Oil and Gas Exploration in the Arctic: Challenges and Perspective

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Introduction

To start with, the Arctic is deemed to be one of the most attractive regions in terms of natural resources exploration process. The reason for this is that over the past 30 years, dozens of fields, both oil and gas, have been explored on the Arctic shelf[1]. It would be substantial to highlight among them such oil fields, as the Shtokmanovskoye field, Leningradskoye field, as well as the Prirazlomnoye field and Dolginskoye field. Additional prospects have arisen out of the delimitation of the so-called "gray zone", which took place in 2010. Russia and Norway have divided this controversial territorial section[2], which, according to experts, is very prospective in terms of the availability of hydrocarbon resources[3].

Talking about the distribution of the initial total resources over the water area of Russia, it is important to note that two thirds of all the resources are concentrated in the Barents, Pechora and Kara Seas. Apart from this, according to some estimates, the Arctic contains 25% of all energy resources that exist on our planet[4].

The main problem here is that all estimates of Arctic hydrocarbon resources are quite approximate since the ocean bottom of the Arctic is still very poorly studied and, moreover, the Russian continental shelf is poorly explored as well - ten times lower than the American shelf of the Chukchi Sea and twenty times lower than the Norway shelf.

Challenges and Risks

As it has already been stated, the Arctic region seems to be a little gold mine for the potential investors in the petroleum industry. That is why so many states are willing to develop it. However, the conditions of this region and challenges

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[1] A. Fadeyev, *Transport, Logistics and Production Outlook for Arctic Offshore Exploration: An International Perspective, (Northern (Arctic) Federal University (NArFU)), 2014.*

[2] Alexander N. Vylegzhanin, Oran R. Young & Paul Arthur Berkman, *Governing the Barents Sea Region: Current Status, Emerging Issues, and Future Options, (2017), URL: //* https://www.tandfonline.com/doi/full/10.1080/00908320.2017.1365545.

[3] Ibid.

[4]SDWG Report, *Arctic Energy*, 2009, URL:// https://www.sdwg.org/wp-content/uploads/2016/04/ArcticEnergyReport-2009.pdf

and risks which investors might face with need to be considered.

Taking into account the low level of the region's research together with its specific climate, it should be mentioned that despite the perspectives the Arctic region opens, a plenty of challenges appear in the exploration of it as well[5]. They can be classified in some particular groups:

Environmental challenges (including severe ice conditions; high probability of icebergs, which determines structural complexity of offshore mining; vulnerability of the region's ecosystem, short-term period during which working activity on the shelf is possible <so-called "weather window">, insufficient exploration of the shelf);

Technical challenges (i.e. weak transport system; no service infrastructure, which is necessary for the effective development of Arctic region; shortage of technology and production capacity);

Corporate challenges (involving potentially high costs for the construction of the mining complex, the organization of its infrastructure and protection against industrial accidents; the complexity of the logistics of employees; lack of developed competition between suppliers and contractors who serve the oil and gas sector).

The challenges mentioned above lead to a number of risks, which make the development of Arctic region far more complicated. Among these risks are: geological, economic, environmental and transport and technological risks, which can lead to a significant increase in the cost of the project and to the difficulty of making investment decisions.

Geological risks include low shelf exploration, high costs on drilling, financial losses. Economical risks are: high project cost, long duration of it, significant increase in payback periods and reduced return on invested capital. Among ecological risks are: weak ecosystem of Arctic region, complicated liquidation of emergencies and accidents and ecological disasters. Finally, there are transport and technological risks, such as possibility of the equipment crash, lack of transporting experience in the area and increasing of costs of transportation[6].

[5] Directorate-General for External Policies of the Union Policy Department, *Arctic Governance: balancing challenges and development*, Regional Briefing 2014, URL: // http://www.europarl.europa.eu/RegData/etudes/briefing_note/join/2012/491430/EXPO-AFET_SP(2012)491430_EN.pdf.

[6] E. Thylander, *Offshore Oil and Gas Activities in Arctic areas -An Investigation of Best Available Techniques for Reducing Environmental Impacts,* (Chalmers University Of Technology 2013) 17.

Clusters

In order to solve all the problems arise out of the Arctic exploration and minimize risks involved, a comprehensive offshore project support system is needed. Talking about the Russian Federation, it has been proposed to implement the creation of offshore oil and gas so-called "clusters".

Pursuant to the Russian legislation, cluster is referred to a set of special economic zones of one type or several types, which is determined by the Government of the Russian Federation and which is ruled by one management company[7]. In other words, the cluster is a group of geographically neighboring companies and related organizations that operate in a specific area and help each other staying independent legal entities.

Up to date, within the Russian territory, Murmansk and Arkhangelsk claim to be the capitals of the new oil and gas clusters due to the fact that they are located far close to the hydrocarbon deposits, have a developed infrastructure in comparison with many other regions and have a number of geographical advantages that have allowed them to be in the focus of attention of oil and gas project operators.

There is a range of companies that to some extent compete with each other, but at the same time interact, helping each other, and thereby increase their own competence. This is the way the oil and gas clusters work as well. The concept of cluster policy includes signing of an agreement (memorandum) with companies and organizations of industry clusters; creation of industrial, technological, transport and logistics, tourist and recreational parks involving small and medium-sized companies; creation of resource centers with the participation of educational institutions; drafting of investment plans for the development of municipalities.

Briefly speaking, the model of the oil and gas cluster can be presented as follows: there is some governmental support at least at the regional level, a group of companies that represent research and educational organizations, suppliers themselves, petrochemical processing enterprises, services in the form of an icebreaking and tanker fleet, port infrastructure, exploration and oil companies[8].

Apart from this, definitely, not every single company and/or territory is suitable for successful cluster formation. There are definitely conditions that are

[7] Russian Federation, Federal Law on Special Economic Zones in the Russian Federation, adopted by State Duma, 22 July 2005, art 2.

[8] A. Fadeev *Transport, logistics and industrial prospects for the development of the Arctic shelf: an international aspect*, 2014, URL: // http:// russiancouncil. ru/inner/?id_4=3373#top.

necessary for the cluster to be created, such as:

- regional initiative;
- availability of technology;
- national policy, which requires the demand for this type of product;
- sale of deposits;
- availability of projects for the development of raw materials.

Moving further, in order to launch a cluster, it is necessary to form demand centers. Most companies today face certain difficulties in the international and even Russian oil and gas market. It is explained in the way that they often cannot directly participate as suppliers due to the lack of distribution channels. To solve this problem, the creation of related ventures is necessary.

It sounds not so obvious, but the amount of people involved in the creation of a cluster and its further operation does not have a great sense. For instance, Murmanshelf includes a wide range of companies, most of which are small and medium-sized businesses. 44% of companies have less than 20 employees. And another 20% are firms with 26 to 100 employees[9].

Talking about practice example, the most successful ones are "Sozvezdie" and "Murmanshelf." In 2005, the Norwegian authorities turned to the governments of the Murmansk and Arkhangelsk regions with a proposal to develop the gas field together with local suppliers. The total amount of gas produced was greater than expected. In addition, there was an active economic development of the region, located near the extraction site[10].

State assistance

In terms of preparing local infrastructure, cooperation with regional authorities is of great importance.

Gazprom Neft is actively engaged in dialogue with both the governments of the Murmansk and Arkhangelsk regions. They are talking about opening of checkpoints for flights of staff to drilling platforms, about possible joint participation in the reconstruction of infrastructure, as well as creating a favorable investment climate at the local level[11].

Speaking about the logistics process, it is necessary to reconstruct roads, improve the quality of communications. Changes

[9] Strategy for socio-economic development of the Murmansk region until 2020 and for the period until 2025, URL: http://minec.gov-murman.ru/content/strat_plan/sub02/index.html.

[10] A. Fadeev *Transport, logistics and industrial prospects for the development of the Arctic shelf: an international aspect*, 2014, URL: // http:// russiancouncil. ru/inner/?id_4=3373#top.

[11]"Gazprom and Murmansk region sign Cooperation Agreement" URL: // https://www.gazprom.ru/press/news/2005/november/article55504/.

in customs legislation, the opening of checkpoints, the organization of access for foreign citizens to facilities related to the implementation of logistics operations are also of fundamental importance.

This is especially true for Arkhangelsk, because many enterprises that are perspective from the point of view of creating transport and logistics infrastructure facilities are still under the jurisdiction of the military-industrial complex and even Russian citizens have limited access.

While using the cluster approach, the creation of Special Economic Zones (SEZ) is also relevant and essential for the formation of attractive investment climate.

SEZ is a part of the territory of the Russian Federation, which determined by the Government of the Russian Federation and which has a special business regime, and customs zone[12]. The creation of SEZ is aimed to attraction of financial resources to border regions, by establishing in a limited territory a special legal status and preferential economic conditions for national or foreign investors[13].

According to the Federal Law on Special Economic Zones in the Russian Federation, there are the four types of SEZs: 1) industrial production zone, 2) technical and innovative zone, 3) tourist and recreational zone and 4) port zone[14].

Port Special Economic Zone of the city of Murmansk is an example of how do special economic zones operate in Arctic region.

The specific of this SEZ is that investors of the port SEZ "Murmansk" receive tax and customs benefits, as well as access to infrastructure facilities. Investors are guaranteed stability of tax rate throughout the existence of the SEZ[15].

Nevertheless, by researching the influence of state assistance in the development of the Arctic region, there must be noticed a problem in the balance of participation of state oil and private companies.

There prevails the point of view that the main participants in projects on the shelf will be state-owned corporations.

[12] Russian Federation, Federal Law on Special Economic Zones in the Russian Federation, adopted by State Duma, 22 July 2005, art 2.

[13] E. Bashmakova, A. Nikolaeva, *Influence Of Special Economic Zones On The Clustering Process* (North And Market: Forming The Economic Order 2009) 171.

[14] Russian Federation, Federal Law on Special Economic Zones in the Russian Federation, adopted by State Duma, 22 July 2005, art 4.

[15] On the development of the port special economic zone as an element created at the territory of the Murmansk region production and transport and logistics a cluster. Report of the Minister of Economic Development of the Murmansk Region Agarkov S.A.:, URL: // http://murmanshelf.ru/files/arctic_logistics_2012/6_Min_of_Econom_Dev_ S_Agarkov.pdf

Private companies should have limited access, while the involvement of foreign companies will be minimized[16].

However, it must be taken into consideration that the development of the Arctic region requires the allocation of a huge amount of resources, such as money, assets, authority. In comparison to the private companies, state oil companies are able in larger part to cover these costs[17].

In addition, control of the Russian Federation over the development of the Russian part of the Arctic is ensured, guaranteeing political and economic security.

Huge investments are required for social and economic development of the Arctic zone of the Russian Federation as well as political power, as any project in the Arctic is always connected with many environmental, transport and logistics, infrastructure, financial and social risks. Due to the fact that the Arctic region is a prospective area from the point of economics, politics and sociology, there is a high level of competition between the Arctic States for the area. That is why it is important to ensure economic and political security in the Arctic region, which is impossible without State authority[18].

At the same time, Russian government is ready to minimize the standards for penetration of private investors to the Arctic region. Thus, a draft of Federal Law on companies' access to the unallocated Arctic shelf will be presented for public. This was announced by the Deputy Minister for Development of the Far East and the Arctic[19].

Conclusion

In conclusion, it is necessary to infer that Arctic region is a "double-edged weapon" for the oil and gas industry, as far it attracts by its promising nature, but at the same time, is an area full of a various risks (e.g. environmental, technological, political etc.).

An effective developing of the area, which would be safe and beneficial for the society, environment and enterprises, is impossible without formation of complex and well-organized system, where the authority of government and the assets and abilities of investors will be coordinated.

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[16] P. Kaznacheev, R. Bazaleva, *Comparison of the role of private and public oil companies in development offshore fields*: http://cre.ranepa.ru/wp-content/uploads/2015/04/policy-paper-arctic-2.pdf

[17] I. Vizhina, A. Kin, A.A., V. Kharitonova, *Problems of the state-private partnership in strategic projects of the North, (Ekon. Sotsiol.*, 2011, no. 4) 154.

[18] Ibid 155.

[19] "A draft law on expanding access to the shelf of the Arctic will be presented within a month": , URL: // https://tass.ru/ekonomika/7052935.

Nowadays this system has been creating with the creation of clusters and Special Economic Zones.

The foundation of a modern effective management model in the Arctic implies the balanced participation of all interested parties - companies in the development of Arctic deposits, including federal, regional and local authorities, business organizations, educational institutions, the creation of oil and gas clusters in the Arkhangelsk and Murmansk regions, while ensuring the economic and political security of Russia.