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Commentary

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Behind the recent acceleration of the Arctic oil and gas development in Russia: Potential, ongoing projects and challenges

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Abstract

The Arctic is the last potential source of hydrocarbon left on Earth which makes it a quite attractive area for oil and gas company expansion and development. However, this development cannot proceed without the support from the Russian government. There are non-negligible risks which cannot be evaluated by pure economics as well as various challenges that must be overcome. This commentary will explore those risks and challenges and evaluate the recent acceleration of Arctic oil and gas development in Russia. It will also set the stage where the discussion on the sustainability of Russian Arctic resource development should be focused.

Introduction

In March 2014, the US and the European Union imposed sanctions against the Russian Federation due to its annexation of Crimea. These sanctions targeted the country's oil and gas industry which in recent years has expanded to include three concrete areas of future exploration: deepwater, Arctic offshore, and shale formations. Due to the sanctions, exports of necessary equipment were prohibited in July as well as services in September.

The sanctions by the US and the EU provided a certain unintentional hint that Russia actually has huge hydrocarbon potentials in those areas. This potential can be backed up by actual results. In 2008, the United States Geological Survey (USGS) published a report which stated that the Arctic contains 13% of the world's undiscovered oil resources and 30% of undiscovered natural gas reserves (Gautier & Moore, 2008). Since Russia has the most Arctic territory out of the five Arctic states from the point of total acreage, this is indicative of positive results for resource development. Russian oil companies already have capitalised on this potential by investing in the region after the oil price hike in the early 2000s and after the Lehman Crisis. Figure 1 shows some of those developments.

However, while the development of the Russian Arctic seems to be going well, those projects are restricted to onshore or shallow water areas where Russian companies are able to develop by using domestic technology. In 2008, Rosneft and Gazprom succeeded to monopolise the potential blocks in continental shelf exploration because of the passing of the Strategic Investment Laws which restrict foreign investment (Harada, 2017). But now, due to the western sanctions, those offshore blocks have been frozen. As the Russian government aggressively supports and draws attention to the Arctic by marketing the Northern Sea Route (NSR), the Yamal LNG, and Arctic LNG-2, projects are becoming popular. But even though their production cost is cheaper than conventional gas fields, the development cost is higher because of the remoteness and harsh environment in the Arctic.

In the oil and gas industries, it is commonly recognised that a crude oil price greater than US$70 is required for upstream development in the Arctic offshore projects. The Russian government provides oil and gas companies tax incentives in order to promote this kind of frontier development. In other words, they support projects that cannot be maintained without incentives. Furthermore, those projects require careful measures for environmental conservation. If an incident of the calibre of the 2010 Deepwater Horizon oil spill would occur, even oil major companies lack countermeasures and technologies to respond to such an event due to the harsh and extreme environment of the Arctic. This means that additional costs will be required for the development of new measures, new technology, and insurance in case of an emergency.

It is also true that Arctic development is attractive for oil and gas companies considering its high hydrocarbon resource potential and due to it being the last untouched reserves on Earth. However, these projects cannot be promoted without the support of the Russian government. In addition to the economics of the projects, there are also various issues, challenges (including US and EU sanctions), and unknown risks that have to be overcome.

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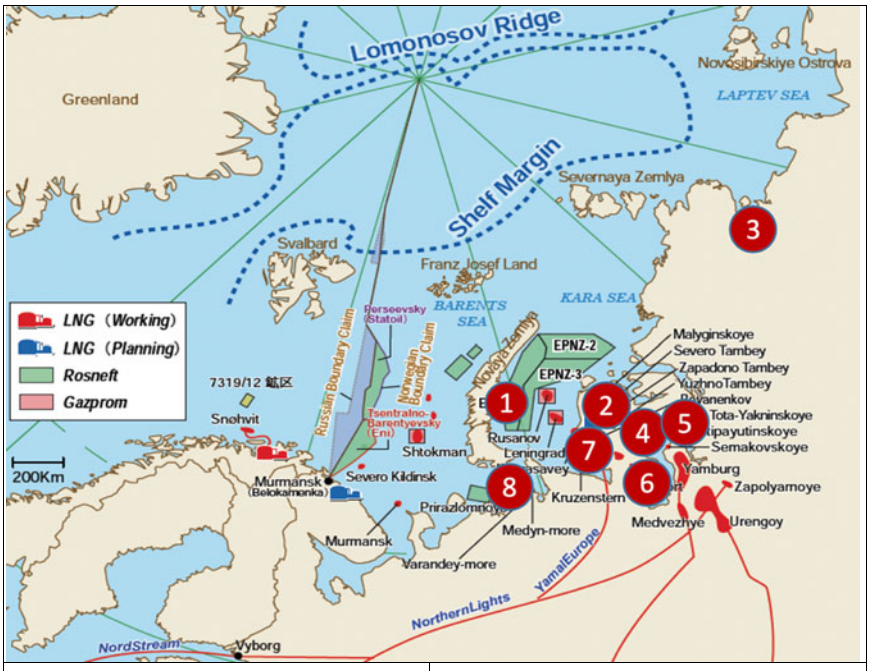

1. Rosneft (ExxonMobil) East Prinovozemelsky Block (1, 2 and 3) • Kara Sea (Water Depth: 81m) • Confirmed oil and gas in 2014.	**5. Gazprom Neft・Rosneft** Messoyakshoye Field • Gydan Peninsula (onshore) • Started production in 2016.
2. NOVATEK Yamal LNG Project • Yamal Peninsula (onshore) • Started operation in 2017.	**6. Gazprom Neft** Novo-portovskoye Field • Yamal Peninsula (onshore) • Started operation in 2014.
3. Rosneft Khatangsky Block • Laptev Sea (Water depth 32m) • Confirmed oil and gas in 2017.	**7. Gazprom** Bovanenkovskoye Field • Yamal Peninsula (onshore) • Started operation in 2012.
4. NOVATEK Arctic LNG-2 Project • Gydan Peninsula (onshore) • Currently under development	**8. Gazprom Neft** Prirazlomnoye Field • Barents Sea (Water depth: 19m) • Started production in 2013.

Fig. 1. Oil and gas projects under development in Russian Arctic. Source: Produced by the author.

Sanctions by the US and the EU targeting Arctic oil development and the endless debates for additional sanction measures by the US

The US and EU sanctions were initially limited to individuals and entities through visa restrictions and asset freezes, but they became more wide-ranging after the downing of Malaysian Airlines MH17 over eastern Ukraine in July 2014. Because of this event, the US and the EU introduced new sanctions targeting the Russian oil industry which is at the economic core of the Russian Federation. The sanctions focus on areas "having the potential to produce oil in Russia" and include exploration or production for deepwater (>500 feet), Arctic offshore, or shale projects. From July to September 2014, the sanctions began to prohibit the export of equipment and services for these areas.

While Russia expects a decline in the production and reserves of crude oil in the near future, it currently holds abundant natural gas resources. They plan to recover from the decline of crude oil production by exploiting the Bazhenov Shale Formation which lies beneath current staple oil-producing basins in West Siberia. These areas require highly advanced equipment for development which requires technology from western oil companies that Russia currently lacks.

It is important to note that the reason why the US and EU targeted only future production of crude oil (as opposed to current production) and excluded natural gas was their consideration to minimise the risks and adverse effects on EU countries which are dependent upon Russian oil and gas. Over time, the US and EU started to publicly display disagreements about the Russian sanctions. Unlike the US, the EU requires unanimous agreement from its Member States for applying additional measures or the lifting of sanctions. Some EU members are sceptical of the effectiveness of the current sanctions, while others are reluctant for additional sanctions due to the pressure from their business sectors. This discord between the US and EU was already visible in December 2014, when the US expanded its sanctions target to include foreign persons and entities under the "Ukraine Freedom Support Act (UFSA)", while the EU kept the existing measures and expanded only the scope of the targeted persons and entities. In February 2015, the Minsk II package was signed

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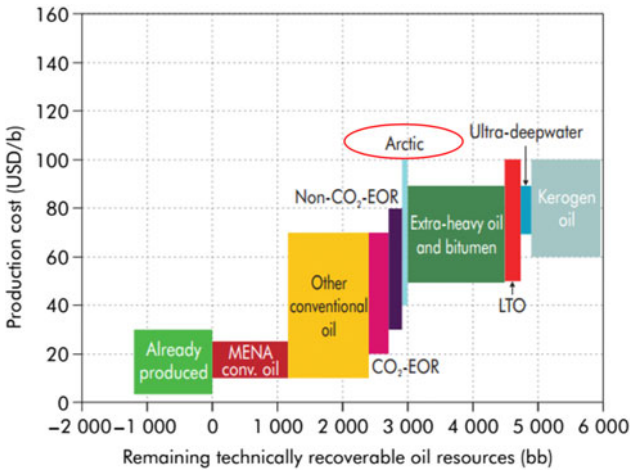

Fig. 2. Correlation between the production cost of crude oil by resources and recoverable reserves. Source: IEA with the modification by the author.

between Germany, France, Russia, and Ukraine. Without any tangible results, the US announced additional sanctions including identifying the subsidiaries of targeted Russian oil and gas companies (Rosneft in July 2015, Gazprom in September 2016, NOVATEK in December 2016, Transneft in June 2017, and Surgutneftegaz in January 2018). In August 2015, the US expanded its sanctions again by targeting a gas field named South Kirinsky which contains huge liquid potential (condensate), while EU maintained its existing sanctions (see Table 1 and 2).

In August 2017, President Trump signed an act for new sanctions (H.R.3364: Countering America's Adversaries Through Sanctions Act (CAATSA)). CAATSA was made a part of the existing UFSA and prohibited any person, including foreign persons and entities, to provision, export, or re-export, directly or indirectly, all goods, services (except financial services), and technologies in support of the exploration or production of deepwater, Arctic offshore, and shale projects in Russia. Furthermore, under this new act, foreign investment for subsidiaries of Russian national oil companies to participate in the upstream projects shall be restricted, if it would be regarded as the promotion of the privatisation of such national companies. The act also restricted foreign investment for providing technology to Russian energy export pipelines (Harada, 2017).

Crude oil price as the barometer of Arctic resource development

When speaking about Arctic resource development, the hardships in order to realise an individual project are unique since they depend on the location of the project, whether it is on land or offshore, if it is located near existing pipeline infrastructure, or if it is close to navigable waters for the transportation of heavy equipment materials. If a project on land is close to the existing pipeline infrastructure, costs would be much lower compared to an offshore project with limited windows for developments depending on the sea ice conditions.

At the March 2017 International Arctic Forum held in Arkhangelsk, Alexander Novak, the Russian Minister of Energy, said: "The cost of offshore production in the Arctic is in the range of US$70–100 per barrel. 'But it is important to understand that the cost of production is not a fixed value–it can vary greatly depending on the availability of technology, demand for it and a number of other factors. In the case of the commencement of the industrial development of the Arctic shelf, the establishment of service centres, infrastructure and technology improvements, the cost will drop'" (Ministry of Energy of the Russian Federation, 2017). Figure 2 shows the correlation introduced by the International Energy Agency (IEA) between the production cost of crude oil by resources and their recoverable reserves. It represents the extent of Arctic resource development in the range of US$40–US$100/Barel (BBL) (average US$70). This range represents the cost for offshore projects (US$100) and for onshore projects (~US$40) in the Arctic as discussed above. By considering crude oil prices as a barometer of the Arctic resource development and by looking at current oil price levels and future price prospects, we can evaluate whether the project can proceed without problems.

In Russia, major western companies such as ExxonMobil, Total, Equinor (Statoil), and Ente Nazionale Idrocarburi (ENI) have participated in upstream development projects in the Arctic Sea in response to the farm-out by Russian state-owned oil and gas companies, as described in detail in the next section. The timing shows that those foreign companies decide to base their participation in the case of high oil prices of US$70 or more.

Behind the high expectations: oil price and politics drive the development

The Russian government enacted the Strategic Investment Laws in 2008 during the period when oil prices reached their highest point ever. This restricted the development of the continental shelf including the Arctic seas to the national oil and gas companies (namely Rosneft and Gazprom). In order to work within these regulations, western companies that have the experience and knowledge of Arctic continental shelf development are forced to launch joint projects with these Russian companies. During this period, media interest about Arctic resource development increased with the following events receiving prominent attention: Gazprom Neft's crude oil production in the Barents Sea, Rosneft and ExxonMobil's successful drilling in the Kara Sea, and the granting of new licence blocks in the Arctic by the Russian government. However, in the end, Arctic developments depend on and are driven by oil prices and politics.

As an example, in 2011, Rosneft began searching for major cooperative partners for future Arctic projects in the Kara Sea. British Petroleum (BP) was approached first in January 2011, but their participation ended because of lawsuits in the UK. Instead, they reached an agreement with ExxonMobil. Italian ENI was approached in April 2012 and agreed to join a project focused on Barents Sea and Black Sea exploration. One month later, Equinor (Statoil) joined a joint venture in the Barents Sea and the Sea of Okhotsk. Having these agreements in place in 2012 (just before President Putin's 2012 inauguration) was a major coup for Rosneft's public image.

Why did Rosneft begin to aggressively develop the Arctic and the continental shelf during this period? The Strategic Investment Laws were signed by President Putin at the end of his first presidential term (2004–2008). During this time in 2008, the crude oil price was at a historic high and the price of West Texas Intermediate (WTI) crude oil futures hits its highest point ever: US$147/BBL. Because of these historic high prices, the Russian oil industry began its acquisition of potential licence blocks under these high prices since returns from Arctic development were thought to be promising. However, due to the Lehman shock in September 2008, the crude oil price plunged to US$30/BBL in

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Table 1. Implementation of the sanctions by the US, the EU, and Japan

Year	Month	Event
2014	**March**	– Travel ban and individual asset freeze
	April	– Expanded entity restrictions (including Igor Sechin)
	May	– Expanded individual sanctions (including entities in Crimea)
	July	– Expanded restrictions to banks and upstream development goods
		– Expanded sanctions to entities in Ukraine & Russia; prohibition on weapons trade; restrictions on goods, technology, upstream development, and financing
		– Expanded individual sanctions (including entities in Crimea)
	September	– Expanded restrictions to more banks, companies, and upstream development services
		– Bans on military services, financing, and technical support
		– Stricter measures for exporting military goods & new license system for Russian banks
	November	– Expanded individual & entity sanctions
	December	– Ukraine Freedom Support Act signed and covers 'special oil projects'
		– Expanded individual & entity sanctions
2015	**February**	– Expanded individual & entity sanctions
	March	– Expanded individual & entity sanctions
	July	– Expanded individual & entity sanctions & subsidiaries identification
	September	– Expanded individual & entity sanctions
2016	**September**	– Expanded individual & entity sanctions & subsidiaries identification
	December	– Expanded individual & entity sanctions & subsidiaries identification
2017	**June**	– Expanded individual & entity sanctions & subsidiaries identification
	July	– OFAC (Office of Foreign Assets Control) imposed $2 million USD penalty on ExxonMobil
	August	– Countering America's Adversaries Through Sanctions Act signed and covers 'special oil projects'
2018	**January**	– Expanded individual & entity sanctions & subsidiaries identification
	March	– Expanded individual & entity sanctions & subsidiaries identification
	April	– Expanded individual & entity sanctions & oligarch identification
	June	– Expanded individual & entity sanctions
	July	– Expanded individual & entity sanctions
	August	– 1st sanctions in response to 'Novi-chok' attack in UK
	November	– Expanded individual & entity sanctions
2019	**January**	– Removed 3 DERIPASKA related companies from the SDN list
		– Expanded individual & entity sanctions
	March	– Expanded individual & entity sanctions
	April	– OFAC imposed $75000 USD penalty on Haverly Systems
	August	– 2nd sanctions in response to 'Novi-chok' attack in UK
	September	– 2 subsidiaries of COSCO (China Ocean Shipping Companry) listed as SDN
		– Expanded individual & entity sanctions
	December	– Indictment charging Russians, Italians & Americans for violation of export
		– New sanction for Nord Stream-2 & Turk Stream through NDAA (National Defense Authorization Act) 2020
2020	**January**	– Expanded individual & entity sanctions

Source: Produced by the author

Table 2. Sanctions: comparison between the US and EU.

	United States	European Union
Financial	Prohibition of debt financing of more than 60 days maturity	Prohibition of dealing in transferable securities and money-market instruments of more than 30 days maturity
	Targeting: Rosneft, NOVATEK (and subsidiaries), Gazpromneft, & Transneft (and subsidiaries)	**Targeting:** Rosneft, Transneft, & Gazpromneft
Export Restrictions	Technology export restrictions (goods & services) for deepwater, Arctic offshore, or shale project that can produce oil in Russia	Technology export restrictions (goods & services) for Russian oil E&P in deepwater, arctic oil E&P, and shale oil projects
	Targeting: Rosneft (and subsidiaries), Gazpromneft, Gazprom (and subsidiaries), LUKOIL, & Surgutneftegaz (and subsidiaries)	**Targeting:** Unspecified (de facto all Russian entities)
UFSA	"Special Russian crude oil projects" including deepwater, Arctic offshore, or shale projects	
	Targeting: Foreign entities and financial institutes	
	Withholding supplies from North Atlantic Treaty Organization (NATO) countries, Ukraine, Georgia, and Moldova	
	Targeting: Gazprom	
CAATSA	Prohibits Americans from being involved with the provision of Russian goods and services for deepwater, Arctic offshore, and shale formations	
	Prohibits foreigners from being involved in the above in Russian territory	
	Restricts investment in Russian energy export pipelines and involvement in the privatisation of Russian state-owned enterprises	

Source: Produced by the author.

Table 3. Preferential tax measures that the Russian government applies in Yamalo-Nenets Autonomous Okrug.

	Crude oil		Condensate		LNG	
Taxes	General	Yamalo-Nenets	General	Yamalo-Nenets	General	Yamalo-Nenets
MET	Yes	A	Yes	B	Yes	B
Export Duty				C		C
Corporate Tax				D	Yes	D

Source: Produced by the author.
(A) Exempted (including Black Sea and Okhotsk Sea) since January 2012, until reaching a designated amount of production or the certain period of the Production License.
(B) Exempted specially for LNG projects since October 2010 until they reached a certain amount of production. Exempted for gas utilisation for EOR (Enhanced Oil Recovery).
(C) Exempted for LNG projects all over Russia. In the Yamal area, the export of condensate is also exempted.
(D) Decreased for gas and condensate projects until reaching a designated amount of production or the certain period of the Production License.

January 2009. This price shock forced both Rosneft and Gazprom to stop their development in the Arctic, which was considered a national embarrassment as they were given opportunities that they could not fulfil. Therefore, when Putin returned to the Presidency in 2012, Rosneft quickly developed these foreign partnerships to ensure that Arctic development moves forward and to avoid repercussions from the incoming President.

Unlike Rosneft, Gazprom's promotion of natural gas projects in the Arctic starts from reviewing past experiences. These experiences originated with the Snøhvit (Snow White) LNG Project promoted by Equinor (formerly known as Statoil) in the Barents Sea of Norway (Equinor, 2007). While the gas field was discovered in 1984, the development of the fields only began in 2001. Production started in 2007, but due to issues with the project, it only reached 70% of its total production capacity. Learning from the Snøhvit experience, Gazprom welcomed Statoil and TOTAL as partners and started development of the Shtockman Gas Field in 2008. However, due to many factors including the US shale gas revolution, the decline in European demand, and technical challenges in its development, the project is now in a state of indefinite suspension. Statoil decided to withdraw from the project in 2012 followed by TOTAL in 2015.

Arctic development through Russia's out of pocket expenses

What kind of tax incentives does the Russian Government provide to Arctic resource development? Table 3 shows the current three general staple taxes (Mineral Extraction Tax (MET), Export Duty, and Corporate Tax) applied in the case of upstream development in Russia. It also shows the comparison between general taxation and those applied in the frontier areas like the

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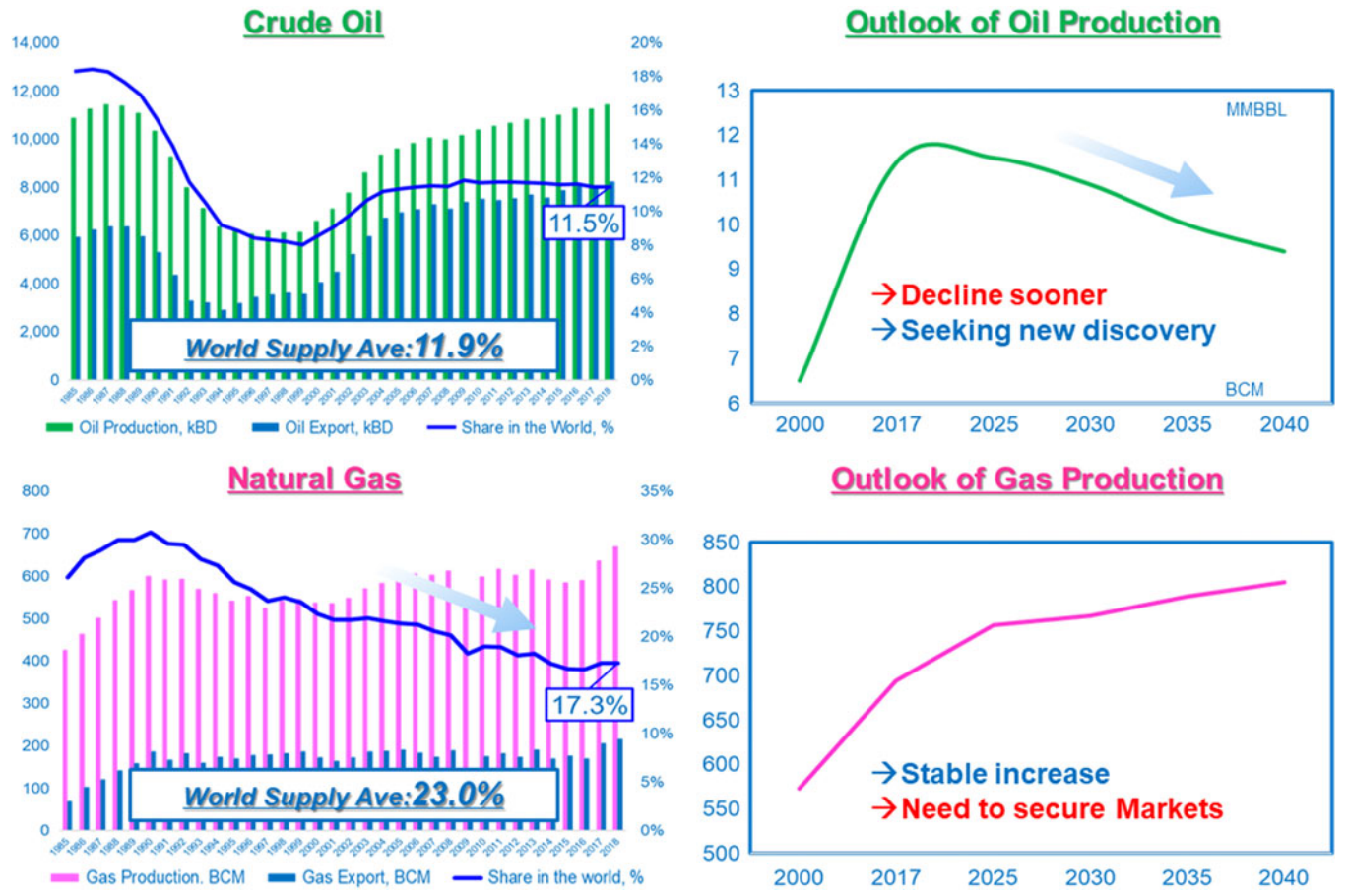

Fig. 3. Russian oil and gas production: trend (left) and outlook (right). Source: Produced by the author from BP statistical review and IEA-WEO 2018.

Yamalo-Nenets Autonomous Okrug including the Yamal Peninsula and Gydan Peninsula.

The LNG and condensate projects are only required to pay the corporate tax, which is reduced from the start of production until it reaches a specified amount (250 BCM) and a certain period of time (12 years). Even if the capital expenditure (CAPEX) for Arctic development is overly large, these tax incentive schemes provide a high probability of cost recovery over such a period. This kind of tax incentive system is generally used by oil and gas producing countries for attracting foreign capital and promoting development in difficult areas like the Arctic. Such projects do not have the economic potential, should these preferential tax regimes be suspended or deprived. This means that the government is deeply involved in the future of these projects. Russia is the only country in the G8 to incorporate crude oil prices into their fiscal budget indicators, and the rise and fall in crude oil prices affect its national revenues. As a result, securing tax revenue from the oil and gas industry is extremely important. Consequently, when oil prices fall, the government tightens its control over the oil industry. In such cases, tax reforms tend to be carried out haphazardly, and it is one of the major risks for foreign capital as well as for Russian companies. The evaluation of the Yamal LNG project and the Arctic LNG-2 project depends greatly on how we understand these tax incentives. Are they governmental guarantees or temporary measures?

Why is Russia trying to attract frontier development in the Arctic by presenting the maximum tax incentives? There are serious challenges facing Russia. First, crude oil production is expected to reach its peak in the next 5 years and then decline afterwards (see the upper right chart in Figure 3). Second, natural gas production is expected to increase steadily, but existing production in West Siberia is also in decline. Consequently, the transition for production to move to more difficult areas needs to be implemented with a gradual rising of production costs. Third, the Russian market share for natural gas in the world reached its peak in 1990.

This indicates that the current upstream development cannot cover the decrease of existing production, and potential frontier developments like the Arctic seas and shale formation are urgently needed to supplement crude oil production deficits. In the lower left chart in Figure 3, the downward curve represents the portion of Russia's natural gas supply share compared to the world. The trend shows a continuing decline from the peak of 31% in 1990 to 17% at the present. The reason behind the decline is the intensification of competition between Russia and the new suppliers to the European natural gas market like the North Sea, North Africa, and the Middle East. Furthermore, competition has been even more severe with a projected increase in demand from Central Asia and future LNG imports from US shale gas. Russia encourages further expansion of the market of LNG sales in countries where the pipeline infrastructure of Russia cannot reach like the UK, France, and Spain.

Characteristics of the NSR

The NSR (Northern Sea Route, also known as the Northeast Passage) from the Yamal and Gydan Peninsulas to the Bering

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Table 4. Comparison of performance evaluation (Suez vs NSR).

Vessels	2010	2011	2012	2013	2014	2015	2016	2017	2018
Suez	17,993	17,800	17,224	16,596	17,148	17,483	16,833	17,550	18,174
NRS	4	41	46	71	31	18	19	27	27
Delta (%)	0.022	0.230	0.267	0.428	0.181	0.103	0.113	0.154	0.149
1000t	2010	2011	2012	2013	2014	2015	2016	2017	2018
Suez	846,389	928,964	928,473	915,469	962,745	998,654	974,184	1,041,573	1,139,629
NSR	111	821	1812	1864	452	40	215	514	571
Delta (%)	0.013	0.088	0.195	0.204	0.047	0.004	0.022	0.049	0.050

Source: NSR Information Office and Suez Canal Authority.

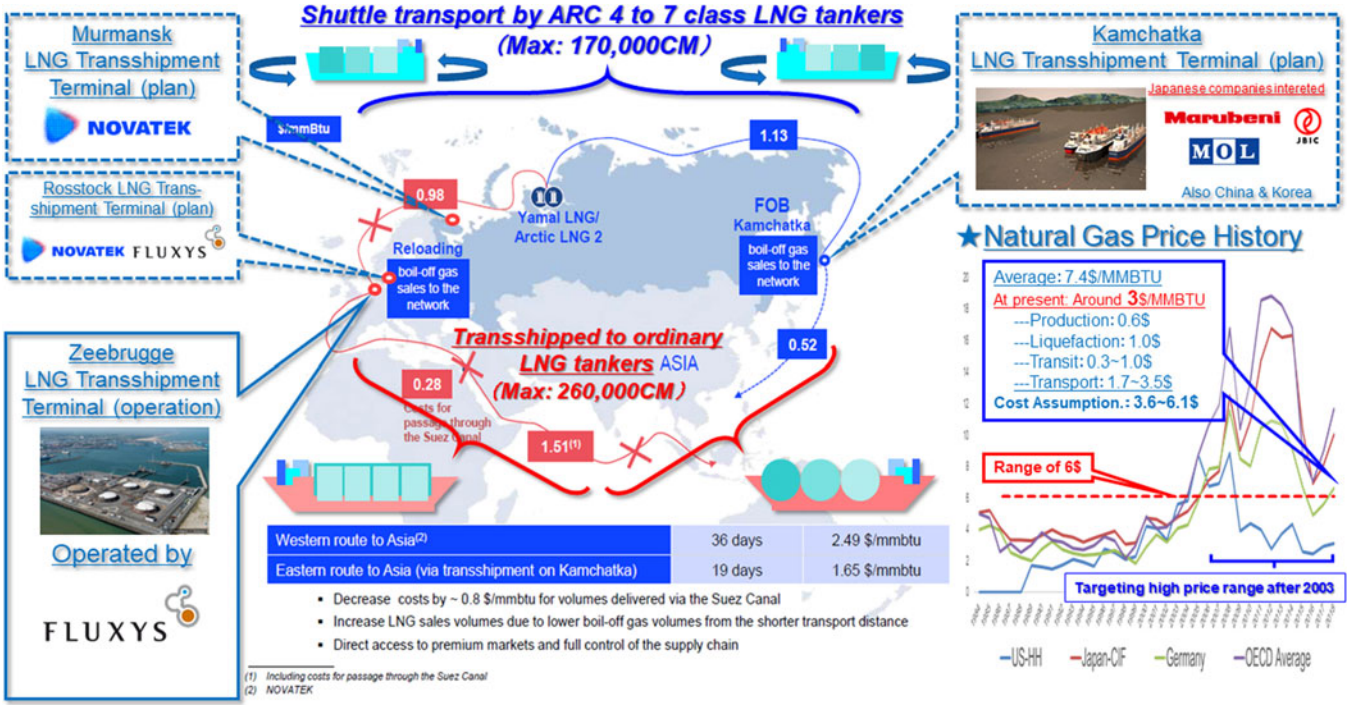

Fig. 4. New LNG Transport Scheme offered by NOVATEK. Source: Produced by the author from NOVATEK public presentation.

Strait is the prime LNG export route for the Asia Pacific market during the summer season. At present, whole year navigation is becoming more possible by the use of LNG tankers with ice-breaking capabilities (Ice class/ARC 4–7). In order to optimise the usage of these specially functioned, expensive, and heavy tankers, NOVATEK implemented a new transportation scheme using a transshipment facility in the Zeebrugge LNG terminal in Belgium. At this facility, LNG from the ice-breaker tanker is offloaded to the terminal and reloaded onto a bigger sized LNG tanker for normal sea navigation. NOVATEK is planning to construct new LNG transshipment terminals in Kamchatka and Murmansk in Russia and Rostock in Germany for further optimisation of the year-round NSR (see Figure 4).

While it is true that the use of the NSR has been increasing rapidly with the lessening of sea ice due to climate change, it is also true that there has been an additional demand for increased modular transportation due to the construction of the Yamal LNG project. Table 4 shows recent transport data for the NSR in terms of numbers of vessels and their tonnages. It compares NSR data with the Suez Canal and shows an increasing trend from 2012. This date is key as it is when Gazprom conducted the world's first navigation through the NSR to deliver LNG to Kyushu Electric Power Co., Inc. (Gazprom, 2012). However, the use of the NSR sharply declined after its peak in 2013 but increased again because of the Yamal LNG project construction. When compared with the Suez Canal operation data, the NSR is no match both in numbers of vessels using the route and the volume of tonnage hauled. This is because the Suez Canal allows goods to be relayed or shipped on demand to major ports in Asia and in the Middle East. There are no comparable ports along the NSR. As a result, its usage is limited to special, non-periodic supplies that need to be shipped faster than using the Suez Canal route as long as it is during the summer and weather conditions are good. Another difference is that goods transported using the NSR like crude oil, condensate, and LNG tends to require

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specialty tankers. These specialty ships leave their origin full but return empty. This may be one of the reasons that the use of the NSR is limited compared to the Suez Canal since the latter allows for access to more versatile ports and the ships are tailored to carry more varied goods.

The Yamal LNG Project started operation in November 2017, and its delivery of LNG started the next month. Since this occurred, market participants, analysts, and related stakeholders are carefully watching the trends and results of this first pilot project utilisation of the NSR. Areas of specific interest are the types of transportation used, how long the route was navigable, and what was the cost for using the NSR. Although the current information disclosed to the public is limited, it is important for the above queries to be answered to better determine the future feasibility of the NSR.

Could the NSR be a more attractive option to allow project stakeholders to deliver to Europe rather than Asia because of the lower management risks? The summer navigable period is becoming longer because of shrinking sea ice coverage, and the range of nuclear and diesel icebreakers is also increasing. In addition, the number of LNG tankers with ice-breaking capabilities is also increasing. At the same time, it is important to understand that the thick winter ice remains unchanged and the water depth may result in the limitation of a ship's draft. If the draft of the ship is deeper than 11 m, it is required to take a more northerly route where the navigation period is limited. From an operational standpoint, since most of the cargo from the Yamal LNG Project has been transported to Europe over the past few years, this may signal a difficulty in delivering to Asia.

How is the feasibility of this new transportation route and its cost? The costs for LNG production, transshipment, and transportation from the Yamal LNG Project can be estimated to be around US$6/MMBTU (Million British Thermal Unit). The speed of LNG tankers through the NSR can be estimated from around 5 knots (approximately 9.2 km/h) to 20 knots (approximately 37 km/h) depending on the sea ice conditions. NOVATEK's calculation is assumed to be US$1.65 for a round trip through the Northeast Passage to China. It is also clear that this cost is greatly affected by the weather. In the future, should the summer window become shorter, the polar zone becomes colder, or sea ice conditions worsen, transportation cost could be doubled.

Conclusion

This commentary has shown that there are high hydrocarbon potentials in the Arctic region and that the access to these resources and their transportation is becoming easier due to decreasing sea ice and changing sea ice conditions. With the success of Rosneft and ExxonMobil's exploration well in the Kara Sea in September 2014, it looks to be likely that there is more potential for crude oil and condensate in the area.

For Russia, whose crude oil production will soon decline, Arctic resource development is extremely important to complement its future production and its national revenue. This is the main reason why Russia has implemented one of the largest preferential tax schemes in its history to attract Russian companies and foreign investments into the region. For western oil companies, there is a benefit in investing in the region as it is an opportunity that would be hard to achieve in other areas in the present. This is precisely the reason why the US and EU sanctions were imposed on Russia's "future oil production potential (development of deepwater, Arctic, and shale formation)". In response, Russia, which does not have the technology for offshore development, is promoting upstream development fields starting from onshore projects (the Yamal LNG Project and the Arctic LNG-2 Project) and then moving to shallow waters. Several positive results have already been achieved from these developments like the Prirazlomnoe oil field and the Novo-Portovskoye oil field. Because of the US and EU sanctions, it could be said that Russia, with its long history of being a player in the oil industry as well as its high level of technology and science, is now given the opportunity to train itself to create and develop its own technology independently without having to rely on the west.

Due to constraints caused by the region's harsh environmental conditions, lack of infrastructure, and other cost-increasing factors (using the NSR, supporting icebreakers, the high oil price level (>US$70/BBL)), it is necessary for the realisation of the project that the Russian government supports these initiatives through various tax incentives and subsidies for building infrastructure such as ports and the regional airport. Severe risk management for environmental protection, accident prevention, and compliance measures are also required for companies to participate in the projects.

The NSR increases the prospects and potential for increased regional development by expanding the summer shipping window. However, there are still uncertainties. Full-year navigation cannot be guaranteed yet, and the number of days at sea could be longer due to sea ice conditions. As a result, the NSR is inferior and less attractive than the Suez route for regular cargo (goods) transportation among consumption areas. Its use will be limited to energy resource exporting from Russia to Europe, to the Asia-Pacific region, and the special cargo transportation that requires quick delivery between Europe and the Pacific.

This is the situation where the discussion about the sustainability of Russian Arctic resource development should be engaged.

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