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MECHANISMS OF PUBLIC-PRIVATE PARTNERSHIP IN SOLVING ENVIRONMENTAL PROBLEMS

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Abstract

In recent decades, the consequences of climate change on the planet have had an increasing impact on the dynamics of the development of national economies. Therefore, it is no coincidence that different parts of the world are adopting environmental programs that solve local and global problems in this area. The research subject is the issues related to environmental problems in the forestry complex of the macroregion of Yenisei Siberia. Their solution is proposed using public-private partnership mechanisms, through the formation of an industrial cluster, specialized financial institutions, and the use of appropriate specialized financial instruments. The study aimed to develop an effective system for solving environmental problems in the macro-region of Yenisei Siberia using public-private partnership mechanisms. One of the study results was assessing the prospects for solving environmental problems based on recycling by combining the activities of the industrial cluster and specialized financial organizations. The proposed approaches may be interesting for the subjects of the federation that are part of the macroregion and the world scientific community as a whole.

Keywords: Public-private partnership, national economy, sustainable development, clasters

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1. Introduction

The developed countries of the world and, first of all, the European Union are the leaders in solving environmental problems. The developed countries of the world are adopting the most radical environmental programs, including the "European Green Agreement," "Hydrogen Strategy for Climate Neutral Europe," and other programs. Thus, according to the "European Green Agreement" by the middle of the XXI century, the level of environmental pollution in continental Europe should not exceed zero. For this, it is planned to annually invest in the development of the so-called "green" economy in the amount of up to five hundred billion euros. In turn, the "Hydrogen Strategy for Climate-Neutral Europe" is proposed to use ecologically clean hydrogen obtained by electrolysis as the main energy carrier (Danilova, 2020; Financing the Green Transition…, 2021).

It must be said that the Russian Federation is also undertaking major projects in the field of ecology, for example, the federal project "Ecology" and others. These projects are primarily similar in terms of goals and objectives to the projects of the European Union. They also aim to develop a resource-efficient low-carbon economy that will reduce carbon emissions and other greenhouse gases. Russian projects are also aimed at solving specific environmental problems, including the elimination of environmentally hazardous objects on the country's territory and prevention of the emergence of new and other tasks.

2. Problem Statement

Russian projects in ecology differ from European ones in the mechanisms used for solving existing environmental problems. Their list in the Russian Federation concerning international practices is relatively narrow. This circumstance is mainly because environmental problems in the country began to be solved systematically relatively recently. Moreover, therefore, the Russian environmental regulatory framework is not fully developed. It practically lacks mechanisms based on public-private partnerships, which, unlike Russia, are successfully used in the world's developed countries. At the same time, it is a public-private partnership that allows, through the widespread use of private investments, to increase the efficiency of used public resources, including in such a complex area as the environment.

3. Research Questions

The negative situation in the environmental sphere emerged, including in the forestry complex of the country. This situation requires the adoption of additional decisions, both at the federal and regional levels. They will make it possible to remove the restrictions on the joint use of public funds and private capital in solving environmental problems, which will give a huge potential for scaling up environmental activities in the country. Therefore, at the federal level, it is necessary to supplement the existing regulatory framework with new, more effective public-private partnership mechanisms in solving environmental problems, including in the forestry complex of the country (Anikina et al., 2020; Maskell & Larenzen, 2003; Ragozina et al., 2020).

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4. Purpose of the Study

The study aims to develop an effective system for solving environmental problems in the macro-region of Yenisei Siberia using public-private partnership mechanisms.

5. Research Methods

The study of the existing international practice in solving environmental problems was used for finding more effective mechanisms for public-private partnership in ecology, including in the forestry complex. The international practice of solving environmental problems demonstrates that public-private partnership mechanisms in the field of ecology are widely used. Their application essentially gave rise to a new type of economy, the so-called "green economy." Moreover, its formation is taking place not only in the world's developed countries but also in China, India, and other countries unfavorable in ecology. In general, the development of the "green economy" is proceeding in many areas, including the use of renewable energy sources, reduction of energy consumption by legal entities and individuals, rational use of fossil natural resources (but not based on carbon), and other areas (Enright, 1992; Mikhalev et al., 2020; Yushmanova et al., 2021).

6. Findings

The analysis of international practice in solving environmental problems with the help of public-private partnership mechanisms made it possible to combine them into many groups according to the level of state domination in this partnership. Among them are the following.

The first group presents the mechanism of interaction between the state and private business based on tax instruments. This group assumes that the state provides private businesses with both tax preferences and tax restrictions to solve problems in the environmental sphere of the country. This decision effectively stimulates the participation of private businesses in solving environmental problems in the country. In particular, the European Union provides VAT exemption to purchase small generators on renewable energy sources. In addition, accelerated depreciation of equipment using renewable energy technologies can be carried out. Private investors are provided with investment tax incentives for income tax refunds when investing in projects related to renewable energy sources. In the UK, in 2013, a tax on fuel and energy resources was introduced. At the same time, enterprises using renewable energy sources were exempted from paying it, which stimulates their commercial activities in a particular direction. Moreover, outside of Europe, tax mechanisms are also used. For example, in the United States in 2013–2015, there was a tax break that was up to 2.5 cents per 1 kW*h. generated electricity based on renewable energy sources, which were provided for up to 10 years (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

The second group of public-private partnerships is based on the mechanism of state subsidies for commercial activities of private businesses to address national environmental problems. The state often subsidizes private business parts or the total cost of paying interest rates on loans and bonded loans to solve environmental problems. The costs associated with generating electricity from renewable energy sources

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are often subsidized. Pre-investment costs (costs of developing environmental projects), costs associated with the modernization of facilities based on renewable energy sources, and other costs are subsidized by the state (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

The third group of public-private partnerships is represented by the mechanism of differentiated tariff regulation in the energy sector, transport, and other activities, considering the solution of the state's environmental problems. Thus, in the European Union, electricity obtained with the help of renewable energy sources, despite its high cost for the consumer, is purchased by him in the first place and in full. This solution allows private businesses to recoup the investment costs of these technologies, improve them and make them more competitive. In domestic freight transport in the European Union, at the expense of tariffs, a policy of transferring the transportation of goods to rail and inland waterways is carried out, which helps reduce environmental damage from the road and air transport (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

In the fourth group of public-private partnerships, a quota mechanism and trade in "green" certificates are used for reducing greenhouse gas emissions by energy enterprises. This mechanism is based on certain obligations (quotas) for electricity generating companies for their production using renewable energy sources. In the European Union, the share of energy produced by generating companies based on renewable energy sources by 2025 should be at least 12.1 % (in 2016 – 5.1 %) of the total production. In case of violation of the quota, the generating company must either pay a fine or buy a "green" certificate, which must cover the difference in the existing violation. The "green" certificates themselves are issued by government agencies that regulate their national markets for the production and circulation of electricity. They are issued to producers generating electricity based on renewable energy sources to prevent a certain amount of CO2 emissions, as a rule, one certificate for every several hundred kilograms of this substance. As a result, a situation arises in the energy market when one generating company has a surplus of "green" certificates while the other has a shortage. That is, their circulation arises based on sale and purchase. However, the main thing here is that generating companies have an incentive to improve technologies for electricity production based on renewable energy sources (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

The fourth group of public-private partnerships is a variation of the previous group. It uses a system for trading greenhouse gas emissions from industrial enterprises. This trade began to form after the signing of the Kyoto Protocol in 1997. However, the first public trading in quotas began only in 2005 on a particular trading platform – the European Emissions Trading System. The number of quotas is limited. Moreover, industrial companies must pay either a hefty fine or buy an additional quota for emissions in case of exceeding the quota. At the same time, enterprises can receive free quotes from the state and use quotas of previous years (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

The fifth group is based on the direct use of public funds in implementing environmental projects by private businesses. Through various state institutions, interest-free loans are issued to purchase technological equipment based on renewable energy sources. In addition to loans, entrepreneurs can receive government guarantees for loans from commercial banks for nationally significant infrastructure projects related to environmental protection. The state often uses grants that are issued on a competitive basis to

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private businesses for one-time gratuitous support of environmental projects (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

The sixth group is based on using a stock market mechanism when, on market conditions, corporations' issue so-called "green" bonds, through which environmental projects are financed to protect the environment. They are issued based on the Green Bonds Principles (GBP), initially formulated in 2014 by the most significant investment banks, and then finalized with the support of the International Capital Markets Association (ICMA) in 2015. In this regard, it should be said that in the spring of 2020, based on the GBP, a draft EU Green Bond Standard was developed. According to this project, the funds received from the issuance of green bonds should be directed exclusively to projects related to mitigation of the consequences of climate change, protecting water and marine resources, restoration of biodiversity and ecosystems. At the same time, issues of state, municipal bodies, and international financial organizations (European Investment Bank and others) may also fall into the category of "green" bonds. In the European Union during 2007–2018, "green" bonds were issued in aggregate amounting to 122 billion euros. Moreover, if their first issues were government bonds, then in 2018, 145 European companies were their issuers (Formation of the green bond market in Russia…, 2018; Spiridonova, 2021).

As can be seen from the above, in world practice, quite interesting public-private partnership mechanisms are used, which can be applied in Russia, including in the country's forestry complex. Of course, not all of them are applicable in Russian conditions in the forestry complex of the country. However, some of them, subject to a specific modification, can be used in the forest regions of the Russian Federation.

At the level of the macroregion of Yenisei Siberia, to solve environmental problems in the forestry complex, a specific institutional infrastructure should be used based on the widespread use of public-private partnership mechanisms and tools corresponding to this infrastructure. It is an industrial cluster with all its elements (a specialized organization, industrial and technological infrastructure), and many other separate specialized institutions can act as an institutional infrastructure. In general, the use of an industrial cluster will make it possible to form technological chains based on existing and newly created enterprises to produce end products with high added value. This solution can be implemented based on the existing waste of the forest complex of the macroregion of Yenisei Siberia. An example of the final products of the established enterprises are biofuels, artificial yarns and fabrics, cardboard and paper products, wood-based panels, and other types of products. The industrial cluster for the processing of forest waste allows receiving subsidies for the costs of enterprises included in it per the Decree of the Government of the Russian Federation of July 31, 2015, N 779. In addition, the participation of cluster enterprises in the program of priority investment projects allows receiving preferential rates for forest lease per the Decree of the Government of the Russian Federation of February 23, 2018, No. 190 (On industrial clusters and specialized …, 2015; On priority investment projects in the field …, 2018).

In turn, public-private partnership mechanisms are the basis for the creation of separate specialized financial institutions. This process will improve the efficiency of the industrial cluster for processing waste from the forestry complex of the macroregion of Yenisei Siberia. This group of institutions should include, among other things, an environmental fund, a guarantee (pledge) fund, and a specialized financial organization. These specialized institutions should provide funding for environmental projects implemented within the industrial cluster and outside these frameworks. The ecological fund of the macro-

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region Yenisei Siberia should be formed at the expense of funds, including regional enterprises with environmentally harmful production (on a voluntary and compulsory basis), budgetary funds of the macro-region Yenisei Siberia, funds from the federal center, private donations from individuals, sponsorship of legal entities and environmental funds organizations (including foreign ones). The activities of this fund should be based on the use of three main groups of instruments for financing environmental activities on the territory of the macroregion of Yenisei Siberia, including co-financing, subsidies, and the provision of grants. The guarantee (collateral) fund of the Yenisei Siberia macro-region should be formed from the property owned by the subjects of the Federation included in this macro-region and transferred under the management of this fund. Its purpose is to provide loans and bonded loans to solve environmental problems in the region and, in many other cases, to provide guarantees to third parties when it is necessary to solve environmental problems. Environmental loans are loans aimed at financing, in whole or in part, or refinancing new and existing environmental projects. Specialized financial organizations should be formed on a parity basis at the expense of enterprises and administrations of the constituent entities of the Federation included in the macro-region of Yenisei Siberia. This organization should provide financing for long-term tasks to solve environmental problems by issuing its bonds, placed through the exchange floor, which will reduce the cost of such borrowing. Within the framework of the industrial cluster and specialized institutions for solving environmental problems in the state's interests, it makes sense to use the appropriate instruments, which can be conditionally subdivided into the following groups: tax, financial, investment, tariff, and procurement instruments. These tools make it possible to stimulate the enterprise's economic activity from different sides to solve environmental problems in the region, both on a commercial basis (production from waste products) and on a non-commercial basis (reforestation, cleaning up reservoirs). The tax differentiation system should be used as tax instruments for the payment of taxes for cluster enterprises implementing projects that positively affect the region's ecological sphere. At the level of the macro-region of Yenisei Siberia, it is possible to reduce the rates for any taxes paid to the regional budget. At the same time, for taxes paid to the federal budget, it is possible to partially subsidize them at the expense of the regional budget or the Ecological Fund of the macro-region Yenisei Siberia. At the same time, it is necessary to show a legislative initiative and come up with a proposal to the supreme legislative body of the country, on the provision of benefits in the payment of any taxes to the federal budget, for enterprises solving environmental problems in the territories of the subjects of the Federation. In addition to these financial instruments, it is possible to use others, including the provision of tax investment loans. The use of financial instruments within the proposed institutions should be based on co-financing, subsidies, guarantees, and grants. Co-financing should be used in scientific research, the development and implementation of projects in the field of preserving and protecting the environment of the region, when holding public environmental events, loans and bonded loans used for financing them, as well as for many investments and other costs incurred under these projects. Guarantees should be issued for loans provided by banking and banking organizations and, if necessary, for bonded loans used to finance environmental and related projects. The provision of grants must be carried out within the framework of the environmental initiative of the population of the macroregion of Yenisei Siberia.

Investment instruments can be presented in the form of public targeted bond borrowings, including those based on the principles of "green" bonds. These bonds may be of interest to foreign institutional

investors who have assets under their management in the amount of more than 11.2 trillion US dollars. The use of the principles of "green" bonds will allow entering the "green" Eurobonds market and, accordingly, receiving foreign funding for regional environmental projects.

The use of tariff instruments should be used for enterprises to reduce payments for electricity and other resources associated with operating activities for the processing of forest waste. Reducing such tariffs for the enterprise can be carried out due to their partial subsidies from the regional budget. The same mechanism can be used when reducing transport tariffs to export products made from the waste of the forest complex of the region.

One of the practical tools for involving private businesses in environmental projects can be the use of government procurement of products produced within their framework. Due to the guaranteed sale of these products, to recoup the private investments made in environmental projects. At the same time, the volume of these purchases can amount to tens of billions of rubles within the cluster.

7. Conclusion

1. In forming an industrial cluster for the processing of forest waste based on public-private partnership, a unique role should still be played by the state partner. It should create favorable conditions at the initial stage of its formation since environmental projects, as a rule, have significant capital costs at the pre-investment and investment stages, which affects the availability of capital and its cost already for a private partner.

2. Therefore, the public partner must create favourable regulatory and market conditions, including tax incentives, government subsidies, co-financing, market guarantees, government procurement. All this together will allow the private partner to finance environmental projects more efficiently and maintain its financial stability in general.

3. The use of specialized financial institutions with their specialized tools and the industrial cluster for processing waste from the forest complex of Yenisei Siberia will effectively solve environmental problems in the macroregion and solve the problems of developing countries entrepreneurship in the forest complex as a whole. Therefore, the proposed approaches may be interesting for the subjects of the federation that are part of the macroregion and the world scientific community as a whole.

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