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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 10 **Volume:** 126

Published: 05.10.2023 **http://T-Science.org**

Issue Article

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FEATURES OF TERRITORIAL DEVELOPMENT THAT ENSURE THE IMPLEMENTATION OF BOTH SUPPORT ZONES IN THE ARCTIC AND THE INNOVATIVE NORTHERN SEA ROUTE

Abstract: *In the article, the authors traced the emergence of support zones for the development of the Arctic zone of the Russian Federation using state documents and carried out an examination of the definitions of their content. The main features of support zones are indicated: general and social functions, organizational form, economic model, spatial structure, type. For the first time, a comparative description and rating assessment of support zones was carried out using the Rosstat database of municipal indicators and with an emphasis on population dynamics, volume and structure of production, and the nature of local budget revenues. The assessment results made it possible to identify factors of strong differentiation of zones that adversely affect the socio-economic development of the Arctic regions. An overview is presented and an assessment is made of the regions' proposals for the design filling of support zones.*

Key words: *formation of support zones, Arctic zone of the Russian Federation, criteria for selecting investment projects, support zone, monocities of the Arctic, investment project, socio-economic development, spatial development, Arctic, rating assessment, natural resources, energy resources, oil and gas projects, Northern Sea Route, personnel.*

Language: *English*

Citation: Korotkova, O. I., Tikhonova, N. V., Blagorodov, A. A., Prokhorov, V. T., & Volkova, G. Yu. (2023). Features of territorial development that ensure the implementation of both support zones in the Arctic and the innovative Northern Sea Route. *ISJ Theoretical & Applied Science, 10 (126)*, 24-44.

Soi: http://s-o-i.org/1.1/TAS-10-126-5 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.10.126.5

Introduction

UDC 332.36:339.23

The relevance of the study is expressed in the development and deepening of the theoretical provisions of the Russian scientific school of spatial economics in terms of substantiating the regulatory mechanisms for ensuring the functioning of the regional economy based on the management of spatially differentiated micro-, macroeconomic and institutional parameters of the multi-level economic system of the Arctic zone of the Russian Federation (AZRF) in order to overcome the rarefaction and ensuring the coherence of its space. The growing complexity of multi-dimensional economic systems and the increase in the number of spatially determined economic connections between their levels in conditions of increasing instability of the global environment determine the need to deepen the conceptual foundations of the theory of spatial economics, and additional elaboration of particular theoretical issues that directly address the solution of specific practical problems of spatial organization of the economy.

However, the use of these critical software tools faces some serious challenges. Today we are observing not only a pronounced downward trend in the volume of budget funds allocated for the implementation of the Development Support Zones Program, but also a deviation in the implementation of initial plans. On the other hand, a different approach to the implementation of Russia's strategic goals in the Arctic has been developed - through a "special economic regime". There is an obvious need for a combination and flexible use of the capabilities of each of these mechanisms of spatial development, depending on current external and internal challenges and regional characteristics. The most pressing issue of developing these mechanisms for spatial development is in relation to the regions recently included in the Russian Arctic.

Which in the future could be enshrined in regulatory legal documents regarding the implementation of the state program of the Russian Federation for the socio-economic development of the Arctic zone of the Russian Federation and the subprogram "Formation of support zones for development and ensuring their functioning, creating conditions for accelerated socio-economic development of the Arctic zone of the Russian Federation ". The main approaches to selecting and assessing the effectiveness of investment projects in the Arctic zone of the Russian Federation are considered, the main results of the VII International Forum "Arctic: Present and Future", held in December 2022, are presented. Prospects for the development of various areas of the Arctic zone of the Russian Federation are presented and analyzed. The following areas aroused the greatest interest among forum participants: such as the socio-economic development of the polar territories and support zones, the retention of personnel in the Arctic zone of Russia, the development of the Northern Sea Route. The most significant conclusions and recommendations on the issues considered are presented (Figures 1-3).

Figure 1 - Support zones - an economic development tool that provides for the creation of a favorable regime for management in the territories of the Arctic zone.

Figure 2 – Scheme of macro regions of Russia

The new edition of the state program of the Russian Federation for the socio-economic development of the Arctic zone of the Russian Federation was approved by Decree of the Government of the Russian Federation of 2021 No. 1064. The state program includes three subprograms, the main one of which, with the nearest deadlines for implementation and the amount of funding from the federal budget, is the subprogram "Formation of support zones for development and ensuring their functioning, creating conditions for accelerated socio-economic development of the Arctic zone of the Russian Federation."

At the same time, the wording “support zone” has not yet received a normative definition. Just as the criteria for selecting investment projects in the “support zones” of the Arctic have not been defined.

In this publication, we will focus on methodological approaches to the selection of investment projects in the “support zones” of the Arctic, which could later be enshrined in regulatory legal documents. Today, when developing methodological approaches to both the formation and functioning of support zones for development in the Arctic, and the Arctic zone of the Russian Federation as a whole, meeting the goals and objectives of the socio-economic development of the Arctic zone of the Russian Federation and ensuring the national security of Russia in the Arctic, the question increasingly arises on the criteria and requirements for projects implemented with government support. The methodology for assessing the costs and benefits of investment projects to provide support from budget resources is closely related to the methodology for assessing the effectiveness of investments. At the same time, The harsh conditions of the Arctic impose their own requirements on the selection of priority projects. The tasks of geopolitics, national security, intensification of economic activity in the Arctic zone, and social effects from the implementation of projects come to the fore.

Figure 3 – Characteristics of budgetary provision of Russian regions

To date, a significant number of methods and approaches to the assessment and investment projects have been developed and approved. Here are some of them: Decree of the Government of the Russian Federation of December 30, 2018 No. 1516 "On approval of the Rules for the selection of investment projects for inclusion in the register of investment projects and maintaining a register of such investment projects"; Order of the Ministry of Economic Development of Russia and the Ministry of Finance of Russia 2020 N 139/82n "On approval of the Methodology for calculating indicators and applying criteria for the effectiveness of investment projects applying for state support from the Investment Fund of the Russian Federation"; Order of the Ministry of Regional Development of the Russian Federation 2018 N 117 "On approval of the Methodology for calculating indicators and applying criteria for the effectiveness of regional investment projects"; Order of the Ministry of Regional Development of the Russian Federation of 2019.

At the same time, today the main principles for selecting priority projects in the Arctic include the following. Projects must be coordinated and interconnected at the stages of goal setting and planning, which will significantly reduce the costs of their implementation. The implementation of support zone projects should have a multiplier effect and help improve the efficiency and diversification of the economy of the Arctic zone, stimulate the development of nearby territories and the development of plume industries. The functioning of support zones should help improve the quality of life in the region, level out imbalances in the territorial structure of the region, primarily in bridging the gap between the location of production and the population, and create new jobs. Requirements for projects are caused by the priorities of investment projects, promoting import substitution, increasing exports and technological development. At the same time, it is important that when selecting projects the mistakes of forming a mono-profile structure of territories and cities (mono-cities) are not repeated. The criteria for selecting project proposals from the constituent entities of the Russian Federation that are part of the Arctic zone of the Russian Federation for their subsequent implementation within the framework of projects to create support zones for development in the Arctic are, namely:

- location on the territory of the Russian Federation of the production site of the investment project;
- implementation of an investment project in a sector of the economy that is a priority for the development of the economy of the Russian Federation in accordance with the Main Directions of Activities of the Government of the Russian Federation for the period until 2035;
- availability of a construction permit (in the case of construction work being carried out as part of an investment project);
- presence of the status of a legal entity registered on the territory of the Russian Federation.

Investment projects, when selected, must comply with the long-term priorities of the socio-economic development of the Russian Federation and

act on the basis of the following principles: intensification of investment activity in key sectors of the regional economy; support for investment projects introducing technologies for the production of products with high added value; support for investment projects that introduce modern technologies for the production of competitive goods on the market; support for investment projects that have a positive economic, budgetary and social effect.

Additional criteria for assessing industry efficiency and feasibility of project support may include the following indicators, namely:

 an increase in the share of the region's provision with products produced under the project by at least 1 percent compared to the current situation in providing the region with products of its own production in the total volume of consumption of similar products as of the last reporting year preceding the year of filing documents for the investment project for participation in selection;

 reduction in the cost of sales of products planned for production under the project by no less than 5 percent compared to the average cost of similar types of goods sold in the region;

 production within the project of export-oriented products, as well as products for which there is no own production in the region as of the last reporting year preceding the year of submission of documents for the investment project for participation in the selection;

 creating conditions for retaining the population in rural areas by co-financing the costs of construction (purchase) of housing for newly hired workers within the framework of the project in the amount of at least 30% of the total cost of construction (purchase) of housing;

 the presence within the framework of the project of expenses for training (retraining) of personnel in higher and secondary educational institutions, including for improving the skills of employees.

The economic requirements for the selection of investment projects for the development of support zones in the Arctic are obvious, namely:

 net present value (NPV) for the investment project for the billing period, but not more than 8 years from the start of production commissioning, has a positive value;

 the budget effect of the investment project in the form of tax revenues to the regional and local budgets has a positive value to the total amount of government support planned to be received for the project;

 the forecast level of wages for workers under the investment project is not lower than the forecast average level of wages in similar types of economic activity of the constituent entities of the Russian Federation in the Arctic zone.

It is advisable that each investment project meets the following criteria, namely:

 aimed at producing products with high added value and reducing the export of raw materials outside the Russian Federation;

 introduces modern technologies that make it possible to produce goods (services) with better consumer properties, or having a lower cost in comparison with similar goods (services) produced in the Russian Federation;

 creates on the territory of the constituent entities of the Russian Federation and support zones of the Russian Arctic objects of fixed assets that were not part of the tax base of the subject of investment activity before the start of the project;

 creates at least 30 new jobs (including at least 5 highly productive ones) in the case of creating a new production facility or ensures the preservation and modernization of jobs in the case of expansion of existing production.

Thus, it is obvious that project selection based solely on values is not applicable to the Arctic.net present value (net present value, NPV) of the project, internal rate of return, weighted average cost of raising capital. Any project in the Arctic must be comprehensive in nature, ensure the interconnection of measures to create an Arctic transport system, the development of energy infrastructure, industrial facilities, the synchronous, interconnected application of existing territorial development instruments and mechanisms to support the implementation of investment projects. Each project is a contribution to both the development of the “support zone” for the development of the Arctic and the Northern Sea Route.

Effective management of the territories of the Arctic zone of the Russian Federation (AZ RF) is an urgent scientific and practical task. Support zones of development are recognized as a key mechanism for achieving strategic interests and ensuring national security in the region. However, this tool does not yet have sufficient methodological, regulatory and organizational development.

The evolution of the normative economic and spatial image of the support zones of the Russian Arctic allows us to track the evolution of special documents on the development of the Arctic Zone of the Russian Federation (Table 1). Their study helps to identify the most significant features for the methodology of development and implementation of concepts for the formation of support zones: general and social functions, organizational form, economic model, spatial structure and the main features of the potential type of zone.

Table 1. Evolution of the content of support zones for the development of the Russian Arctic

Document	Information related to support zones (SZ)
Strategy for the development of the Russian Arctic and ensuring national security for the period until 2035. Section "Spatial development of the Arctic: zones of advanced development...". Approved 2020	The possibilities for ensuring the global competitiveness of the Russian Arctic include the formation of priority development zones (shelf development of the Pechora-Barents Sea province, Polar-Ural pioneer development; Belkomur industrial; Kola innovative, etc.). Has no spatial aspect.
State program "Socio-economic development of the Arctic zone of the Russian Federation for the period until 2035." 2020	Key implementation mechanisms: frame-cluster approach; formation of support zones for development; selective state policy for the development of Arctic territories.
"On the development of the Arctic zone of the Russian Federation." Federal Law, April 2018 Ch. 1, clause 5, art. 3 "Basic concepts used in this Federal Law."	OZ is "a part of a subject of the Russian Federation, in which, in order to ensure the socio-economic development of this subject and the Arctic zone as a whole, as well as ensuring national security issues in the Arctic, it is planned to provide measures of state support for economic and other activities in order to create favorable conditions for the provision of investments, ensuring accelerated comprehensive development and creating comfortable conditions to ensure the livelihoods of the population."
"On the development of the Arctic zone of the Russian Federation." Federal Law, September 2018 Art. 3 "Basic concepts used in this Federal Law."	OZ is "a comprehensive project for planning and ensuring the socio-economic development of the Arctic zone, aimed at achieving strategic interests and ensuring national security in the Arctic, providing for the synchronous interconnected application of existing instruments of territorial and sectoral development and mechanisms for the implementation of investment projects, including on the principles of state- private partnership".
State program "Socio-economic development of the Arctic zone of the Russian Federation". Implementation until 2035, 2020	OZs are "comprehensive projects for the socio-economic development of the Arctic zone, aimed at achieving... (hereinafter, see above)...on the principles of public-private and municipal-private partnership."
"On the development of the Arctic zone of the Russian Federation." Federal Law, September 2018 Art. 3 "Basic concepts used in this Federal Law."	OZ is "the territory of the Arctic zone, where interrelated projects are being implemented aimed at the comprehensive socio-economic development of the Arctic zone, achieving... (hereinafter, see above)...PPP, as well as special regimes for carrying out economic activities and territories with preferential conditions for conducting business activities."

Support zones realize and develop the communication and resource potential of the Russian Arctic. They will activate the transport capabilities of the Northern Sea Route (NSR), meridional river and road corridors, air and railway communications, information communication to involve fuel and energy, minerals, raw materials and biological resources of the Arctic into economic circulation, taking into account interregional interaction.

Support zones work for the development of their region and the Russian Arctic as a whole, ensuring an improvement in the quality of life of the population living and working here. The regional vector of development of each specific support zone is determined by the level and nature of the problems of the municipality on the basis of which it is formed. Directions and projects for the formation of the zone should solve these problems. In organizational form, support zones represent a "project of projects", consisting of a set of transport, industrial, social projects that must be linked to each other in time and space. The "struggle" of spatial and organizational forms manifested itself in changing definitions of the support zone. Sharing the point of view of one of the authors of the bill "On the development of the Arctic Zone of the Russian Federation", member of the Council for the Arctic and Antarctic under the Federation Council M. A. Zhukov, The authors consider the support zone to be the territory in which projects are implemented. The economic model for the formation and functioning of support zones involves the use of public-private partnerships (PPP) and other state support mechanisms operating in an interconnected and synchronized manner in the implementation of investment projects on their territory.

The spatial structure of support zones is materialized by a transport-industrial framework, the planning and creation of which ensures their formation and development. The main elements of such a frame are:

1) highways providing access to the Northern Sea Route, communication with neighboring regions and their support zones and transport accessibility of new sources of raw materials;

2) transport (ports, stations), mineral resources (extraction and primary processing of raw materials) and multifunctional nodes and centers (resource processing, cargo transshipment, socio-cultural sphere, energy, construction, etc.).

The ideology of the transport-industrial framework grew out of the concept of the supporting framework - "the combination of the main focuses of the economic, social and cultural life of the territory and the socio-economic lines connecting them" - a classic analytical and constructive tool of economic geography. It also works in the formation of settlement and infrastructure frameworks (through the concentration of necessary resources) and the supporting framework for the re-industrialization of the Arctic.

Typical features of support zones are determined, namely:

*level and nature of natural resource development;

*related maturity of industrial specialization;

*relationship between center and periphery;

*features determined by the specifics of the financial and economic mechanisms used for their formation and implementation.

The beginnings of typification can be traced in the classification of priority development zones in the Development Strategy of the Russian Arctic for 2020. until 2035 and in the type of Arctic territories (promising, active development, industrial development) identified in the State Program for the Development of the Arctic Zone of the Russian Federation. An analysis of the Arctic strategies of foreign countries did not reveal direct analogues to Russian support zones. Territories of special attention in the Arctic policy of European countries and Canada are areas inhabited by indigenous peoples, which are allocated administratively in Denmark and Canada. Norway's Arctic strategy affects only the High North, which includes the provinces of Nurlan, Troms and Finnmark. A special approach within the framework of a special program (Northern Periphery and Arctic Program 2018–2035) is being implemented by the European Union,

The text of the updated State Program for the Development of the AZ of the Russian Federation (2020) outlines the goals and objectives of the support zones, the mineral and raw material nature of their projects and their close connection with the development of transport. The large section "Participation of government bodies of the constituent entities of the Russian Federation in the implementation of Program activities" presents material that requires updating on the formation and functioning of eight support zones of the Russian Arctic regions. With the inclusion of three municipal districts of Karelia into the Arctic zone of Russia in 2020, the Karelian support zone was added to this eight.

In the last two years, the formation of a statistical base for the macro-territory has been underway: section 2.5 has been introduced into the Federal Statistical Work Plan. "Indicators of socio-economic development of the Arctic zone of the Russian Federation and ensuring national security", the State Statistics Committee website presents the Publication Calendar of official statistics. However, for now the information is provided in general for the Arctic Zone of the Russian Federation, or for regions that include Arctic territories. In this article, using available statistical materials, a socio-economic characterization of the support zones is carried out, they are compared using a rating assessment, and the factors influencing interzonal differentiation are revealed. We chose the municipality as the operational unit of comparative analysis, which is due to the different status composition of the support zones. The main information source was the passports of municipalities; additional data (for example, on the execution of municipal budgets) were collected on the websites of the respective districts. The general indicators of the support zones were determined by summing up similar indicators of municipalities, which provides a unified methodological and information basis for the assessment and representativeness of the characteristics of the Arctic zone itself, and not the totality of the subjects of the Federation, of which only four are included in it entirely, and five are separate municipalities. The calculation of zone ratings for each indicator and the summary average as its place in a series of nine reference zones was carried out according to the author's methodology. To assess the socio-economic situation of support zones, data for 2017 was used, allowing us to get an idea of the starting situation of their development (Tables 2 and 3). The paucity of indicators is due to the focus on assessing production development and the lack of information on individual indicators and municipalities.

Table 2. Characteristics of support zones for the development of the Russian Arctic

Support zone for the development of the Russian Arctic	General characteristics of support zones				
	Area, km^2	Population per 01/01/2021, people	Share of urban population,%	Social nal density population, people/km^2	Home-produced goods shipped, completed services in-house (TSPiUSS), thousand rubles.
Arkhangelskaya	185 617	650 755	92.8	771,533	351 868 546
Kola	139 523	634 282	92.8	838.516	401 431 288
Nenets	176 810	43,937	72.4	307,604	324 557 313
Taimyr-Turukhanskaya	1,095,095	227 220	90.4	31,164	1 036 785 268
Karelian	43 377	43 930	67.2	1.315	8 714 223
Yamalo-Nenets	769 667	536 049	83.7	272,914	2 524 084 683
Vorkutinskaya	24180	80 061	99.4	-	41 580 714
Chukotka	723 489	49,822	70.0	84,733	83 144 623
North Yakutskaya	593875	26 190	50.5	0.048	25 844 772

The analysis revealed contrasting differences in support zones in composition, area, size and social density of the population, the cost of goods produced and services provided, and the share of manufacturing industries in it. Common to the support zones is the predominance of the urban population (with the exception of North Yakutia), low and very low population density and the road network. The general trend of "northern outflow" of the population is intensified by the production decline (Vorkuta and Karelian zones), but the trend reverses in those zones where production is developing (Nenets and Yamalo-Nenets zones). The "earned" revenues of local budgets are directly dependent on the nature and power of the municipal economic basis. The identified differences are largely explained by the accumulated transport and industrial potential of mineral resource development, which makes it possible to distinguish old and new industrial Arctic territories. The first include Arkhangelsk, Kola, Vorkuta, Taimyr-Turukhansk, Karelian, the second - Nenets, Yamalo-Nenets, Chukotka, North Yakutsk.

Table 3. Rating assessment of support zones for the development of the Russian Arctic

Support zone development AZ RF	Indicators used to calculate ratings						
	Decline in numbers population 2021 by 2002, %	Physical population density, people/km^2	Processed share of production in TSPi-USS,%	Shipped by TSPiUSS for one resident, thousand rubles/person	Tax share and no tax income in own local budget revenues,%	Road density, km/100 km^2	Consolidated rating
Arkhangelskaya	-6.3	3,506	59.3	541	78.5	1.159	3.9
Kola	-15.0	4,546	28.8	649	73.0	0.566	4.8
Nenets	5.8	0.248	6.3	7387	78.4	0.067	4.8
Taimyr-Turukhanskaya	-20.1	0.207	46.0	4563	56.6	0.050	5.8
Karelian	-26.1	1.013	14.3	198	55.3	3,731	6.0
I have little-Nenets	5.7	0.696	13.9	4709	37.2	0.162	6.1
Vorkutinskaya	-40.3	3.311	1.5	519	46.9	0.496	7.3
Chukotka	-7.4	0.069	0.9	1669	32.0	0.043	7.7
North Yakutskaya	-21.0	0.044	0.2	987	35.4	0.031	8.2

The Arkhangelsk and Kola support zones are especially distinguished by the balance of the economy and the maturity of the industrial complex (diversification of the sectoral structure of industry, the ratio of production and processing, etc.). In them, as well as in the Karelian zone, the main elements of the transport and industrial framework of the AZ of the Russian Federation were formed - the Arctic port and the railway connecting it with the federal railway network (Arkhangelsk, Murmansk, Belomorsk). In other zones, even those with great resource potential, the industrial and transport components are poorly and disharmoniously developed; rare centers cannot overcome the influence of the vast periphery. Spatial and economic imbalances are caused by single-profile specialization and, in fact, the dependence of the economy of a particular territory on the state and development plans of one company.

Closely interconnected integrated resource and (especially) infrastructure areas are the main frontiers (frontiers) for the development of Arctic territories. Their prospects depend primarily on the availability of access to the Northern Sea Route, the formation of the main transport axis, the level of network trunking, and the stage of frame formation. A preliminary assessment of the frames of support zones with an emphasis on the primary transport component, carried out using open sources, revealed the following, namely:

– the framework is developing in the Arkhangelsk, Kola, Karelian zones, which is manifested in the reconstruction of Arctic ports and the ongoing plans for the construction of the Belkomur railway (Arkhangelsk - Syktyvkar - Solikamsk);

– the framework is being formed: actively with powerful corporate participation in the Yamalo-Nenets zone (Sabetta port on the NSR, Northern Latitudinal Railway); moderately, but with real funding under the State Program for the Development of the Arctic Zone of the Russian Federation in North Yakutia (reconstruction of ports on the Lena River, the port of Tiksi, construction of a shipyard on the basis of the Zhatai shipyard);

– the frame is being designed: the Syktyvkar - Naryan-Mar highway is being built in the Nenets zone, a pre-design feasibility study for the port of Indiga has been completed, the construction of the Barentskomur railway line (Indiga - Sosnogorsk - Solikamsk) is proposed; in the Vorkuta zone, the Northern Railway is being modernized, possible railway exits to the NSR through Arkhangelsk "Belkomur", Indiga "Barentskomur", Ust-Kara (or Amderma) "Karskomur" are being considered;

– the framework requires reconstruction in the Taimyr-Turukhansk (port of Dikson, new coal ports "Chaika" and "Sever") and Chukotka zones (port of Pevek) and formation in the Chukotka zone (construction of the Kolyma – Omsukchan – Omolon – Anadyr highway).

Thus, for the Nenets and Vorkuta zones the main task is the railway access to the NSR port. For the Kola, Arkhangelsk, Karelian regions, the development of the transport network through all types of transport (poly-mainline) is essential; for the remaining zones, it is the strengthening of the main transport axis "river-sea" or "road-sea" with the reconstruction of ports on the NSR.

The formed or completed frames are the transport basis for anchor projects that create the production base of support zones and determine their industrial profile.

According to the implementation plan for the State Program for the Development of the AZ of the Russian Federation, in December 2020, a Decree of the Government of the Russian Federation on the procedure and criteria for selecting projects for inclusion in the list of priority ones within the framework of support zones was adopted. This issue is considered in the scientific literature, as a rule, in the aspect of describing the largest investment projects. We were unable to find a comparative analysis of project initiatives for all support zones from the point of view of complementarity. Below, based on materials from various sources, proposals from the Arctic regions for potential anchor projects are summarized.

Kola support zone. The region is positioning itself as a successful investment site, combining traditional and new types of economic activity in the Arctic. The strategic function of the zone can be designated as an outpost of the Northern Sea Route. The basis of the production potential is made up of enterprises in the mineral resources, mining, metallurgical and chemical sectors, which are part of the largest national financial and industrial groups. The necessary transport and energy infrastructure is being formed to meet their current needs and potential capabilities. An indisputable advantage is the presence of an ice-free Murmansk seaport and a base for the Russian icebreaker fleet. The traditional core, which includes the fishery complex, is complemented by a new cluster for the construction of offshore hydrocarbon production and processing facilities, as well as the tourism sector.

Arkhangelsk support zone. The main emphasis in its development is on the creation of an Arctic transport system. The strategic function associated with supporting the NSR is close to the Murmansk region, but with some restrictions that may be of a fundamental nature.

On the territory of the Arkhangelsk region there are strategic enterprises with developed competencies in the field of shipbuilding and ship repair, united in the Severodvinsk cluster. Their specialization is mainly military in nature, while civil shipbuilding is considered as a promising direction. Work has begun

on the creation of the Arkhangelsk production and logistics complex, which will work both in the interests of the Russian Ministry of Defense and for commercial orders. The production potential of the region is represented by the woodworking and pulp and paper industries, which in the long term are unlikely to be able to provide sufficient cargo flow along the NSR, unlike the mining, metallurgical and chemical enterprises of the Murmansk region. Projects for the development of the region's mineral resources are so far limited to the Pavlovskoye silver-bearing lead-zinc deposit.

The economic model of the Arkhangelsk zone is associated with the realization of the advantages of the priority development territory and the widespread use of the cluster approach.

Karelian support zone. The region declared its specialization to be the introduction and use of environmentally friendly technologies for environmental management and production in the Arctic.

The project content is expected to be achieved through the creation of a multimodal transport hub with a deep-water seaport in Belomorsk, which should become a key element of the transport corridor facilitating the development of the natural resource potential of the republic. The existing industrial potential is represented by a mineral resource complex for the development of deposits of common and strategic minerals, and it is proposed to develop it through a biotechnological cluster, combining projects in the field of advanced processing of timber, biological resources of the White Sea, and wild plants. The specialization of the Karelian zone in renewable and alternative energy turned out to be unique for the European sector of the Russian Arctic. In the future, the region can provide itself with the most environmentally safe energy, becoming a leader in the pace of low-carbon development. The direction of economic diversification, as in other Arctic territories, is the promotion of ethnocultural, environmental, fishing and rural tourism. There is no definite vision yet regarding the economic model for the functioning of the Karelian zone.

Nenets support zone. Since the Nenets Autonomous Okrug is the least populated and poorly diversified region of the Russian Arctic, the ideology of development of its support zone is determined by the development of transport infrastructure for more efficient development of hydrocarbon resources on the sea shelf and onshore part of the Timan-Pechora oil and gas province. Most of the hydrocarbon production projects in the western sector of the Arctic, including the shelf zone (Varandey terminal and Prirazlomnaya platform), are already being implemented in the region. This allows the district, in planning its prospects, to rely on the experience of implementing commercially successful projects in the Arctic without special tax and administrative regimes. With regard to the economic model, it is especially emphasized that the development of oil and gas fields already makes it possible to accumulate the necessary financial and technological resources for the formation of a modern system of settlements with high standards of quality of life. The development of transport infrastructure will make it possible to use the economic potential of the territory even more effectively, as well as strengthen ties with the central part of Russia and strengthen the country's position in the Arctic basin.

Vorkuta support zone. The Komi Republic is the only Arctic region of Russia that does not have direct access to the Arctic Ocean and, accordingly, to the infrastructure of the Northern Sea Route. The specialization of its support zone in the context of fulfilling strategic tasks at the national level is a production and logistics complex that provides transcontinental connections between the ports of the Kara, Barents and White Seas with the ports of the Pacific Ocean, which will allow mining and processing enterprises in the regions of the European North, the Urals and Siberia to reach promising global markets in the West and East. The second component of the specialization is national security. Its development is based on the infrastructure of the Arctic group of troops and the Ministry of Emergency Situations.

In the future, it is planned that the support zone will reach the sea by extending the branch of the Northern Railway "Karskomur" from Vorkuta to the potential seaport of Arcturus [Litovsky, 2020] on the shore of the Kara Sea in the village of Ust-Kara, or the village of Amderma, Nenets Autonomous Okrug. An important factor in the development of the transport and logistics hub is the construction of the Northern Latitudinal Railway. The connection of transport corridors, in the zone of influence of which new mineral resources and processing centers may arise, will ensure the filling of cargo flows of the NSR and optimization of the load of Arctic ports. For the development of the Vorkuta zone, it is proposed to use mechanisms to support depressed areas by granting the single-profile municipality "Vorkuta" the status of a PSEDA.

Yamalo-Nenets support zone. One of the most actively developing territories of the Russian Arctic. Positions itself as a transit corridor providing connections between the industrial centers of the Urals and the oil and gas centers of Yamal with the European part of Russia. Essentially, it consists of three elements - operating anchor projects for the extraction and production of liquefied natural gas (LNG) in Yamal, the new seaport of Sabetta and the Northern Latitudinal Railway, which is under construction, which has a chance of being faster than other options (Belkomura and Barentskomur) to materialize the transport link "Ural – Komi – North-West" that is strategically important for interregional

development. The transport-industrial framework is complemented by a strong humanitarian block in the form of numerous environmental, educational and scientific projects for the comprehensive study and natural rehabilitation of this sector of the Russian Arctic. The zone uses a wide range of economic mechanisms in the implementation of projects: private investments are attracted (Yamal LNG), government funding (the port of Sabetta), a PPP mechanism is used along the Northern Latitudinal Railway in the form of a concession, supplemented by regional investments in the construction of the road part of the bridge across the river Ob.

Taimyr-Turukhansk support zone. Its specialization is formed on the basis of mining. At the moment, there are two active cores - the Vankor oil and gas cluster and the Taimyr coal mining center. In the future, two more oil and gas fields may be added to them - Ust-Yenisei and Khatanga. At the same time, only the coal industry and metallurgy, which is being developed in the Norilsk industrial region, are focused on the transport capabilities of the Northern Sea Route (interestingly, the current port of Dikson, according to plans, will be focused only on receiving cargo, and two new ones - "Chaika" and "Sever" - on exporting coal to export). Existing oil and gas flows are tied to a system of trunk pipelines in a southwestern direction outside the zone of influence of the Northern Sea Route and other Arctic territories.

A feature of the economic model of the Taimyr-Turukhansk zone is the high degree of involvement of raw material corporations in the construction and operation of transport infrastructure for their own projects. This, on the one hand, increases their feasibility and independence from government investment (but only during favorable market conditions). On the other hand, it consolidates the export and raw materials specialization of the territory with all the accompanying socio-economic risks.

North Yakut support zone. The fundamental feature of the development of the territory can be considered the basin approach, due to the alternative nature of inland water transport, complete dependence on northern supplies and the connection of all Arctic and northern territories of Yakutia with the Northern Sea Route (via inland waterways). It is noteworthy that the republican authorities classify as territories of integrated development not only five uluses classified as AZ RF by Presidential Decree of 2018, but another eight that are rightfully proposed for expansion of AZ RF and the North Yakutsk support zone.

The river-sea transport infrastructure is the framework of both the support zone and the republic as a whole. At the same time, two vectors of Arctic specialization are clearly distinguished. External (latitudinal) is aimed at ensuring the activities of the Northern Sea Route along the entire coast of Yakutia, including servicing ships and vessels with nuclear power plants in the port of Tiksi. The internal (meridional) vector reflects the realization of the region's own interests in the Lena basin. The key project here is the construction of the high-tech Zhatai shipyard.

The design content of the industrial core of the support zone is supposed to be linked with potential mineral resource centers for the development of acutely scarce and strategically important resources. However, the degree of preparation of projects varies greatly, which casts doubt on their feasibility in the near future. The most relevant in this regard remain the anchor projects of the Anabar territory (diamond, rare earth and oil and gas), as well as the Zyryansky coal center of the Kolyma territory. Among the government support measures that could intensify the formation of the North Yakut support zone are TASED and PPP. In addition, it is proposed to extend to this territory some procedures of a free customs zone and other measures to simplify business activities.

Chukotka support zone. The specialization of the easternmost support zone of the Arctic is fully formed and cannot be changed. Based on the use of the geographical advantages of direct access to the Pacific Ocean and the proximity of the markets of the Asia-Pacific region, two practically isolated territories will be developed here - the Chaun-Bilibino and Anadyr industrial zones. The first specializes in the extraction of polymetallic raw materials, the second - in the development of traditional fuel and energy resources. A special feature of the territory is that its infrastructure framework needs serious modernization of all three subsystems: energy, transport and telecommunications, and so far, unlike other Arctic regions, it is considered not as a competitive advantage, but as a deterrent.

The development concept of the North Yakutsk support zone presents passports of anchor investment projects with an assessment of costs and efficiency, as well as information on mineral resource centers, which distinguishes it favorably in terms of the degree of development from other support zones of the Russian Arctic.

Let us note that the description of project initiatives touches on the proposed mechanisms for the creation and functioning of public health organizations. Several publications by the authors of the article and other researchers are devoted to this issue, including on the basis of comparison with foreign experience.

After some surge in information and discussion activity around the transition from the sectoral to the territorial principle of development of the Russian Arctic (in the format of support zones), there has been a lull in the public space since 2020.

Meanwhile, according to the implementation plan for Subprogram 1 "Formation of support zones for development and ensuring their functioning..." in 2020, the Ministry of Economic Development of

Russia was supposed to present "the concept of a project for the formation of support zones for development", "develop and carry out research work", "adopt regulations". In 2020, a Decree of the Government of the Russian Federation was to be issued on the procedure and criteria for selecting projects for support zones. Planned activities were not completed within the specified time frame. The Ministry of Economic Development is considering 30 regulations aimed at creating conditions for the effective implementation of investment projects in the Russian Arctic, as well as acts on amendments to the Tax Code, the Law "On Subsoil" and other laws. The long approval process in the government of the draft Federal Law "On the development of the Arctic zone of the Russian Federation", entirely dedicated to support zones, postponed until 2024 the financing of research work, the result of which should be economic calculations for projects of support zones in terms of the necessary transport, energy, telecommunications and other infrastructure, the volume of natural resource extraction, and future cargo flows. An important methodological position for developing concepts of support zones and selecting projects, according to the authors of the article, as well as the developers of the Concept for the formation of the North Yakutsk support zone, is the assessment of the multiplicative effects of their implementation, consistently carried out by colleagues from the Institute of Economics and Economics of the SB RAS.

On December 4-6, 2017, the VII International Forum "Arctic:

present and future", which brought together 1,600 participants from 37 regions of Russia and 17 foreign countries. The forum is organized by the Interregional Public Organization "Association of Polar Explorers" (ASPOL), headed by Artur Chilingarov, Special Representative of the President of the Russian Federation for international cooperation in the Arctic and Antarctic. The forum was held with the support of the State Commission for the Development of the Arctic. More than 20 heads of key ministries and departments for the development of the Arctic, governors and heads of all Arctic regions of the Russian Federation took part in the discussion and decision-making process. Members of Parliament took part in the discussions, including Chairman of the Committee on Constitutional Legislation and State Building Andrei Klishas, Chairman of the Council for the Arctic and Antarctic under the Federation Council Vyacheslava Shtyrov, Chairman of the Committee on Regional Policy and Problems of the North and Far East Nikolai Kharitonov, Chairman of the Committee on Ecology and Environmental Protection Vladimir Burmatov and others, as well as representatives of business, science, non-profit and public organizations. The plenary session was devoted to one of the main topics in the forum program - the development of support zones, their regional models and the role of the state. During the plenary session, delegates discussed the readiness of the Arctic regions to launch and operate support zones, as well as the coordination of the activities of federal and regional authorities in this process. The discussion was attended by the special president of ASPOL A. N. Chilingarov, governors and heads of all Arctic regions of the Russian Federation. According to the new edition of the state program "Socio-economic development of the Arctic zone of the Russian Federation" and the draft federal law "On support zones for development in the Arctic zone of the Russian Federation", which is being developed, it is assumed that the main mechanism for the development of the Arctic region will be support zones, which provide for the development of the territory as an integral project on the principle of ensuring the interconnection of all industry activities at the stages of planning, goal setting, financing and implementation. The implementation of pilot projects for the direct creation of support zones is planned for 2018-2020, and their operation for 2021-2025. The creation of support zones was actively discussed at the VI Forum in 2018, where eight support zones were discussed: Kola, Arkhangelsk, Nenets, Yamalo-Nenets, Vorkuta, Taimyr-Turukhansk, North Yakutsk, Chukotka. At the 2020 forum, a decision was made to create a ninth zone - Karelian.

At the plenary session, reports from representatives of all regions in whose territory support zones are being created were heard and discussed. In order not to list all the speakers, we can state that all the governors and heads of the Arctic regions of the Russian Federation made their proposals. The interest of the heads of the constituent entities of the Russian Federation in this problem is enormous, since this is an opportunity for serious development of the northernmost regions of our country, and with the support of the state. But this is also a great responsibility, since many problems have accumulated in the Arctic regions and we must be able to organize everything in such a way that the regions can fulfill the mission that is entrusted to them by the state.

Of particular interest to those present was the report of one of the ideologists of the creation of support zones and... O. Governor of the Nenets Autonomous Okrug (NAO) A.V. Tsybulsky, who dwelled in detail on the prospects for the development of the Nenets support zone and noted the feasibility of interregional interaction. The administration of the Nenets Autonomous Okrug carried out work to form the Nenets support zone, which included projects related to the production of hydrocarbons and the development of the Northern Sea Route (NSR). The NAO is rich in various resources. The subsoil of the district contains 52% of the total oil and gas resources of the Timan-Pechora oil and gas province. In terms of hydrocarbon reserves, the district ranks first in the

European North of Russia and fourth in Russia and, in addition, has a rich resource - access to the coast of the Arctic Ocean, the Northern Sea Route. Thus, the Nenets support zone includes the implementation of investment projects and the creation of infrastructure directly related to the extraction of hydrocarbon resources and the development of the Northern Sea Route. The district envisions the creation of three main centers for the development of the Nenets support zone. The first and main one is the village of Indiga in the ice-free bay of the same name in the Barents Sea. It is planned to build a deep-water port of Indiga in Indiga Bay - the only ice-free bay on the entire coast of the Arctic zone from Murmansk to the port of Sabetta with the ability to receive large ships year-round without icebreaker support. The second direction of development of this territory is the Sosnogorsk - Indiga railway line, the construction of which will give Russia a new sea access to world markets, will allow connecting the port of Indiga with the main cargo-generating and resource-producing regions of the country - the Komi Republic, the Urals, Kuzbass, as well as Kazakhstan. The new multi-functional seaport of Indiga, in combination with the new Sosnogorsk - Indiga line, will become the basis for sustainable socio-economic development not only of the Nenets Okrug, but also of the entire Arctic zone of the Russian Federation, since it will make a significant contribution to the formation of an integral transport network of the European part of the North of Russia.

The second largest center for the development of the Nenets support zone may be Naryan-Mar, the administrative center of the Nenets Autonomous Okrug. Here it is necessary to reconstruct the Naryan-Mar airport and create a checkpoint across the state border on its territory. One of the priority projects of the Nenets support zone is the development of a network of highways. The new edition of the state program "Socio-economic development of the Arctic zone of the Russian Federation" already includes projects for the construction of three transport corridors Naryan-Mar - Usinsk, Naryan-Mar - Toshviska, Naryan-Mar - Mezen. The implementation of these projects will improve the transport accessibility of the region, since this is one of the main problems hindering the development of the Nenets Autonomous Okrug. Until now, the district is isolated from the main centers of the European part; the only connection is air.

The third development center of the Nenets support zone is the village of Amderma. It is proposed to implement projects for the reconstruction of the Amderma airport and the creation of an aircraft refueling point, and the construction of the Vorkuta - Amderma railway for transporting mined coal from the Pechora coal basin.

A.V. Tsybulsky put forward a proposal on the feasibility of interregional interaction. The Vorkuta support zone has rich natural resource potential, has railway connections with the regions of Russia, but does not have access to the Northern Sea Route. Therefore, it is advisable to unite the neighboring Nenets and Vorkuta support development zones. The purpose of the association is to create a transport corridor from the Urals through Vorkuta along the Sosnogorsk - Indiga railway line to Indiga Bay to open a direct route to the port of the same name. The unification of two support zones will not only be an interregional project of the Nenets Autonomous Okrug and the Komi Republic, but will also make a significant contribution to the formation of an integral transport network of the European part of the North of Russia and the realization of the industrial potential of the territories through access to promising sales markets along the NSR.

One of the most controversial was the report of the Governor of the Murmansk Region M.V. Kovtun, who stated the need to amend the bill on the development of the Arctic zone of the Russian Federation. The governor criticized the principle of providing state support to anchor investment projects in support zones worth more than 100 billion rubles. The fact is that often the creation of infrastructure to ensure the operation of a project is too expensive and unaffordable for the region. According to the governor, the criterion for granting the status of an "anchor project" should not be the cost of this project, as stated in the draft law, but its significance for the development of the support zone. In addition, the head of the region noted, the legislation does not provide for sufficient measures to ensure the socio-economic development of support zones and improve the quality of life of the population, Also, the draft law does not contain a list of measures to ensure environmental safety and scientific research. To resolve these problems, it is necessary to develop a separate federal law that would regulate these issues or make appropriate changes to other legislative acts regulating these problems. The problem of raw materials resources in the Arctic has always attracted great interest. The main panel session was "Oil and gas of the Russian Arctic: prospects and problems of development," which attracted the largest number of participants. And this is understandable, since the resources of the Arctic are the future of Russia. The Ministry of Economic Development has compiled a list of 145 projects that are already being implemented or planned for implementation in the Arctic. Most of them (38.9%) are related to the extraction and processing of minerals, primarily hydrocarbons. They are also the most capital-intensive and large-scale. The unfavorable price environment for hydrocarbons on the world market has slowed down the implementation of some projects in the Russian Arctic. Under the conditions of sanctions, the problem of the lack of domestic technologies and equipment for the development of oil and gas fields in the polar

region is still relevant. The situation was also complicated by new US restrictive measures introduced in August 2018 regarding oil production in the Arctic.

At the panel session, a number of issues of interest and concern to many were discussed, among which the following can be highlighted, namely:

- resource potential of oil and gas fields on land and the Arctic shelf;
- implementation of oil and gas production projects in the regions of the Arctic zone;
- ways to reduce the cost of oil and gas production in the Arctic;
- promising markets for Arctic hydrocarbons.

Indeed, the resource potential of the Arctic is rich. The Yamal Peninsula is a strategic oil and gas region of Russia. Explored and preliminary estimated gas reserves here exceed 16.7 trillion. m^3. In the future, Yamal will become one of the three main centers of Russian gas production with a potential annual productivity of up to 310-360 billion m^3 of gas.

The Bovanenkovskoye field is the main center of gas production in Yamal. With initial reserves of 4.9 trillion. m^3 deposit is one of the three largest in Russia and one of the five in the world. In total, three gas fields will operate with a total capacity of up to 115 billion m^3 of gas per year. In the future, the design productivity of the Bovanenkovskoye field will increase to 140 billion m^3 of gas per year.

The second promising area for shelf gas production with a focus on the same Asia-Pacific region could be the Laptev Sea, taking into account its natural conditions (primarily shallow water) and location in the middle of the Northern Sea Route.

However, the main role of the Russian Arctic shelf, taking into account the current situation in the oil production sector, should play in maintaining the achieved levels of oil production.

The pipeline system of the Arctic zone of the Russian Federation is developing. The Transneft company implemented the largest project for the construction of the Zapolyarye – Purpe – Samotlor oil pipeline. The total length of the pipeline system passing through the territory of the Yamal-Nenets and Khanty-Mansi Autonomous Okrug is almost 1 thousand km. This is the shortest route that connected the north of the Krasnoyarsk Territory and the Yamal-Nenets Autonomous Okrug with Russian oil refineries, world markets and the Eastern Siberia - Pacific Ocean directions. The launch of the oil pipeline made it possible to double oil production in the region by 2020.

At the session, serious concerns were expressed regarding the profitability of the extraction of gas resources on the Arctic shelf. Deputy General Director for Scientific Work of the Federal State Budgetary Institution VNII Okeangeology A. A. Chernykh noted that by now it has become completely obvious: the development of gas resources in most areas of the Arctic shelf is unprofitable not only today, as the Shtokman project showed, but even in a fairly distant future. The exception is the NOVATEK Yamal LNG project on the Kara Sea coast. The problem is undoubtedly serious and needs to be worked on. As for the NOVATEK Yamal LNG project, it is unique and we will consider it in more detail. The Yamal-LNG liquefied natural gas plant in Yamal was recently put into operation. It is the world's largest and northernmost liquefied natural gas plant with a capacity of 16.5 million tons per year. Investors: OJSC Yamal LNG as part of PJSC NOVATEK (50.1%), Total (20%), CNPC (20%), Silk Road Fund (9.9%).

Under the conditions of sanctions, the problem of the lack of domestic technologies and equipment for the development of oil and gas fields in the polar region is especially pressing. The situation was also complicated by new US restrictive measures introduced in August 2018 regarding oil production in the Arctic. Therefore, the session “Creation of equipment and technologies for the development of the Arctic shelf” aroused undoubted interest.

The discussions on the creation of domestic equipment and technologies were attended by Deputy General Director of the Federal State Unitary Enterprise VNIIOkeangeology named after. I. S. Gramberg" A. A. Chernykh, head of the project group of the Foundation for Advanced Research (Laboratory of Advanced Underwater Robotics) V. V. Litvinenko, chief designer of the project of JSC "Lazurit" S. Kh. Umyarov and others. Development of the Arctic shelf and its coast is strategically important for the development of Russia and involves the development and implementation of modern means and technologies for the extraction of mineral resources. Considering that, according to various estimates, the share of imports in geological exploration reaches 85%, and in the implementation of offshore projects up to 90%, this is a serious challenge for the domestic industrial and oil and gas engineering industry. During the session, the needs of companies with large-scale projects for Russian equipment, services in the field of geological exploration, geophysical work and production on the Arctic shelf, as well as the possibility of reducing dependence on the import of foreign technologies were discussed. In addition, the discussion participants discussed the creation of favorable conditions for the development of innovative technologies necessary for the development of the continental shelf in the Arctic (for example, the admission of private companies to the shelf). Undoubtedly, projects for the development of Arctic hydrocarbons are grandiose. However, there are problems associated with the supply of foreign technologies and equipment for work on the shelf. The sanctions affected the most vulnerable point of the oil and gas industry - its technical equipment: the provision of technology and the supply of equipment,

As always, much attention was paid to the development of the Northern Sea Route, which, as a result of the development of the Arctic shelf, provides an incentive for economic growth in the northern regions.

In 2017, the Northern Sea Route turned 85 years old. In 1932, for the first time in the history of navigation in northern latitudes, the expedition of the Russian explorer Otto Schmidt managed to navigate the Arctic Ocean in one navigation - from the Barents Sea to the Bering Sea. In the same year, the state administration of the NSR was created. This organization was responsible for a wide range of economic issues in the Arctic, as well as for ensuring navigation along the Northern Sea Route. In essence, a single governing body was created in the country, in whose hands significant resources were concentrated. Without the development of the Northern Sea Route, the development of the Arctic region of Russia is impossible, since it is the basis of the Arctic transport system. It should be noted that there is great interest in the NSR all over the world. Tu Deming, General Director of the shipping company COSCO (China), which transports goods around the world, expressed great interest in the development and use of NSR. The so-called project to create the "Ice Silk Road of the 21st Century" within the framework of the "One Belt - One Road" program is already being actively developed by the joint efforts of China and Russia. The difficult political situation in the world today contributes to the creation of such a global competitive transport artery that will serve both the political and economic interests of both countries.

The main advantage of SMP is its commercial potential. According to some estimates, unlocking the full potential of this Arctic route could reduce the annual costs of international maritime trade by $53.3-127.4 billion by 2024. These are very attractive prospects. The NSR is the shortest sea route connecting Europe and Asia. Sea transportation today is the most cost-effective and this business is only growing and developing. The Russian government is allocating money for the development of the infrastructure of the North, nuclear icebreakers are being created based on the latest technologies, and China plans to build new cargo ships with an increased ice class. And this is the second time at such representative forums that much attention has been paid to people in the Arctic. Without humans, the development of the country's natural resources, the fulfillment of that mission, which is assigned to the North and the Arctic is impossible. The supply of young personnel in the Arctic regions depends on the migration of graduates. The picture is not rosy. Graduates mostly leave for non-Arctic regions of the country. Thus, from the Arkhangelsk region in 2018, 25% left for other regions of the country and only 4% for the Arctic regions. Respectively, 21% and 1% of graduates left the Murmansk region. The volume and quality of personnel training in universities do not always meet the needs of companies operating in the Arctic. At the same time, specialists who received education in other regions are not always ready to move to the Arctic regions for permanent residence. It is necessary to systematically create conditions for improving the quality of education and the demand for graduates, expanding targeted training, introduction of practical training mechanisms with the involvement of specialists from specialized Arctic enterprises. At the forum, it was noted that the problem is not simple; its solution requires serious efforts and, first of all, the state, namely: the creation of a socio-cultural environment, opportunities for professional growth, etc. For the purposes of state development, the Arctic must turn into a territory attractive to life and work. It seems advisable to restore the previously existing northern benefits. This requires a joint solution to the problem by the state, regions, and business. Currently, personnel training for the Arctic zone is carried out through various forms of training, but the main suppliers of personnel are state universities. The state order for personnel training is constantly increasing. The number of budget places in universities in the Arctic zone has increased fourfold over the past four years. In 2023, 5 thousand more budget places were allocated than in 2022. The greatest demand is for engineering and technical specialties, so in the structure of budget places they make up 44%, which is higher than similar indicators in other regions of the Russian Federation. However, it is necessary to increase the number of budget places in engineering and technical specialties, since these are the specialties that are most in demand in the Arctic. One of the most effective forms of implementing educational programs with an Arctic focus is network learning, which consolidates the resources of a number of educational programs of universities and industrial enterprises, and not only universities in the Arctic regions. More than 30 universities in other regions of the Russian Federation use the same programs and modules for training specialists to work in the Arctic. In addition, network learning is also used within the framework of international cooperation, in which Russian and foreign universities take part. Such a consortium is called Barents Transborder University. Studying at the university contributes to the development of student mobility in the Barents region and, ultimately, cooperation in future professional activities. However, there are many problems in its development. The development of the university is hampered by the lack of funding for the creation and implementation of joint master's programs by Russian partner universities, as well as funding for student mobility, since students must undergo training for a semester at a foreign university in accordance with the curriculum. While the number of Russian students studying at Finnish universities is gradually growing, there are practically no Finnish

students in Russian universities. The situation will change when the number of universities in Russia that conduct their master's programs in English increases. Another possibility for the development of the project is the expansion of scientific cooperation within the framework of joint master's programs (research-based master programs), which will allow obtaining additional financial resources and ensuring the mobility of teachers participating in the project. At the forum it was emphasized that in order to motivate young specialists it is necessary to promote them to management positions and create conditions for career growth. Regional authorities and employers should more effectively use the potential of educational organizations in the region, develop a system for attracting and retaining young specialists in production and in the social sphere, increase the attractiveness of working and living conditions, opportunities for professional growth, implementing government support measures. It is necessary to maintain branches of educational institutions in the North, as this is a tool for retaining young people. At the final plenary meeting of the State Duma, it was noted that in order to implement the task of preserving the human presence in the Arctic, colossal funds are allocated from the federal budget - more than 190 billion rubles. Funding will be provided in three key areas: the development of support territories, the Northern Sea Route and shipping in the Arctic, as well as the creation of new equipment and technologies.

Conclusion

The enormous importance of the Arctic region is no longer in doubt, as well as the realization that this region cannot be developed using the methods of the Soviet five-year plans, and as we move to high latitudes (to the Arctic shelf, to the coastal zone and coastal territories), the volumes increase required investments and financial risks.

The main difficulty in introducing new approaches and methods in the formation of space, cells of the territory's framework is that the inertia of already established structures and management methods is still great, and new proposals, developed and even enshrined as mandatory in government documents, have difficulty making their way. This situation can be explained by the difficulties of the transition from the usual strictly centralized management to the need to establish equal rights for different participants in the process of Arctic development. Even with the understanding that they all have a common goal - the modernization of outdated industries and the creation of new ones based on progressive technologies that correspond to the principles of sustainable development of territories and meeting the social needs of the population, uniform rules have not yet emerged.

The Arctic zone of Russia, consisting of the northern parts of eight constituent entities of the Federation, due to completely unique circumstances, has practically approached the position of a special and independent object of state regulation and management. These circumstances include: the huge and diverse resource potential of the territory; the determining role of extracted raw materials in the country's export earnings; the high vulnerability of the Arctic ecological system, on which the state of many regions of the world depends; urbanization of developed territories (80% of the population lives in cities and towns). Exorbitant costs in industrial production and maintenance of public utilities inevitably stimulate the search for methods and solutions to reduce costs, hence the objective need to build an innovative economy here. It depends only on the success of this direction whether the Arctic will develop in the modern format of the 21st century, or whether it will get stuck in the 20th century with its worn-out funds and the continuing outflow of population to more prosperous regions.

Only the state can be a guarantor and necessary participant in the movement of the Russian Arctic along the innovative path of development. Hopes for private capital and the market did not justify themselves. Private companies, which have taken possession of what was developed in Soviet times, are not engaged in the development of the territory, but in the exploitation of rich deposits, more in their own interests than in the Arctic or the country and its population. This is evidenced by the insufficient level of investment in R&D and low spending on corporate social responsibility, despite the fact that almost all owners of Russian mining companies appear on the Forbes list.

However, even under such unfavorable circumstances and despite all the contradictions of state policy, a new space is gradually being built in the Russian Arctic with modernized enterprises serving large government orders and the needs of large companies, thereby forming regional clusters, which will play a major role in the formation her new look. New avant-garde areas of development, as a rule, are tied to the localization of the largest deposits of strategic types of raw materials, cities and towns serving these deposits or producing the necessary equipment and materials for them, as well as seaports and port points associated with sea and river transport routes with access to to the Arctic, Pacific and Atlantic oceans.

In recent decades, the polar territories, regardless of their national protectorate, have increasingly become an area for the implementation of pilot projects to introduce innovative development methods, the latest eco-friendly production technologies, information technologies and communications, monitoring of natural and social processes. Such approaches to the development of resources and space in the Arctic in the modern world order are dictated, on the one hand, by plans to create

a powerful raw material and production base of the polar countries in extreme natural and climatic conditions, and on the other hand, by high investment risks and market requirements to meet international standards. Products created in the Arctic must not only be in demand in the domestic and world markets, but also competitive. Wherein, Today, the task is also not to destroy those unique resources of this region, which are still less involved in economic development or are classified as resources of deferred demand, but in the future may be of even higher importance than the reserves of energy and mineral raw materials that are so in demand today. There are still obstacles to the implementation of such large-scale plans in Russia, which, unfortunately, cannot be overcome tomorrow or in the near future. These include: insufficient, and often meager, funding due to budget deficits and the choice of other priorities for government injections (expenditures on the military-industrial complex and military operations, on new Crimean facilities, etc.); an acute shortage of professional personnel in the absence of effective incentives to attract specialists to work in a difficult climate and in conditions of primitive infrastructure; lack of own technologies and the depressing state of science designed to develop these technologies (during the period of reduction in funding for "northern projects", many scientists and engineers working in this field went abroad); the lack of an effective system for managing complex resource-territorial objects and, finally, a corrupt corps of managers of all ranks, slowing down useful initiatives and transferring state support funds into inappropriate expenses. All these negative factors are well known, and there is no doubt that they were taken into account when developing numerous program documents on the Arctic: this is the "Concept of sustainable development of the Arctic zone of the Russian Federation" (2018), and "Fundamentals of state policy in the Arctic until 2035." (2020), and "Strategy for the Development of the Arctic Zone" (2020), and the State Program for the Social and Economic Development of the Arctic Zone until 2035). However, if we take a realistic approach to the situation on the ground and take into account people's sentiments, it becomes obvious that social policy will play almost the leading role in achieving Russia's ambitious goals in the Arctic. Today it is quite difficult to achieve the voluntary resettlement of people to areas with unfavorable natural and climatic conditions, especially in the absence of modern production and social infrastructure. In addition, the older generation, who spent decades working in Arctic fields or at weather stations on the polar coast and lost their savings during the "shock therapy" of the 1990s, has already popularly explained to her children the dubious advantages of working in the North. "Suitcase" sentiments prevail among both older and younger residents of the northern regions. This is evidenced by a steady downward trend in the population of the latter (except for the Nenets, Yamalo-Nenets districts and the Republic of Sakha (Yakutia)) and special sociological studies. Let us present the results of surveys in the Arkhangelsk region, which are very typical for most northern regions. The main problems pushing young people out of rural areas, respondents consider the impossibility of decent employment (79%), lack of modern leisure facilities (52%), lack of comfortable housing (45%), uncertainty in the future of the settlement (32%), low incomes and inaccessibility of education (14% each).

The next stage of lawmaking for the formation of new spatial structures in the Arctic was the draft of the new Federal Law "On the development of the Arctic zone of the Russian Federation" (2020). In it, this zone of the Russian Federation is considered as a single management object, with the formation of a federal executive body and a new integrated approach to territorial and socio-economic development - the creation of support zones. The support zone is defined as "a comprehensive project for planning and ensuring the socio-economic development of the Arctic zone, aimed at achieving strategic interests and ensuring national security in the Arctic, providing for the synchronous interconnected application of existing instruments of territorial and sectoral development, as well as mechanisms for investment projects, including on the basis of public-private and municipal-private partnerships." In total, it is proposed to create eight support zones in the Arctic (Kola, Arkhangelsk, Nenets, Yamalo-Nenets, Vorkuta, Taimyr-Turukhansk, North Yakutsk and Chukotka). Each zone in terms of infrastructure will be based on ports, and, accordingly, they will all be connected by the main transport route - the Northern Sea Route. At the present stage, the new seaport of Sabetta (the eastern coast of the Yamal Peninsula) has occupied an important place in the Yamalo-Nenets support zone, which has already sent the extracted oil from the Novoportovskoye field by tankers to the west. It is unlikely that anyone will deny that an integrated territorial approach is more effective than a sectoral one, especially in a region such as the Russian Arctic, with its vast expanses, large differences in natural, resource, ethnographic and environmental plans, not to mention the different levels of development of certain territories. This was well understood back in the years of the USSR, when the strategy of creating territorial production complexes (TPC) was adopted as the main concept for the development of new territories. The social and economic effect during the formation of the industrial complex was achieved through the comprehensive and rational development of the entire production infrastructure, the use of local natural (land, water, raw materials) and labor resources. The creation of the TPK was recognized as the most effective spatial form of organization of productive forces, in which the advantages of specialization, cooperation, and combination of

various elements of the economic system are realized. Large TPKs created in the Soviet years in the northern regions of Russia are still operating. Murmansk, Timan-Pechora, North Ob, North Yenisei TPK represent the industrial framework of the entire Arctic. There has never been and could not be a complete territorial development in the Arctic, due to extremely unfavorable natural and climatic conditions, and too high costs for all types of production work, social infrastructure and personnel maintenance. In addition, continuous territorial development in Arctic latitudes is also unacceptable for environmental reasons, since highly vulnerable natural systems are able to withstand anthropogenic loads that are extremely limited in space.

In a word, the focal type of development based on large deposits of strategic types of minerals, both today and in the future, remains the only acceptable one in the Arctic. But now we are faced with the urgent task of modernizing the existing heritage and especially the introduction of more energy-efficient and environmentally friendly production technologies.

It is clear that Soviet approaches to the formation and development of the TPK (by the way, very effectively and creatively used in many foreign countries) today require rethinking and modernization. In the new Russia, the development of production entirely at the expense of the state budget is unacceptable, as is the use of a certain contingent in northern enterprises that does not require high wages for hard work. The ideology of TPK in spatial economics has been replaced by a cluster approach, which has been successfully working for a long time in all Western countries and has enormous potential in the Russian Federation. Clusters, as zones of high concentration of economic activity of business entities, make it possible to introduce new forms of innovative processes that increase labor productivity and the level of specialization of all participants. The purpose of the cluster approach is to intensify activities for the implementation of production projects in a certain territory, which should ensure an increase in production efficiency, diversification and improvement of the structure of the economy, increasing its competitiveness, when not an individual enterprise, but a large industrial complex will compete in the relevant market. For example, the model of the oil and gas cluster in the Arctic represents a balanced interaction of a group of production, service, scientific and educational organizations (oil refining enterprises, petrochemical, geological exploration and oil production companies, icebreaker and tanker fleet services, port infrastructure, universities and scientific organizations).

However, as international experience shows, the most successful clusters are formed where a "breakthrough" is made or expected in the field of technology and production technology with subsequent entry into new market niches. "Collecting" clusters from "debris and waste" of industries and market sectors that are in a state of decline, as a rule, does not lead to success.

An analysis of the clusters that are currently forming in the Arctic zone allows us to identify several leading sectors that, it seems, will receive the most intensive development in the near future: fuel and energy, timber industry, logistics, ecology and tourism, biotechnology, agro-industrial complex. The most industrially developed Murmansk and Arkhangelsk regions have significant potential for the formation of clusters. Each of these regions has its own specifics, both are historically focused on servicing the oil and gas sector and participating in activities that ensure the operation of the Northern Sea Route. The competition that has arisen between Murmansk and Arkhangelsk for the status of the main logistics operator, in our opinion, is temporary and makes little sense, because each region, performing certain functions, contributes to the "Arctic piggy bank". In the field of oil and gas production, both regions are associated with the development of fields in the Barents and Kara Seas, which entails the need to develop coastal infrastructure, the condition of which will determine success in the development of mineral resources, year-round use of the Northern Sea Route, and the interest of foreign investors in participating in Arctic projects. However, it must be taken into account that the process of innovative restructuring with the formation of interaction between many players, from firms to regional authorities, requires a lot of time. In addition, since a difficult economic situation has developed in the Arctic zone, due to an almost twenty-year period of neglect and stagnation, it is obvious that the cluster approach cannot be implemented here without special preparation, government subsidies, intensive cooperation of efforts of both business at all levels and municipal and regional authorities. In 2006, the Federation Council, together with the Higher School of Economics Research University, with the assistance of the Russian-Canadian NORDEP program, prepared "Methodological recommendations for the implementation of cluster policy in the northern regions." The recommendations identified a wide range of issues regarding the participation of all levels of government in supporting and promoting regional clusters, carried out an analysis of existing cluster initiatives in the northern regions, and considered the tasks and instruments of cluster policy.

As already mentioned, the idea of support zones in the Arctic is set out in the new Federal Law "On the Development of the Arctic Zone of the Russian Federation," presented in the summer of 2020 for discussion by interested departments and the scientific community as the main form of spatial development of the regions.

To date, there is no final decision: whether the new bill will be adopted as the main federal act or will turn into "targeted" by-laws. While it is under consideration by the Government of the Russian Federation, the analysis of proposals from the regions, as well as the financial possibilities for its implementation, continues. The prospects for the latter are not very bright: the Russian Ministry of Economic Development, taking into account the comments of the Ministry of Finance, proposed reducing expenses for the state program for the development of the Arctic from 2018 to 2035 by four times (from 209.7 billion to 50.9 billion rubles). However, regardless of the amount of future funding, the bill raised many questions among the expert community.

For example, doubts arise about the appropriateness of the proposed mechanism for managing the development of the Arctic zone. For these purposes, it is proposed to create a new authorized executive body, and for each support zone (there are eight of them, according to the number of subjects of the Federation in the zone) - a "Project Office of the Support Development Zone." Judging by the list of rights and responsibilities of the new formations, two more heavy bureaucratic structures are being created, intermediate between federal bodies and enterprises operating in the region. All powers to develop scientific programs and select topics for inclusion in the state scientific research plan will be transferred to a new executive body, which will, together with the leadership of the Arctic subjects of the Federation, local authorities will coordinate this plan and monitor its implementation. Is there a need to create a new body when there are a large number of highly professional scientific centers that have accumulated a large amount of analytical and information material on the Arctic and the North, and present scientifically developed plans for long-term research based on many years of work to study the entire range of problems? Are we, in the person of the new body, building another Skolkovo, where billions of budget funds have been invested, but scientific results corresponding to such investments have not yet been obtained?

Moreover, in the new law, the northerners did not see answers to the questions that concern them: will the Arctic be developed on a rotational basis or are full-fledged settlements with a full range of services needed; when will the problem of traditional land use for the indigenous peoples of the North be resolved; Is the regional practice of setting lease payments for reindeer pastures at the level of 300 thousand rubles legal? per year (in the Vorkuta district, despite the fact that in the Nenets district similar payments amount to 18 thousand per year); when will the law on free and indefinite use of lands for the indigenous population be adopted; When will they finally introduce rent payments for the development of mineral resources in the Arctic, or, for example, a tax on progressive capital, so that this region can begin to fully develop? Unfortunately, This is not the first time we have encountered quasi-novel approaches in regional politics, which obscure the real picture on the ground, create bureaucratic barriers to free development, introduce additional reporting and inspections, and hamper healthy initiative from the localities with their regulations.

The Kola, Arkhangelsk and North Yakutsk zones are considered to be the most prepared today for the formation of a supporting framework for the re-industrialization of the Arctic. All of them have strong economic prerequisites for accelerated development and in recent years have focused on the formation of clusters of a certain specialization on the basis of existing industrial enterprises and companies associated in their activities with a specialized center.

The implementation of the Kola Support Zone project on a full scale requires certain decisions at the federal level, in particular on granting the Murmansk seaport the status of a special port zone, as well as on the mechanisms for the formation of the so-called Pomeranian zone in the Barents region (the latter project also affects the Arkhangelsk region). Based on the industries that currently determine the specialization of the region, marine, mining and chemical and fishing clusters can be formed. They are represented by a number of large companies that are competitive not only on the national market, but also on the world market. The region has port facilities (operating and projected), vessels of various profiles and an icebreaker fleet, a repair base, highly qualified workers and management personnel.

Arkhangelsk support zone. In recent years, most enterprises in the Arkhangelsk region have been focused on supplying products for large-scale oil and gas projects (development of the Prirazlomnoye oil field, construction of the Varandey terminal, as well as development of the Bovanenkovo gas field on the western coast of Yamal). Eight years ago, the Constellation association was created in the region, which included, in addition to such large enterprises as Sevmash and Zvyozdochka, hundreds of medium and small enterprises - suppliers and contractors of the oil and gas industry. High-tech engineering companies are attracted, connections are established with regional and foreign industry operators. The Yamal LNG project alone became the core for attracting 70 local companies. That is, an oil and gas cluster is practically already being created. In general, there are three more clusters operating in the region - shipbuilding, timber and social, and two more are in the process of creation - biotechnological and fishing. This is the real picture in the area where clustering processes have developed at the regional level, a clear understanding of the need for cooperation and interaction in order to achieve greater benefits for each

level of enterprises and sustainability in the labor market.

Great prospects are associated with the Yamalo-Nenets and Nenets support zones, where the main centers of hydrocarbon production in the Arctic are located. These two subjects of the Federation have not only achieved success themselves thanks to the development of extractive industries and transport infrastructure, but are also major customers of various products outside their regions, attracting many enterprises, firms, research centers, forming modern-type oil and gas clusters.

The proposal to create a North Yakut support zone was perceived by local authorities in the Republic of Sakha (Yakutia) as a very promising project with a large backlog. First of all, a rationale has emerged for the revival of the seaports of Tiksi and Zelenomyssky, where both concrete piers and hydraulic bases have been preserved; the river-sea class fleet will undergo renovation, which will be provided by the modernized Zhatai shipyard. In the future, it is planned to launch the shortest meridional transport corridor from northwest China to Western Europe through Skovorodino, Yakutia and the Northern Sea Route.

Norilsk support zone in the Arctic part of the Krasnoyarsk Territory already has two powerful clusters, occupying one of the leading places in the Eastern Arctic. The core of the first of them is the Norilsk mining and chemical complex (one of the main users of the Northern Sea Route). The second is being formed on the basis of oil and gas fields of the Vankor group, located in the Taimyr and Turukhansk regions.

Vorkutinskaya and Chukotka support zones are still seen as a contour image on the map of the socio-economic space of the Arctic, since their exceptional raw material potential, which was already tapped to a certain extent in Soviet times, has been poorly used in recent years: a significant part of the local mining centers have been experiencing a serious decline since the beginning of market reforms or have been withdrawn from industrial use. In the near future, obviously, one should not expect a rapid change in the situation: the state does not consider the industrial development of mineral deposits in these territories as a priority task, and private investors are not ready to take risks alone.

Consideration of the prospects for the development of support zones presented in the Federal Law "On the Development of the Arctic Zone of the Russian Federation" shows that the industrial scheme for the development of the Arctic based on resource-exploiting industries is preserved. Harmonization of the development process, which takes into account the importance of all types of natural resources on land and sea, renewable and non-renewable, is not prioritized in the document, and this is alarming. Meanwhile, the initial stage of development, typical for a significant part of the Arctic territories, especially for coastal zones, which are the most dynamic in nature and environmentally vulnerable, makes it possible to use the experience of already developed similar habitats in other countries, avoid historically accumulated mistakes, and apply new world methods and technologies of the last 20 years. The new bill provides for financial support for activities and priority projects from the budget system of the Russian Federation and extra-budgetary sources, in a ratio of 1:4. But with such a distribution of financial investments, it is difficult to expect much enthusiasm from business. It is well known that in regions with difficult natural and climatic conditions, the state must lead the way and create infrastructure, which subsequently attracts business.

As in previous years, the Arctic faces a relatively low level of funding for investment programs. At the same time, it is obvious that for greater efficiency in the use of limited funds in the development of strategic documents and basic laws that will determine the conditions and directions of the Arctic zone, it would be necessary to more actively involve the already developed arsenal of scientific proposals from leading scientific centers that have been associated with the Arctic and its problems for decades. In fact, the main expected goal of the new law was to create a working algorithm for solving strategic problems for the future development of Russia in the Arctic region. After almost 20 years of neglect of the Arctic by the state, the present period can be considered as a return to high latitudes, but with the understanding that in the 21st century. this must happen on a fundamentally new motivational and technological basis. The previous period with the most active activity in the 1950–1980s was not only characterized by high financial and labor costs with the determining role of the state, but was also marked by the acquisition of vast experience in solving complex technical and technological problems, which brought the country to the forefront of Arctic exploration in the world. However, at the present stage, when developing new development concepts and approaches, it is necessary to take into account the main conclusions from the difficult experience of past decades, namely:

1) The Arctic does not forgive mistakes; its development is not a sprint, but a long marathon;

2) you cannot "fight" the Arctic, you need to understand its specifics and patterns of development and competently integrate into natural processes, without destroying the ecological balance through technogenic impact, so as not to complicate life and work here for future generations;

3) the use of high technologies, knowledge-intensive products, and innovative approaches is a distinctive feature of the Arctic development process; their main goals are the efficient and safe development of resources, minimizing human participation in production processes, creating materials and technical

means that help reduce costs for all types of work while maintaining high reliability of their operation;

4) When developing new concepts for the development of the Arctic and preparing new legislative initiatives, it is necessary to take into account existing and proven effective scientific methods for organizing the socio-economic space.

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