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Business and Government: Environmental and Economic Responsibility in the Russian Arctic*

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Abstract The growing interest in environmental problems on the part of society leads to the fact that more and more attention is paid to the activities of enterprises, and the criteria for the greening of their production are becoming more stringent. With the growth of industrial production, the scale of the negative impact on the environment increases, so simply discussing environmental problems becomes insufficient. There is a need for a comprehensive accounting of the environmental performance of organizations and the development of measures to compensate for the resulting environmental damage. The article examines the issues of environmental and economic relations between business and government in the Russian Arctic. The purpose of this study is to form a theoretical approach to solving the problem of greening the Arctic regions based on the analysis of the ecological and economic relations between government and business. Legal and economic instruments for regulating environmental protection in Russia, as well as strategic documents for the development of the Russian Arctic in the field of ecology are analyzed. An assessment of the environmental and economic responsibility of companies operating in the Russian Arctic is carried out on the basis of non-financial reporting data. The results of the analysis show that the presented non-financial information is not transparent enough, and the level of business responsibility is rather low. To solve the problem posed, the authors propose a theoretical approach to building a "green" partnership, which allows finding a compromise between the interests of the state and business. The formation of an integrated ecological and economic approach in the state regulation of environmental protection activities will allow reaching a point of bifurcation in the relationship between government and business and thereby leveling the anthropogenic load on the ecosystem of the territory.

Keywords: *ecology, state, business, non-financial reporting, "green" partnership, Russian Arctic.*

Introduction

The problem of the country's raw material specialization influence on its socio-economic development has been repeatedly raised by domestic and foreign scientists. The relationship between the abundance of natural resources and the economic development of the country ("the problem of the resource curse") is considered by scientists from two positions. Some believe that countries rich in natural resources develop more slowly than countries with less rich resources [1, Auty R.M, 2, Sachs J.D., 3, Polterovich V.M., 4, Barma N.]. Others associate the problems in the development of the economy of a country with a rich natural resource potential with the efficiency of managing this resource [5, Torvik R., 6, Mehlum H.]. In particular, E. Raynert in his work "How Rich Countries Got Rich and Why Poor Countries Stay Poor" concludes that the vicious circle of poverty in countries, even those with rich resources, is not connected with the resources them-

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selves, but with the concentration on monoproduction in industries with diminishing returns and with abuse of the theory of comparative advantages [7, Raynert E.S.].

The Russian Arctic is a geostrategic territory of the Russian Federation and is of great economic, military-strategic and transport-logistic importance. Huge reserves of natural resources are concentrated in the Arctic, including energy resources [8, Isaytsev D.N., 9, Kizhaeva A.V.], where the main holdings for the extraction and processing of mineral resources operate. There is a third of the world's proven reserves of nickel and platinoids on its territory, as well as a significant part of the world's cobalt reserves and almost the entire extracted volume (80%) of oil and gas, over 90% of tin, diamonds, gold, mica, apatite and many other types of raw materials¹ [10, Larichkin F.D.]. The Arctic zone of Russia occupies 1/5 of the country's territory and includes the Murmansk Oblast, the Nenets, Yamalo-Nenets and Chukotka Autonomous Okrugs, the northern regions of Karelia, Komi, Yakutia, the Arkhangelsk Oblast and the Krasnoyarsk Territory². According to scientists [11, Ventsyulis L.S., 12, Akimov V.A., 13, Ivanova L.V.], the ecological state of the Arctic is characterized by many problems (waste management, atmospheric pollution, wastewater pollution, climate change, etc.) that require effective solutions. Therefore, the object of this study is the Russian industrial complex of the Arctic regions of Russia. So far, the most discussed discourses in the field of environmental economics include issues of state regulation of environmental protection, environmental and economic relations with stakeholders, assessing the negative impact of industrial companies on the environment. So, at present, a certain economic mechanism is being formed to regulate the relationship between the state and business to eliminate the negative impact of enterprises on the environment. In the works of Russian scientists, the economic mechanism of environmental management involves the use of an environmental management system and its implementation into the general enterprise management system [14, Kochemasova E.Yu., 15, Orgadulova G.A., 16, Potrubach N.N., 17, Kovalenko K.O.]. In addition, tools for environmental and economic incentives for natural resource users have been developed to regulate the environmental activities of enterprises, in particular, measures of positive and negative incentives have been identified.

However, the state economic regulation of the processes of nature management and environmental protection in Russia today does not have a sufficiently developed legislative base. Barkan M., Berezovskiy P. and Borzenkov V. believe that Russia has not created a really operating mechanism for economic stimulation of environmental protection and rational use of natural resources, which would reflect the harm from environmental pollution in the activities of enterprises [18]. A team of authors from the State Regional Centre of Standardization, Metrology and Certifi-

¹ Makurin A. Led tronulsya. Zachem Rossiya vkladyvaetsya v Arktiku? Ezhenedel'nik «Argumenty i Fakty». № 50. 12 dekabrya 2018 [The Ice is Broken. Why is Russia Investing in the Arctic? Weekly newspaper "Arguments and Facts". No. 50. 12 December 2018]. URL: https://aif.ru/money/economy/lyod_tronulsya_zachem_rossiya_vkladyvaetsya_v_arktiku (accessed 15 May 2020).

² Proekt Zakona «O razvitii Arkticheskoy zony Rossiyskoy Federatsii» [Draft Law "On the Development of the Arctic Zone of the Russian Federation"]. URL: <https://regulation.gov.ru/projects?type=Grid> (accessed 15 May 2020).

cation claims that there is no comprehensive approach to the development and adoption of regulations, standards and regulations that limit the negative impact on the environment. T. Sedash notes that currently the legislative mechanism of environmental insurance, environmental audit, implementation of the best available technologies requires significant improvement [19]. T. Alieva believes that the replacement of state environmental supervision by environmental audit will increase the focus on the most important environmental problems [20].

At the same time, sufficient attention is paid to the issues of eco-balance in taxes as the main economic regulator of environmental protection. The eco-balance in taxes is based on A. Pigou's theory of "external or explicit costs". A manifestation of positive external effects is the spread of new environmentally friendly technologies, and negative — of environmental pollution [21, Chuzhmarova S.I.]. I.A. Mayburov and Ivanov Yu.B. pay special attention to the development of the theoretical foundations of environmental taxation [22]. Other environmental economists define taxes as important mechanisms of state environmental policy [23, Shuvalova E.B., 24, Bazin D., 25, Howarth R.B.]. In addition, the scientific community is actively discussing the issue of greening the territories of the North and the Arctic [26, Glaz'ev S.Yu., 27, Gromov V.V.].

Modern research examines the issues of balanced interaction between government and business as a basis for constructive dialogue. So, for example, public-private partnership can act as an effective mechanism for the implementation of "joint activities" of the state and business in solving environmental problems, and communities that develop certain rules for the ownership and economic use of common resources" and are able to ensure their long-term preservation and reproduction play a leading role within the framework of environmental protection measures [28, Medyanik N., 29, Ostrom E.]. In general, there is a widespread transformation of human attitudes to environmental problems, society is increasingly aware of its responsibility for the destruction of the biosystem and is ready to join forces in the combating against environmental problems [30, Alimov A.A.].

Several stages can be distinguished in the development of human relations with the environment:

- Stage I — until the 1960s — awareness of the negative anthropogenic impact on the environment.
- Stage II — 1970s — understanding that intensive use of natural resources and indiscriminate use of natural resources undermines the economy and reduces the well-being of future generations.
- Stage III — 1980s can be characterized by the active introduction of "green" technologies. This period is interconnected with the formation of the concept of sustainable development.
- Stage IV — 2000s — "consolidation" of the concept of sustainable development in international and national legislation, in business and society.

The vulnerability of the natural environment of the Arctic regions predetermines the need to include the ecological component as the main vector of development. Today, increased attention to the problems of preserving ecosystems, reducing the anthropogenic negative impact and developing a green economy is a global trend followed by the Russian Arctic regions.

At present, various state instruments are used to assess the technogenic and anthropogenic impact on the ecosystems of the regions. However, these measures are not enough to level the negative impact of industrial enterprises on the environment. In this regard, the purpose of this study is to form a theoretical approach to solving the problem of greening the Arctic regions based on an analysis of the ecological and economic relations between government and business.

Within the framework of this goal, two hypotheses are put forward:

- Hypothesis 1 — The existing environmental responsibility of business in Russia is not sufficiently transparent, and the mechanisms of state regulation do not allow compensation for environmental damage.
- Hypothesis 2 — Formation of an integrated ecological and economic approach in the state regulation of environmental protection will allow reaching the point of bifurcation in the relationship between government and business and thereby leveling the anthropogenic load on the ecosystem of the territory.

Research methodology

The methodological basis of the study consisted of the works of domestic and foreign economists in the field of environmental economics, regional and spatial economics; scientists engaged in research on the problems of the North and the Arctic.

The methods of economic and statistical analysis were used to achieve the goal. A content analysis of the existing regulatory and legislative framework is carried out, the mechanisms and tools used in Russia to regulate the relationship between government and business in the framework of greening territories in comparison are analyzed, a theoretical model of balanced “green” relationships between government and business is built.

The analysis of conflicts of interest and the construction of a theoretical model of a balanced relationship between government and business on greening issues were based on a comparison of the environmental and economic responsibility of companies and government regulators.

In order to identify and structure the environmental responsibility of a Russian company in a specific territory or region, the authors propose a methodology based on the collection and processing of empirical material and expert assessments. A qualitative assessment of the environmental responsibility of companies in the industrial complex of the Russian Arctic was made on the basis of 7 criteria. Each criterion is assigned a color level according to the degree of fulfillment: green, red and yellow:

- Criterion 1: “Type of independent assessment”: green — there is a professional assurance and assurance taking into account the views of stakeholders, yellow — partial professional assurance or assurance taking into account the views of stakeholders (including public assurance), red — there is no external assurance or there is no reporting in accordance with the requirements of international organizations.
- Criterion 2: “The presence of the quantitative indicators, mitigation measures in the environmental management system”: green — environmental management has been introduced at all subsidiaries of the Group (Company), yellow — at least one or more, red — absent.
- Criterion 3: “Measures to reduce the impact on the environment”: green — yes, red — no.
- Criterion 4: “Interaction with the local population (community) on issues of greening the territory”: green — there is a separate document, yellow — there is no separate document, but work is in progress, red — no work is in progress and there is no separate document.
- Criterion 5: “Energy Efficiency Program”: green — quantitative performance indicators have a positive trend with the previous period, yellow — there are quantitative indicators, but the trend is not reflected, red — there are no quantitative indicators of energy efficiency.
- Criterion 6: “Program for the conservation of biodiversity”: green — available, yellow — partially (for individual projects of the company), red — no.
- Criterion 7: “Voluntary insurance of environmental risks”: green — yes, red — no.

The quantitative assessment of environmental and economic indicators was carried out on the basis of indicators reflected in the non-financial statements of companies.

Analysis and results

Before discussing the assessment of the environmental and economic responsibility of companies, the main and strategic documents regulating environmental protection in the Russian Arctic should be mentioned.

The main document for the formation of state environmental policy in the Arctic, as well as throughout the territory of the Russian Federation, is Federal Law No.7-FZ “On Environmental Protection”³. But there is also a package of documents that is aimed at regulating activities exclusively on the territory of the Russian Arctic, namely: Basic Principles of Russian Federation State Policy in the Arctic to 2035⁴; State program of the Russian Federation “Social and economic development

³ Federal'nyy zakon ot 10.01.2002 N 7-FZ (red. ot 31.12.2017) «Ob okhrane okruzhayushchey sredy» // Konsultant Plyus [Federal Law of 10.01.2002 N 7-FZ (as Amended on 31 December 2017) "On Environmental Protection". Consultant Plus].

⁴ Ukaz Prezidenta Rossiyskoy Federatsii ot 5 marta 2020 g. № 164 «Ob osnovakh gosudarstvennoy politiki Rossiyskoy Federatsii v Arktike na period do 2035 goda» [Decree of the President of the Russian Federation of March 5, 2020 No. 164 "Basic Principles of Russian Federation State Policy in the Arctic to 2035"].

of the Arctic zone of the Russian Federation”⁵; “Development strategy of the Arctic zone of the Russian Federation and ensuring national security for the period up to 2020”⁶. For example, “Basic Principles of Russian Federation State Policy in the Arctic to 2035” reflect the environmental specificity of the Arctic, focusing on leveling the environmental consequences of economic activity in the Arctic. The main aspects of socio-economic development, ecology, achieving strategic interests and ensuring national security in the Russian Arctic are reflected in the State Program and in the Strategy for the Development of the Arctic Zone of the Russian Federation.

In addition, ASPOL and other international associations have developed various standards: the National Public Standard “Environmental Safety of the Arctic”, Arctic Standards OCS (Outer Continental Shelf); ISO standards; “Guidelines for ships operating in polar waters”; Polar Code and others. The introduction of standards makes it possible to define specific rules for the economic activities of organizations in the existing legal framework. For example, the “Environmental Safety of the Arctic” standard was developed with the aim of ensuring socially acceptable formats of economic activity in the Russian Arctic regions, since the existing regulatory framework does not reflect all aspects of environmental management in the Arctic zone⁷.

Any companies conducting economic activities in the Arctic must strive to ensure the achievement of sustainable development goals in the region of presence, to preserve the natural and cultural heritage for future generations⁸. This is possible thanks to the implementation of CSR practices, active interaction with stakeholders, competent management of social and environmental risks, and, consequently, the maintenance of public non-financial reporting

Public non-financial reporting is a set of information and indicators that reflect the goals, approaches and results of organizations' activities on all significant issues of social responsibility and sustainable development, a minimum list of mandatory disclosed indicators⁹. There are differ-

⁵ Postanovlenie Pravitel'stva RF ot 21.04.2014 N 366 (red. ot 31.08.2017) «Ob utverzhdenii gosudarstvennoy programmy Rossiyskoy Federatsii «Sotsial'no-ekonomicheskoe razvitie Arkticheskoy zony Rossiyskoy Federatsii» [Decree of the Government of the Russian Federation of April 21, 2014 No. 366 (as Amended of August 31, 2017) “On Approval of the State Program of the Russian Federation “Social and Economic Development of the Arctic Zone of the Russian Federation”].

⁶ Strategiya razvitiya Arkticheskoy zony Rossiyskoy Federatsii i obespecheniya natsional'noy bezopasnosti na period do 2020 goda RF. Sayt Pravitel'stva RF [Development Strategy of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period Up to 2020. RF Government Website]. URL: <http://government.ru/info/18360/> (accessed 05 July 2019).

⁷ Natsional'nyy obshchestvennyy standart «Ekologicheskaya bezopasnost' Arktiki» [National Public Standard “Environmental Safety of the Arctic”]. URL: http://arcticas.ru/docs/2016/Broshura_Arctica.pdf (accessed 15 May 2020).

⁸ The Call for Responsible Economic Activity in the Arctic Region was also announced by the Arctic Council, namely the Working Group on Sustainable Development in the Arctic (Sustainable Development Working Group, SDWG, <http://www.sdwg.org/>). So, in 2012, the Initiative on Corporate Social Responsibility was created and a platform for constant dialogue between representatives of business communities operating in the Arctic region was opened, which is called the Arctic Economic Council (<http://arcticeconomiccouncil.com/>). The Arctic Council CSR Initiative was created to bring together companies from various industries to engage them in dialogue to achieve sustainable development and responsible use of natural resources in the Arctic. URL: http://www.kas.de/wf/doc/kas_39168-1522-2-30.pdf?141112150837 (accessed 15 May 2020).

⁹ Rasporyazhenie Pravitel'stva RF ot 05.05.2017 N 876-r «Ob utverzhdenii Kontseptsii razvitiya publichnoy nefinansovoy otchetnosti i plana meropriyatiy po ee realizatsii» [Order of the Government of the Russian Federation of

ent standards for the provision of non-financial information GRI, SASB. With the integration of Russia into the international market and the adoption of international accounting and reporting standards, many large Russian holdings practice the development of environmental policy based on the GRI standard, despite the fact that it is not always possible to determine the stated goals by these standards company [31, Borgstedt P., 32, Heflin F.].

Consider the non-financial reporting of large Russian holdings implementing projects for the exploration and development of resources in the Arctic regions of Russia. These include FOSAGRO, NORILSK NICKEL, NOVATEK, EUROCHEM, SEVERSTAL, AKRON, LUKOIL, GAZPROM, ROSNEFT, ALROS¹⁰. The analysis of companies' activities from the point of view of ensuring environmental responsibility is based on the official public annual non-financial statements of companies for 2018¹¹. It should be noted that the activity of Russian companies in terms of placing both environmental and other non-financial reports is rather low. So, as of January 2019, 176 companies and 924 reports were registered in the National Register (on a cumulative total since 2001). Environmental reports (ER) — 82, social reports (SR) — 326, reports on sustainable development (RSD) — 314, integrated reports — 174, industry reports — 27 are among them¹². Against the global background of the development and activation of the process of public non-financial reporting, Russia still occupies the last position (Fig. 1).

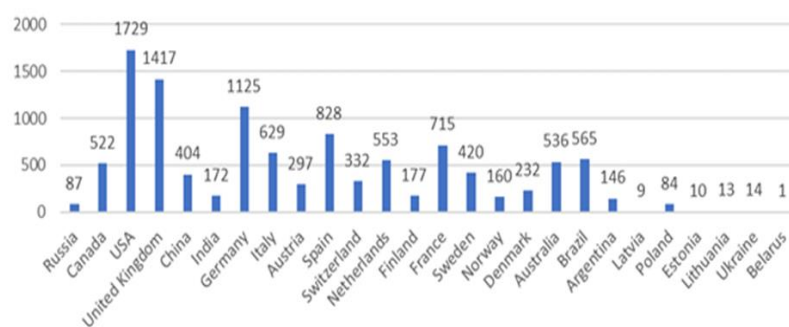


Fig. 1. The number of companies publishing non-financial reporting in different countries, 2018¹³.

05 May 2017 No. 876-r "On Approval of the Concept for the Development of Public Non-Financial Reporting and an Action Plan for Its Implementation"]. URL: http://www.consultant.ru/document/cons_doc_LAW_216631/ (accessed 15 May 2020).

¹⁰ Perechen' vedushchikh kompaniy-rabotodateley, osushchestvlyayushchikh deyatelnost' na territorii Arkticheskoy zony RF [List of Leading Employing Companies Operating in the Arctic Zone of the Russian Federation]. URL: <http://arctic-union.ru/napravleniya/kompanii-rabotodatelei/>. Obzor ustoychivogo razvitiya arkticheskikh kompaniy (dekabr' 2019) [Sustainable Development Review of Arctic Companies (December 2019)]. URL: <https://goarctic.ru/news/obzor-ustoychivogo-razvitiya-kompaniy-rabotayushchikh-v-rossiyskoy-arktike-za-period-15-sentyabrya-1/>. «Sibur», «Nornikel'» i «Lukoil» – v trojke liderov po ustoychivomu razvitiyu Arktiki ["Sibur", "Norilsk Nickel" and "Lukoil" are Among the Three Leaders in the Sustainable Development of the Arctic]. URL: <https://porarctic.ru/blog/2019/06/07/sibur-nornikel-i-lukoil-v-trojke-liderov-po-ustoychivomu-razvitiyu-arktiki/> (accessed 15 May 2020).

¹¹ The data used in this paper is taken from the annual non-financial statements of Russian companies for 2018 due to the availability of the most relevant information at the time of the study, since the non-financial statements of companies for the last year are usually published in the second half of this year.

¹² Nefinansovaya otchetnost' v Rossii i mire: tseli ustoychivogo razvitiya – v fokuse vnimaniya / Analiticheskij obzor, Moskva, 2019 [Non-Financial Reporting in Russia and Worldwide: Sustainable Development Goals in Focus. Analytical review, Moscow, 2019].

¹³ Based on the data of URL: www.corporateregister.com (accessed 15 May 2020).

In 2018 almost all of the above companies submitted the Sustainability Report. The exception was EUROCHEM and AKRON, which reflected their environmental responsibility in the company's general annual report. To disclose their non-financial activities, 9 out of 10 companies used B/C GRI (main type of standard), NORILSK NIKEL used A GRI (extended type of standard).

The results of a qualitative assessment of the environmental responsibility of companies in the industrial complex of the Russian Arctic for 2018 according to the methodology proposed by the authors are presented in Table 1.

Table 1
*Qualitative assessment of the environmental responsibility of companies in the industrial complex of the Russian Arctic for 2018.*¹⁴

| Company name | Type of report | Type of GRI standard | Type of independent assessment | The presence of quantitative indicators in the environmental management system | Measures to reduce the impact on the environment | Interaction with the local population (community) on issues of greening the territory | Energy efficiency programs | Biodiversity conservation programs | Voluntary insurance of environmental risks |
|----------------|-------------------|----------------------|--------------------------------|--|--|---|----------------------------|------------------------------------|--|
| FOSAGRO | RSD ¹⁵ | B | Yellow | Yellow | Green | Green | Yellow | Red | Red |
| NORILSK NICKEL | RSD | A | Green | Green | Green | Green | Yellow | Green | Red |
| EUROCHEM | GO | B | Red | Green | Green | Red | Green | Red | Red |
| SEVERSTAL | RSD | B | Yellow | Green | Green | Green | Green | Red | Red |
| AKRON | GO | B | Red | Red | Green | Yellow | Red | Red | Red |
| LUKOIL | RSD | B | Green | Green | Green | Green | Green | Green | Green |
| GAZPROM | RSD | B | Green | Green | Green | Green | Yellow | Yellow | Green |
| NOVATEK | RSD | B | Yellow | Green | Green | Green | Green | Yellow | Green |
| ROSNEFT | RSD | B | Green | Green | Green | Green | Yellow | Green | Green |
| ALROS | RSD | B | Green | Green | Green | Green | Green | Yellow | Green |

All the surveyed companies take measures to reduce their environmental impact. Almost all the companies (8 out of 10) publish information on quantitative indicators in the environmental management system. The environmental management system has not been implemented in the main production subsidiaries of AKRON and has been partially implemented in FOSAGRO (in 2018 Apatit JSC and Apatit BF JSC successfully passed inspection audits for compliance with the requirements of international standards ISO 9001: 2015, ISO 14001: 2015).

The criterion "Interaction with the local population (community) on issues of greening the territory" is also "green" for almost all companies. As a rule, companies enter into cooperation agreements with the regions of their presence and provide them with significant assistance in the economic and social development of local communities, as well as preserving the ecological safety

¹⁴ Perechen' vedushchikh kompaniy-rabotodateley, osushchestvlyayushchikh deyatel'nost' na territorii Arkticheskoy zony RF [List of Leading Employing Companies Operating in the Arctic Zone of the Russian Federation]. URL: <http://arctic-union.ru/napravleniya/kompanii-rabotodateli/>. «Sibur», «Nornikel'» i «Lukoil» – v troyke liderov po ustoychivomu razvitiyu Arktiki [“Sibur”, “Norilsk Nickel” and “Lukoil” are Among the Three Leaders in the Sustainable Development of the Arctic]. URL: <https://porarctic.ru/blog/2019/06/07/sibur-nornikel-i-lukoil-v-trojke-liderov-po-ustojchivomu-razvitiyu-arktiki/> (accessed 15 May 2020).

¹⁵ RSD — report on sustainable development.

of residence and the national identity of indigenous peoples. Note that the EUROCHEM company does not have clear information about the population leading a traditional way of life in the report, therefore the criterion was assigned a red color.

Only half of the companies included in the analysis have energy efficiency programs, and quantitative performance indicators have a positive trend with the previous period.

AKRON does not have quantitative energy efficiency indicators, but the company claims in the report that its energy efficiency indicators are expressed in terms of cash savings.

The situation is worse with biodiversity conservation programs. Four companies — FOSAGRO, EUROCHEM, SEVERSTAL, AKRON — do not have biodiversity programs. And for 3 companies — GAZPROM, NOVATEK, ALROS — the criterion is met partially in one or more (but not simultaneously in all) of the following areas: there is the amount of funding for biodiversity conservation; availability of an approved list of indicator types in the regions of presence / activity of the company; availability of research and / or monitoring programs for indicator species; the availability of the results of scientific research and work in the field of biodiversity conservation in public space; mechanisms for the participation of stakeholders in the discussion of biodiversity conservation programs.

The presence of voluntary environmental risks insurance demonstrates the understanding of the importance of managing these risks by the company's management. For example, in order to reduce the risk of financial losses, NOVATEK carries out the following types of voluntary insurance: property insurance in case of loss (destruction) and / or damage; insurance of losses from business interruptions (business risks); insurance of construction and assembly risks; insurance of risks during prospecting, exploration and development of deposits (risks of loss of control over a well); management liability insurance.

In general, according to this criterion, the companies were divided into two groups:

- with voluntary insurance of environmental risks — LUKOIL, GAZPROM, NOVATEK, ROSNEFT, ALROS;
- without voluntary insurance of environmental risks — FOSAGRO, NORILSK NICKEL, EUROCHEM, SEVERSTAL, AKRON.

Thus, a comparative analysis of the information provided in the non-financial reporting on the proposed criteria would reveal a leader in environmental responsibility — this is LUKOIL. The company publicly declares that in its activities are guided by the principles of sustainable development and is trying to achieve a balance between socio-economic and natural-ecological development. LUKOIL makes a significant contribution to the environmental safety of production, storage and transportation of oil products in Arctic conditions. The company was the first in Russia to

use the zero discharge technology in offshore projects. LUKOIL possesses a full arsenal of oil spill response equipment in Arctic waters, including infrastructure and trained specialists¹⁶.

Within the framework of the concept of sustainable development, a balance between environmental and economic responsibility is important, since long-term planning is impossible without the efficient, rational use of natural resources. Relying only on the qualitative indicators of companies, one cannot judge their overall environmental and economic responsibility. It is appropriate to supplement them with an assessment of quantitative indicators.

Quantitative indicators, as well as qualitative ones, characterizing the environmental and economic responsibility of companies, do not have sufficient transparency to conduct their comprehensive assessment.

Table 2

Quantitative assessment of the economic responsibility of companies in the industrial complex of the Russian Arctic in 2018.

| Company name | Environmental protection costs, mln rub. | Environmental payments for excess emissions, waste disposal, mln rub. | Environmental payments for regulatory emissions, total, mln rub. | Share of excess payments in the total volume of environmental payments, % | Fines for non-compliance with environmental legislation, mln rub. | Company revenue, bln rub. | Share of environmental payments for excess emissions in the company's total revenue, % | Share of gross environmental payments for regulatory emissions in the company's total revenue, % | Share of environmental protection costs to the company's revenue, % |
|----------------|--|---|--|---|---|---------------------------|--|--|---|
| FOSAGRO | 8053.1 | 2.901 | 153.4 | 1.89 | 0.6 | 233.4 | 0.001 | 0.07 | 3.5 |
| NORILSK NICKEL | 31768 | 695.2 | | n/d | 3.2 | 728.9 | 0.001 | | 4.4 |
| EUROCHEM | n/d | n/d | n/d | n/d | n/d | 349.8 | n/d | n/d | n/d |
| SEVERSTAL | 3436 | n/d | n/d | 31.6 | n/d | 457.5 | n/d | n/d | 0.8 |
| AKRON | 686 | n/d | 10.8 | n/d | n/d | 108.1 | n/d | 0.0001 | 0.6 |
| LUKOIL | 35528 | n/d | n/d | 23 | 0 | 8058.3 | n/d | n/d | 0.4 |
| GAZPROM | 39154 | 197.04 | 615.8 | 32 | 10.2 | 8126 | 0.002 | 0.01 | 0.5 |
| NOVATEK | 2384 | 8.5 | | n/d | 1.1 | 832 | 0.001 | | 0.3 |
| ROSNEFT | 31 697 | 1040 | 1159 | 22 | 290 | 8200 | 0.012 | 0.014 | 0.4 |
| ALROS | 5 221 | n/d | n/d | n/d | n/d | 282.6 | n/d | n/d | 1.8 |

Table 2 shows that practically no company (with the exception of FOSAGRO, GAZPROM and ROSNEFT) provides data on the volume of environmental payments, on the amount of fines for non-compliance with environmental legislation, which significantly complicates the adequate analysis of non-financial reporting indicators and does not allow an accurate assessment of the environmental responsibility of companies. Nevertheless, on the basis of the data presented, we will try to analyze the activities of industrial companies in relation to measures to green the territories of their presence. The most active in the implementation of environmental protection measures in the Arctic regions (in absolute terms) are mainly oil and gas companies — LUKOIL, GAZPROM, ROSNEFT and one metallurgical enterprise — NORILSK NICKEL. For example, the top three are investing about 30–40 million rubles in environmental protection measures. However, if

¹⁶ Rejting ustoychivogo razvitiya kompaniy, rabotayushchikh v rossiyskoy Arktike, 2018 [Sustainable Development Rating of Companies Operating in the Russian Arctic, 2018]. URL: <https://porarctic.ru/wp-content/uploads/2018/09/Polyarnyj-indeks.-Versiya-1.0.pdf> (accessed 15 May 2020).

we compare them in terms of the specific volume of environmental protection costs to the company's revenue, the picture changes significantly. Leadership in environmental protection measures aimed at preserving natural ecosystems is observed mainly in the chemical and metallurgical industries. For example, FOSAGRO spends about 3.5% of its revenues on greening, NORILSK NICKEL and ALROS — 4.4% and 1.8% respectively, other enterprises have less than 1% environmental costs. The analysis of reports on the sustainable development of companies showed that the bulk of funding is aimed at measures to reduce emissions of pollutants into the atmosphere, land reclamation and wastewater treatment.

Can the damage from pollution of the territories of the companies' presence be compared with the amount of financing for its elimination? The question is quite complex and multifaceted. To answer this question, let us try to analyze the data in table 3 and compare them with the data of the previous tables 1 and 2.

Table 3

Quantitative assessment of the environmental responsibility of companies in the industrial complex of the Russian Arctic for 2018

| Company name | Gross emissions of SO ₂ into the atmosphere, thousand tons | Emissions of other significant pollutants into the atmosphere, thousand tons | Gross emissions of greenhouse gases, thousand tons | Water consumption for the company's own needs, Thousand m ³ | Waste, total, thousand tons | Number of accidents with negative consequences for the environment, pcs. | Volume of energy consumed from renewable sources, thousand kW/h | Specific weight of emissions into the atmosphere, kg/t ¹⁷ |
|----------------|---|--|--|--|-----------------------------|--|---|--|
| FOSAGRO | 11.36 | 16.55 | 451.2 | 97369 | 99125 | 0 | n/d | 161.94 |
| NORILSK NICKEL | 1869.6 | 57.0 | 10000 | 1412.1 | 30720 | 0 | 4132.5 | 33242 |
| EUROCHEM | n/d | 0.027 | 204.5 | 72100 | n/d | 0 | n/d | 43.5 ¹⁸ |
| SEVERSTAL | 96.5 | 43.6 | 22.1 | 149530 | n/d | 0 | n/d | 1054 |
| AKRON | n/d | n/d | n/d | n/d | 43.1 | 0 | 45.0 | n/d |
| LUKOIL | 25.1 | 408.2 | 30.0 | 428.5 | 2963 | 43 | 1 365.3 | 340 |
| GAZPROM | 276.2 | 2617.86 | 120.1 | 4280.2 | 180.74 | 917 | 459 666.3 | 248 |
| NOVATEK | 33 | 51.3 | 7936.8 | 2 993 | 71.2 | 1 | 9877778 | 0.075 ¹⁸ |
| ROSNEFT | 86 | 1749 | 76.4 | 2 153.5 | 14 064 | 0 | n/d | 573 |
| ALROS | 219.1 | n/d | 550.8 | 8.1 | 15 933 | 1 | n/d | 1.626 ¹⁹ |

It should be noted that the variation in some indicators (gross greenhouse gas emissions, wastes, water consumption) between companies in 2018 is several orders of magnitude. At the same time, some companies accumulate significant volumes of waste as a result of their activities (FOSAGRO, NORILSK NICKEL), others consume water actively for their own needs (SEVERSTAL) or are the main “pollutants” of the atmospheric air (NORILSK NICKEL, SEVERSTAL, ALROS, GAZPROM).

¹⁷ Otchet ob ustoychivom razvitii kompaniy promyshlennogo kompleksa Arktiki RF za 2018 g. [Sustainable Development Rating of Companies Operating in the Russian Arctic, 2018.]

¹⁸ * Calculation based on greenhouse data emissions only, as other data are not available.

¹⁹ Calculated in relation to the company's revenue due to the complexity of the conversion per unit of finished goods (unit of measurement of finished goods carats).

For example, the company NORILSK NICKEL (non-ferrous metallurgy) spends 4.4% of its revenue on greening and is the leader in CO₂ and SO₂ emissions into the atmosphere: about 33 tons per 1 ton of finished products, while Gazprom with large volumes of emissions spends less than 1 % of proceeds.

Thus, a comparison of data on the costs of greening with quantitative indicators of the environmental responsibility of companies in the industrial complex of the Russian Arctic for 2018 allows us to conclude that not all enterprises have environmental costs comparable to the amount of environmental damage caused. Companies need to pay more attention to efficient use of energy resources, reduction of emissions and waste disposal.

Summarizing the analysis of the non-financial reporting of Russian holdings operating in the Arctic regions, we can conclude that their level of responsibility is now insufficient and opaque, which confirms the previously put forward hypothesis 1. Nevertheless, the importance of greening the territories of presence is growing, especially among companies in the industrial sector, even despite the fact that activities in the Arctic are regulated by separate (specific) regulatory and legal documents and there are various economic regulators. However, the increasing severity of environmental problems requires the improvement of a different system of environmental protection measures in the Arctic, possibly through the adoption of special legislation in the field of environmental protection in the Arctic zone

Discussion

Current legislation in the field of environmental protection regulation is not aimed at building symmetrical relations between government and business and does not help to reduce the negative impact of enterprises' activities on the environment. An analysis of existing economic mechanisms and legal measures showed that the use of directive management methods only is ineffective and does not lead to a significant improvement in the state of ecosystems. For example, the ecological disaster in Norilsk on May 29, 2020 is a confirmation of this. It should be noted that Norilsk has previously been in the focus of ecologists' attention due to accidents at Norilsk Nickel. In 2016 the Daldykan River turned red due to emissions from the Nadezhda Metallurgical Plant. According to Oleg Mitvol, the former deputy head of Rosprirodnadzor, the damage from a diesel spill in Norilsk could reach 100 billion rubles, and work to restore the natural environment will take up to 10 years²⁰. At the same time, an increase in cargo traffic in the Arctic leads to an increase in fuel consumption, which, of course, has a great impact on the ecological state of the atmospheric air in the region, increases the risks of fuel spills²¹. The recently adopted subprogram

²⁰ «V Arkticheskoy zone takoy avarii ne bylo nikogda»: otsenen ushcherb ot razliva diztopliva v Noril'ske [“There Has Never Been Such an Accident in the Arctic Zone”: the Damage from a Diesel Fuel Spill in Norilsk Was Assessed]. URL: [https://www.infox.ru/news/283/236801-v-arkticheskoy-zone-takoj-avarii-ne-bylo-nikogda-oceneni-userb-ot-razliva-diztopliva-v-noril'ske](https://www.infox.ru/news/283/236801-v-arkticheskoy-zone-takoj-avarii-ne-bylo-nikogda-oceneni-usherb-ot-razliva-diztopliva-v-noril'ske) (accessed 15 May 2020).

²¹ Perevod arkticheskogo flota s mazuta na szhizhenny prirodnyy gaz (SPG). Rossiya v okruzhayushchem mire. Knizhnikov A., Kliment'ev A. Diskussionnye materialy k mezhdunarodnoy konferentsii «Sudostroenie v Arktike», iyun' 2019 g., Arkhangel'sk [Conversion of the Arctic Fleet from Fuel Oil to Liquefied Natural Gas (LNG). Russia in the Outside

“Development of the NGV fuel market”²² will help to reduce and possibly even avoid accidental oil spills. Unfortunately, the current economic mechanisms now are aimed only at eliminating emergencies (fines, etc.), and not at preventing them. At the same time, the extreme deterioration of equipment and the lack of funds allocated for its repair significantly increase the likelihood of such environmental disasters.

To determine the economic effect, we compare the costs of business and the government for environmental protection. The business costs are payments for negative impact on the environment, and public expenditures are the expense on environmental protection (Fig. 2).

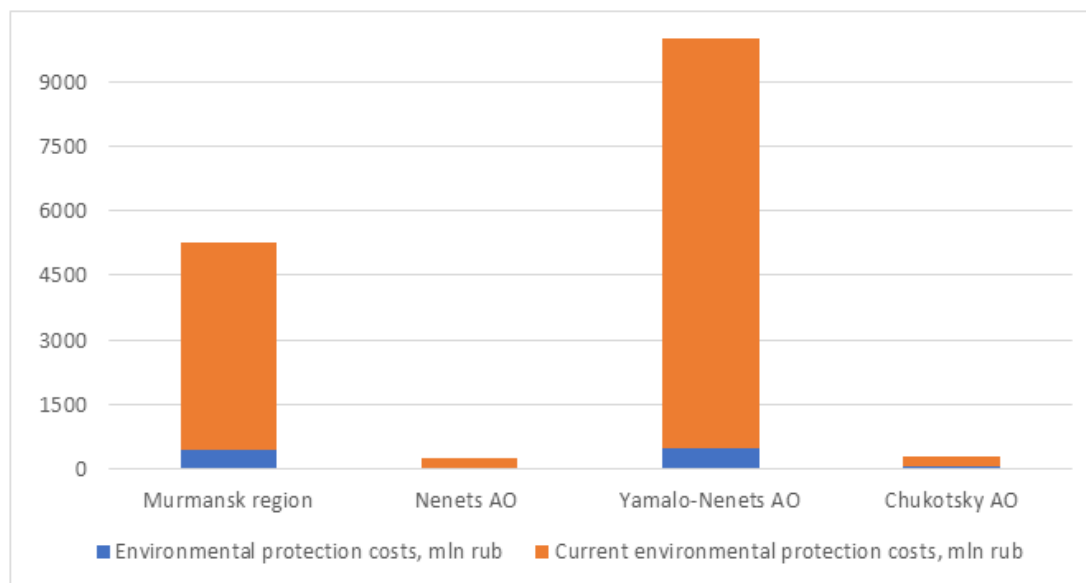


Fig. 2. Comparison of business and government expenditures on environmental goals in 2018 by regions of the Russian Arctic^{23, 24}.

The analysis showed that the compensation payments of businesses for the negative impact on ecosystems established by the state are incomparable with the costs of the state for financing programs for the protection and restoration of the environment. Note that all regions of the Arctic — regions with a significant level of impact of enterprises on ecosystems and a marginal threshold of environmental vulnerability, have a significant negative effect.

Thus, it is necessary to develop a system of regulators that will allow not only to minimize the level of costs associated with the greening of territories, but to form symmetrical relations between government and business while simultaneously reducing the level of anthropogenic load on the ecosystem. To reduce the economic damage from environmental pollution, it is necessary to

World. Knizhnikov A., Klimentiev A. Discussion Materials for the International Conference "Shipbuilding in the Arctic", June 2019, Arkhangelsk]. URL: https://wwf.ru/upload/iblock/629/rabochie_materialy_po_spg_forum_sudostroenie_iyun_2019.pdf (accessed 15 May 2020).

²² Postanovlenie Pravitel'stva RF ot 02.03.2020 N 221 [Decree of the Government of the Russian Federation of 03 February 2020, No. 221].

²³ As an example, data for the regions fully included in the Arctic zone of the Russian Federation are given.

²⁴ Note: data for one year are given, since no significant changes were revealed for previous periods. Source: authors' calculations based on Rosstat data.

improve microeconomic indicators (the environmental costs of the enterprise, namely, to adjust the profit when calculating the amount of the company's environmental obligations to compensate for environmental damage). Such actions will “translate” the economic damage into internal costs of the company, affecting directly their business activities and at the same time stimulating the introduction of the best available technologies.

In modern conditions, in the opinion of the authors, an effective mechanism can be the model of “green” partnership, which will allow achieving balanced relationships between government and business in the context of environmental protection [33, Chapargina A.N.] (Fig. 3)

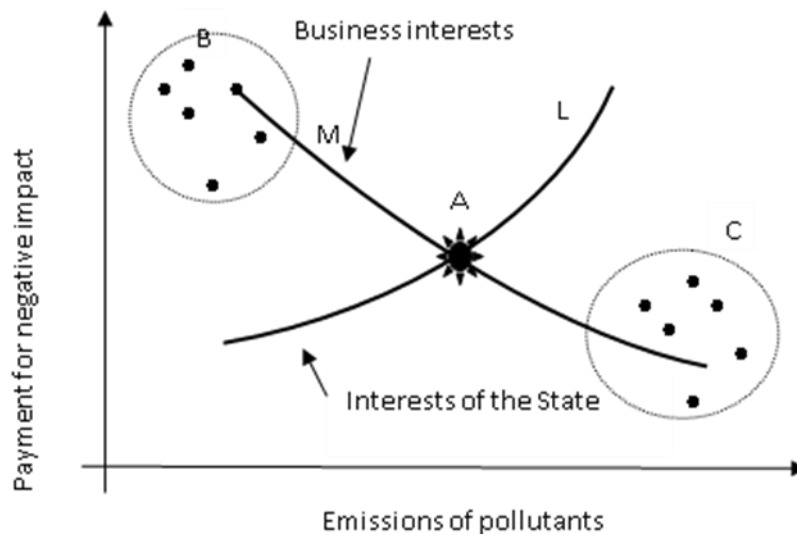


Fig. 3. Model of “green” partnership between business and state ²⁵.

In the presented model, the set of points B are the interests of the authorities, that is, when compensation for environmental damage is significantly higher than harmful emissions. The set of points C, on the contrary, reflect business interests that are focused on minimizing environmental costs with a significant amount of pollutant emissions. There is a conflict of interests between government and business. At the same time, this situation causes an imbalance and leads to asymmetric relationships and, as a consequence, to negative economic effects. The urgency of the problem makes it necessary to find a point where the interaction of business and government on issues of greening will move to a qualitatively new level of their relationship.

The alignment of interests can be represented graphically. Curve L in Fig. 3 reflects the interests of the state, and curve M — the interests of business. New relationships arise between the interested groups (power-business) at the intersection of the curves at point A. Point A is a bifurcation point²⁶ that characterizes the moment of the formation of a new qualitative order of bal-

²⁵ Source: compiled by the authors.

²⁶ It is important to distinguish the concepts of bifurcation and optimum. Within the framework of this study, the authors use the concept of bifurcation to characterize the new relationship between power and business, since bifurcation is a critical state of the system, in which there is a qualitative leap and the transition of the system to a new state of stability. In addition, the optimum point characterizes only the mutual economic benefit as a result of certain relations and does not reflect their qualitatively new level.

anced interaction between business and government. At the same time, the environmental responsibility of business will come exactly at this point — the point of bifurcation, since the maximum marginal environmental payments will be highly unprofitable for business and thereby stimulate them to “voluntarily” invest in the modernization of technologies to reduce the technogenic impact on ecosystems. At the same time, the level of corporate environmental responsibility of the business will increase significantly.

Today, the relationship between business and government on environmental issues in the context of the presented model can be conditionally characterized by a set of points C (Fig. 3). In other words, low payments for adverse ecosystem effects are associated with high levels of harmful emissions (Table 4).

Table 4

Indicators reflecting the relationship between government and business in the Arctic (percentage of units)²⁷

| | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------------|---------------------------------------|--------|--------|--------|--------|
| | <i>Murmansk oblast</i> | | | | |
| Payments for negative impact on GRP | 0.0002 | 0.0013 | 0.0010 | n/d | n/d |
| Share of pollutant emissions in GRP | 1.1100 | 1.0700 | 0.8700 | 0.2363 | 0.1610 |
| | <i>Nenets Autonomous Okrug</i> | | | | |
| Payments for negative impact on GRP | 0.0017 | 0.0002 | 0.0001 | n/d | n/d |
| Share of pollutant emissions in GRP | 0.6100 | 0.7100 | 0.5500 | 1.1656 | 0.9020 |
| | <i>Yamalo-Nenets Autonomous Okrug</i> | | | | |
| Payments for negative impact on GRP | 0.0008 | 0.0004 | 0.0002 | n/d | n/d |
| Share of pollutant emissions in GRP | 0.4700 | 0.5300 | 0.6100 | 0.3536 | 0.2660 |
| | <i>Chukotka Autonomous Okrug</i> | | | | |
| Payments for negative impact on GRP | 0.0009 | 0.0009 | 0.0006 | n/d | n/d |
| Share of pollutant emissions in GRP | 0.4100 | 0.5000 | 0.5100 | 0.3663 | 0.3609 |
| | <i>The Russian Federation</i> | | | | |
| Payments for negative impact on GRP | 0.0004 | 0.0004 | 0.0002 | n/d | n/d |
| Share of pollutant emissions in GRP | 0.3900 | 0.4000 | 0.4000 | 0.4287 | 0.3804 |

Despite the steady downward trend in the share of emissions to GRP, caused mainly by the stagnation of the regional economy, the ecological situation in the Arctic regions remains tense. Environmental payments established for enterprises of the extractive and manufacturing industries (the main pollutants) are only the minimum requirements of the legislation for compensation for harm caused, not taking into account the future development of the regions where the polluting enterprises operate.

²⁷ Source: authors' calculations based on Rosstat data.

The model of “green” partnership presented above indicates that it is possible to achieve a compromise solution to the problem only if the vectors of interests of the authorities and business are aligned. For example, in 2014, NORILSK NICKEL entered into an agreement with the Government of Russia²⁸, part of which was the closure of the Nickel Plant in Norilsk (one of the dirtiest industries in the Arctic²⁹), which did not provide for the elimination of nickel and copper production, but for the “transfer” of production to regions with a more favorable environmental situation in comparison with the city of Norilsk (Sverdlovsk oblast — concentrate melting, Murmansk oblast — concentrate processing)³⁰.

Although such agreements show to some extent a constructive dialogue and the coordination of business and government actions, they still do not reflect the achievement of the so-called bifurcation point, demonstrating only extreme measures to prevent an environmental catastrophe in the region. This type of measures should not be systemic, otherwise, widespread closure of enterprises will be required.

The harm to society caused by the technogenic impact of enterprises on the environment must, of course, be compensated. One of the ways may be the introduction of corrective taxes, which will, to some extent, compensate for the losses of society from the mismatch between the interests of the state and business. The well-known economist A. Pigou proposed introducing a special tax to resolve conflicts caused by externalities (external effects), based on the condition of binary relations between social damage from harmful emissions and the marginal social costs of reducing this damage.

In Russia, the expert community is actively raising and discussing the issue of introducing an environmental tax³¹. Experts note that its introduction is necessary for the financial support of the activities of the Government of the Russian Federation in the direction of greening the regions and ensuring conditions in the country for the realization of the constitutional right of citizens to a favorable environment. At the same time, the state environmental policy does not provide for a compromise solution of problems between the state and business.

Thus, it is necessary to develop such a “theory of implementation” of economic mechanisms, which, on the one hand, will provide the state with financial resources for the implementation of state environmental programs, on the other hand, will arouse the interest of business in creating effective environmentally balanced behavior when investing in environmental technolo-

²⁸ Thus, the closure of the oldest asset of the company, the Nickel Plant, as well as the modernization and reconstruction of the existing production facility, allowed to reduce SO₂ (sulfur oxide) emissions in the city of Norilsk by 30%.

²⁹ *Predpriyatie ezhegodno vybrasyvalo v vozdukh okolo 400 000 t dioksida sery* [The Enterprise Annually Emitted about 400,000 Tons of Sulfur Dioxide into the Air]. URL: <https://www.vedomosti.ru/business/articles/2016/06/28/647054-nornikel-zakrivaet-nikelevii-zavod> (accessed 15 May 2020).

³⁰ *Direktor zapolyarnogo filiala «Noril'skogo nikelya» — o modernizatsii proizvodstva i zakrytii Nikelevogo zavoda, 2 maya 2015* [Director of the Polar Division of Norilsk Nickel — on the Modernization of Production and the Closure of the Nickel Plant, May 2, 2015]. URL: www.trk7.ru (accessed 15 May 2020).

³¹ We leave out of the scope of attention the assessment of the effectiveness of the introduction of the new tax, since this was not the subject of research.

gies. The proposed theoretical approach (model) to the formation of a constructive partnership will allow reaching a bifurcation point in the relationship between government and business and thereby leveling the technogenic load on the ecosystem of the Arctic territories, which confirms the previously put forward hypothesis 2.

Conclusion

Theoretical postulates suggest that the state environmental policy is based on the following basic principles: the introduction of the best available technologies, compensation for environmental harm and a scientifically grounded combination of the triad (ecology — economy — society) of interests of a person, society and the state.

Today, the achievement of symmetrical relations between business and government should be based on “partnership” interactions that allow taking into account the interests of opposing sides. Unfortunately, in practice, the asymmetry of their interests is noted: the narrowly pragmatic attitude of business towards nature and the inability of the authorities to preserve the natural environment for future generations, which necessitates a change in the forms and methods of state policy in the field of environmental protection measures. The main idea of the transformations is not “pressure” on business, but the elimination of the existing conflict of interest by moving to a new qualitative level of interaction between government and business.

Searching for symmetrical relations between government and business in the Arctic becomes even more urgent due to the resource-raw materials orientation and the mono-profile of the economies of the Arctic regions. This specificity and features of the socio-economic development of these regions must be taken into account when developing mechanisms and tools for regulating the relationship “power–business”.

It should be noted that economists do not have a unified approach to modeling constructive partnership between government and business in the field of ecology. We believe that it is necessary:

- firstly, to develop symmetry in relationships, and cooperation in this case should be bilateral and interdependent in addressing important environmental issues. Namely, on the part of the authorities — formation of such legal initiatives that will allow to develop and stimulate the environmental responsibility of business and create favorable conditions for the development of entrepreneurship. On the part of business structures — striving for transparency and openness in reflecting non-financial environmental information and compliance with environmental management standards, as well as improving the conditions for partnership in the environmental field;
- secondly, to reconstruct environmental taxation according to the principle “it is not the consumer who pays, but the polluter does,” thereby shifting the tax burden on enterprises, whose activities cause irreparable harm to the environment. In addition, it is necessary to develop a system of tax incentives (tax credits, cancellation of payment of

certain payments, etc.) for enterprises that implement the best available technologies, but not within the framework of general taxation, but in the system of environmental payments;

- thirdly, to follow the principles of the above-presented model of “green” partnership (reaching the bifurcation point), which allows to transform the system of state regulation of environmental management qualitatively, which in the future will make it possible to achieve the decoupling effect.

In the opinion of the authors, it is only possible to stop the further degradation of the biosphere through the joint efforts of all participants and at all levels of the society organization.

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