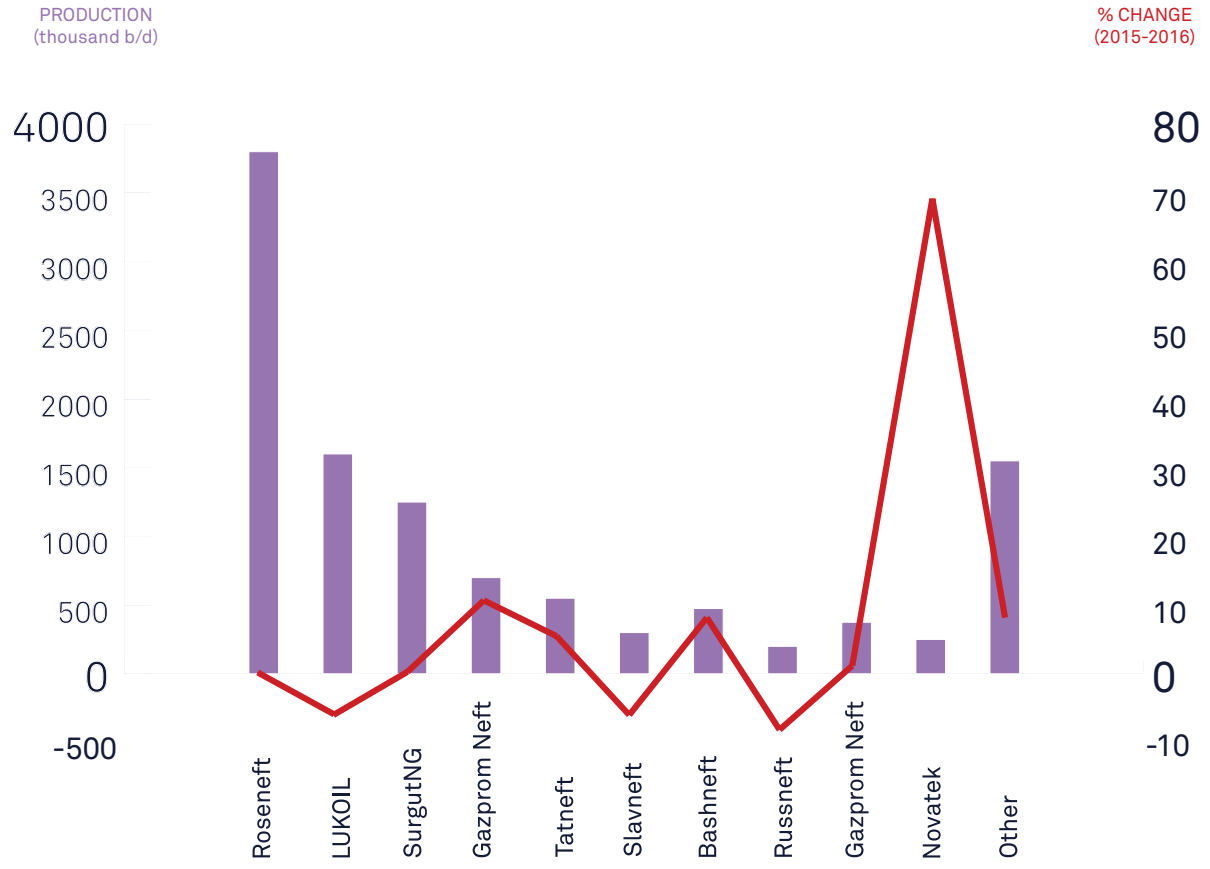


Despite the successes in staving off the inevitable decline of West Siberian production the future of Russian oil lies in the new 'frontier' regions. These areas are both geologically challenging to develop, and are located far from traditional producing regions: the two factors that make their development both complex and expensive. Just as West Siberia replaced the Volga-Urals in the 1970s as the Soviet Union's main producing region, East Siberia and the Arctic offshore will eventually overtake West Siberia. The sanctions imposed on Russia by the US and EU following Russia's illegal annexation of Crimea in 2014 will at best delay — and certainly will not preclude — the development of Russia's difficult-to-recover reserves and offshore hydrocarbons (see Impact of Sanctions on Russia below).

About 80% of Russia's liquid production came from private sector companies in 2002 but, by the end of 2013, this had fallen to just over 50%. A consistent decade-long trend of increasing state control over Russia's oil production has led to the growth of the majority state-owned company, Rosneft.

In October 2016, the government approved Rosneft's purchase of a controlling stake in Bashneft which was the country's sixth-largest oil company. This acquisition enabled Rosneft to further consolidate its role in the country's oil sector. It continues to control the lion's share of Russian oil production as the world's largest listed oil producer by output, raising production by 4.6% year-on-year as of December 2018.

RUSSIAN OIL AND CONDENSATE PRODUCTION BY COMPANY (THOUSAND B/D)



Data of the Central Dispatching Department of Fuel Energy Complex of Russia

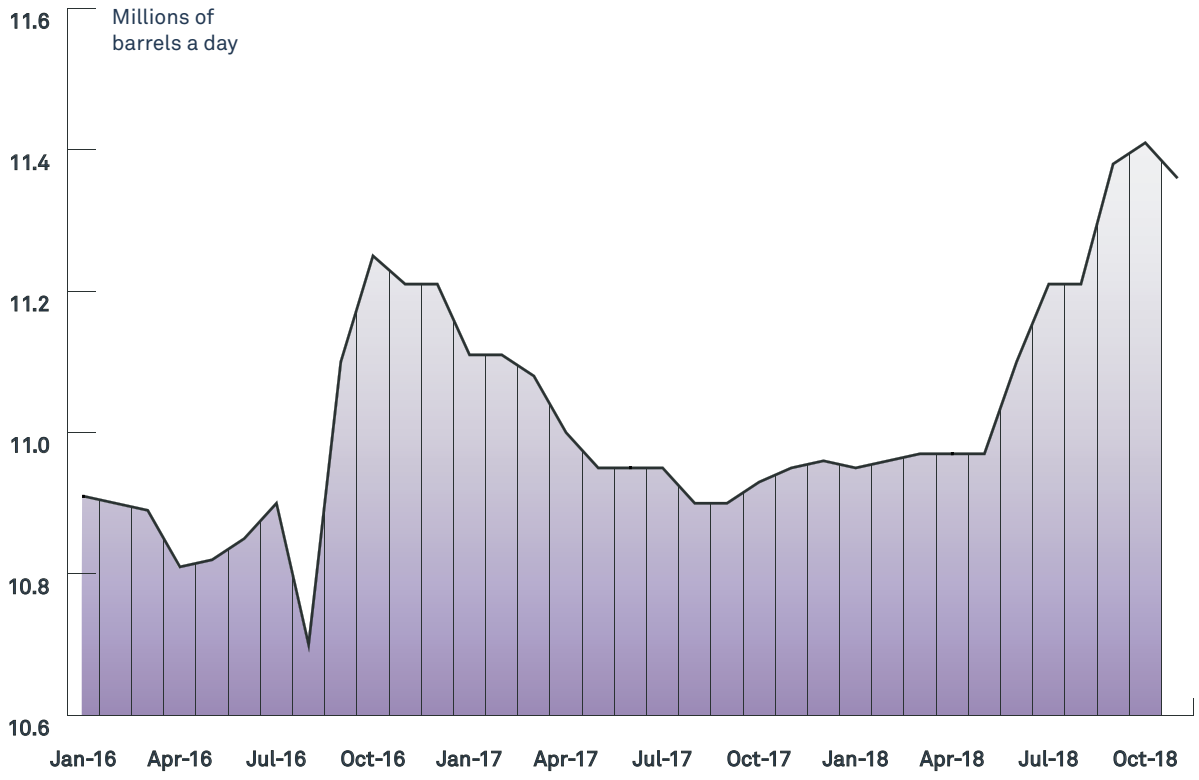
Bashneft's attractiveness was its low production costs and its potential to increase output at the time when Rosneft's production was stagnating Indeed, Bashneft was one of the few Russian oil companies that had significantly raised production: in 2010–2016 it increased by more than 50% and this continued unabated, at 2.4% per annum, even after Russia had agreed to a 300,000 b/d production cut with OPEC.

Lukoil and Surgutneftegas have been left as the only major private sector producers, although they also remain highly attuned to the political climate. Both companies saw output gains of 2.5% each year-on-year as of December 2018. They were included on the 2014 list of Russian companies that were sanctioned by the West before being tightened by the US Treasury in January 2018 when twelve Surgutneftegas subsidiaries were added to the list of sanctioned entities.[9]

Prospects for growth

Russia's annual average oil output increased by 1.6% to a record post-Soviet high of 11.16 million b/d in 2017, compared to 10.98 million b/d in 2016, which is notable given that Russia had cut production by 230,000 b/d in October 2017 as part of OPEC agreements.[10] It was also the tenth consecutive annual increase to the highest production level since the collapse of the Soviet Union in 1991.

RUSSIA'S OIL PRODUCTION BEFORE AND AFTER DEAL WITH OPEC



Bloomberg

9 home.treasury.gov
10 Ministry of Energy

Russian oil companies believe that, as competition for oil export markets intensifies, increasing production, even in a low oil price environment, may be the only way to maintain and expand their position. Therefore — despite the 2014-2016 collapse in oil prices — Russia continued to increase production in order to gain a larger international market share. Energy Minister Alexander Novak is on record stating that Russia possesses the capacity to raise oil production to 13 million b/d and would do so 'if others tried to win a larger market share'.[11]

Stress tests conducted by Russian companies at the request of the Energy Ministry suggested that, at the international oil price of US$30 a barrel, Rosneft could continue to invest in new frontier projects. Rosneft's CEO Igor Sechin claimed that the company's per barrel pre-tax and transport costs were as low as US$4 and that Rosneft is 'ready to continue the struggle for the markets'.

One reason for the increased Russian oil production has been the new fields — including Yarudeyskoye, Novoportovskoye, East Messoyakha, and Prirazlomnoye — coming on stream. The latter — in the Pechora Sea — is highly significant because it is Russia's only producing offshore Arctic oil field and delivered 2.64 million tonnes in 2017, representing a 22.7% increase from the previous year.

Oil production is likely to decline in 2019 following the December 2018 agreement with OPEC producers to cut total production by 1.2 million b/d from January 2019 in a bid to stop further declines in oil prices.

There is currently a sufficiently large number of new fields under development to compensate for the declining production rates in the mature West Siberian fields. There is also a continued commitment to maintaining upstream spending, in Rouble terms, aided by a devaluation of the local currency. East Siberia, the Arctic and hard-to-reach resources will enable Russia to maintain and increase its oil production during the next decade.

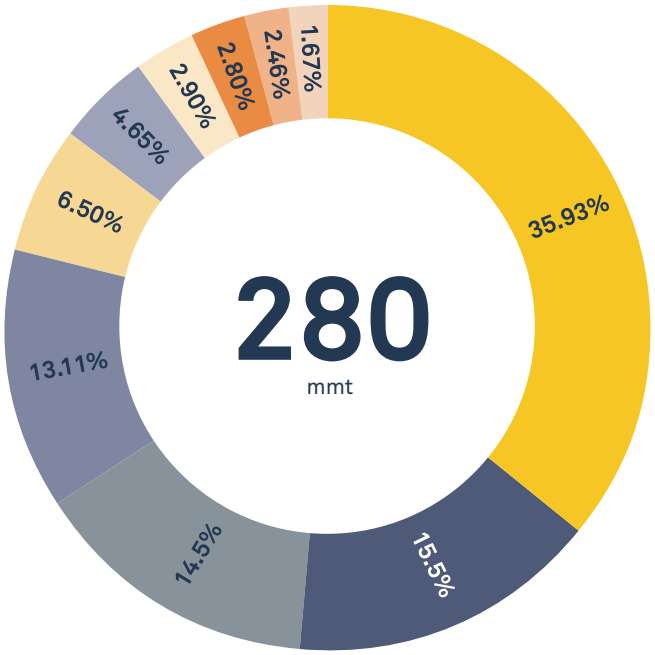
Refining

In 2011, the authorities encouraged Russia's oil industry to upgrade the country's refining system. Tax incentives were provided in return for the companies incorporating the upgrades into their investment plans.

The government's objective was to reduce low quality fuel oil output and increase the production of higher value-added products. Consequently, a gradually harsher tax burden was introduced on lower quality oil products (see Box 1) in order to incentivise companies to invest in new refining equipment. Consequently the quality of the Russian refining sector has increased. But the government's priority since 2014 has shifted to the upstream sector, and companies have sought, and have been granted, permission to delay their downstream investment.

11 Pochemu OPEC proigryvaet bor'bu za dolyu na rynke nefti' [Why OPEC is losing the fight for market share], Vedomosti, 2 October 2016.

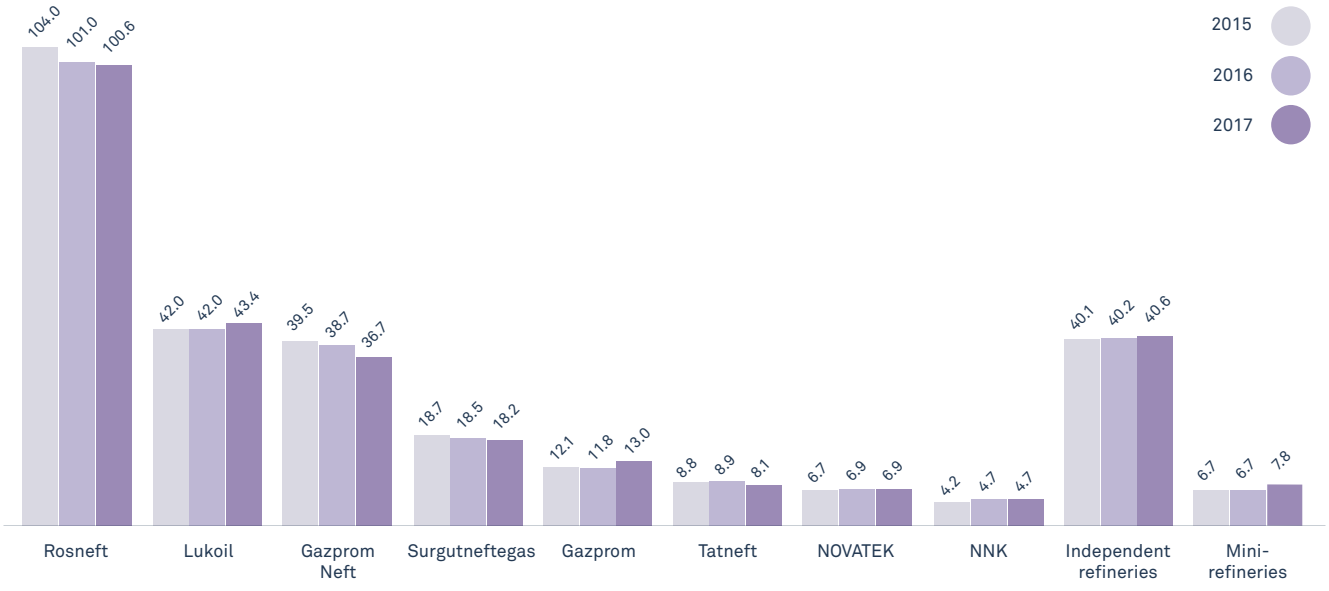
STRUCTURE IN OIL REFINING AND CHANGES IN OIL REFINING IN 2014–2017



	MMT
Rosneft	100.6
LUKOIL	43.4
Independent refineries	40.6
Gazprom Neft	36.7
Surgutneftegas	18.2
Gazprom	13.0
Tatneft	8.1
Mini-refineries	7.8
NOVATEK	6.9
NNK	4.7

Rosneft

CHANGES IN OIL REFINING IN THE RUSSIAN FEDERATION, MMT



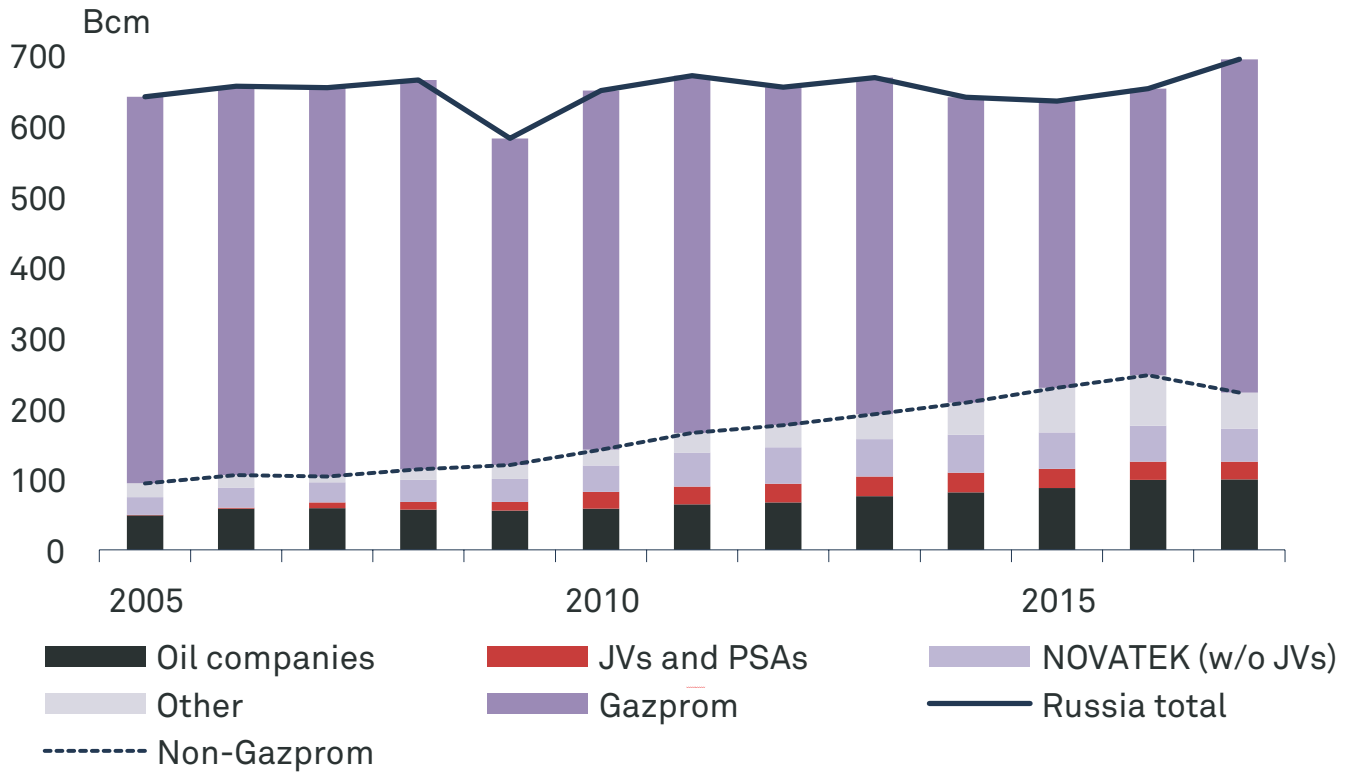
Rosneft

Production and key players

Russia's gas production sector is undergoing major changes that will be amplified in the coming decade. The production centre of gravity has been moving from Gazprom's traditional West Siberian three super-giant fields — Urengoyskoye, Yamburgskoye and Medvezhye — to new fields in the Nadym-Pur-Taz region and Yamal Peninsula. This trend will continue, with other fields in East Siberia, the Russian Far East and the offshore Arctic gradually being added to the list.

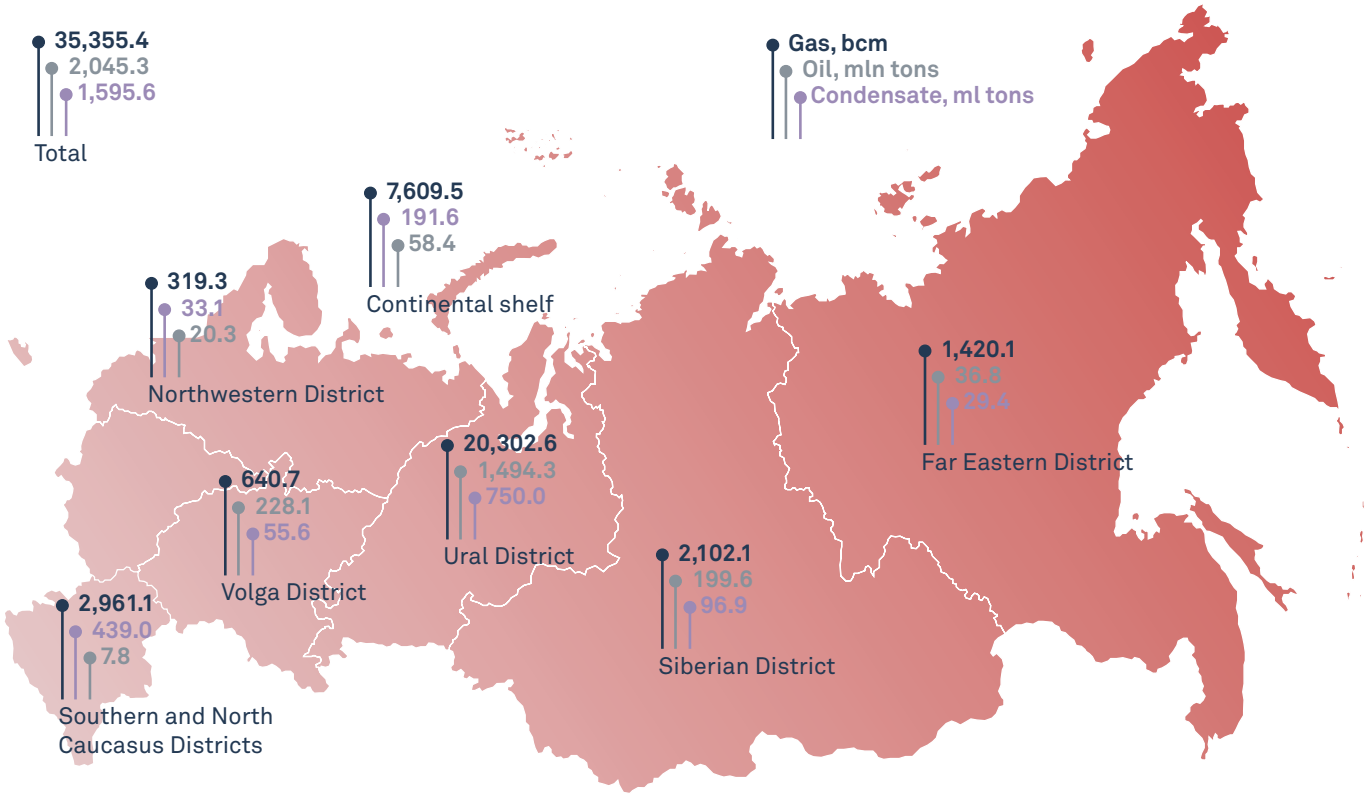
The three West Siberian super-giant fields that previously produced almost all of Russia's gas for domestic consumption and exports are expected to decline by 25% before 2020 and by 75% before 2030, by when they will only account for about 100 BCM. New fields that have helped stave off production declines have been Zapolyarnoye, Bovanenkovo and Yuzhno-Russkoye. Others are expected to be developed, including: Kovyktinskoye, Kruzenshtenskoye, Kharasaveyskoye, and others.

RUSSIAN GAS PRODUCTION BY MAIN PRODUCER



CDU TEK

GAZPROM GROUP'S EXPLORED HYDROCARBON RESERVES BY RUSSIAN REGIONS



Gazprom

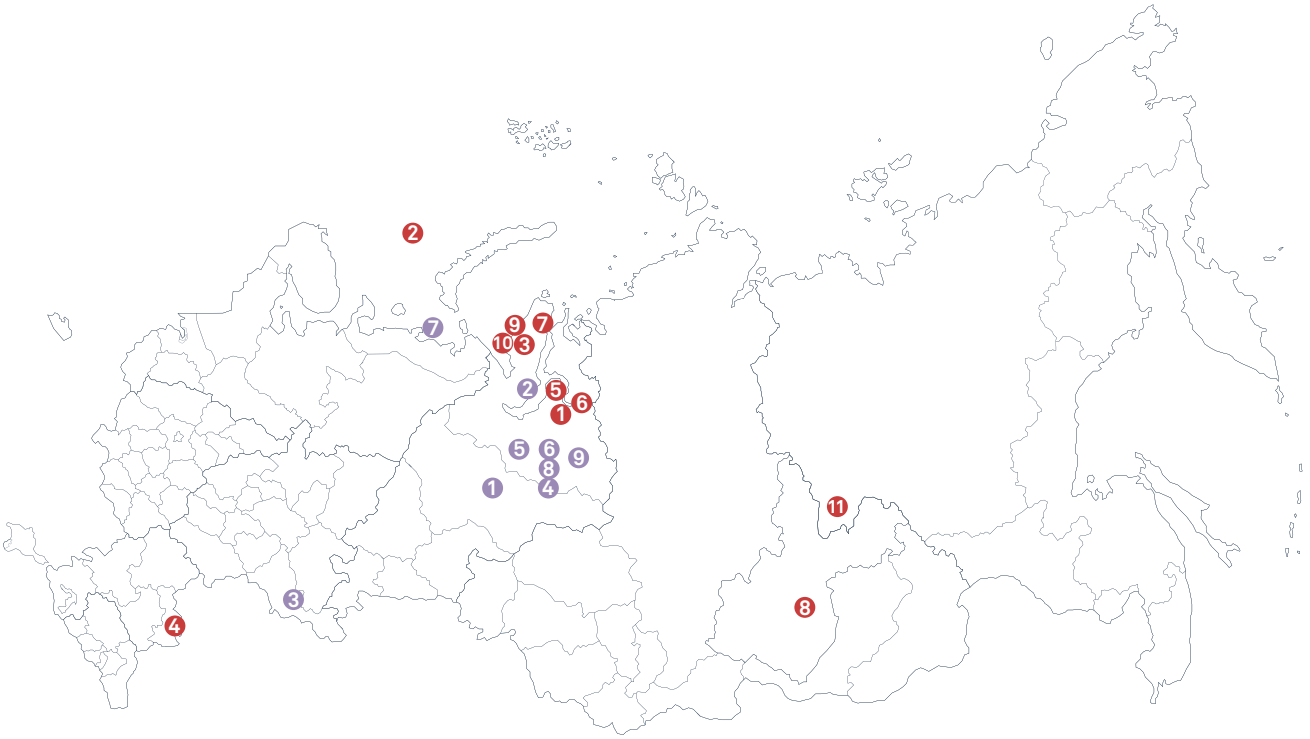
Russia's gas production is now less dominated by Gazprom because Novatek and Rosneft — which are considered to be independent gas producers — have increased production in recent years. Gazprom has been struggling to adapt to the challenges posed by global economic crises, and the advent of US shale gas revolution which has led to increased competition in both the domestic and export markets. This is illustrated by the significant decline in its share of production, from 80% in 2009 to 64% in 2016 which is partially because Gazprom has become a swing producer in recent years (see below). Despite these changing market dynamics, however, the vast majority of Russia's future gas production will still come from Gazprom.

In total, there are about 250 gas-producing entities in Russia but many only operate very small fields. Gazprom remains by far the largest Russian gas producer and in 2017 accounted for 68% of total production and operated 154 gas fields and 7,438 producing wells.[12]

Gazprom produced 471 BCM in 2017 which was a 12.4% year-on-year increase. This was, however, exceptional and was due to recovering domestic demand as well as exports which grew by 8.1% annually to a record high of 193.9 BCM (preliminary data for 2017).[13] While its production declined between 2010 and 2016 — due to a markedly lower domestic and global demand, and increased shipments by independent producers — the situation has begun to shift in recent years.

12 gazprom.com - The company also operates 8,681 oil producing wells.
13 Statement by Gazprom CEO Alexei Miller, December 2017.

GAZPROM GROUP´S FIELDS IN RUSSIA WITH THE LARGEST RESERVES OF NATURAL GAS AND OIL



Gazprom

Fields with the largest reserves of natural gas

1 Urengoyskoye
2 Shtokman
3 Bovanenkovskoye
4 Astrakhanskoye
5 Yamburgskoye
6 Zapolyarnoye
7 Yuchno-Tambeyskoye
8 Kovyktinskoye
9 Kharasaveyskoye
10 Kruzenshternskoye
11 Chayandinskoye

Fields with the largest reserves of oil

1 Priobskoye
2 Novoportovskoye
3 Eastern block of the Orenburgskoye OGCF
4 Vyngapurovskoye
5 Sutorminskoye and Severo-Karamovskoye
6 Vyngayakhinskoye
7 Prirazlomnoye
8 Novogodneye
9 Ety-Purovskoye

Note: *The map shows Gazprom Group's hydrocarbon fields (excluding entities in which Gazprom has investments classified as joint operations) with combined reserves accounting for 70% or more of A+B1+C1 natural gas and oil reserves as of 31 December 2017.*

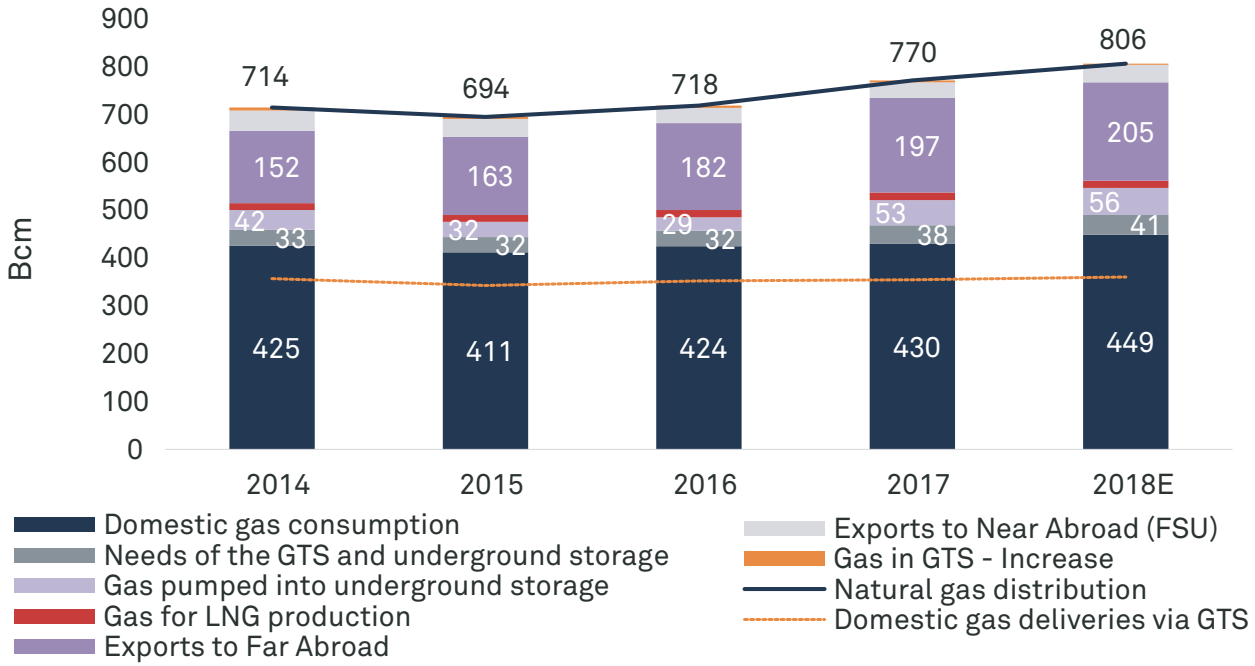
Demand

Russia is the world's second-largest gas consumer after the United States. Historical data show that over the 2000s it increased by 2.3% per annum between 2000 and 2007, before falling until 2016 albeit with some recovery in the 2009–2011 period.[14] The rapid expansion of Russia's domestic demand in the first half of the 2000s was because of the growth in power generation, as well as the growth in industrial consumption following stronger industrial output.

Since 2016, however, the demand picture has begun to change. There was rapidly increasing European demand for Gazprom's gas in 2017-2018 period — as well as some recovery in domestic consumption — which increased demand. To meet this, supply has also been ramped up. Increased production from Russia's new gas fields is close to their maximum capacity levels and the output from balancing fields has increased which has reduced their spare productive capacity. But, at the same time, a natural decline in production from Russia's older gas fields has begun to take a toll. At the beginning of 2019, concerns about the availability of Russian gas to meet domestic and global peak demand have regained the spotlight.

Reviewing the changes in the gas balance over the last few years reveals two primary reasons for the higher demand for Russian gas and the corresponding increase in production: higher export deliveries and an increase in gas storage facilities. The latter reflects the anticipated persistence of strong robust demand in the short to medium term.

RUSSIA'S GAS BALANCE DISTRIBUTION



Gazprom

14 statista.com

Exports to countries outside the Baltic states increased by 15.7 BCM in 2017 and probably increased by around 8 BCM in 2018, to a total of 205 BCM. According to some industry experts, however, this estimate is conservative because of the significant increase in Gazprom's exports to Europe — and moderate increases to the Commonwealth of Independent States (CIS) member states — in the first nine months of 2018. It is worth noting that the 2015-2016 and 2016-2017 gas seasons saw drawdowns from storage facilities significantly exceed newly stored gas supplies. Consequently, storage levels had to be replenished which led to sharp increases in gas storage re-fill in H2 of 2017 and H1 of 2018.[15]

GAZPROM EXPORT GAS SALES, JANUARY-SEPTEMBER 2018

	9m2017, Bcm	9m2018, Bcm	Incremetal Change, Bcm	% Change
Western Europe	**112,7**	**119,0**	**6,3**	**6%**
Germany	37,9	42,7	4,8	13%
Italy	18,1	18,3	0,2	1%
Turkey	21,2	17,9	-3,3	-16%
France	8,9	9,8	0,8	9%
Austria	6,0	8,0	2,0	34%
Great Britain	12,1	10,8	-1,3	-11%
Other	8,5	11,5	3,0	36%
Central Europe	**26,7**	**29,3**	**2,6**	**10%**
Hungary	4,5	5,6	1,1	24%
Poland	7,7	8,6	0,9	12%
Slovakia	3,4	3,3	-0,1	-4%
Czech Republic	4,3	4,6	0,3	7%
Bulgaria	2,5	2,3	-0,1	-6%
Croatia	1,5	1,7	0,2	15%
Other	2,8	3,1	0,3	11%
FSU	**23,1**	**25,1**	**1,9**	**8%**
Ukraine	1,6	1,8	0,2	11%
Belarus	13,4	14,3	0,9	7%
Moldova	1,8	2,0	0,2	11%
Lithuania	0,9	0,9	0,1	8%
Latvia	1,7	1,0	-0,6	-38%
Estonia	0,3	0,3	0,0	-11%
Kazakhstan	1,8	2,3	0,5	28%
Armenia	1,4	1,4	0,0	1%
Azerbajan	0,0	0,8	0,8	-
Other	0,3	0,2	-0,1	-17%
Total	**162,6**	**173,4**	**10,8**	**7%**

Gazprom Emitent Report, 9M 2018

15 Gazprom

Russia's gas industry has had to accommodate fluctuations in production — caused by swings in demand and seasonal requirements — and this is likely to continue in the future. Gazprom has been the principal balancing force for Russia's gas production because of three principle reasons. The demand fluctuations and subsequent required production are so large that only Gazprom can manage the necessary volumes. Gazprom also has the assets to balance this output from its giant Cenomanian dry gas fields in the Yamal Peninsula. For example, the technological risks associated with stop-go operations for these fields is significantly lower than for the more complex fields with higher liquid contents operated by Russian independent companies. Thirdly, Gazprom's customer base is more seasonable because it comprises industrial and residential customers, whilst the independents mainly supply larger industrial consumers with more steady demand levels.

Electricity demand from gas-fired power generation has increased because of major infrastructural projects. For instance, the development of oil and gas projects in Yamal and Tyumen regions, or the construction of the Primorsk Port, both increased gas consumption. Such increases are, however, geographically limited in scope.

Gazprom's main social project is the gasification of Russia, which is set by the government. The project's formal title is the 'Programme for Expansion of Gas Infrastructure'. According to Gazprom, in the period of 2005–2016 the average gasification of the country increased from 53.3% to 67.2%, including from 60% to 71% in cities and from 34.8% to 57.1% in rural areas. More recently, the government has prioritised the development of gas use for the transportation sector in order to stimulate domestic demand.

Prospects for growth

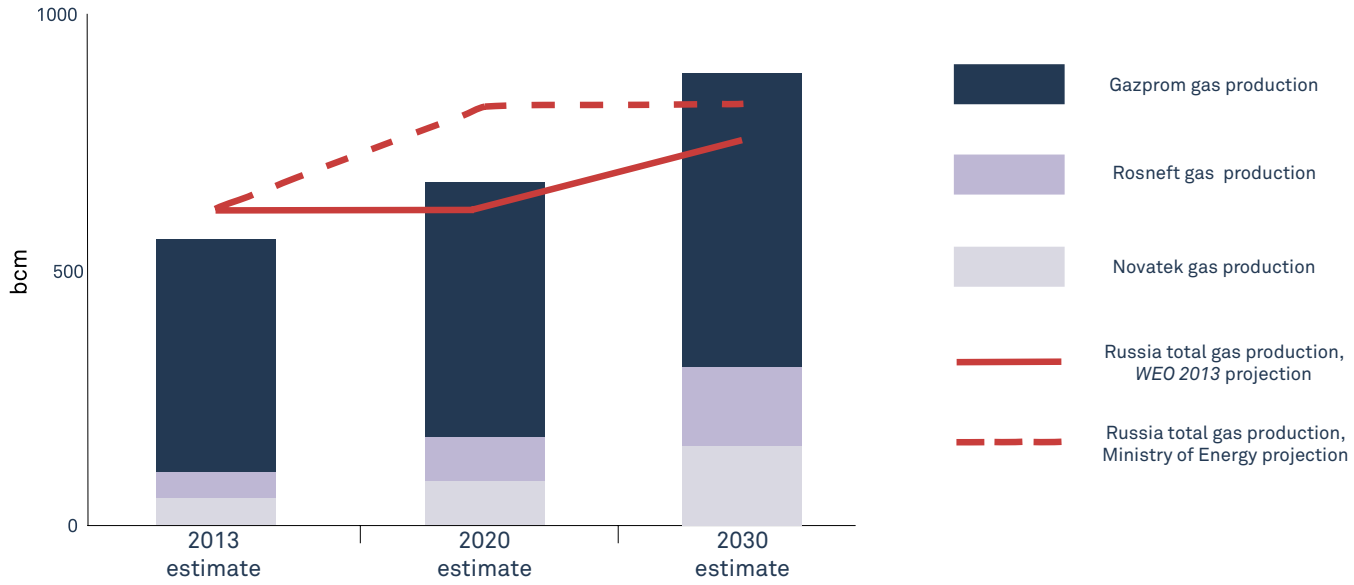
Gazprom's share in total gas production has steadily declined as Rosneft and Novatek have expanded their presence. By 2020, both Novatek and Rosneft aim to produce over 100 BCM per annum. Their actions have consistently supported their ambitions and both have acquired and developed additional fields while Novatek pioneered Russia's first greenfield LNG terminal (see below).

It is likely, however, that Gazprom's production will continue to increase. Russia's domestic pipelines continue to be controlled by Gazprom and this will disproportionately benefit the company if domestic demand increases. Moreover, in order to safeguard its export sales — which account for the majority of its profits and offset the cost of selling gas in Russia — Gazprom has increased its capital spending on new export pipelines to record levels. These new pipelines are:

- TurkStream to Turkey;
- Nord Stream to Germany;
- and the Power of Siberia to China.

Security of demand for Gazprom will stem from the fact that most of the sales through these pipelines will be regulated by long-term take-or-pay contracts.

OUTLOOK FOR RUSSIA'S GAS PRODUCTION TO 2030



IEA (2013), World Energy Outlook 2013, OECD/IEA, Paris; Gazprom Investor Presentation 2013; Novatek and Rosneft company information; IEA estimates; Ministry of Energy projections.

The most stark threat to Gazprom's domestic market dominance is found in Russia's continued growth in LNG. In 2009 — when Russia's first LNG export terminal Sakhalin-2 project came online — it provided 4% of the world's total LNG capacity. When Yamal LNG reached full capacity in December 2018 — with the early inauguration of the plant's third LNG train — it increased Russia's LNG capacity by a further 16.5 million tonnes per year. The Kremlin's support plays an important role in the development of this market. Until recently, Gazprom had a complete monopoly on Russian gas exports which is enshrined in Federal Law No. 117, On Gas Exports, from 18 July 2006. However, Gazprom failed to develop domestic LNG projects even though such targets were explicitly set by the government. Lobbying efforts by Novatek and Rosneft to weaken Gazprom's monopoly over gas exports finally led to the law being amended in 2013. This is significant because it illustrated the government's willingness to accommodate private sector companies with political connections when 'state champions' fail to meet their objectives.

Gas, but only in LNG form, can now be exported by entities other than Gazprom if one of two conditions are met:

1. the field is classed as of 'federal importance', its licence predates January 2013, and includes provision for gas liquefaction or the construction of LNG facilities; or

2. the field from which the gas will be exported is an offshore asset owned by a state company.

The first condition created the legal framework for Novatek to export LNG from Yamal LNG, while the second has paved the way for Rosneft to export LNG. The latter claims that in order to make its remote gas projects in East Siberia viable, it should be allowed to export gas.

Novatek has very significant ambitions, and rivalry for gas fields is becoming strikingly apparent. For instance, Gazprom owns the Tambey group of six gas fields which are located further north on the Yamal Peninsula than Yamal's LNG South Tambey holding. In December 2016, Novatek had asked the government — with the support of the Minister of Natural Resources, Sergei Donskoy — to let it take over four of these fields. This would have greatly increased Novatek's resource base for LNG production. At that point President Putin asked Energy Minister Novak to look into a possible transfer in support of Novatek's ambitions. But Gazprom made it clear that it had no plans to surrender the fields, after it signed a Memorandum of Intent (MoI) with Rusgazdobycha to jointly extract gas from the Tambye cluster. These deals are not finalised commitments — Novatek signed a similar MoI with Gazprom in 2012 and, until something more substantive than a MoI is signed, Novatek could, in theory, still enter that market.

The door does remain open for Novatek. The Kremlin has clearly backed Novatek's LNG ambitions. For example, Russia's Arctic investments have provided several billions in subsidies through the financing of the construction of critical infrastructure and the port at Sabetta; these subsidies could have gone to other companies had they been preferred partners to develop LNG on the Yamal Peninsula. However, much does depend on the political dynamics behind Gazprom and its potential partnership with Rusgazdobycha.

AERIAL VIEW OF THE
YAMAL PENINSULA

Novatek can be expected to increase its presence, and additional amendments to the law on exports are likely to pave the way for more projects that are already being developed by the company.

The enablers for Novatek's success lie, not only in the company's close connections to the political leadership in the Kremlin, but also in its ability to overcome Western sanctions and complete the highly challenging Yamal LNG project on time, thereby satisfying Russia's key political objectives.

The Yamal Peninsula is Russia's frontier hydrocarbons province. Before any work could take place on the extraction and liquefaction of hydrocarbons, the project partners therefore had to put in place the necessary infrastructure, including: staff facilities, an international airport at Sabetta; and a large LNG export terminal. This increased the US$27 billion cost of Yamal LNG but also paved the way for the new Arctic LNG-2 liquefaction terminal on the neighbouring Gydan Peninsula. At a comparable planned annual capacity of 10 million tonnes of LNG per annum, the costs for the new project are expected to be significantly lower, at US$10 billion.

The Yamal LNG operating company is a joint venture between Russia's Novatek (50.1%), France's Total (20%), China National Petroleum Corporation (50%), and China's Silk Road Fund (9.9%). The bulk of foreign financing came from China which lent the consortium US$12 billion at a critical point in time and thereby enabled the project to proceed despite the Western sanctions.

Yamal LNG was launched in December 2017, becoming Russia's first Arctic gas liquefaction plant and representing an ultimate act of political defiance of the Western sanctions regime.[16] Novatek's success in procuring LNG technology from non-Western sources has greatly contributed to undermining the sanctions' effectiveness and this led to its later success in inaugurating all three Yamal LNG trains by December 2018.

Yamal LNG has used 200 LNG modules that were manufactured across 10 Asian fabrication yards. South Korea's Daewoo Shipbuilding and Marine Engineering Ltd was also commissioned to build 15 ARC7 LNG tankers to transport LNG from the project. These are the world's first ice-class LNG tankers which are able to navigate in temperatures of –50oC and sail independently through up to 2.1 metres of ice.

Following the successful launch of Yamal LNG, Novatek has announced that it would invest US$47.6 billion in the Arctic by 2030. Its investments are expected to focus on the Yamal and Gydan peninsulas. The plant could become operational by 2022-2023. This time the LNG modules are expected to be built at the Kola Yard which the company is constructing outside the north western city of Murmansk.

Yamal LNG has become the world's first LNG project inside the Arctic Circle and demonstrates that Western sanctions will not preclude the development of Russian hydrocarbons. This is seen through the recent signing of a US$2.5 billion LNG platform construction contract for the new Arctic LNG

16 Prior to Yamal LNG, Russian companies had very limited experience with LNG: the country's only LNG-producing facility, Sakhalin-2, came under Gazprom's ownership closer to the project's completion. Even then, Shell had to be retained as the operator and technical advisor on the project.

2 project in the Yamal-Nenets autonomous district. The contract was signed with a joint-venture between Italy's Saipem and Turkey's Renaissance services company at the end of 2018. This was followed by tenders issued to build an airport for Arctic LNG-2.[17]

FOREIGN COMPANY INVOLVEMENT

Russian Legislation

Russian companies in general, and state-controlled companies in particular, dominate the upstream oil and gas production sector. The participation of foreign companies has been constrained by Russian domestic legislation and, since 2014, by Western sanctions.

From 1991 until mid-2008, no Russian law dealt directly with foreign investment in Russia. Although some rules governed how foreign investors could interact with local business entities, Russia had not yet adopted legislation detailing the types of entities and the size of investments in which foreign direct investors could invest. This came with the Strategic Sector Law (Federal Law No. 57-FZ of 2008) which codified the limitations of foreign investors wishing to invest in the Russian economy.

The Strategic Sector Law includes, but is not limited to, the natural resource sectors and had to be reconciled with the revision to the 1992 law 'On Subsoil'. In a nutshell, the law sets thresholds on oil and gas reserves that make them of federal significance. A list of the fields with federal significance (the 'Official List') is published by Rosnedra. The fields may be put on the Official List if they meet the following qualifications[18]:

- must be located onshore within Russian territory and contain, according to the state balance of mineral reserves recoverable oil reserves, in excess of 70 million tonnes or gas reserves in excess of 50 BCM;
- be required to use land plots as part of Russia's defence and security zones;
- be located in Russia's territorial or internal waters; and
- be located on Russia's continental shelf.

An entity seeking to acquire the rights to use a subsoil block of federal importance has to satisfy a set of criteria which have been criticised as favouring Russian applicants.

Furthermore, there are specific restrictions on who can participate in auctions for licences on Russia's continental shelf including Russia's offshore Arctic fields. These restrictions specify that all

17 Reuters
18 The thresholds as they apply to oil and gas only; copper, gold, rare earth metals, etc. which are also covered by the law are not considered in this text.

auction participants must have at least five years' experience in continental shelf exploitation and the Russian Federation must either hold more than 50% of the voting shares in the bidding company, or have the ability to directly or indirectly control more than 50% of the voting shares. In practice, the latter criterion means that only Rosneft and Gazprom are allowed to bid for the development of subsoil blocks of federal importance on the continental shelf. Currently, over 80% of licences in the Arctic have already been allocated to these two companies. Companies with significant offshore experience, such as Lukoil, are currently excluded from the process, although private sector Russian companies have been successful — for example in the Caspian and Black seas — at getting access to fields in Russia's internal and territorial seas.

While Russian private sector companies are currently excluded from the Arctic offshore, this may change in the future if Gazprom and Rosneft fail to meet their exploration licence obligations. The example of Novatek at Yamal LNG (see Case 2) demonstrates that the government is able and willing to show flexibility in amending or bypassing the law to fit its political and energy development objectives.

WESTERN SANCTIONS

Foreign companies mostly enter oil or gas exploration or production agreements through JVs. Three production-sharing agreements (PSAs) — Sakhalin-1, Sakhalin-2, and Kharyaga — that were signed in the early 1990s are currently producing hydrocarbons. However, there was a Russian political backlash against the PSA regime — because, amongst other things, of the legal incompatibilities and bureaucratic impediments — and no additional agreements of this type have been signed since.

When oil prices were high the development of Russia's remote reserves remained economically attractive. The post-2008 JVs that were signed — after the Strategic Sector Law was adopted — have involved foreign companies as minority shareholders, with the licence held by the Russian company. Many contain a commitment by the foreign partner to finance exploration activities in line with the obligations contained in the licence and to either jointly develop or supply technology that is unavailable in Russia.

Therefore, a number of foreign-registered JVs were established with Rosneft for the exploration of several blocks in the Kara, Barents, Okhotsk and Black seas. Most of these, signed with Western partners, came to a standstill following the imposition of Western sanctions in 2014. One of the first victims was ExxonMobil's project with Rosneft in the Kara Sea where drilling was conducted in 2014. It had led to a discovery of more than 130 million tonnes of oil and the Pobeda (University-1) structure. The second drilling campaign that had been scheduled for 2015 had to be cancelled because of the sanctions. One of the latest JVs to be stopped was ENI's drilling operation in its JV with Rosneft in the Black Sea. This came after the tightening of sanctions in January 2018. ENI was due to conduct geological surveys for a project.

US companies have been most affected by the sanctions because of the strict approach that the US Office of Foreign Assets Control (OFAC) has taken to enforce the US companies' adherence to the

regime. OFAC's fearsome reputation has acted as a deterrent. Companies also know that they not only risk being heavily fined but that their reputation could be tarnished because OFAC makes such breaches public. It is therefore unsurprising that ExxonMobil stalled all of its Russian exploration projects — including Arctic offshore, deep water, shale, and tight oil — incurring losses of US$1 billion. The same applies to service companies — such as Schlumberger and Halliburton — which, in the words of Russian industry experts, have been 'afraid to touch the Bazhenov [West Siberian deposit with unconventional reserves] as if it were fire'.

Recent developments

In the past 12 months, there have been several developments in the sanctions environment. The events that unfolded from the March 2018 nerve agent attack on British citizen and former Russian military intelligence officer Sergei Skripal and his daughter led to the US determining that Russia had used a chemical weapon in breach of international law. This is significant because the finding triggered the Chemical and Biological Weapons Control and Warfare Elimination Act — CBW Act, P.L. 102-182, Title III; 22 U.S.C. 5601 et seq — which required President Donald Trump to terminate most foreign aid, export licences for controlled goods and services, and government-backed financial assistance.[19]

Later in December, the Trump Administration designated two GRU officers for the attempted assassination of Skripal and his daughter under the cyber-related authority provided by Section 224 of the Countering Russian Influence in Europe and Eurasia (CRIEEA) Act of 2017. In March 2018 it then designated 16 persons for interference into the US presidential elections in 2016. A further 12 more persons — referred to as FSB enablers — were added in June and August. In December 2018, a further 13 GRU officers were designated for election interference or cyber operations against the World Anti-Doping Agency and the Organisation for the Prohibition of Chemical Weapons.

The geopolitical fallout from the March events was significant. The UK expelled 23 Russian diplomats and this was followed by similar actions by 20 other Western states, including the expulsion of 60 diplomats from the US. Russia responded with by ordering 60 US diplomats, as well as diplomats from 16 EU countries, to leave Moscow. EU-Russia tensions were compounded by a naval confrontation between Ukraine and Russia in November. That being said, these developments have adapted, rather than ended European companies' interests in the country. For example, many European companies are considering

19 Congressional Research Service

acquiring smaller Russian domestic firms in a bid to get around import bans and protect their operations in the future.[20]

By contrast with the US, Europe has had a limited shift in its sanctions policy towards Russia, in spite of 2018's events. While the EU has extended sanctions — including individual and corporate sanctions until March 2019 and economic sanctions to July — these have been in connection with Ukraine, and are not directly linked to the events in the UK. There has been little evidence that the EU would impose fresh sanctions on Russia over the nerve agent attack, despite London's pressure to do so. This is because the EU has long been split over its approach on how to manage its relationship with Russia. Governments, such as Italy, Hungary and Austria have openly voiced their opposition to sanctions while Spanish officials have suggested that the sanctions do not exclude cooperation. In line with this logic, Austria's OMV has not seen its Russian business suffer post-sanctions. The EU has had economic sanctions in place against Russia since 2014 because of the annexation of Crimea. But any additional EU sanctions would require unanimous support from national governments to take effect, and this is highly unlikely to happen.

This leads to an interesting dynamic in the relationship between EU and US sanctions. Since the Countering America's Adversaries Through Sanctions Act (CAATSA) was implemented into law in 2017, the EU and US sanctions policy have been uncoordinated. The EU's approach to sanctions over Russia since 2014 has been predictability. For example, three stages of escalation — diplomatic sanctions, persons and entities responsible for the destabilisation of Ukraine, followed by sectoral economic sanctions — were announced in advance and subsequently implemented as the Eastern Ukraine events unfolded.

By contrast, the US sanctions approach under the Trump Administration is unpredictable and often depends on domestic developments in the US. For example, in April 2018 Treasury Secretary Steven Mnuchin referred to 'a range of malign activity around the globe' as the reason for a new round of sanctions.[21] However, the sanctions came as a shock to investors and importers of Russian commodities, and particularly in Europe. The US proceeded to blacklist large internationally integrated Russian businesses for the first time, such as the aluminium giant, RUSAL, although this has since been lifted. Europe's engagement on an effective sanctions dialogue with Washington is made even more difficult because of tensions between the White House and US Congress over the correct Russia policy.

Another loophole that has been exploited by European companies is the redefining of the types of reserves at stake. Sanctions specify that there is a direct prohibition — as opposed to restriction by way of an authorisation procedure — on providing certain services for deep water oil exploration and production, Arctic oil exploration and production, and shale oil projects in Russia. Equinor has, for example, been able to obviate this prohibition and continue work on the Domanik formation in the Volga-Urals region by classifying the project as 'limestone' rather than shale, which has placed its project outside the prohibition of the sanctions regime.

Moreover, European companies have a 'grandfathering' provision built into the sanctions which enables projects that were initiated prior to the imposition of sanctions to continue. According

20 Financial Times
21 US Department of The Treasury

to this provision, prohibitions do not apply to the execution of obligations arising from a 'contract or framework agreement' that was concluded prior to 12 September 2014 or ancillary contracts necessary for the execution of these contracts. As the meaning of 'contract', 'agreement' or 'framework agreement' can be widely interpreted, this wording creates yet another significant loophole: a provisional agreement entered into prior to the imposition of sanctions could be used to get authorisation for cooperation, which would otherwise be prohibited.

Finally, and very significantly, EU sanctions have a very important limitation: they do not apply to gas exploration and production. Given that much of the oil equipment, technology and services that have been listed as sanctioned are also used in gas exploration and production, this structuring of the sanctions allows scope and flexibility in interpreting the relevant EU legislation.

In spite of escalations in the sanctions environment and the geopolitical backlashes (see below), European companies continue to take a laxer interpretation of the sanctions, compared with their US counterparts. The St Petersburg International Economic Summit (SPIEF) in May 2018 surpassed the expectations of the previous year's conference. Carrying the slogan, 'Building a Trust Economy' the SPIEF saw France's President Emmanuel Macron, Japan's Prime Minister *Shinzō Abe* and the IMF's Christine Lagarde in attendance. A total of 593 commercial agreements were signed worth a cumulative US$40 billion — compared to 386 agreements worth US$35.3 billion the previous year — signalling more optimism in the current sanctions environment.

IMPACT OF SANCTIONS ON RUSSIA

There is no doubt that the sanctions have delayed the implementation of the Arctic offshore projects as well as the development of the Bazhenov shale deposit. The latter requires some clarification.

The 'Bazhenov formation' refers to a specific geological stratum in the centre of West Siberia, running at depths of between 2,000 and 3,000 metres. It covers an area of approximately one million square kilometres and is classified as unconventional reserves (shale oil). The area was known to Soviet geologists, but it is only after the US shale technological breakthrough that it became of commercial interest.

The US Department of Energy believes that the Bazhenov formation is the world's single largest deposit of shale oil. In 2013, the EIA gave the following assessment to the Bazhenov shale: '1,243 billion barrels of risked shale oil in-place, with 74.6 billion barrels as technically recoverable; and 1,920 trillion cubic feet (TCF) — 54 trillion cubic meters — of risked shale gas, of which 285 TCF are deemed to be recoverable'.[22]

22 eia.gov

By comparison the Bakken-Three Forks deposit in the US is 90% smaller. Its estimated reserves of shale oil were assessed by the US Geological Survey in the same year at 7.4 billion barrels of shale oil and 6.7 TCF of shale gas.

There is a general acknowledgement in the Russian energy industry that Western equipment would have been helpful in accelerating the development of the Bazhenov deposit and the Arctic offshore. However, there is also an understanding that Russia has the potential to develop the technology and drilling methods without Western partners. Therefore, in the Arctic, exploration slowed down considerably but China Oilfield Services has been conducting drilling in the Kara Sea on the Leningradskoye field where Gazprom Neft is the licence holder. It is highly likely that more drilling activity would have been witnessed had oil prices been sufficiently high. As such, it is likely that the oil price, rather than sanctions, is currently the main impediment to further drilling in the Arctic.

By contrast, the development of the Bazhenov deposit makes commercial sense because it is located in a region with highly developed oil infrastructure. As a result, the Centre for Engineering and Technology for Difficult-to-Recover Reserves was set up by Gazprom Neft in conjunction with the authorities of the Khanty-Mansi Autonomous Okrug. In the summer 2016, Gazprom Neft successfully drilled 30 hydraulic fractures, after which its application to the Energy Ministry to award its work on the Bazhenov deposit to the status of a national project was approved in 2017.

The project, which is now state-sponsored, envisages the development and implementation of technologies for geological prospecting at promising oil and gas-bearing Bazhenov deposits using domestically developed seismic, magnetic and gravitational methodologies. It also envisages specialist well investigations and technologies for geological hydrodynamic modelling of the strata. Implementation also envisages the development of technologies for the construction of multi-stage horizontal wells.

The government programme of import substitution, adopted in response to the Western sanctions, is also helping companies such as Eurasia Drilling Company, Integra Solution and SSK to develop services to replace Western companies. By implementing the multi-sector import substitution policy, the government's political and financial focus, overwhelmingly been on the country's oil and gas sector, is already yielding results.

The commercial implementation of the technologies developed at Bazhenov is expected after 2022 with target production of about 400,000 b/d by 2030. However, as the previous analysis has shown, Russia has ample conventional reserves to continue producing 11 million b/d and more. The increasing use of horizontal drilling techniques will enhance reservoir productivity. Rosneft estimates that about 30% of its wells in 2016 were horizontal, while Gazprom Neft's figure stood at 40%.

In January 2018, Gazprom Neft announced the completion of the construction of Russia's first multilateral well with four horizontal cased-hole side tracks at its Novoportovskoye field on Yamal Peninsula.[23] This is expected to produce a significant increase in drainage from low-permeability strata

23 gazprom-neft.com

and significantly increase the oil recovery factor. Importantly, Russian-produced equipment was used in well construction and retooled in line with the Novoportovskoye field's specific geological conditions.

All companies in Russia are now incorporating horizontal drilling in their development plans and it has been estimated that 50% of all new wells in Russia will be horizontal.[24] It should be reiterated that horizontal drilling is only covered by Western sanctions if they are to develop shale deposits but not the difficult-to-recover conventional deposits. Difficult-to-recover oil production is expected to rise by 10%, compared to the previous year, to 860,000 b/d largely because of tax incentives.[25] In 2016, this share of oil accounted for roughly 7% of Rosneft's total output, while this figure is expected to grow to 11% by 2020. The scope for cooperation with European companies therefore remains. Meanwhile the example of Novatek (see Box 2) demonstrates that, even during a period of low oil prices, Asian partners remain keen to take part in Russian frontier projects.

ABOUT US

Menas Associates is a leading strategic, political and integrity risk consultancy headquartered in London and run by a team of professionals with significant government and commercial sector expertise. The firm has been helping companies operate in emerging markets since the late 1970s, working with in-country experts and a network of well-placed sources to provide actionable intelligence and sound analysis based on real 'on the ground' knowledge. We consult on a wide range of commercial risks facing multinational organisations, focusing on political, social, security and reputational issues. The success of our firm is founded on our analytical rigour, independence and client confidentiality. To find out more about Menas, visit our website menas.co.uk or email info@menas.co.uk.

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24 ROGTEC Russian Oil and Gas Technologies data.
25 Reuters