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Arctic Offshore Oil in Russia: Optimism, Pessimism and Realism

Nina N. POUSSENKOVA
Senior Researcher
Primakov National Research Institute of World Economy and International Relations of the Russian Academy of Sciences, 117997, Profsoyuznaya St., 23, Moscow, Russian Federation
E-mail: npoussenkova@imemo.ru
ORCID: 0000-0002-8971-1620

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ABSTRACT. *A strong global interest in the hydrocarbon resources of the Arctic emerged in the mid-2000s, after the US Geological Survey published data on its petroleum potential. While oil prices were growing, an "Arctic optimism" prevailed everywhere, and it was anticipated that a broad-scale oil production in the Arctic would soon begin. At that time, a political aspect dominated in the Russian plans to develop Arctic offshore. Russia intended to prove that it was an energy power capable of establishing a new petroleum province in the Polar seas to replace the aging West Siberia.*

But later the global energy sector underwent radical changes, and optimism was gradually replaced by realism. The decline of oil prices and introduction of anti-Russian sanctions contributed to the downgrading of the Arctic plans in Russia. Besides, the monopoly of Gazprom and Rosneft on the Arctic shelf hinders the development of its hydrocarbon resources because the state companies do not have sufficient competencies to operate offshore fields on their own.

After 2014, Russian oil companies began to revise downwards their plans of oil production in the Arctic seas. Given the sanctions and low oil prices, now relevant ministries also more realistically perceive the prospects of the northern continental shelf development, and their new attitude is clearly visible in their public statements. Thus, they indirectly admit that Russia is not ready yet for environmentally sustainable activities in the Arctic offshore. Actually, many experts and oil companies previously demonstrated a cautious approach to the possibility of the broad-scale oil production in the Polar seas reminding that the potential of the mature Russian oil provinces onshore is still significant. Now, the government makes a strong focus on the onshore alternatives to the Arctic shelf of Russia: the development of hard-to-recover reserves, enhanced oil recovery, and support of small and mid-size companies, i.e. the priorities seemingly shift from the extensive to the intensive mode of the sector development. However, pessimistically one can recall that such plans were often made in the past and they remained on paper.

Ultimately, broad-scale oil production on the Arctic continental shelf will not begin before 2035. Russian oil and shipping

sectors benefit from such time-out, because they receive a chance to train qualified personnel capable of operating on the Arctic shelf with strict adherence to the environmental sustainability principles.

KEY WORDS: *Arctic, oil companies, oil production, continental shelf, Rosneft, Gazprom neft, environmental safety, hard-to-recover reserves*

The Arctic first gained its 'celebrity status' on the world energy stage in 2007, when the United States Geological Survey announced that its subsurface may contain up to 25% of the world's undiscovered and untapped hydrocarbon resources[1]. Another factor that pushed the Arctic into the limelight was the global climate change, whose consequences have been particularly pronounced in the Arctic region and have been associated with new challenges and opportunities. On the one hand, the projected thawing of the ice cover in the Arctic seas should facilitate access to offshore oil and gas resources and make their transportation easier; on the other hand, increased weather and climate variability generates considerable risks for the development of these resources – not least because of the growing intensity and potential damage of natural disasters.

In recent years, the region has become the focus of attention, both in the Arctic countries and elsewhere. While Russia, the United States, Canada, and Norway (all of them Arctic states) are already the world's major oil producers, non-Arctic emerging economies with a high demand for energy resources like China and India are particularly interested in the region's hydrocarbon resources, including those on the continental shelf. Both Chinese and Indian companies have been successfully competing for access to the Russian Arctic against international oil and gas majors, especially in the face of Western sanctions.

In the 2000s, while oil prices were on the rise, the general atmosphere was that of 'Arctic optimism': it seemed that the age of the offshore Arctic oil (and later gas) exploration and production was right around the corner. However, much has changed since then in global energy sector: realism gradually replaced optimism, both globally and particularly in Russia, where falling oil prices and Western sanctions snapped people back to reality about the Arctic and the opportunities it promised. After 2014, Russia entered a period of 'Arctic realism', when oil companies started to scale back their plans for oil production in the Arctic offshore. It is noteworthy that relevant ministries have adopted a more down-to-earth view of the prospects for developing offshore fields in the Arctic, which is reflected very clearly in their public statements. By doing this, they have indirectly admitted that Russia is not ready yet to extract offshore resources in an environmentally sustainable way.

Does the world really need the Arctic oil?

The hydrocarbon potential of the Arctic can be realistically estimated within the framework of the global energy balance. Until recently, experts have been arguing whether the world's hydrocarbon resources are sufficient to meet the rapidly growing demand for energy (the so-called 'peak oil' debate). Now, in a radical reversal of expectations, they are discussing when oil demand will peak. In-

1 Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle (2008) // United States Geological Survey // https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf, accessed 12.12.2019.

deed, global oil supply is immense, and the world's oil reserves are increasing as technology develops. According to ExxonMobil analysts, technological progress is gradually making extraction of shale hydrocarbons, as well as production of oil from oil sands and deepwater fields commercially viable. In addition, new effective technologies are being developed that extend the life of mature oil fields. ExxonMobil estimates that less than a quarter of global oil resources have been extracted, and that the remaining reserves can meet up to 150 years of demand at its current level [Outlook for Energy 2018].

According to BP experts, when it comes to the Arctic, in the foreseeable future oil companies will mainly conduct geological exploration there, as the region is far from the top on their list of priorities. Here they present some simple but convincing statistics. Over the century and a half-long history of the world's oil industry, about 4.5 trillion barrels of oil and gas have been discovered. Approximately 1 trillion barrels were extracted, and another 1.6 trillion barrels are proven reserves, i.e. the reserves that humanity will be able to extract with a sufficient degree of certainty. The remaining 2 trillion barrels are by most accounts unrecoverable at this moment. Beyond these 4.5 trillion barrels, we can expect to discover about 1 trillion more, mostly in deep waters, on shore and in the Arctic. The US Geological survey estimates that the Arctic may contain 90 billion barrels, which is about 1/10th of the total number. To compare: this is slightly less than UAE's proven reserves (97 billion barrels) and much less than Venezuela's reserves (303 billion) [Statistical Review of World Energy 2019]. The Arctic may also contain about 47 trillion cubic meters of gas – but gas is much more difficult to transport than oil, which means that, in the medium term, companies will prioritize Arctic oil[2].

Many oil companies have been conducting onshore exploration in the Arctic for a long time, with some gradually moving offshore, as well. However, they recognize that maritime operations are fraught with additional risks. The biggest hazards are associated with sea ice and icebergs, low temperatures, permafrost, short daylight, remote location of the region and lack of infrastructure. Because of these reasons, environmental accidents, especially oil spills, can turn into real disasters. According to Igor Chestin, CEO of WWF-Russia: "Talking about the Arctic, there is not a single company with the technology to extract oil from under the ice. When it is on the surface, it's not a problem; when it is snowing, it may be a bit more difficult, but still easier than extraction from water; but if you want to extract oil from under a meter-thick cover of ice – that just isn't done[3]."

Given these environmental risks that exacerbate the existing financial, technological, managerial, logistical and other difficulties associated with developing the Arctic, the oil majors have long held very realistic views about Arctic projects, emphasizing that one should not expect quick results there. For example, in 2012, Peter Voser, the former CEO of Shell, said: "Let's put it this way: Russia and other countries have a massive resource base in the Arctic. But because of the conditions there, they would need to create and widely in-

2 The Changing Global Energy Landscape – Prospects for Arctic Oil and Gas (2013) // British Petroleum // https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/news-and-insights/speeches/speech-archive/the-changing-global-energy-landscape-prospects-for-arctic-oil-and-gas-dev-sanyal-2013.pdf, accessed 12.12.2019.

3 I. Chestin (2012) It is unprofitable and dangerous to drill for oil in the Arctic // Vedomosti. October 3, 2012 // https://www.vedomosti.ru/opinion/articles/2012/10/03/chto_skryvaet_arkticheskij_shelf, accessed 12.12.2019.

troduce special technologies, knowledge and expertise. The Arctic will be developed! It will happen, sooner or later. It may take years or even decades, but the Arctic will be developed."[4] And in 2013, the late Christophe de Margerie, then head of Total, came out with a warning: "Given the risks, the Arctic should be left well enough alone, for the time being.[5]"

Indeed, in September 2015, Royal Dutch Shell decided not to conduct exploration on the Alaskan continental shelf in the foreseeable future. The company said that "this decision reflects both the Burger J well results, the high costs associated with the project, and the challenging and unpredictable federal regulatory environment in offshore Alaska.[6]" Thus the Dutch-British energy company ended its $7 billion Arctic venture, following ExxonMobil, Chevron and BP, who also abandoned their plans to develop the Arctic seas in the face of consistently low prices[7], which became an important factor that undermined economic feasibility of the Arctic projects.

The approach chosen by the majors seems reasonable, since humanity has no need for the Arctic hydrocarbons yet. Also, the US shale revolution, which led to dramatic shifts in the balance of supply and demand on the global oil market, was sobering to many – as a result, Arctic oil simply lost its relevance. And the fall in oil prices has further reduced the intensity of competition in the Arctic. As the US State Department's Special Representative for the Arctic Admiral Robert Papp noted in 2016: "Just 10 years ago, the US was looking for more oil, which is why companies like Shell, ConocoPhillips, and British Petroleum came to the Arctic. We felt we needed additional energy resources. But now that the US became an energy exporter itself, there is not much interest in Arctic resources. Companies no longer view working in the Arctic as a profitable investment. This may change some day, but it is unlikely to happen within the next decade.[8]"

Following that, the US oil policy with respect to the Arctic offshore drilling changed dramatically, influenced by oil prices, the shale revolution and large-scale protests by environmentalists. In 2016, the US President Barack Obama imposed a ban on new oil and gas drilling in the US federal waters of the Chukchi Sea, most of the Beaufort Sea, and the northern part of the Atlantic ocean, reasoning that the Arctic oil production poses too much of an environmental risk[9]. His successor, Donald Trump, attempted to restore oil and gas leasing in these waters – however, his order was blocked in early 2019 by the US District Judge Sharon Gleason, whose decision became a win for environmentalists who argue that the risks of offshore drill-

4 E. Derbilova (2012) Interview - Peter Vozer, Chief Executive Officer of Royal Dutch Shell // Vedomosti. October 15, 2012 // https://www.vedomosti.ru/newspaper/articles/2012/10/15/my_v_rossii_nadolgo_piter_vozer_glavnyj_ispolnitelnyj, accessed 12.12.2019..

5 A. Razintseva (2013) Should Russia hurry with the development of the Arctic shelf // Vedomosti. March 4, 2013 // https://www.vedomosti.ru/library/articles/2013/03/04/ostorozhno_arktika, accessed 12.12.2019.

6 Shell Updates on Alaska Exploration (2015) // Shell, September 28, 2015 // https://www.shell.com/media/news-and-media-releases/2015/shell-updates-on-alaska-exploration.html, accessed 12.12.2019.

7 Kent S. (2015) Shell to Cease Oil Exploration in Alaskan Arctic after Disappointing Drilling Season // Wall Street Journal, September 28, 2015 // https://www.wsj.com/articles/shell-to-cease-oil-exploration-offshore-alaska-1443419673, accessed 12.12.2019.

8 "Now that the US is an energy exporter itself, there is not much interest in Arctic resources" (2016) // Kommersant. January 13, 2016 // https://www.kommersant.ru/doc/2890393, accessed 12.12.2019.

9 Obama Bans New Oil and Gas Drilling Off Alaska and Part of the Atlantic Coast (2016) / / Fortune, December 21, 2016 // https://fortune.com/2016/12/21/barack-obama-oil-gas-drilling-ban-arctic-alaska-atlantic-coast/, accessed 12.12.2019.

ing are unjustifiably high[10]. In other words, the development of offshore Arctic projects in North America was, figuratively speaking, put on ice.

In Arctic oil we trust?

In the 2000s, Russia also went through a period of 'Arctic optimism', when state officials and oil producers alike were thrilled and excited by the potential wealth of hydrocarbon resources contained in the Far North: in 2008, President Dmitry Medvedev announced a strategic goal – to turn the Arctic into Russia's resource base for the 21st century.[11]

Indeed, Russia's Arctic is expected to have enormous potential. The Ministry of Natural Resources and Environment estimates that land and sea in the Russian Arctic Zone contain 258 billion tons of recoverable hydrocarbons, or 60% of Russia's total hydrocarbon resources. It should be noted that the Russian Arctic onshore has been developed for a long time: in 2017, it produced 96.2 million tons of oil (3.8% more than in 2016) and 568.9 billion cubic meters of gas (9.6%)[12].

The situation with the Arctic offshore is more complicated. While the existence of oil reserves in the Kara, Barents and Okhotsk seas was proven in the Soviet Union back in the early 1980s, their development never started due to the limited petroleum infrastructure and, most importantly, due to lack of technologies for offshore hydrocarbon production in the USSR[13]. As noted in 2017 by the then head of the Ministry of Natural Resources and Environment Sergey Donskoy, "the USSR was the first country in the world to develop gas and oil in the Arctic, albeit only on land. As for offshore development, the West beat us to it. The gap in technology became especially pronounced in the 1990s, when Russia had other business to attend to, besides the shelf.[14]"

For these reasons, the development of hydrocarbon resources (primarily oil) on the Arctic shelf is a particular challenge to Russia. According to the Russian Ministry of Energy, 33 oil fields have been discovered in the waters of the Russian Arctic, with estimated 120 billion tons of oil equivalent (TOE) of recoverable reserves, mainly natural gas[15].

Since oil production in Western Siberia is gradually declining, Russia's strategic goal is to develop new oil and gas resources that could support the aging giant – for a time, it was believed that offshore petroleum production in the Arctic would serve as a replacement[16].

Moreover, in the 2000s, the development of polar sea resources seemed a great opportunity to prove to the world that Russia is a global energy power capable of establishing a major hydrocarbon province: the scope of this task rivaled the launch by the Soviet Union of the oil province in Western Siberia in the 1960s and 1970s. In

10 J. A. Dlouhy, K. Mehrotra (2019) Trump's Arctic Oil Drilling Edict Blocked by Federal Judge / / Bloomberg, March 30, 2019 // https://www.bloomberg.com/news/articles/2019-03-30/trump-s-arctic-oil-drilling-plan-is-shelved-by-federal-judge, accessed 12.12.2019.

11 Arctic will have its borders defined (2008) // Rossiyskaya Gazeta. September 18, 2008 // https://rg.ru/gazeta/2008/09/18.html, accessed 12.12.2019.

12 Reversing the Polarity (2018) // Severpress. March 28, 2018 // https://sever-press.ru/2018/03/28/polyus-na-minus/, accessed 12.12.2019.

13 N. Milchakova (2018) We've got the Shale! // Oil and capital. September 21, 2018 // https://oilcapital.ru/article/general/21-09-2018/slanets-nash?ind=450, accessed 12.12.2019.

14 Keys to the North (2017) // Ogonek. No 12. March 27, 2017. p. 16 // https://www.kommersant.ru/doc/3247645, accessed 12.12.2019.

15 Reversing the Polarity (2018) // Severpress. March 28, 2018 // https://sever-press.ru/2018/03/28/polyus-na-minus/, accessed 12.12.2019.

16 Time for exploration (2018) // Rossiyskaya Gazeta. July 3, 2018 // https://rg.ru/gazeta/rg/2018/07/03.html, accessed 12.12.2019.

other words, Arctic optimism at that stage had strong political and reputational overtones. It is no wonder that in April 2012, at a presentation dedicated to Rosneft's strategic alliance with ExxonMobil, aimed mainly at developing offshore operations in the Arctic, Igor Sechin, then Deputy Prime Minister, stressed that this cooperation "was greater than some of humanity's major endeavors – like the first spacewalk or the flight to the moon – and in terms of investment, it surpassed the development of hydrocarbon resources in the Brazilian shelf and the North Sea"[17].

In terms of its global image, when it comes to creating an Arctic offshore petroleum province, it is vital for Russia to not repeat the environmental mistakes made during the 'conquest' of Western Siberia. To this day, our country can feel the effects of the environmental atrocities committed under socialism, when it was deemed politically expedient to extract as much West Siberian oil as possible and as quickly as possible [*Tchourilov, Gorst, Poussenkova* 1996].

In this context, Konstantin Simonov, Director General of the National Energy Security Fund, stressed that there are different views on the development of the Arctic in modern Russia: "Some lobbyists still hold on to what I would call the Soviet approach: "the region must be developed, no matter the cost" But times are different now, and the state actually considers environmental risks, breaks with the old ways, and rectifies errors of the past by cleaning up the Arctic.[18]"

Indeed, Russian oil companies, caring about their international image, have announced their commitment to ensuring environmental safety in the Arctic – at least on paper. Ever since the 2012–2013 Greenpeace campaigns against environmentally unsustainable and economically unfeasible oil production in the Arctic[19], Gazprom Neft has been making a particularly strong focus on environmental aspects of developing the Prirazlomnoye field. According to the company, special purpose icebreakers equipped with the latest technology for oil spill response are on continuous emergency duty around the platform. Gazprom Neft says the Prirazlomnaya platform operates under a 'zero discharge' system: drilling mud and other wastes are re-injected into a special purpose absorbing well[20].

In addition, while in the Soviet era, economic and financial aspects were not considered in the development of Western Siberia, they are now becoming a real obstacle to the implementation of oil and gas projects in the Arctic offshore. Experts note that the cost of a small exploration well on the Arctic shelf is over $150 million. For comparison: in the Caspian Sea, drilling such a well would cost less than $100 million, while in Western Siberia, a medium-size exploration well costs $1.5-2 million, with costs of larger wells ranging between 5 and 10 million dollars[21].

Financial challenges are further aggravated by uncertain prospects: Russian Arctic seas remain largely unexplored,

17 K. Melnikov (2012) Igor Sechin emptied his closet of all the skeletons // Kommersant. April 19, 2012 // https://www.kommersant.ru/doc/1918809, accessed 12.12.2019.

18 Russia does not want to be seen as a nation that spits on the environment in the Arctic (2017) // Regnum. April 26, 2017 // https://regnum.ru/news/polit/2268338.html, accessed 12.12.2019.

19 Greenpeace activists climb aboard Prirazlomnaya platform (2013) // Greenpeace. September 18, 2013 // https://www.greenpeace.org/russia/ru/news/2013/18-09-action-on-Prirazlomnaya/, accessed 12.12.2019.

20 Gazprom Neft's output of the first oil produced on the Russian Arctic shelf in 2016 shows a 2.5-fold increase (2017) // Gazprom Neft. January 26, 2017 // https://www.gazprom-neft.ru/press-center/news/1116140/?sphrase_id=5470927, accessed 12.12.2019.

21 A. Razintseva (2013) Should Russia hurry with the development of the Arctic shelf // Vedomosti. March 4, 2013 // https://www.vedomosti.ru/library/articles/2013/03/04/ostorozhno_arktika, accessed 12.12.2019.

meaning their resource potential is unclear. Russia has yet to study more than 90% of the Arctic shelf (and 53% of the Arctic coastline). There has been very limited seismic exploration of the Arctic shelf: by the mid-2010s, the level of exploration in most of the Arctic seas remained either low (0.1-0.3 km per square km) or, in the case of the East Siberian Sea, for example, very low (less than 0.1 km per square km). This rate of exploration is at least an order of magnitude lower than in Norway, Denmark, Britain, Brazil, and even several African countries[22]. Thus, the Arctic holds a lot of potential for both major discoveries – such as the Pobeda field on the Kara Sea shelf – and for bitter disappointments.

However, even if discoveries are made on the Arctic shelf, the question immediately arises whether Russia is capable to extract these hydrocarbons in an economically efficient and, most importantly, environmentally sustainable manner, especially in the polar seas to the east of the Urals? After all, Arctic waters strongly differ depending on the location. In areas covered with ice for several months a year, hydrocarbons are already being extracted with the use of existing technologies. Some areas remain frozen for about six months a year; environmentally safe development of these zones requires progressive development of these technologies. And still other regions are covered with ice for almost the entire year: exploring these areas would demand radical technological breakthroughs. The eastern part of Russia's Arctic belongs to this third category. With this in mind, a worrisome trend is observed that the draft Energy Strategy of Russia until 2035 says: "...developing the hydrocarbon potential of the continental shelf of the Arctic seas and the Far North is the biggest geopolitical and technological challenge for the Russian oil and gas industry" [Draft Energy Strategy of Russia, 2017], while disregarding the environmental challenge, which is of no less importance to the region.

Wishful planning

During the above-mentioned period of 'Arctic optimism', Rosneft and Gazprom divided the continental shelf between them, bought up licenses for exploration and development of offshore resources, signed strategic agreements with the majors and actively prepared to launch the production of hydrocarbons in the Arctic. But Gazprom, which had planned to develop the Shtokman field in the Barents Sea, quickly pulled the plug on the project, deciding to postpone it indefinitely in 2012. Low natural gas prices and transformation of the United States from a potential importer of liquefied natural gas (LNG) to an exporter undermined the profitability of the Shtokman field. In February 2018, Sergey Donskoy commented on the situation, saying that "today it remains a reserve, an excellent reserve for the future, which will certainly be used one day. But with the current economic situation and gas prices, the development of the Shtokman field is unprofitable."[23]

However, in December 2013, Gazprom's subsidiary Gazprom Neft commissioned the Prirazlomnoye field[24], becom-

22 Time for exploration (2018) // Rossiyskaya Gazeta. July 3, 2018 // https://rg.ru/gazeta/rg/2018/07/03.html, accessed 12.12.2019.
23 Sergey Donskoy: Too early to talk about stabilization of the oil market (2018) // TASS. February 16, 2018 // https://tass.ru/forumsochi2018/articles/4962147, accessed 12.12.2019.
24 Discovered in 1989 in the Pechora Sea (60 km off the shore at a depth of 20 m), the Prirazlomnoye field has 70 million tons of recoverable oil reserves. It produced 2.15 million tons of oil in 2016, 2.64 million tons in 2017, and is soon expected to reach peak production of 5 million tons of oil. To develop the field, Gazprom built the Prirazlomnaya offshore ice-resistant stationary platform.

ing the only Russian company to produce oil in the Arctic offshore. A new oil export grade (ARCO – Arctic Oil) from Prirazlomnoye hit the global market in April 2014. Gazprom Neft's other offshore reserves are still at the exploration stage. Gazprom Neft-Sakhalin holds licenses for four plots on the Arctic shelf: Severo-Vrangelevskiy (East Siberian and Chukchi seas), Kheisoveisky (Barents Sea), Dolginsky and Severo-Zapadniy (Pechora Sea). Inititally, the Dolginsky field, with 200 million TOE of reserves, was expected to enter the commercial phase sooner than its other fields. However, Gazprom Neft successfully lobbied for changes to the Dolginsky license, as it was dissatisfied with the results after drilling an exploration well: consequently, the start of production was postponed from 2019 to 2031[25].

Rosneft, having become the queen of the Arctic seas[26], started to conduct active geological exploration in cooperation with its international partners – ExxonMobil, ENI and Equinor – with whom it signed strategic agreements in 2011-2012 with the goal of developing both offshore oil and gas in the Arctic seas and hard-to-recover onshore reserves. "Our strategic advantage is the huge conventional onshore oil reserves in regions with developed infrastructure. Our strategic prospects are the immense reserves of offshore oil and gas", Sechin noted in 2017, outlining his Rosneft 2022 Strategy[27]. Still, Rosneft seems to prefer offshore reserves. The company is quite optimistic about its prospects for hydrocarbon production in the Arctic seas: according to its website, "experts estimate that by 2050, offshore production in the Arctic will account for 20 to 30 percent of all Russian oil production."[28] Clearly, since Rosneft seeks to position itself as a global major[29], and being the "queen of the Arctic" is an important component of this image, its Arctic plans also have a strong political aspect.

In August 2014, Rosneft and ExxonMobil started drilling the $700 million Universitetskaya-1 well, the northernmost offshore well in Russia, using the West Alpha drilling platform provided by the Norwegian company North Atlantic Drilling. The scale of the project was truly impressive: the Universitetskaya structure covers 1,200 square kilometers and has resources of more than 1.3 billion TOE. The project garnered a lot of attention, as optimistic estimates placed the potential of the Kara oil and gas province well above the Gulf of Mexico, Brazil's continental shelf, or the continental shelf of Alaska and Canada[30]. In October, the partners announced the discovery of the Pobeda (Victory) field with recoverable reserves of 130 million tons of oil and 499 billion cubic meters of C1+C2 natural gas. However, their victory celebration was premature.

25 Gazprom Neft to push offshore oil production to 2031 (2015) // RBC. November 15, 2015 // https://www.rbc.ru/business/15/11/2015/5645a9429a7947c868dcadf9, accessed 12.12.2019.

26 Rosneft owns licenses for 19 plots on the continental shelf of Russia's West Arctic seas – in the Barents, Pechora, and Kara seas, with total recoverable resources of 16.3 billion TOE. Five fields were discovered in the licensed areas (Pobeda in the Kara Sea, North-Gulyaevskoye, Medynskoye-sea, Varandey-sea and Pomorskoye in the Pechora Sea). In addition, in 2013-2015, it acquired licenses for 9 plots in Russia's East Arctic: in the Laptev Sea, the East Siberian Sea, and the Chukchi Sea, with recoverable oil and gas resources of 18.2 billion TOE.

27 I. Sechin (2017) Rosneft-2022: strategy for the future // Izvestia. June 27, 2017 // https://iz.ru/611245/igor-sechin/rosneft-2022-strategiia-budushchego, accessed 12.12.2019.

28 Offshore projects (2019) // Rosneft // https://www.rosneft.ru/business/Upstream/offshore/, accessed 12.12.2019.

29 Notably, in the report outlining Rosneft's 2022 strategy, Igor Sechin wrote: "Over the past five years, our company has grown from a regional player to a global major, the world's largest public oil company in terms of production, reserves and business scale, and the most efficient in terms of operating costs" (I. Sechin (2017) Rosneft 2022»: strategy for the future // Izvestia. June 27, 2017 // https://iz.ru/611245/igor-sechin/rosneft-2022-strategiia-budushchego, accessed 12.12.2019.

30 Rosneft and ExxonMobil started drilling in the Kara Sea (2014) // Rosneft. August 9, 2014 // https://www.rosneft.ru/press/releases/item/153553/, accessed 12.12.2019.

The Perfect Storm

Arctic optimism was replaced by realism in 2014, when Russia was hit by a double whammy of low oil prices and Western sanctions, both financial (aimed at major Russian oil companies) and sectoral, aimed against Russia's deepwater, Arctic offshore, and shale projects.

Which of these blows was more painful for the development of Arctic offshore fields? Russian experts hold different views on this issue [*Tikhonov* 2019]. See for yourself.

Offshore projects have certainly suffered from low oil prices. Generally, experts' opinions differ with respect to the exact price at which offshore Arctic oil production would be profitable. But they do agree on one thing: the price should be high. For example, Russia's Minister of Energy Alexander Novak noted in 2017 that oil production in the Arctic offshore would be profitable at the price of $70 to $100 a barrel.[31] According to Deputy Director of the Institute of Energy and Finance Alexey Belogoryev, developing offshore fields, especially Arctic ones, should be cost-effective at a price of at least $90 a barrel[32]. President of the Union of Oil and Gas Producers of Russia Gennady Shmal noted: "Both today and in the near future, all Arctic projects are still very expensive. According to my calculations, even at current oil prices, which are not that low – over $70 a barrel – none of the Arctic shelf projects would be profitable[33]."

However, since only state-owned companies – Gazprom and Rosneft – operate on the Russian Arctic shelf, they receive strong government support, which offsets some of the negative effects of low oil prices. Thanks to Rosneft's efforts, in 2012 the government provided significant tax incentives to offshore projects[34]. According to experts, this resulted in Russia having the most liberal tax regime for offshore operations in the world. However, analysts at the SKOLKOVO Business School calculated that it will be Russian state oil companies, primarily Rosneft, and not the state itself that will benefit most from these projects[35].

Rosneft, which signed an agreement with ENI on April 25, 2012 to jointly develop the Fedynsky and Central Barents fields in the Barents Sea and the Shatsky Ridge in the Black Sea, then openly admitted that it was the generous tax incentives that facilitated the agreement[36].

Gazprom Neft was also able to lobby for fiscal benefits. Notably, in 2014, Gazprom Neft head Alexander Dyukov said that the tax breaks provided for the project will ensure efficient development of the Prirazlomnoye field, even if prices fall to $ 80

31 Novak named the price of oil at which production on the Arctic shelf would be profitable (2017) // Vedomosti. March 29, 2017 // https://www.vedomosti.ru/business/news/2017/03/29/683204-novak, accessed 12.12.2019.

32 Private companies will be allowed into the Arctic (2016) // RBC. December 26, 2016 // https://www.rbc.ru/newspaper/2016/12/27/585fd0129a79475d1768ff08, accessed 12.12.2019.

33 Oil production projects in the Arctic offshore remain unprofitable (2018) // TASS. September 4, 2018 // https://tass.ru/ekonomika/5521572?utm_source=rfinance, accessed 12.12.2019.

34 All offshore projects were divided into four categories in terms of their complexity – from 'basic' to 'Arctic'. Special mineral extraction tax (MET) rates are provided, ranging from 30% of the cost of the extracted resources for basic level projects to 5% for the most complex Arctic projects. Offshore projects in the Arctic are divided into three levels in terms of complexity: The Pechora and White seas (15% MET), the southern part of the Barents Sea (10% MET), the Northern part of the Barents Sea, the Kara Sea and the Russia's East Arctic (5% MET). Offshore project operators receive guarantees that the tax regime will remain unchanged for 5-15 years (which is especially important for such expensive projects with a long payback period), and are exempted from export duties on oil as well as import duties and VAT on imported high-tech equipment. This applies to fields where production starts in 2016.

35 The northern liberal ocean (2012) // Kommersant. September 21, 2012 // https://www.kommersant.ru/doc/2026740, accessed 12.12.2019.

36 O. Gavshina (2012) Italy's ENI invited to develop the Russian shelf // Vedomosti. April 25, 2012 // https://www.vedomosti.ru/business/articles/2012/04/26/shelf_dlya_vseh, accessed 12.12.2019.

a barrel [*Andrianov* 2015]. Further events showed that he had been overly optimistic with respect to oil prices, but realistic in assessing the value of state support. For example, the zero MET rate for the Prirazlomnoye field was extended from 2019 to 2022.[37] Since April 1, 2014, ARCO oil has been subject to a zero export tariff. As a result, the Prirazlomnoye field will probably remain viable even at low oil prices.

At the same time, anti-Russian sanctions have dealt an equally heavy blow to the development of the Arctic offshore. ExxonMobil withdrew from projects in the Kara Sea, leaving Rosneft unable to develop the Pobeda field by itself.

Still, Rosneft decided to carry on with the Arctic projects on its own and in April 2017 started drilling the Tsentralno-Olginskaya-1 well (the northernmost well in Russia) in the Laptev Sea under very challenging conditions: The Hara-Tumus Peninsula has no seaports, and the navigation season lasts there only two months of the year[38]. In June 2017, Rosneft announced the discovery of a field with 80 million tons of recoverable light and sweet oil (C1+C2)[39], which means that a new oil and gas province could be created in Russia's East Arctic. However, some experts are doubtful that Rosneft is able to organize and finance full-scale development of a field this remote and difficult to access without the help of international partners.

As part of Russia's geopolitical pivot to the East, both Rosneft and Gazprom Neft started inviting oil companies from non-Arctic States – China, India, and even Vietnam – to participate in their offshore Arctic projects, but with little to no success. For example, in 2013, some time before the sanctions, Rosneft wanted CNPC to join its project for the development of oil and gas reserves of the Pechora and Barents seas[40]. The Chinese, however, were in no hurry to start operating on Russia's Arctic shelf, apprehensive about high capital costs and the dubious profitability of these projects, as well as Rosneft's rigidity in trying to maintain control over the assets [*Milov* 2015]. So, even for the Chinese companies, usually eager to obtain access to foreign hydrocarbons and possessing substantial financial resources, offshore oil production in Russia's Arctic remains one of the less attractive investment opportunities: they find it more profitable to work in other regions of the world, with milder climates and more flexible partners. In 2017, Gazprom Neft started talks with India's ONGC and China's CNOOC about potential joint operations in the northern seas, which are yet to be completed[41].

It is the companies from non-Arctic Asian countries that are, in effect, the main beneficiaries of Western sectoral sanctions against Russia's Arctic operations, since they now have a chance to access Russia's hydrocarbon reserves on attractive terms. But are Asian oil companies capable of replacing the departed majors with their rich experience of working in Russia's Arctic offshore?

37 The Ministry of Finance to extend the mineral extraction tax holiday for the Yamal Peninsula and the Nenets Autonomous Okrug fields until 2022 (2013) // Vedomosti. September 10, 2013 // https://www.vedomosti.ru/finance/news/2013/09/10/minfin-hochet-prodlit-do-2022-g-kanikuly-po-ndpi-dlya, accessed 12.12.2019.

38 Rosneft started drilling the northernmost well on the Russian continental shelf (2017) // Rosneft. April 3, 2017 // https://www.rosneft.ru/press/releases/item/186075/, accessed 12.12.2019.

39 Rosneft discovered hydrocarbon deposits on Russia's East Arctic shelf (2017) // Rosneft. June 18, 2017 // https://www.rosneft.ru/press/releases/item/186987/, accessed 12.12.2019.

40 Rosneft and CNPC to start joint operation on the continental shelf and in East Siberia (2013) // RIA Novosti. March 22, 2013 // https://ria.ru/20130322/928606393.html, accessed 12.12.2019.

41 V. Petlevoy (2017) Gazprom Neft inviting its partners to the Arctic // Vedomosti. March 29, 2017 // https://www.vedomosti.ru/business/articles/2017/03/29/683288-gazprom-neft, accessed 12.12.2019.

The shelved shelf?

2014 turned out to be a turning point for Russia's Arctic plans, undermined by low oil prices and Western sanctions. However, top-ranking governent officials seemed to maintain an optimistic outlook, despite the obvious challenges the industry was facing.

In December 2014, Sergey Donskoy stated that Russia does not intend to change plans for the development of the Arctic. "Like the Ministry and the companies have stated before, the development of the Arctic remains our key priority." Still, the Minister added that "there are no plans to start large-scale operations on the Arctic shelf in the next five years, or more." "Most of the production will begin after 2030, and currently we're at the exploration stage," he explained[42].

"Clearly, low oil prices have quite a negative effect on the ability to attract investment for Arctic projects, for Arctic offshore development – still, our companies continue to work on the continental shelf," Alexander Novak said in 2016.[43]

And in 2017, Vladimir Putin, paraphrasing the famous line by Lomonosov, formulated his vision like this: "Russia's wealth should grow with the Arctic."[44]

In reality, however, sanctions and low prices forced both companies and the government to scale back their plans to develop hydrocarbon resources in the polar seas. In 2016, the Ministry of Energy estimated that offshore oil production in the Arctic could grow to reach 31-35 million tons by 2035, although before that the Draft Energy Strategy up to 2035 had predicted that production would reach 35-36 million tons by that date.[45] And in November 2018, Deputy energy Minister Pavel Sorokin presented very modest scenarios for the development of offshore oil production in the Russian Arctic until 2035, talking about an output of 9-11 million tons per year in 2030-2035.[46]

High costs of drilling, problems with financing, and the shortage of sea drilling rigs, auxiliary vessels and ice-breakers resulted in missed deadlines established in the licenses. As a result, in 2016, Rosneft asked the Ministry of Natural Resources for permission to delay exploration and production at its offshore fields. Rosnedra agreed to let Rosneft postpone exploration activities at 19 plots in the Arctic, Far East and southern seas for two to five years, and also allowed Gazprom and Gazprom Neft to postpone activities at 12 plots. Experts calculated at that time that because of the missed deadlines, offshore oil production in the Arctic would reach only 13 million tons by 2030, instead of the previously planned volume of 18 million tons[47].

And in 2016, the Ministry of Natural Resources and Environment imposed a temporary moratorium on issuing new offshore licenses until the obligations under existing licenses are met. Interestingly, according to Evgeny Kiselev, Deputy Minister of Natural Resources and head of the Federal Agency for Mineral Resources,

42 Ministry of Natural Resources and Environment: no changes in the course of development of the Arctic shelf (2014) // RIA "Novosti". December 10, 2014 // https://ria.ru/20141210/1037505756.html, accessed 12.12.2019.

43 Oil and gas of Russia's Arctic: small steps towards big resources (2016) // RIA Novosti. May 25, 2016 // https://ria.ru/20160525/1439399879.html, accessed 12.12.2019.

44 G. Mislivskaya (2017) Putin spoke about the program for Arctic development // Rossiyskaya Gazeta. December 14, 2017 // https://rg.ru/2017/12/14/putin-rasskazal-o-programme-osvoeniia-arktiki.html, accessed 12.12.2019.

45 L. Podobedova (2016) Russia abandons plans for intensive offshore oil and gas production // RBC. June 9, 2016 // https://www.rbc.ru/business/09/06/2016/57593ed59a79476c142e7256, accessed 12.12.2019.

46 A. Chernykh, O. Suprunenko , M. Rudenko (2019) The Arctic shelf: do we drill or do we wait? // Oil and gas hierarchy. No 2. p. 43 // http://www.ngv.ru/magazines/article/burit-na-arkticheskom-shelfe-ili-zhdat/, accessed 12.12.2019.

47 L. Podobedova (2016) Russia abandons plans for intensive offshore oil and gas production // RBC. June 9, 2016 // https://www.rbc.ru/business/09/06/2016/57593ed59a79476c142e7256, accessed 12.12.2019.

this suspension contributes to improving the environmental practices of oil companies. "You cannot launch any serious offshore work without environmentally safe technologies, because oil spills in the Arctic are not something we can accept. We hope that companies will make use of this time-out,, and that we won't have to extend it – we hope that we can instead start some of the projects in the upcoming years."[48]

However, in August 2018, the Ministry of Natural Resources and Environment opposed the lifting of the moratorium on issuing new licenses, thereby confirming, albeit indirectly, that Russia is no longer committed to intensive development of offshore hydrocarbons in the Arctic. It seems that the government's strategic priorities are shifting towards Russia's onshore hydrocarbon potential.

Offshore vs onshore

It is noteworthy that even during the period of Arctic optimism, many Russian experts remained level-headed with respect to offshore drilling in the Arctic – an approach that was later adopted by government officials in the era of Arctic realism. Analysts have long been saying that Russia's onshore hydrocarbon reserves will last for a very long time.

Back in 2012, long before the Western sanctions, WWF-Russia experts issued a study called State Subsidies to the Oil and Gas Sector in Russia: At What Cost? In it, they rightly noted that "Russia can choose one of the two ways of maintaining its role in international energy markets: *extensive development – by commissioning new fields, including in the Arctic; or intensive development – by improving oil recovery ratio at existing fields* [everywhere author's italics] and releasing appropriate volumes of hydrocarbon resources for export following a reduction in the energy intensity of the domestic economy" [*Gerasimchuk* 2012].

In 2013, senior analyst at Sberbank CIB Valery Nesterov said: "In part, we are forced to develop the Arctic: not for oil or gas production, but in order to support and modernize Russia's northern regions – and for geopolitical reasons, too, like consolidating our position on the continental shelf. *First we need to deal with onshore resources. In the next 10-15 years, hard-to-recover oil reserves on shore are going to be much easier and more efficient to develop than those in the Arctic.* There will be no rapid production in the Arctic, and the volumes will be much smaller."[49]

Indeed, there are at least three viable alternatives to Arctic offshore projects.

The first alternative to offshore oil is the development of hard-to-recover onshore reserves[50]. In 2017, hard-to-recover reserves provided some 38-39 million tons of oil (including 1.6 million tons from Bazhenov, Abalak, Khadum and Domanic formations). This contributed 7.2 percent of the total Russian production, and that share is growing. According to the General Scheme of the Russian Oil Industry Development up to 2035, hard-to-recover reserves are expected to yield some 82 million tons / year[51], which will considerably

48 A. Gorokhova (2017) The Arctic shelf: sanctions do nothing but stimulate Russia's progress // Regnum. September 13, 2017 // https://regnum.ru/news/economy/2321227.html, accessed 12.12.2019.

49 A. Razintseva (2013) Should Russia hurry with the development of the Arctic shelf // Vedomosti. March 4, 2013 // https://www.vedomosti.ru/library/articles/2013/03/04/ostorozhno_arktika, accessed 12.12.2019.

50 Hard-to-recover reserves include oil from Bazhenov, Abalak, Khadum and Domanic and Tyumen formations, as well as oil extracted from productive reservoirs with low permeability and considerable vertical thickness of net oil pay. Sometimes, high-viscosity oil is also categorized as hard-to-recover.

51 Interview of Deputy Minister of Energy Kirill Molodtsov to a Russian newspaper regarding the prospects of hard-to-recover oil production (2017) // Ministry of energy. December 13, 2017 // https://minenergo.gov.ru/node/10093, accessed 12.12.2019.

exceed the anticipated output from the offshore Arctic.

Indeed, the Bazhenov Formation, stretching across most of Western Siberia, is considered the world's largest shale formation. Its geological resources are estimated at 100-170 billion tons[52], although with a very low oil recovery rate. While Arctic offshore development requires the creation of infrastructure in harsh conditions, not suitable for permanent human habitation, the Bazhenov Formation is located in regions with the already established infrastructure. Developing these reserves has a great social significance for Russia, as the decline in oil production in Western Siberia would affect the well-being of local oil and gas towns.[53]

Russian oil companies also have long compared the viability of developing hard-to-recover reserves and the resources of the Arctic shelf. Back in 2012, Gazprom Neft experts recognized: "For a long time, the Bazhenov Formation and its resources were seen as impractical in terms of exploration and development. These days, however, tapping into the Bazhenov Formation reserves seems more attractive, compared to a number of alternative scenarios of maintaining oil production, such as *starting offshore operations to the east of the Urals*, and in the undeveloped areas of Eastern Siberia. After all, the region of the Bazhenov Formation already has all the necessary infrastructure."[54]

However, projects for the development of shale oil also fall under anti-Russian sanctions; for example, in 2014 Total withdrew from its joint venture with LUKOIL to develop the Bazhenov Formation.[55] But a number of Russian companies, such as Surgutneftegas, have accumulated impressive experience in oil production from the formation, as it has been working there since 2005.[56]

It is noteworthy that officials of the relevant ministries now also adhere to a more pragmatic position with respect to offshore drilling in the Arctic. In December 2017, Kirill Molodtsov, then-Deputy Minister of Energy, stated that "the development of Bazhenov formation, though it is more expensive and risky than the development of traditional reserves, still looks more attractive than a number of alternatives aimed at supporting oil production, such *as the Northern continental shelf to the east of the Urals* and the virgin lands of East Siberia." According to the Minister, "the region of the Bazhenov formation already has all the necessary infrastructure, so one can expect lower costs and reduced damage to the environment."[57]

The second alternative to the Arctic offshore is enhancing oil recovery ratio. This method is widely applied in the developed petroleum producing countries, and even in developing countries such as Saudi Arabia and Oman. The average oil recovery ratio in Russia is less than 25%, while in Norway and the United States it is 40-50%.[58]

52 The potential of the Bazhenov Formation has already been confirmed (2018) // Gazprom Neft. April 5, 2018 // https://www.gazprom-neft.ru/press-center/lib/1509341/, accessed 12.12.2019.

53 The Bazhenov Formation: searching for major shale oil in Upper Salym (2013) // ROGTEC. August 27, 2013 // https://rogtecmagazine.com/%D0%B1%D0%B0%D0%B6%D0%B5%D0%BD%D0%BE%D0%B2%D1%81%D0%BA%D0%B0%D1%8F-%D1%81%D0%B2%D0%B8%D1%82%D0%B0-%D0%B2-%D0%BF%D0%BE%D0%B8%D1%81%D0%BA%D0%B0%D1%85-%D0%B1%D0%BE%D0%BB%D1%8C%D1%88%D0%BE%D0%B9-%D1%81/?lang=ru, accessed 12.12.2019.

54 V. Kalinin (2012) A Formation For Oil Kings // Gazprom Neft. May 2012 // https://www.gazprom-neft.ru/press-center/sibneft-online/archive/2012-may/1103904/, accessed 12.12.2019.

55 Total may return to the joint venture with LUKOIL within three years (2015) // Vedomosti. July 8, 2015 // https://www.vedomosti.ru/business/news/2015/07/08/599772-total-mozhet-vernutsya-v-sp-s-lukoilom-v-techenie-treh-let, accessed 12.12.2019.

56 Let's go to the formation (2014) // Oil and Gas Russia, July 2014.

57 A. Vozdvizhenskaya (2017) Let's loosen the deposits // Rossiyskaya Gazeta. December 12, 2017 // https://rg.ru/2017/12/12/minenergo-v-rf-k-2035-godu-vdvoe-uvelichitsia-dobycha-trudnoj-nefti.html, accessed 12.12.2019.

In their forecast of global energy development until 2030, LUKOIL analysts write: "Increasing the oil recovery factor to 44% would ensure growth of Russian recoverable reserves by about 4 billion tons" [Main Trends of the Global Oil Market Development up to 2030 2016]. For comparison: recoverable reserves of the Prirazlomnoye field are estimated at 70 million tons of oil.

According to the Ministry of Economic Development, a mere 1 percentage point increase in the oil recovery ratio in Russia would let it produce an additional 20 million tons of oil each year [Forecast of Social and Economic Development of the Russian Federation, 2018], which is roughly what the Arctic offshore is projected to yield by 2035. In addition, just as developing hard-to-recover reserves, raising the rate of oil recovery will extend the life of the mature fields in Western Siberia, which would help resolve the problem of declining old oil towns built in Western Siberia near the aging giants, thus mitigating potential social tension.

The third alternative to Arctic offshore development is small and medium-sized non-integrated oil companies (some 250 firms operating in Russia) that work on small or depleted fields which are not of interest to big businesses. Currently, these smaller companies produce about 14 million tons / year of oil. (For comparison: in the United States, roughly 9,000 independent oil and gas companies produce 54% of oil and 85% of natural gas in the country[59].) Skolkovo Energy Center experts note that the US and Norwegian tax and licensing policies are aimed at fostering the development of independent companies. In the United States, it was these companies that developed and pioneered the technologies behind the shale revolution, while in Norway, a large number of operator companies contributed to efficient offshore oil production. Skolkovo experts say that that if Russian independent companies are granted certain benefits, their production could increase up to 42 million tons / year by 2030 [Does the Russian independent oil sector have a future, 2014]. This figure, again, is higher than the volume that the Arctic continental shelf is expected to produce.

At the moment, the first alternative to offshore development in the Arctic seems to be the most popular with the government. According to the new head of the Ministry of Natural Resources and Environment Dmitry Kobylkin, it is too early to talk about offshore oil production in the Arctic. "We have enough oil in West Siberia, but those are hard-to recover reserves. The Bazhenov Formation, for example, requires a lot of work. It already has the infrastructure, so there are many opportunities there."[60]

In fact, the government has long been taking measures to increase the investment attractiveness of hard-to-recover reserves. Back in 2013, the mineral extraction tax for the development of Bazhenov, Abalak, Khadum and Domanic formations was reduced to zero – moreover, these tax breaks are to remain in force for 10-15 years.[61] And in 2018, the Ministry of Natural Resources and Environment proposed amendments to the Law on the Subsurface with the aim of stimulating the production of hard-to-recover oil. These incen-

58 O. Matveeva (2017) Chemistry and deep extraction // Kommersant, Chemical industry. June 15, 2017 // https://www.kommersant.ru/doc/3325258, accessed 12.12.2019.

59 Who Are America's Independent Producers? // IPAA // https://www.ipaa.org/independent-producers/, accessed 12.12.2019.

60 The Ministry of Natural Resources and Environment: "It is too early to talk about offshore oil production in the Arctic" (2018) // The Oil and Gas hierarchy. 17 August 2018 // http://www.ngv.ru/news/mpr_govorit_ob_arkticheskom_shelfe_poka_rano/, accessed 12.12.2019.

61 A. Sotnikova, L. Podobedova (2014) Rosneft is interested in 'difficult' oil // RBC. October 1, 2014 // https://www.rbc.ru/newspaper/2014/10/01/56bda4999a7947299f72c87b, accessed 12.12.2019.

tives will open "a new stage in the development of the West Siberian oil and gas province," the Ministry said, citing Dmitry Kobylkin. According to his estimates, in this region, the Bazhenov Formation alone will provide growth in recoverable reserves by 1 billion tons of oil.[62]

At the same time, the government continues to set strategic goals to promote all three onshore alternatives to the Arctic shelf, obviously trying to stimulate the industry's transition from extensive to intensive development. The draft Energy Strategy of Russia until 2035 sets the following as a priority: "Modernization and development of the industry on the basis of state-of-the-art technologies, primarily of domestic origin, in order to: *increase design oil recovery ratio from 28% to 40%* (excluding the development of hard-to-recover reserves); *increase the share of hard-to-recover resources up to 17% of the total oil production* (current share is roughly 8%)" [Draft Energy Strategy of Russia, 2017]. The amendments to the General Scheme of the Russian Oil Industry Development up to 2035 state that it is "*necessary to increase the average current oil recovery ratio from 0.248 in 2015 to at least 0.28 by 2020 and at least 0.36 by 2035. It is also necessary to increase the share of independent (and smaller) companies in the production of oil with gas condensate from 3.8% in 2015 to at least 5% by 2020 and at least 8% by 2035*" [General Scheme of the Russian Oil Industry Development, 2011]. (However, pessimistically speaking, these strategic goals have been set for a long time, ever since the 1990s, yet little has been done to implement them.)

In general, these three options are simpler, cheaper, and more environmentally friendly than developing the Arctic offshore. They are politically less attractive for Russia's image as an energy power, but they are more socially oriented and economically viable.

This explains why the experts of the Analytical Center for the Government of the Russian Federation have been saying that, "given the long-term forecasts of domestic and foreign demand for oil and gas, and considering the available resources and plans for production in continental Russia, it appears that, *until 2035, there will be no need for large-scale offshore production of hydrocarbons in Russia's Arctic*" [*Amiragyan* 2016].

In the current era of Arctic realism, the launch of offshore fields in the Arctic is postponed or put on hold. This is good news, since Russian oil companies and related industries are getting a break, which the country can use to overcome a serious challenge that prevents Russia from engaging in environmentally safe operations in the Arctic.

Only human after all

Much has been written about the financial, technological, environmental and infrastructure problems of developing offshore Arctic hydrocarbons. But another challenge lies in the acute shortage of qualified workforce capable of producing and transporting Arctic oil in an environmentally safe way. This deficit is felt worldwide, in fact, but in Russia it is further exacerbated by a number of objective factors: under socialism, oil companies did not promote environmental awareness among their personnel in any significant way, never teaching their workforce the principles of sustainable development. Moreover,

62 The Ministry of Natural Resources believes it is premature to lift the moratorium on issuing Arctic offshore licenses (2018) // Pro-Arctic. August 20, 2018 // http://pro-arctic.ru/20/08/2018/news/33463, accessed 12.12.2019.

during the 1990s, Russian civilian shipbuilding and maritime industry lost much of their human potential. And this lack of trained specialists is more difficult to overcome than the lack of modern technologies, since the latter can be purchased on the market, whereas teaching an employee how to use it correctly (and in an environmentally friendly manner) can only be done through close cooperation with other, more experienced partner companies.

Moreover, recent events show that the human factor is one of the main causes of environmental disasters. Take, for example, the oil spills at the Trebs field in April 2012. Rostekhnadzor (Russia's Federal Service for Ecological, Technological and Nuclear Supervision), which investigated the accident, concluded that, among other things, the accident was caused by personnel lacking experience in work-over of deep wells in the extreme north.[63] These spills took place on shore; can we be sure that Russian oilmen are qualified enough to safely produce oil from offshore fields in the Arctic, under much harsher conditions? Another case is the Nadezhda oil tanker that crashed off the coast of Sakhalin in November 2015, resulting in a massive spill of petroleum products. It was established that the captain of the vessel, a number of administration officials at the ports of Vanino and Nevelsk, as well as the ship owner and the charterer were responsible for the accident.[64]

Gazprom Neft has also admitted the need for qualified workforce. The company's Deputy General Director for the Development of Offshore Projects Andrey Patrushev noted that "implementation of technically challenging offshore projects requires unique competencies and expertise beyond the scope of regular training programs."[65] In fact, Russian oil companies are very aware of this shortage: For example, in order to train personnel to work in the Arctic, Gazprom Neft (in addition to its own training programs) cooperates with the Gubkin Russian State University of Oil and Gas, Norway's University of Stavanger and the Murmansk State Technical University.

Moreover, the lack of skills and expertise is compounded by the fact that, by law, only Rosneft and Gazprom have had access to new offshore fields since 2008. The problem is, they do not have sufficient experience of independent development of continental shelf resources. Rosneft's only offshore oil project has been Sakhalin-1, operated by ExxonMobil. As for Gazprom, it became the main shareholder and operator of Sakhalin-2, but only by the time the project was already fully operational. In other words, the two companies do not have sufficient experience to manage large-scale and complex projects like these. At the same time, LUKOIL has accumulated real experience of offshore hydrocarbon production: the company launched oil projects in the Caspian Sea all by itself, effectively creating the Caspian petroleum province; it produces oil in the Baltic Sea, and operates offshore fields abroad in consortia with international and national oil companies. However, despite Vagit Alekperov's persistent lobbying for equal access of private and public companies to offshore resources, LUKOIL still has not been allowed to work on the northern offshore fields. The monopoly on the Arctic shelf resources maintained by Gazprom

63 K. Dokukina (2012) Bashneft spilled some oil // Vedomosti. October 17, 2012 // https://www.vedomosti.ru/business/articles/2012/10/17/fontan_im_trebsa, accessed 12.12.2019.

64 Threats know no borders (2019) // Oil and Gas Hierarchy. No 2. P. 37 // http://www.ngv.ru/magazines/article/ugrozy-ne-znayut-granits/, accessed 12.12.2019.

65 We have gained unique experience of developing offshore resources (2018) // Gazprom Neft. December 13, 2018 // https://www.gazprom-neft.ru/press-center/lib/2112700/, accessed 12.12.2019.

and Rosneft severely hinders their development.

The Ministry of Economic Development is also aware of the potential consequences of insufficiently skilled manpower, which is why in its Forecast of Development until 2024 it notes: "*At the same time, there are still risks that insufficient expertise with respect to implementing offshore and other complex projects, given the restrictions on import of equipment and technologies required, may have a negative impact on the dynamics of oil production*" [Forecast of Social and Economic Development of the Russian Federation 2018].

Arctic shipping, too, lacks qualified personnel. The government has high hopes for the development of the Northern Sea Route (NSR) going from the Bering Strait to the Barents Sea, which should reduce the distance that cargo must travel from Asia to Europe (via the Strait of Malacca) by 2.5–4 thousand nautical miles, or 10-14 days, saving hundreds of thousands of dollars. The NSR could become one of Russia's major geopolitical projects, as it will serve as a Russian bridge connecting Europe and Asia. Given its economic, commercial and political significance both globally and for Russia, Vladimir Putin in his 'May Decrees' announced that by 2024, the cargo turnover of the Northern Sea Route will reach 80 million tons / year, compared to 10 million tons in 2017, mainly thanks to NOVATEK's LNG and oil produced by Gazprom Neft and Rosneft.[66] Still, a number of experts rightly point out that it will not be easy to reach such volumes of traffic[67], among other things, because of the lack of skilled specialists.

Although Russia has always been an Arctic nation and a sea nation, even the heads of relevant agencies are forced to recognize the acute shortage of professionals in the field. In 2017, the then head of Sovcomflot and Deputy Minister of transport Viktor Olersky noted: "The key issue for us now is finding people with relevant skills and experience – they are immensely valuable. *In fact, there is only a handful of sailors and officers working in the Arctic right now.* We at Sovcomflot are searching for them, bringing them together and training them."[68] The same sentiment is expressed by the head and owner of Sovfracht Dmitry Purim: "What we also need to ensure is the high quality of our personnel: pilots, icebreaker captains, port operators, etc. – *it's not just about professional knowledge and skills, but also experience of working in the Arctic*, and basic language training."[69] If Russia, being an Arctic nation, experiences such an acute shortage of qualified workforce able to work in the Arctic, then you can imagine what the situation is in non-Arctic states that plan to explore and produce the region's hydrocarbon resources.

The development of Arctic offshore petroleum assets is also strongly hindered by the dismal situation in the Russian civilian shipbuilding industry. Since the early 1990, after the collapse of the Soviet Union, the sector has been in considerable decline. The few Soviet enterprises that had started producing equipment for offshore drilling by the end of the 1980s, went nearly bankrupt in the early 1990s. Many skilled workers left the industry in search of gainful employment, and as a result, Russia faced

66 E. Kryuchkova, A. Vedeneeva (2019) The Arctic was moved to the Far East // Kommersant. January 19, 2019 // https://www.kommersant.ru/doc/3859135, accessed 12.12.2019.

67 Widening the Northern Sea Route (2019) // Kommersant. April 10, 2019 // https://www.kommersant.ru/doc/3938883, accessed 12.12.2019.

68 Internationalization of the Northern Sea Route can only be good in terms of transit (2017) // Kommersant. November 17, 2017 // https://www.kommersant.ru/doc/3468678, accessed 12.12.2019.

69 The Arctic is a high-risk zone, and nothing is certain (2017) // Kommersant. October 20, 2017 // https://www.kommersant.ru/doc/3442065, accessed 12.12.2019.

an acute shortage of qualified professionals and advanced technologies of civilian shipbuilding. For a long time, Russian oil and gas companies had to order ships from abroad. Speaking of this problem, United Shipbuilding Corporation (USC) President Alexey Rakhmanov noted:"Generally speaking, working in the civilian market is itself a huge financial risk. For many decades, Russia's domestic shipbuilding has been stalling: at first because the Soviet leadership thought it necessary to support other COMECON nations, then for economic reasons. *As a result, now building a commercial vessel, especially a prototype, is sailing in uncharted waters.*"[70]

This is what led to the creation of the Zvezda Shipbuilding Complex in the Far East, which, according to experts, should revive Russian civil shipbuilding. The Zvezda 'super-wharf' attracts both Western and Eastern partners to use shared technologies and train personnel. For example, Zvezda and Samsung Heavy Industries recently signed an agreement to create a joint venture to manage shuttle tanker construction projects. Samsung will not only provide Zvezda with technical specifications and documents, but will also train Russian workers at Samsung's own shipyard and organize internship programs. This type of cooperation, including personnel training, is very valuable for Zvezda, since Samsung has extensive experience in designing and building Arctic shuttle tankers.

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Thus, by postponing large-scale offshore projects in the Arctic, Russia bought time to train the workforce, teach it proper environmental awareness and develop a different mindset in order to move away from the old Soviet slogan of 'conquering the Arctic' and towards the principle formulated by Alexander Makarov, Director of the Russia's Federal Service for Hydrometeorology and Environmental Monitoring: "The Arctic is a region of extremes – it cannot be conquered, and it does not forgive mistakes. We must learn to live and work there."[71]

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