

Prospects of socio-economic development of the Arctic zone of the Russian Federation

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Abstract. Strategic documents related to the socio-economic development of the Arctic zone of the Russian Federation are considered. The role of system-forming projects that have a significant impact on the development of engineering and transport infrastructure in the Arctic is determined. The place of St. Petersburg as a historically developed center for the study and development of the Arctic zone in various directions is shown. The article analyzes a systematic approach to the development of mineral resources in the Arctic on the basis of a broad interdepartmental and interregional interaction of various economic entities in the real sector of the economy and government authorities.

1 Introduction

In modern conditions, the Arctic territories provide the country's economy with 11 % of income, up to 22 % of all-Russian exports. It is here that about 60% of gas, 80% of oil, 60% of copper and 90% of nickel are extracted. Arctic resources make up the main part of the country's mineral resource base.^a

The development of the Arctic began in the XI-XII centuries by Russian sailors who discovered the island of Vaigach and the Novaya Zemlya archipelago. In the XVI-XVII centuries, the pioneers mastered the coastline of the Arctic with access to the Pacific Ocean. The expediency of using the Northern Sea Route became relevant in the XII century with the "introduction" of Russia to Siberia and the Far East.

The issue of ownership of the Arctic territories and their development is one of the priorities of many states, including the Russian Federation.

Russia's right to the Arctic territories was first designated by the Ministry of Foreign Affairs of the Russian Empire in 1916, when on September 20, a diplomatic note was sent to foreign states on the inclusion of territories along the northern coast of Siberia discovered by B. A. Vilkitsky during an expedition to the Arctic Ocean in 1913-1915^b. Further consolidation of the Arctic territories took place in 1926, when the decree of the Presidium of the CEC of the USSR of 15.04.1926 "On the declaration of the territory of the USSR of lands and islands located in the Arctic Ocean" referred to the territories of the USSR opened and "could be opened" lands and islands located in the Arctic

Ocean, north of the coast of the USSR. Decree of the Presidium of the Supreme Soviet of the USSR No. 8908-IX of 21.02.1979 clarified the borders of the Arctic territories of the USSR.

Currently, the territories belonging to the Arctic zone of the Russian Federation are fixed by the Decree of the President of the Russian Federation No. 296 of 02.05.2014 [1]. Initially, this Decree included the territories of the Murmansk Region, the Nenets, Chukotka, Yamal-Nenets Autonomous Districts, individual municipalities of the Republic of Sakha (Yakutia), the Krasnoyarsk Territory, and the Arkhangelsk Region as the Arctic Zone. In 2017, 3 additional municipal districts of the Republic of Karelia were assigned to the Arctic Zone, in May - July 2019 – 8 municipal districts of the Republic of Sakha (Yakutia) and 3 municipalities of the Republic of Komi.

2 Research methods

The theoretical basis of the research is the work of domestic and foreign experts on the socio-economic development of the territories of the Arctic zone of the Russian Federation; the development of the mineral resource base, ecology and economic geography, spatial development, strategic planning [2, 3, 4, 5, 6, 7, 8, 9, 21].

In the course of the work, the following research methods were used: statistical, comparative-analytical, balance sheet, expert assessments, economic-geographical. The analysis of the problems of socio-economic development of the territories, the assessment of the potential of the regions and the allocation of the special role of St. Petersburg in the development of the Arctic are based on the materials prepared by the author during the period of participation in the work on the Strategy of Socio-economic Development of the North-

^a <https://tass.ru/info/2505058>
<https://rg.ru/2016/09/01/patrushev-konfrontaciia-mezhdu-arkticheskimi-stranami-nedopustima.html>
^b <https://tass.ru/info/6312329>

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Western Federal District until 2020 and the Strategy of Socio-economic Development of St. Petersburg until 2035 [10].

The information base, in addition to the special literature, was the official data of Rosstat, the materials of various federal and regional programs on the development of the Arctic.

3 The main directions of development of the socio-economic complex of the territories of the Arctic zone of the Russian Federation

Over the past 6 years, active work has been carried out on the regulatory regulation of the development of the Arctic zone of the Russian Federation. In 2008, the "Fundamentals of the State Policy of the Russian Federation in the Arctic for the period up to 2020 and Beyond" was approved, which defines the main goals, main tasks, strategic priorities and mechanisms for implementing the state policy of Russia [11]. In 2013, the "Strategy for the development of the Arctic Zone of the Russian Federation and ensuring national Security for the period up to 2020" was approved, which defines the main mechanisms, methods and means for achieving strategic goals and priorities for the sustainable development of the Arctic zone of the Russian Federation and ensuring national security [12]. In 2014, the state program of the Russian Federation "Socio-economic Development of the Arctic Zone of the Russian Federation" (hereinafter referred to as the state program) was approved, which defines specific measures for the development of the Arctic zone, indicating the timing, amount of funding and responsible performers [13]. In 2015, the State Commission for the Development of the Arctic was established, which is the main coordinating body that ensures interaction between federal and regional authorities, local self-government bodies and various organizations on the development of the Arctic [14]. In 2019, the Ministry for the Development of the Far East was reformed into the Ministry for the Development of the Far East and the Arctic. Decree of the President of the Russian Federation No. 164 of 05.03.2020 "On the Fundamentals of the State Policy of the Russian Federation in the Arctic for the period up to 2035" fixed the priorities of state policy in the Arctic territories [15].

The main document that sets out the mechanisms and measures for the development of the Arctic is the above-mentioned "State Program for the socio-economic Development of the Arctic Zone of the Russian Federation", the activities of which are divided into 3 main areas: the formation of reference zones and territories, the development of the Northern Sea Route, the production of equipment and the development of technologies for oil and gas and industrial engineering.

The total amount of federal funding for this program from 2015 to 2019 amounted to more than 190 billion rubles, and more than 179 billion rubles were provided for 2020-2025. 131 billion rubles are allocated for the creation of 9 reference zones, 35 billion rubles for the

development of the Northern Sea Route, and more than 23 billion rubles for the creation of equipment and technologies for the development of mineral resources in the Arctic zone. The main performers are the Ministry of Economic Development, the Ministry for the Development of the Far East and the Arctic, the Ministry of Industry and Trade, as well as other state authorities and organizations [14, 15, 22].

The special role of the center for Arctic competencies and the center for Arctic research has historically always been assigned to St. Petersburg. It was from St. Petersburg that the Great Northern Expedition started in 1733, the Russian Geographical Society was founded here in 1845, which later made a significant contribution to the study of the Arctic, in 1920 the Sevexpedition (now the "Arctic and Antarctic Research Institute") was established, and in 1932 the Main Directorate of the Northern Sea Route. The city has an exceptionally favorable geopolitical position, a developed logistics complex, including the presence of sea and river passenger and cargo ports. St. Petersburg has a huge human and intellectual potential, and significant industrial and technological resources, including those aimed at the development of the Arctic region.

The "Strategy of socio-economic development of St. Petersburg for the period up to 2035" defines the role of St. Petersburg as an All-Russian center for the organization of polar research, development of the Northern Sea Route and offshore fields, training of domestic specialists in geography and geology, climatology and glaciology, etc. [10].

Taking into account the need to coordinate work and research, in 2018 a new executive body of state power was formed in St. Petersburg- the Committee of St. Petersburg for Arctic Affairs. Its main tasks include: creating the necessary organizational conditions for establishing and developing ties in the socio-economic sphere, as well as in the field of education and culture with the regions of the Arctic zone; assisting the regions of the Arctic zone in complex socio-economic development, ensuring environmental safety [16]. The Ministry for the Development of the Far East and the Arctic has developed a draft "Strategy for the development of the Arctic Zone of the Russian Federation and ensuring national Security for the period up to 2035", which defines the main directions for the development of St. Petersburg as a historically established center for the study and development of the Arctic zone of the Russian Federation in the following areas:

- * formation and development of the Arctic research and production cluster, promotion of increasing the competitiveness of its products, including through state support for economic projects implemented within the cluster;

- * integration of scientific and educational organizations of the city

- * research and educational centers established in the Arctic zone;

- * implementation by the city's educational organizations of educational programs in professions, specialties and areas of training of secondary vocational

and higher education that are in demand in the labor market of the Arctic zone, as well as the implementation of additional professional programs;

- * development of the system of vocational guidance for students of the city in order to attract them to work in the Arctic zone;

- * organization and holding of major Russian and international congress and exhibition events on the Arctic theme in the city;

- * creation of a world-class Arctic museum and exhibition center;

- * Assistance to the development of the Arctic and Antarctic Research Institute and the Institute of the Peoples of the North of the Russian State Pedagogical University named after A. I. Herzen;

- * development of specialized tourist infrastructure that provides the beginning and end of tourist routes to the regions of the Arctic zone.

A special role for the development of the Arctic is assigned to the shipbuilding, mechanical engineering and instrument-making enterprises located on the territory of St. Petersburg. 13 clusters have been formed on the territory of the city, including the Cluster of Information Technologies and Radio-electronics, the Composite Cluster, the Cluster of Transport Engineering, the Cluster of Machine Tool Industry, the Cluster of Clean Technologies for the Urban Environment, the Cluster of Innovation in Energy and Industry, the Cluster of Manufacturers of Electronic and Computer Equipment, the united Cluster "Innograd of Science and Technology", whose products and developments are already in demand or can be used for the needs of Arctic development [17, 18].

In 2017-2018, 2 specialized Arctic clusters were created in St. Petersburg: "Liquefied Natural gas. Equipment and technologies" and "Cluster of high-tech solutions for the development of the resources of the World Ocean and the Arctic" [17, 18].

According to the results of monitoring of the cluster environment conducted by the Center for Cluster Development of St. Petersburg in 2018, it was found that another proto-cluster was formed: "The Arctic vector of cluster development of St. Petersburg".

In total, there are more than 200 organizations in St. Petersburg whose products, developments or services can be in demand in the Arctic zone. Enterprises and organizations of the city actively participate in the activities of the state program for the development of the Arctic. So, in 2019, the Admiralty Shipyards association laid the ice-resistant self-propelled platform "North Pole", designed for scientific research in the Arctic. The construction of this platform is provided for by the subprogram for the formation of reference zones^c.

The Baltic Plant in 2016 built the nuclear icebreaker "Arctic" according to the "Project 22220", in 2019 the icebreaker "Ural" was launched, the icebreaker "Siberia" is being completed. By 2026, Atomflot plans to receive 2 more icebreakers for this project. The expansion of the

icebreaker fleet is provided for by the subprogram for the development of the Northern Sea Route^d [13].

State research centers and universities of the city take part in the implementation of measures to "Ensure management in permafrost conditions" in terms of developing mechanisms for geotechnical monitoring of large cities of the Russian Arctic, developing regulatory and technical documents in the field of design and construction of facilities in the Russian Arctic.

The participation of high-tech enterprises of the city is possible in the events on "Modernization of the automated ice-information system "North" in terms of modernization and development of appropriate hardware and software. The subprogram for the development of the Northern Sea Route provides for measures to "Develop and create a unified secure information and telecommunications system for the transport complex of the Arctic zone" and "Create radio-electronic equipment, an interregional Arctic system for collecting, processing and communicating information throughout the Arctic". The enterprises of St. Petersburg, including those that are part of the "Concern "Granit-Electron" and "Concern of East Kazakhstan Region "Almaz - Antey", have the necessary competencies and resources to implement these projects [13].

The participation of the city's enterprises and organizations in the activities of the state program is aimed at implementing the state policy in the Arctic and will have a positive effect on both the Arctic regions and the Russian Federation as a whole, will provide them with additional orders, will create additional jobs in St. Petersburg, will become the basis for further scientific and technological development of enterprises producing products for the Arctic.

The creation of the Arctic industrial cluster will not only provide a tool for coordination and interaction between enterprises and universities, but also enable companies that initiate cluster projects to apply for subsidies from the federal budget to reimburse part of the costs (up to 50 %) when implementing joint projects for the production of industrial products [17, 18].

In the Arctic, the same mechanisms for supporting investment projects will be implemented as in the Far East, using positive experience in managing territories of advanced socio-economic development. One of the criteria for the selection of residents will be the minimum amount of capital investments of at least 500 thousand rubles during the first three years. The low investment threshold for granting preferences is associated with the possibility of providing state support not only to large, but also to medium and small projects. The system of benefits for investment projects in the Arctic has been in effect since 2020.

The current Federal Laws (193, 194, 195 of 13.07.2020) provide that the entire Russian Arctic becomes a special economic zone with a wide range of tax benefits and non-tax preferences for businesses. Their main goal is to encourage the creation of new enterprises and high-paying jobs in the Arctic [19].

^c <http://government.ru/docs/32090/>

^d <https://www.aosk.ru/products/universalnyy-atomnyy-ledokol-proekta-22220-arktika/>

Thanks to the adoption of a package of laws on the system of preferences, the Russian Arctic becomes the largest economic zone in Russia and the world with an area of almost 5 million square kilometers with a single set of preferences.

These laws have expanded the territory of the Arctic zone of Russia. In addition to the 31 territories, it includes the Kostomuksha city district, Segezha and Kalevsky national municipal districts of the Republic of Karelia; the Inta and Usinsk city districts, as well as the Ust-Tsilemsky municipal district of the Komi Republic; the villages of Surinda, Tura, Nidym, Uchami, Tutonchany, Essey, Chirinda, Ekonda, Kislokan, and Yukta of the Evenki Municipal District of the Krasnoyarsk Territory; and the Leshukonsky and Pinezhsky municipal districts of the Arkhangelsk Region. Thus, the territory of the Arctic zone of Russia now includes 4 subjects of the Russian Federation and 45 municipalities [1, 15];

On the basis of the Northern Fleet, a new, fifth military district will be created, which will improve cooperation in the Arctic strategic direction. The district will include the Republic of Komi, the Arkhangelsk and Murmansk Regions, and the Nenets Autonomous Okrug.

For the integrated socio-economic development of the Arctic, it is necessary to provide the territories with energy and engineering and transport infrastructure based on the latest scientific developments, which include large generating complexes, local sources of heat and electricity supply based on distributed systems, and green energy.

The prospects for the development of the Arctic zone of the Russian Federation are associated with the development of new oil and gas fields on the mainland and on the shelf of the Arctic Ocean. It contains 30 % of the world's gas reserves and 13% of oil. Russia is one of the leaders in the supply of liquefied natural gas (LNG) from the Arctic zone.

The Arctic has an undervalued potential not only for oil and gas reserves (see Fig. 1), but also for solid minerals (see Table. 1), whose reserves are calculated for 150-200 years at the beginning of development in the next 5 years.

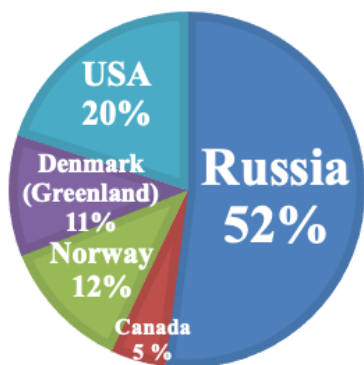


Fig. 1. Arctic oil and gas reserves, % (Source: <https://www.pnp.ru/economics/arktika-territoriya-liderstva.html>).

Table 1. Share of the Arctic in world reserves and production by major types.

Minerals	Share of global reserves, %	Share of global production, %
Nickel	10,15	14,25
Cobalt	3,3	11
Copper	0,48	0,6
Zinc	3,8	4,64
Lead	2,69	2,37
Tungsten	0,44	4,03
Titanium	10,52	4,84
Zircon	1,05	1,76
Gold	3,25	2,87
Silver	3,72	4,19
Platinum	18,93	15,33
Palladium	19	41,24

Source: Institute of Ore Deposit Geology, Petrography, Mineralogy, and Geochemistry of the Russian Academy of Sciences

For the development of the Arctic zone, it is necessary first of all to provide transport logistics. For the regions of the Arctic zone of the Russian Federation, port capacities are being expanded and new ones are being built, including the ports of Sabetta, the Arctic Gate, Varandey, and Dudinka. Projects for the development of the Murmansk transport hub, the deep-water port in Arkhangelsk, and the ports in Pevek and Indiga require additional funding on the terms of public-private partnership. So, in 2019, 50% of the Sevodny – Lavna railway line of the Murmansk transport hub has already been built, with the total cost of the state contract of 41.5 billion rubles.

As part of the development of the Yamal LNG and Arctic LNG projects (Table. 2) it is planned to build a transshipment complex in the village of Ura-Guba at a cost of more than 70 billion rubles, with commissioning in 2023.

Table 2. Russian Federation on the liquefied gas market, million tons.

	2013	2015	2020, forecast	2025, forecast
LNG production in Russia, total	10,8	11	55,1	87
Sakhalin LNG factory	0	11	16,5	33
Rosneft (Ilyinsky Port)	0	0	10	10
Pechora LNG factory	0	0	2,6	8
Baltic LNG factory	0	0	5	10
Primorskiy LNG factory (Vladivostok-LNG factory)	0	0	5	10
Global LNG market		280	383	449
Share of Russian LNG		3,9%	14,3 %	19,3 %

Source: Ministry of Energy of Russia

The project of the Belkomur railway (White Sea, Komi, Ural) is divided into 2 parts – northern and southern. The first is the northern section from

Syktyvkar to Arkhangelsk with a continuation to Solikamsk (Perm Krai). Along the northern section, it is necessary to build 215 km of new track and reconstruct 449 km. active land plots. The estimated annual cargo turnover of 20 million tons should be reached by 2035. The construction of the northern section will combine three major infrastructure projects: the Northern Latitudinal Passage, the Arkhangelsk Production and Logistics Complex of the Russian Defense Ministry, and the Murmansk Transport Hub. When the project is implemented, cargo delivery from the Trans-Siberian Railway to Murmansk will be reduced by 360 km by 2026.

4 Conclusion

Due to the sanctions and technological restrictions against Russia, the real commercial exploitation of oil and gas fields classified as hard-to-recover reserves will begin in 8-10 years, so it is possible to conduct detailed geological exploration of promising fields and create all the necessary engineering and transport infrastructure based on the implementation of existing strategic programs and documents and the completion of mainly large system-forming projects.

To maintain the priority presence of the Russian Federation in the Arctic, it is necessary to maintain the volume of construction and commissioning of the icebreaker fleet, increase the construction of deep-sea vessels of various types for seismic exploration, and continue the creation of offshore ice-resistant drilling rigs and geophysical exploration vessels. The interests of the development of the Arctic zone should be linked to the comprehensive expansion and modernization of the main engineering and transport infrastructure for the period up to 2024. The geostrategic significance of the Arctic zone for the Russian Federation means that this territory will occupy a special place in the implementation of 12 national projects [20, 21, 22]. We will have to look for answers to the challenges: What resources of national projects are provided for the Arctic territories? How will their implementation affect the Arctic economy? Is the proposed support measures sufficient or is it necessary to allocate additional resources for the sustainable socio-economic development of the territories of the Arctic zone of the Russian Federation?

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