Innovative Development Management of Mining Industrial Companies in the Russian Arctic Zone

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Abstract. Management of innovative development of mining companies of the Arctic zone of the Russian Federation. The paper presents the results of research on the management of innovative development of mining companies of the Arctic zone of the Russian Federation. When managing the innovative development of Arctic mining corporations it is proposed to focus on three areas: outsourcing non-core activities, institutional and investment approaches. In the paper the existing problems of each of the three areas are analyzed and basic recommendations for their development, taking into account the specific features of the economy of the Russian Arctic regions, are developed. Practical examples of actions of companies for innovative development in line with the proposed directions are considered. The conducted studies are of great theoretical and practical importance for the innovative development of mining companies of the Arctic zone of the Russian Federation, increasing the quantitative and qualitative indicators of development and processing of mineral raw materials, the exploitation efficiency of natural resources and transition of the Arctic territories to an innovative development way.

1. Introduction
Mining industrial companies are the basis for industrial development in the Russian Arctic zone (hereinafter referred to as the Arctic). Mineral extraction accounts for about 75% of tax revenues and fees to the budget system of the Arctic regions, which is three times higher than the similar value in the Russian Federation [1,2].

The document adopted in 2010 by the Organization for Economic Cooperation and Development - "Innovation Strategy" can be a basis for the innovative development of the mining companies in the Arctic [3]. The strategy provides five directions for developing a complex strategic approach:

- organization of conditions and incentives for realizing the innovative potential of the population;
- formation of new directions for innovations in the business sector;
- increasing competencies and use of knowledge;
- development and application of innovations to solve social and global problems;
- improving state regulation in the field of innovation.

Innovative nature of the mining industry is often questioned, however, using performance statistics, it can be shown that the innovative level of the mining companies is comparable to those of other industries [4].
Innovative development of the mining industrial companies of the Arctic provides for institutional and investment approaches and outsourcing of non-core activities.

The novelty and originality of the work is caused by searching for a balance between balanced managerial decisions made with the harsh climatic conditions taken into consideration, low population density, high life support costs, fragility and vulnerability of the natural balance of ecosystems, the focal type of industrial development of the territories, limited transport accessibility, underdeveloped energy infrastructure, and other northern peculiarities.

2. Institutional approach

Institutional approach requires: the creation of federal legislative acts in the field of innovation, development of a mechanism for managing the business sector in the direction of transition to an innovative type of economic growth, formation of effective incentives for scientific organizations and corporations to develop and implement innovations, development of information and advisory activities for participants of innovative process, creation of an insurance system for innovative and investment risks [5].

Besides it is necessary:

- to adopt the federal law “On Development of the Arctic Zone of the Russian Federation” with the aim of regulating the relations arising in the process of implementing the main goals and directions of the state policy of the Russian Federation in the Arctic macroregion aimed at creating conditions for complex socio-economic development of ice conditions;
- to intensify activities of the State Commission for the Development of the Arctic through creation of the special working group to improve the quality of the state regulation system of innovative;
- to create a scientific and methodological basis for coordinating the interests of the state, regions and corporations in the Arctic. According to the authors the most important element in coordinating the interests of the state, regions and corporations in the Arctic is public-private partnership.

To coordinate interests of the state, regions and companies in the Arctic a serious methodological basis is required. Two methods for coordinating innovation policy in the Arctic when preparing the management decision: normative and expert are proposed.

The most important element coordinate interests of the state, regions and companies in the Arctic is state-private partnership. In the Arctic reconciliation of interests on the basis of state-private partnerships can take a dominant importance at least for two reasons. First, project investment involving attraction of capital and investors to various projects, new promising business ideas, new technologies has a special significance in this macroregion in connection with the resource and raw materials orientation of the industry. Secondly, more than half of industrial productions are located in single-industry towns, where interactions with the basic enterprise (which as a rule is part of the corporation) are extremely necessary not only in the economic but also in the social sphere.

Companies can agree to have additional costs, including social costs, costs for the region or municipalities where their enterprises are located, for a number of purposes including:

- reduction of expenditures of the enterprise for other goals in commensurate amounts;
- improvement of the infrastructure of the region and municipalities used by the personnel of the enterprise, which positively effects “climate” in the team and labor productivity;
- improving the image and influence of corporations in territorial formation.

Expenditures of companies can be formed within adapted normative legal instruments, local contracts and agreements. Such a normative legal instrument can be so-called tripartite agreements signed by the corporation, its base enterprise and the regional government. Thus, for example, in the period 2010 - 2015 JSC “Apatit” (Murmansk region) formed and got approved by PJSC “FosAgro”, a tripartite agreement on the transfer of additional taxes to the budgets of the region and municipalities. The main part of which was returned to the company's accounts for repayment of multi-million debts created by municipal organizations for the heat supplied by the boiler houses of JSC “Apatit”.

At the corporate level, it is necessary to create and develop innovative systems. An innovative system of companies is a set of human resources with their knowledge, skills, behavior, and institutions
interacting between each other within the enterprise in the direction of developing, implementing, supporting and distributing innovative technologies. The system is based on the effective operation of various subsystems, including: investment, information, personnel, technology and marketing [6].

Improving the innovative systems of mining companies in the Arctic will require:

- creation of an effectively functioning network of information resources that allow all participants in the innovative process to obtain the required data, exchange them, and also receive reliable information from their enterprises and their activities;
- formation of a system of training and professional development of specialists, created on the basis of a unified concept and methodology of managers at all levels of the corporation (corporate training) [7].

As an example of successfully functioning corporate training, we can cite the Private educational institution of additional professional education "Corporate University "Norilsk Nickel", which has been operating since 2006. This educational institution is designed to meet the needs of Norilsk Nickel Group companies in highly qualified personnel. The organization of the training system provides for training and training of managers and specialists, training events aimed at the development of personnel reserve of managers at different levels of management, distance learning courses, trainings and seminars. Much attention is paid to high-quality professional training of workers in accordance with the growing production requirements and long-term development plans of Norilsk Nickel.

Improvement of the innovation systems of companies faces the following problems:

- northern rise in cost of living expenses,
- increased transaction costs,
- shortage of highly qualified specialists,
- used technologies remain, as a rule, at the level of the third technological order;
- insufficient information support.

Formation and effective functioning of innovation systems allows companies to create the necessary prerequisites for implementation of innovative modernization and receiving competitive goods for domestic and international markets [8].

3. Investment approach

Application of the investment approach for innovation and technological development is impossible without financial mechanisms to ensure long-term investment of mining companies.

The Decree of the President of the Russian Federation No. 204 of May 7, 2018, the Government of the Russian Federation was set a number of tasks, one of which is “to accelerate technological development of the Russian Federation, increase the number of organizations that carry out technological innovations to 50 percent of their total number”. Such an increase in innovative activities of enterprises is impossible without financial mechanisms to ensure company investments [9].

An analysis of the financial security of the Arctic companies has shown that out of two dozen of the investigated companies, only one - JSC “Kola MMC” (Murmansk region) has the corresponding amount of investments to accelerate the technological development envisaged by the May decree of the Russian Federation.

Under these conditions, it is necessary to find ways to solve the problem by attracting private investors, which will require creation of favorable conditions for the regional authorities to their work, cooperation with the Industrial Development Fund is possible, which can provide preferential terms for co-financing projects, using of a special investment contract, and an investment tax loan. It should be noted that there is the possibility of increasing capitalization of assets of Arctic companies in order to attract financial resources for investment using such financial instruments as options [10].

4. Industrial outsourcing

The scope of tasks related to acceleration of technological development and increase in the number of organizations implementing technological innovations raises the issue of improving the efficiency of working with problematic and non-specialized assets. There is a developed international practice when
companies transfer of not specialized and problematic business assets on a contract basis to third-party service companies (industrial outsourcing).

The market of services for the mining industrial companies of the Arctic is primarily related to production modernization, use of new materials and innovative technologies, and acceleration of scientific and technological progress. Service companies because of specialized nature of labor, high level of technical and technological equipment, generalization and analysis of the accumulated experience in various types of activities and facilities significantly increase competitiveness compared to similar work performed by companies.

International experience allows asserting that service companies are able to offer and implement a wide range of goods and services to Arctic corporations. For example, in Canada service companies that cooperate with mining industrial corporations in geological exploration, ore mining and processing, metallurgy, construction of buildings, functioning and reclamation of lands are widely spread [11]. At the same time, extraction and processing of natural raw materials in the Russian Arctic can serve as a catalyst for development of service companies that help companies improve competitive advantages at international markets [12].

Non-core activities of mining companies in the Arctic may include:
- repair and maintenance of main technological and auxiliary equipment;
- manufacturing of spare parts and nonstandard equipment;
- transportation service;
- repair and construction works;
- staff catering;
- security activity;
- cleaning of industrial premises;
- social activities;
- maintenance of domestic roads;
- snow removal in winter;
- energy and water supply.

The transfer of business processes to industrial outsourcing allows mining companies to improve their efficiency, including:
- to increase productivity;
- focus on developing new products and services;
- use the released resources on key aspects of core activities;
- to reduce the time of development of new technologies.

An example of successful application of industrial outsourcing is the transfer in 2013 by PJSC “FosAgro” of maintenance services and other activities of JSC “Apatit” to a service company. Since 2014 the corporation has been purchasing technological equipment with service and guarantee of the service company.

Another successful example is the transfer from PJSC “MMC Norilsk Nickel” in 2006 of business processes for maintenance and repair of the main production, performing general construction works when doing major equipment repairs and repairs of various buildings and structures for industrial outsourcing to “Norilsknickelremont” service company.

5. Conclusion
The conducted researches have great theoretical and practical value for technological development of mining corporations of the Russian Federation Arctic zone, increase of quantitative and qualitative indicators of development and processing of mineral raw materials and efficiency of use of natural resources and transition of Arctic territories to an innovative way of development. Taking into account the huge reserves of Arctic mineral resources and special transportation importance (the Northern Sea Route) the importance of the result of such development reaches a global scale.
The management of innovative development of mining corporations taking into account severe climatic conditions, low population density, increased life support costs, fragility and vulnerability of natural ecosystem balance, focal type of industrial development of territories, limited transport accessibility, undeveloped energy infrastructure and other northern features was considered for the first time.

6. References

[1] Tsukerman V A, Goryachevskaya E S, Ivanova L V 2017 On Innovation Activities of Industrial Companies of the North and the Arctic under the Conditions of Resource Restrictions Proceedings of the 2017 International Conference "Quality Management, Transport and Information Security, Information Technologies" (St. Petersburg) Publ. Saint Petersburg Electrotechnical University “LETI” 593-597

[2] Komkov N I, Selin V S, Tsukerman V A, Goryachevskaya E S 2017 Problems and perspectives of innovative development of the industrial system in Russian Arctic regions Studies on Russian Economic Development 1 31-38

[3] OECD 2010 The OECD Innovation Strategy: Getting a Head Start on Tomorrow OECD Publishing (Paris) https://doi.org/10.1787/9789264083479-en

[4] Matysek A L, Fisher B S 2016 Productivity and Innovation in the Mining Industry BAE Research Report 1 (Canberra)

[5] Rytova E V , Kozlov A V, Gutman S S, Zaychenko I M 2017 Analysis of the Regulatory and Legal Framework of the Socio-Economic Development in the Far North Regions of Russia Journal of Advanced Research in Law and Economics vol 7 1828-1836

[6] Peter Bryant The imperative case for innovation in the mining industry https://www.ceecthefuture.org/wp-content/uploads/2016/01/Clareo_Case-for-Innovation-in-Mining_20150910_lo.pdf

[7] Judith Walker & George Sarkodie 2019 Adult education as corporate social responsibility in Canadian mining companies: performing the good citizen for greater self-regulation, Compare: A Journal of Comparative and International Education 49(2) 298-317

[8] Komkov N I, Tsukerman V A, Goryachevskaya E S 2019 Analysis of the Main Factors of Innovative Development of the Arctic Regions of Russia Studies on Russian Economic Development vol 30 1 22–27 DOI: 10.1134/S107570071901009X

[9] Tsukerman V A, Goryachevskaya E S 2019 On Implementing the Strategy of Scientific and Technological Development of the Russian North and the Arctic Advances in Economics, Business and Management Research International Scientific Conference "Far East Con" (ISCFEC 2018) vol 47 814-817 DOI http://doi.org/10.2991/iscfec-18.2019.198

[10] Selin V S, Larichkin F D, Tsukerman V A, Goryachevskaya E S 2016 Challenges of the national industrial development and policy of mineral mining companies in the Arctic Region of the Russian Federation Gorny Zhurnal 10 25-30

[11] MSTA Canada compendium of canadian mining suppliers 2018 https://mstacanada.ca/docs/default-source/default-document-library/mstacanada-2018-compendium.pdf?sfvrsn=2f7d29_2

[12] Tsukerman V A, Kozlov A A 2018 Outsourcing Noncore Activities of Industrial Enterprises in the Arctic Zone of the Russian Federation Studies on Russian Economic Development 3 252-256

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