Formation of new conditions for the development of the Arctic zone of the Russian Federation with a focus on high technologies and environmental restrictions

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Abstract. The authors identify and re-evaluate some of the necessary factors, conditions and key indicators of development of the Arctic zone of the Russian Federation, important in identifying challenges in the development of technologies and innovations. It is shown that in modern conditions it is necessary to actively introduce breakthrough technologies, to identify opportunities for formation, organization, financing and management of priority directions of the economic development. Result of research. As part of the search for management solutions, the change in indices and indicators of development and forecasting of the Arctic zone of Russia has been studied. Conclusions are due to research, analysis, identification of problems of scientific and technological development of the Arctic zone of Russia. Recommendations for the development of a new Strategy for Scientific and Technological Development of the Arctic Region are presented. New tools and mechanisms to achieve the competitiveness of Arctic projects are needed to transition to a new technological order and develop spectacular scientific technologies.

Keywords: Arctic zone of Russia, innovation, scientific and technological development, strategy, development, indicators, indicators.

1. Introduction
The purpose is to analyse and study the organizational conditions, terms and the indicators of the implementation of the forecast and the current legislation for the development of the Arctic Zone of the Russian Federation.

Strategic scientific and technological development of the Arctic zone of the Russian Federation (further – AZRF) where considerable stocks of natural resources and minerals are concentrated,
assumes justification of the purposes of development, the analysis of the located potential, technologies and resources for its mastering and assessment of the expected results [1]. When forming ecological strategy [2] it is necessary to provide protection of fauna, as on the continent, and sea inhabitants, careful attitude to poor vegetation of the Arctic zone. A considerable factor in development of Strategy of scientific and technological development is necessity of accounting of reserves of fresh water which becomes more and more valuable object of life activity on Earth. In recent years considerably the research and scientific and technological development of the Arctic became more active [3]. The Northern Sea Route (NSR) in the long term can become the trunk which connects different zones not only the Arctic, but continents. Now such countries as China, India and Japan are also interested in mastering of NSR [4].

In the context of challenging the borders of the Arctic Zone of Russia by related states and the United States, the development of scientific innovative technologies does not receive adequate financial support. At the same time, scientists and developers of new technologies face the need to take into account global changes that affect the Earth’s climatic conditions, circulation of water and air. Natural difficulties and low levels of intelligence are inhibiting the active development of the Arctic Zone. In order to save resources in the practical development of innovative technologies in high latitude conditions, special simulators for training personnel by simulating technological processes in difficult conditions become a necessary direction for investment in Arctic development. From the point of view of the principle of continuity of the production cycle, it is a question of forming a new link of the production chain [5].

2. Methods

The methods of solving the set tasks in the study are analytical, systemic and approaches to identifying relationships between related sectors of the national economy [6], as well as a methodological approach based on systemic, holistic and statist-oriented approach to future projects of the Arctic zone of the Russian Federation.

In modern political, economic and ecological conditions, mastering of explored reserves of gold, oil and gas, coal, rare metals and other natural resources demands forming of full synchronization of two cycles: from production before deep processing of resources; and full stroke of management of development: from forecasts to projects and results of their implementation, as it has been stated in [7].

Effective development of the Arctic zone requires the development of new organizational forms, fundamentally new technologies taking into account national security, including the development of aviation, satellite communications, robotics and others, as it stands in [8].

The search for organizational-economic and conceptual-ideological conditions ensuring the solution of these tasks raises among the necessary questions about the type of economic entity most adequate for:

1. Realization of the above-mentioned tasks, having the corresponding resource potential for this purpose (technological, financial, personnel, intellectual, state support);
2. Formation of own technological potential and technological advantages at the Russian side - in conditions when the technologies necessary for development of high latitudes, such as the Kara and Laptev Seas [9], are not actually available to any country of the world;
3. Ensuring protection of Russia’s interests in the scientific and technological sphere, not limited to the spheres of control over resource and information flows alone, as indicated by, for example, the source [10];
4. Boosting technical, technological and scientific cooperation with companies of other countries participating in the activities of the Arctic Council and other international organizations operating in the region - and directing this cooperation in the interests of Russia.

All the above-mentioned conditions and requirements for an economic entity representing the Russian side in the Arctic are satisfied - from the point of view of organizational structure - by a
monopolist company, what is de-facto described in [11]. Depending on the current business situation, such companies play a role of either:

a) Natural monopoly formed on the basis of economically reasonable optimal minimization of costs and concentration of so-called economically impractical resources - infrastructure, exclusive rights, markets, etc. Natural monopolies are subject to special regulation, including maximum levels of prices and tariffs, approval by public administration of investment programs, dividends and creation/liquidation of corporate funds and diversification, registration in regulatory documents of the necessary conditions for the use of infrastructure and restrictions on resale of products and services of the monopolist and others;

b) Business-type of a de-facto/quasi-monopoly, hence the very type of a large-scale vertically integrated company [12], which even having nominal competitors, will behave in the market as a classic monopolist.

Such companies are usually established and owned by the State and are subject not only to regulation, but also to exclusive powers to represent the founding country in particularly large projects with international participation [13]. One of the major properties is shown to both pure, and enterprise monopoly: a possibility of mobilization of effect of economy of scales, for decrease in long-term average expenses. For instance, in relation to economy of the Republic of Belarus of which social orientation of the enterprises of the industry and energy industry is characteristic, the model legally and theoretically "non-ideal" enterprise monopoly appears the closest that many scientists and publicists declare in quality of the economic entities corresponding to social and economic models of the countries different from the western civilization [14].

The increased interest in the development of natural reserves of the Arctic zone by monopolists of innovative and scientific technologies of representatives of the largest vertically integrated Russian and foreign well-known oil and gas production and service companies (examples: [15]) is based on the possibility of obtaining high added value and expected significant profit from the planned projects. Vertically integrated corporations are interested in developing potential natural oil reserves in the Arctic, which amount to more than 90 billion barrels. Also, attracted by monopolists are significant volumes of expected gas production, which amount to more than 47.3 trillion cubic meters. With gas condensate alone expected to produce more than 44 billion barrels, Russia has significant reserves. The global monopoly corporations are interested in joint development of adjacent territories [17] to the Russian Federation of the Arctic shelf due to the significant availability of hydrocarbon reserves there. In addition to hydrocarbons, many rare earth metals are concentrated in the Arctic zone, including gold, diamonds, mercury, platinum, manganese, tin, etc. In total, the value of reserves in the Arctic zone is estimated at more than $30-35 billion [18].

Monopoly corporations producing equipment and equipment prepared their proposals and took care in advance of agreements and intentions to supply the relevant equipment to major Arctic projects [19]. The practice of involving leading scientific research institutes and technological centres in the formation of new projects, the preparation of programs and the training of workers in the Arctic zone is increasing, as the training of highly professional personnel depends on the effective development and development of projects in the harsh conditions of the Arctic. Special importance is attached to the training of young personnel and the transfer of great experience to scientists and professionals in various sectors of the national economy, as it has been stated in [20].

For example, training of specialists in development of new natural reserves in cementation of wells became possible not in severe conditions of the Arctic, and a framework of the exercise machine which imitates difficult technology processes. Physical and various hydraulic processes in the conditions of the Arctic can be unpredictable, unlike carrying out these works on the continent [21]. Exercise machines (or simulators) for imitation of technology processes allow the studying specialists to make the right management decisions in difficult climatic conditions. The process of well completion is multistage; a possibility of check, comparison and control over technology process by means of the exercise machine allows creating big skills in their preparation. Complex problems of deep cementation of wells, often, become unpredictable and destructive in severe conditions of the
Arctic. Trouble-free operation in severe conditions of the Arctic is a basis for prevention of traumatism, stable safe and trouble-free operation of the companies [22].

3. Results

Regarding development of technologies the program for development of projects of import substitution can increase low activity of the Russian companies. For the past five years, various conferences and exhibitions of scientific technologies in the development of the Arctic have been held, which allow expanding the use of advanced technologies. New scientific methods of development of the Arctic zone require constant exchange of experience, monitoring and survey of monopolist companies [23].

Importance, special role and strategic necessity of Arctic development within the framework of the approved version of the Strategy for Social and Economic Development of Russia. At the same time, attention is drawn to the need for economic stability of the Northern Territories and strategic national security of Russia as a whole [24]. Emphasis is placed on the need to develop the Arctic on the principles of openness, multilateral cooperation and cooperation between state structures, representatives of business, scientific structures and public organizations. Given the active introduction of international monopoly corporations into Arctic projects, there is a need to integrate projects at the international level. International integration processes are sought not only by the near-Arctic countries, but also by those countries that do not have continental borders in the Arctic, as the Northern Sea Route significantly reduces the distance in the transport of goods between the West and the East [25].

Innovative and technologies have been actively used in the development of infrastructure projects for NSR in recent years. Significant progress in the development of Arctic projects is expected due to the introduction of two nuclear power plants. Electric power is the driver of development of all infrastructure projects and provision of continuous navigation in the Arctic. The use of local energy innovations and technologies allows to shape the scientific and technical base of NSR [26].

The construction of more than ten LNG/compressed gas-carrying vessels on SSK “Zvezda” suggests that these Arctic projects are related to the large-scale interests of the state. At the same time, state support of high-tech and capital-intensive shipbuilding is necessary in conditions of strict competition with foreign monopoly shipbuilding plants, as it is stated in [27].

Within the framework of the national project "Science" 28.4 billion roubles are provided for the construction and equipping of scientific equipment of two multifunctional research vessels. Significant innovative project is the design and construction of an ice-resistant self-propelled North Pole platform. [28]. Many investment investments and funds of the state program for the development of the Arctic zone are mainly aimed at the formation of infrastructure. In the forecasts of the development of the Arctic zone, the development of high-tech economic activities in Russia as a whole is unacceptably small. [29].

Table 1 shows production indicators for high-tech processing types of economic activities in Russia.

Table 1. Production indicators for high-tech industries of economic activities in Russia; evaluation based on the open data provided by the Russian Federal Service of statistics – ROSSTAT

| N | Months | 2016 year | 2017 year | 2018 year | 2019 year |
|---|--------|-----------|-----------|-----------|-----------|
|   |        | of the relevant period to the previous period | of the relevant period to the previous period | of the relevant period to the previous period | of the relevant period to the previous period |
| 1 | 1      | 100.7     | 29.5      | 123.0     | 32.8      | 110.1     | 45.8      | 65.6      | 30.6      |
| 2 | 2      | 119.2     | 141.6     | 83.3      | 95.9      | 99.2      | 86.4      | 101.3     | 130.8     |
As it can be seen from Table 1, in recent years there has been a steady decline in the index on the development of high-tech manufacturing activities in Russia. At the same time, the projected recoverable natural reserves of Arctic hydrocarbon raw materials are estimated at 258 billion tons in the future [30].

Table 2. Comparative analysis of financial results of profitable and loss-making organizations in AZRF and the Russian Federation (million roubles), evaluation based on the open data provided by the Russian Federal Service of statistics - ROSSTAT

| N  | Title                                                                 | 2016        | 2017        | Change in million roubles | %Change  |
|----|-----------------------------------------------------------------------|-------------|-------------|---------------------------|----------|
| 1  | Financial result of profitable organizations in the Arctic zone of the Russian Federation (except small business entities) |             |             |                           |          |
| 2  | AZRF                                                                 | 1042158     | 870205     | -171953                   | -16.5%   |
| 3  | RF                                                                    | 1319543     | 1227610    | -919335                   | -7.0%    |
| 4  | AZRF : RF                                                             | 7.9%        | 7.1%       |                           |          |
| 5  | Financial result of loss-making organizations in the Arctic zone of the Russian Federation (except small business entities) |             |             |                           |          |
| 6  | AZRF                                                                 | 48720       | 119635     | +70915                    | +145.6%  |
| 7  | RF                                                                    | 1607732     | 1955575    | +347843                   | +21.6%   |
| 8  | AZRF : RF                                                             | 3.0%        | 6.1%       |                           |          |
| 9  | Share of profitable organizations of the Arctic zone of the Russian Federation (except small business entities) |             |             |                           |          |
| 10 | AZRF                                                                 | 66.2        | 66.5       | Share of profitable organizations - ratio of number of profitable organizations to total number of organizations |          |
| 11 | RF                                                                    | 74.0        | 73.7       |                           |          |

As can be seen from Table 2, in AZRF in 2017 the financial results of profitable organizations in the amount of 171953 million roubles decreased sharply, which was 16.5%. At the same time in the Russian Federation the financial result of profitable organizations decreased by 919335 million roubles, which amounted to 7.0%. In terms of the financial result of loss-making organizations of AZRF there is a similar situation. The increase in losses for loss-making organizations occurred in the total version by 70915 million roubles, which amounted to 145.6% compared to 2016. At the same time in the Russian Federation losses of loss-making organizations amounted to 347843 million roubles in total terms, and in percentage ratio 21.6% [31].
In recent years, there have been many IT forums for the development of the Russian oil and gas industry. The transition to a new technological era is impossible without digital technologies, further automation not only of the oil and gas industry, but also of all types of economic activities [32]. Scientists' development of new energy sources indicates the advancement of scientific technologies. The vector of development of effective scientific and technological projects of the Arctic zone is important. However, events and forums have headlines about the development of mainly oil and gas companies with the participation of large vertically integrated international monopoly structures. Many trends in the development of new technologies are aimed at short terms, that is, at 1-2 years, and the development of promising technologies and obtaining a prototype of innovative products, the exit to the industrial design of intellectual products, as well as possible serial production require longer terms from 3-5 years or more.

Table 3 provides information on the volume of investments in fixed assets in the Arctic regions for 2017.

Table 3. Investments in fixed assets carried out in the Arctic zone of the Russian Federation by sources of financing in 2017; evaluation based on the open data provided by the Russian Federal Service of statistics - ROSSTAT

| N | Region | Investments in fixed assets | Own sources | Raised funds |
|---|--------|----------------------------|-------------|-------------|
|   |        | Thousands rub | % | Thousands rub | % | Thousands rub | % |
| 1 | Republic of Karelia | 349 421 | 100 | 110 537 | 31.6 | 238 884 | 68.4 |
| 2 | Republic of Komi | 5 266 726 | 100 | 4 694 582 | 89.1 | 572 144 | 10.9 |
| 3 | Nenets Autonomous District | 106 310 165 | 100 | 84 021 391 | 79.0 | 22 288 774 | 21.0 |
| 4 | Arkhangelsk region (except for Nenets Autonomous District) | 54 227 312 | 100 | 18 494 680 | 34.1 | 35 732 632 | 65.9 |
| 5 | Murmansk Region | 107 623 032 | 100 | 61 104 561 | 56.8 | 46 518 471 | 43.2 |
| 6 | Yamalo-Nenets Autonomous District | 1 051 444 407 | 100 | 242 592 878 | 23.1 | 808 851 529 | 76.9 |
| 7 | Krasnoyarsk Krai | 143 492 901 | 100 | 93 034 326 | 64.8 | 50 458 575 | 35.2 |
| 8 | Republic of Saha (Yakutia) | 3 794 336 | 100 | 3 583 454 | 94.4 | 210 882 | 5.6 |
| 9 | Chukot Autonomous District | 11 856 234 | 100 | 5 325 574 | 44.9 | 6 530 660 | 55.1 |
| 10 | Total Arctic Zone of the Russian Federation | 1 484 364 534 | 100 | 512 961 983 | 34.6 | 971 402 551 | 65.4 |

As it can be seen from Table 3, investments in fixed assets at the expense of attracted funds grow only in those regions where oil and gas industries are significantly developed, that is technological chains are used: production without deep processing. Monopoly corporations in their forecasts and intentions intend to develop on the territory of oil and gas fields the application of 3D-technology, digital models of asset dynamics, technologies of virtual industrial automation, robotics, and thus increasing the efficiency of business with reduction of the share of human factor, reduction of
accidents, optimization of information security of remote control of processes of natural resources extraction. In the harsh conditions of the Arctic, digitalization allows to increase the safety of people, reduce the costs of their maintenance in the harsh conditions of the Arctic.

4. Discussion
The demand for a new science-based strategic concept of technological development of the Arctic zone of the Russian Federation is up to date. The activity of business-type monopolists that are subdue to the Russian state and serve the country’s national interests becomes a key factor here.

In theory, the fact is that the "downward line" of the income limit function for the monopolist can pass both above and below the level of price that would be formed under the competitive structure of the market. But from a practical point of view, in the context of the state limiting the maximum price level for monopolists, the theoretical model of marginal income itself does not exclude the profitable work of the monopolist at relatively low prices. These properties and patterns of operation of the monopolies of the energy industry do not prevent them from being producers of cheap and accessible resources for society, which corresponds to the ideas of most non-Western cultures about the public goods and services, the management of which cannot be reduced to sole profit-gaining and shareholders’ income.

However, in real practice, in order to avoid the likely reduction (due to low prices) of fixed assets and scientific and technical damage at regulated prices, the monopolist uses natural behaviour - cross-subsidization, price discrimination and dumping. It should be accepted that in a non-Western economic model, cross-subsidization, price discrimination and dumping are inevitable, natural and should be in a milder legal framework than in the West, necessarily reflecting the specificity of national long-term strategic objectives and system economic linkages.

In the West during the 20th century, negative attitudes were legally established towards market practices natural to the monopolist, when the company was subjected to large fines, forced reorganization, and its management – even to a criminal prosecution in some cases. This formal concept of antitrust regulation is based on the formal principle of balancing revenues and costs of a large company, in fact, masks the non-economic interests of large companies when they go beyond the national economy. Large projects, even with potential international participation, can be imagined as a higher level of competition between companies, each using typical market techniques for monopolists.

Monopoly corporations, within the framework of effective management, form digital technologies in terms of supply chain management and procurement for Arctic projects. Digital automated drilling and other installations developed by monopoly international companies can be seen as an example modern representation effective development of Arctic zone territories.

5. Conclusion.
The formed development of the Arctic zone of the Russian Federation requires a fundamental review of strategic, tactical and functional objectives for the long, medium and short term. The shift of the mining industry to the northern regions should be not only a "territory of international dialogue," but also an optimal platform for deep processing and technological breakthrough of the Russian Federation. In order to ensure a technological breakthrough through the use of Arctic resources, it is necessary to develop a new Strategy or update existing regulatory documents with regard to the development of innovative technologies of the next generation, with a focus on the formation of high value added in various projects. Only national-oriented and state-controlled full-cycle monopolist companies can guarantee such an approach to the development of the Russian Arctic Zone that is congruent to the country’s long-term strategic interests and goals.
References

[1] Komkov N.I., Selin V.S., Tsukerman V.A., Goryachevskaya E.S. PROBLEMS AND PERSPECTIVES OF INNOVATIVE DEVELOPMENT OF THE INDUSTRIAL SYSTEM IN RUSSIAN ARCTIC REGIONS // Studies on Russian Economic Development. 2017. vol. 28. № 1. pp. 31-38.

[2] Leksin V.N., Porfiryev B.N. SOCIAL AND ECONOMIC PRIORITIES OF SUSTAINABLE DEVELOPMENT OF THE ARCTIC MACROREGION OF RUSSIA // Regional economy 2017. vol. 13. No. 4. pp. 985-1004.

[3] Didenko, N., Rudenko, D., Skripnuk, D. ENVIRONMENTAL SECURITY ISSUES IN THE RUSSIAN ARCTIC, 2015, International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, 3(5), pp. 267-274

[4] Leksin V.N., Porfiryev B.N. SPECIFICS OF TRANSFORMATION OF THE SPATIAL SYSTEM AND THE STRATEGY OF REDEVELOPMENT OF THE RUSSIAN ARCTIC IN THE CONDITIONS OF CLIMATE CHANGES // Regional economy, 2017. vol. 13. No. 3. pp. 641-657.

[5] Rudenko, D., Skripnuk, D. ENVIRONMENTAL KUZNETS CURVE: THE CASE OF ARCTIC RUSSIAN REGIONS, 2016, International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, 3, pp. 209-216

[6] Skripnuk, D., Kikkas, K., Romashkina, E. SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL SECURITY IN THE COUNTRIES OF THE CIRCUMPOLAR NORTH, 2019, E3S Web of Conferences, 110,02037

[7] Didenko, N.I., Cherenkov V.I. ECONOMIC AND GEOPOLITICAL ASPECTS OF DEVELOPING THE NORTHERN SEA ROUTE, 2018, IOP Conference Series: Earth and Environmental Science, 180(1),012012

[8] Skripnuk, D.F., Kikkas, K.N., Safonova, A.S., Volodarskaya, E.B. COMPARISON OF INTERNATIONAL TRANSPORT CORRIDORS IN THE ARCTIC BASED ON THE AUTOREGRESSIVE DISTRIBUTED LAG MODEL, 2019, IOP Conference Series: Earth and Environmental Science, 302(1),012096

[9] Kikkas, K.N., Cherenkov, V.I., Berezovskaya, I.P., Anosova N.E. THE APPLICATION OF THE ARCH MODEL FOR THE ASSESSMENT OF TRANSPORT ROUTES IN NORTHERN EUROPE AND SOUTHEAST ASIA, 2019, IOP Conference Series: Earth and Environmental Science, 302(1),012100

[10] Kikkas, K., Romashkina, E. POTENTIAL OPPORTUNITIES FOR THE ARCTIC TRANSPORT SPACE, 2018, IOP, Conference Series: Earth and Environmental Science, 180(1),012016

[11] Kikkas, K.N., Kulik, S.V., Kreppkaia, T.N., Mokhorov, D.A. ANALYSIS OF THE ECONOMIC RELATIONS OF THE CIRCUMPOLAR COUNTRIES, 2019, IOP Conference Series: Earth and Environmental Science, 302(1),012093

[12] Ivanter V.V., Uzyakov M.N., Shokhin I.N., Shirov A.A., Suvorov A.V., Nekrasov A.S., Sinyak Yu.V., Ksenofontov M.Yu., Budanov I.A., Borisov V.N., Korovkin A.G., Panfilov V.S., Govtvan O.D., Shurakov A.G., Komkov N.I., Frolov I.E. LONG-TERM FORECAST OF RUSSIAN ECONOMIC DEVELOPMENT FOR 2007-2030: POSSIBLE OPTIONS // Studies on Russian Economic Development. 2007. vol. 18. № 6.pp. 565-592.

[13] Komkov N.I., Tsukerman V.A., Goryachevskaya E.S. ANALYSIS OF THE MAIN FACTORS OF INNOVATIVE DEVELOPMENT OF THE ARCTIC REGIONS OF RUSSIA // Studies on Russian Economic Development. 2018. vol. 30. № 1 pp. 22-27

[14] Ivanter V.V., Govtvan O.D., Gusev M.S., Ksenofontov M.Y., Kuvalin D.B., Moiseev A.K., Porfiryev B.N., Semikashev V.V., Uzyakov M.N., Shirov A.A. SYSTEM OF MEASURES TO RECOVERY OF ECONOMIC GROWTH IN RUSSIA // Studies on Russian Economic Development. 2018. vol. 29. № 1.pp. 1-5.
[15] Didenko, N.I., Skripnuk, D.F., Kikkas, K.N., Romashkin, G., Kulik, S.V. THE ANALYSIS OF CONVERGENCE - DIVERGENCE IN THE DEVELOPMENT OF INNOVATIVE AND TECHNOLOGICAL PROCESSES IN THE COUNTRIES OF THE ARCTIC COUNCIL, 2018, International Conference on Information Networking, 2018-January, pp. 626-631

[16] Leksin V.N., Porfiryev B.N. ORGANIZATION OF SYSTEMIC MONITORING OF THE MACROREGIONS' DEVELOPMENT: CASE STUDY OF THE RUSSIAN ARCTIC // Regional Research of Russia. 2017. vol. 7. № 3. pp.189-196.

[17] Leksin V.N., Porfiryev B.N. STATE AND TASKS OF PUBLIC ADMINISTRATION BY SOCIAL AND ECONOMIC DEVELOPMENT OF THE RUSSIAN ARCTIC: LEGAL ASPECT // Problems of the public and municipal administration. 2018. No. 2. pp. 114-138

[18] Komkov N.I., Selin V.S., Zuckerman VA., Goryachevskaya E.S. PROBLEMS AND PROSPECTS OF INNOVATIVE DEVELOPMENT OF THE INDUSTRIAL COMPLEX OF THE RUSSIAN ARCTIC // Studies on Russian Economic Development. 2017. No. 1 (160). pp. 41-49.

[19] Komkov N.I., Selin V.S., Tsukerman V.A., Goryachevskaya E.S. PROBLEMS AND PERSPECTIVES OF INNOVATIVE DEVELOPMENT OF THE INDUSTRIAL SYSTEM IN RUSSIAN ARCTIC REGIONS // Studies on Russian Economic Development. 2017.vol. 28. № 1. pp. 31-38.

[20] Leksin V.N., Porfiryev B.N. RUSSIAN ARCTIC TODAY: SUBSTANTIAL INNOVATIONS AND LEGAL COLLISIONS // Regional economy. 2018. vol. 14. No. 4. pp.1117-1130.

[21] Dyatlov, S.A., Didenko, N.I., Lobanov, O.S., Kulik, S.V. DIGITAL TRANSFORMATION AND CONVERGENCE EFFECT AS FACTORS OF ACHIEVING SUSTAINABLE DEVELOPMENT; 2019, IOP Conference Series: Earth and Environmental Science, 302(1),012102

[22] Dmitrievskiy A.N., Komkov N.I., Krotova M.V., Romantsov V.S. STRATEGIC ALTERNATIVES OF IMPORT SUBSTITUTION OF POWER EQUIPMENT FOR THE OIL-AND-GAS SECTOR. // Studies on Russian Economic Development. 2016. vol. 27. № 1. pp. 21-33.

[23] Romashkina G.F., Didenko N.I., Skripnuk D.F. SOCIOECONOMIC MODERNIZATION OF RUSSIA AND ITS ARCTIC REGIONS // Studies on Russian Economic Development. 2017. vol. 28. № 1.pp. 22-30.

[24] Zuckerman V. A., Goryachevskaya E.S. MANAGEMENT OF INNOVATIVE TECHNOLOGICAL DEVELOPMENT OF THE MINING AND PROCESSING ENTERPRISES OF THE ARCTIC ZONE OF THE RUSSIAN FEDERATION // Mountain informational and analytical bulletin (scientific and technical magazine). 2017. No. 6. pp. 5-13.

[25] Selin V.S., Larichkin F.D., Zuckerman V. A., Goryachevskaya E.S. PROBLEMS OF NATIONAL INDUSTRIALIZATION AND INDUSTRIAL POLICY OF RESOURCE RAW MATERIAL COMPANIES OF THE ARCTIC ZONE OF THE RUSSIAN FEDERATION // Mountain magazine. 2016. No. 10. Page 25-30.

[26] Tsukerman V.A., Kozlov A.A. OUTSOURCING NONCORE ACTIVITIES OF INDUSTRIAL ENTERPRISES IN THE ARCTIC ZONE OF THE RUSSIAN FEDERATION // Studies on Russian Economic Development. 2018. vol. 29. № 3 pp. 252-256

[27] Selin V.S., Zuckerman V.A., Selin I.V. COORDINATION OF INTERESTS IN THE COURSE OF INNOVATIVE MANAGEMENT OF MOUNTAIN ARCTIC CORPORATION // Mountain informational and analytical bulletin (scientific and technical magazine). 2016. No. 10. pp. 82-92.

[28] Selin V.S., Zuckerman V.A., Selin I.V. INTERACTION OF MINING CORPORATION AND THE REGION WHEN FORMING INNOVATIVE POLICY ON THE EXAMPLE OF MURMANSK REGION // Mountain informational and analytical bulletin (scientific and technical magazine). 2016. No. 9. pp. 115-127.
[29] Usmanova T.Kh. PROJECTS OF DEVELOPMENT OF INTERACTION OF FEC AND HCS: PROBLEMS OF FORECASTING AND MANAGEMENT // Studies on Russian Economic Development. 2018. T. 29. № 3. pp. 274-279.

[30] Komkov N.I., Selin V.S., Tsukerman V.A., Goryachevskaya E.S. SCENARIO FORECAST OF THE DEVELOPMENT OF THE NORTHERN SEA ROUTE Studies on Russian Economic Development. 2016. vol. 27. № 2. pp. 180-188.

[31] Efremova, I., Didenko, N., Rudenko, D., Skripnuk, D. Disparities in rural development of the Russian Arctic zone regions, 2017 Research for Rural Development 2, pp. 189-194

[32] Rudenko, D.Y., Pogodaeva, T.V., Didenko, N.I. Poverty alleviation strategies in the Russian arctic zone regions, 2015, Mediterranean Journal of Social Sciences ,6(1), pp. 32-39
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