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Conceptual Aspects of Environmental Insurance

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Abstract: New challenges dictate changes in the direction of development in the field of environmental insurance. Environmental problems are an extremely important factor behind such changes. It is obvious that the strategic directions outlined long before the crisis have lost their significance and, to a certain extent, have defined a new range of problems and their consequences. Taking into account the outlined range of problems, environmental insurance, which has undergone changes caused by the challenges of modernity and determined the definition of new strategic guidelines for their development, acquires special relevance. The article outlines the stages of development of climate policy in the world. The focus is on decarbonization, including areas such as resources, infrastructure, markets and carbon pricing, carbon quota trading and a combination of these approaches, consumers and investments. A methodology for calculating the cost of the insurance tariff is presented. Ways for further development of environmental insurance in Russia are proposed.

1 INTRODUCTION

The need for theoretical justification and development of methodological principles for organizing and implementing an environmental insurance system is due to the growing level of environmental danger in Russia.

Today, the number of man-made environmental accidents and catastrophes, nuclear incidents, facilities and activities that are sources of increased danger to the natural environment, as well as problems arising during the storage and disposal of environmentally hazardous waste, is growing, as a result of which the negative impact of economic activities on the state of ecosystems.

This situation encourages countries around the world to tighten environmental and legislative requirements for industrial and other economic activities, provide economic incentives for environmental protection activities and at the same time increase liability for harm caused by violation of environmental legislation, and, as a result, introduce environmental insurance.

In Russia, Article 18 of the Federal Law of January 10, 2002 No. 7-FZ, which contains a number of legal norms, is devoted to the legal regulation of environmental insurance. However, now there is no system-wide procedure for regulating the area under consideration in procedural terms. To do this, it would be possible to highlight mandatory territory in legal acts as a generalization of a higher order. For example, territorial liability for damage caused by an accident or incident at a hazardous production facility. However, unfortunately, this institution does not apply to the area of environmental damage. Thus, the fragmentation of environmental insurance is obvious.

The theoretical basis for research in the field of environmental insurance is the research of scientists, including E. M. Nemtsurova (2020), A. S. Tulupov (2019), V. N. Kuzmin (2019), E. S. Lokhanova, L. K. Vasyukova (2020), O. L. Konyukova, I. A.

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Korchebny (2021), etc., however, its use in the domestic practice of insurers is insignificant.

2 MATERIALS AND METHODS

The study used a comprehensive approach to environmental insurance processes, namely methods such as analysis and synthesis, induction, comparison and specification. When forming the methodology for calculating the cost of the insurance tariff, theoretical generalization and systematization were used.

3 RESULTS AND DISCUSSION

Climate policy has gone through 5 stages of development over time (Egorova, 2020; Kvanina, Makarova, 2021):

1) awareness of the problem by the scientific community (1979-1988, in particular climate conferences in Switzerland, Austria and Canada);

2) the transition of the scientific problem to the political plane (1988-1990, in particular the creation of the Intergovernmental Panel on Climate Change (IPCC) and its presentation of a report on the rate of increase in global temperature);

3) creation of an institutional platform (1990-2007, in particular the UN Framework Convention on Climate Change; Geneva Declaration; Kyoto Protocol; second to fourth IPCC report);

4) the first period of the Kyoto Protocol (2007-2012, in particular climate conferences in Poland, Denmark, Mexico, South Africa and Qatar);

5) Paris Agreement (2013-2020, in particular the fifth report of the IPCC and the adoption of the Paris Climate Agreement. It is worth noting that Russia has ratified the Kyoto Protocol).

After the fifth stage, we can distinguish the Sixth stage of climate policy development, the basis of which was the UN Climate Change Conference (COP26) in 2021 (at COP26 the first review of the promises that were made in Paris in 2015 took place). Despite significant greenhouse gas emissions, military events are not currently targeted for economy-wide emissions reductions. With the exception of a few Alliance members (such as France, Germany, the Netherlands, the United States and the United States) which already make such calculations, military emissions are not measured or reported - either due to data or because military emissions are classified information . Even where hazardous emissions are measured, the measurements are not the same everywhere).

In total, global industrial production annually emits about 20 billion tons of pollutants into the air, more than 15 billion tons of which is carbon dioxide. In addition to the immediate threat to human health, emissions of carbon compounds into the atmosphere cause global warming due to the greenhouse effect. According to the Australian analytical group Breakthrough - National Center for Climate Restoration, current trends in carbon dioxide emissions into the atmosphere will continue by 2050. This could lead to an increase in average temperatures by 3°C, leading to massive displacement of people due to lack of drinking water and in addition, a sharp decline in agricultural productivity is expected.

Back in 2011, parties to the UN Framework Convention on Climate Change agreed on the need to reduce emissions and committed to taking climate change mitigation and adaptation measures to limit global warming to 2°C. Most countries in the world are parties to the United Nations Framework Convention on Climate Change (UNFCCC), which has set a 2°C temperature reduction target. According to a report by the United Nations Conference on Trade and Development (UNCTAD), the implementation of the action plan, which contains 17 iterations aimed at achieving the goals of the Framework Convention, requires funding of almost $4 trillion per year.

It is worth noting that today investment accounts for approximately 35 % of the required capital raising, which leaves an investment gap of $2.5 trillion. Moreover, the costs of decarbonizing the economy are difficult to estimate. A recent study by American environmental scientists J. Hansen and J. Niels shows that by 2100, removing carbon from the atmosphere will cost up to $535 trillion per year. In contrast, if global carbon emissions were reduced by 6% per year from 2021, costs would be reduced by approximately $100–200 billion per year.

In general, decarbonization trends can be classified into areas:

– resource: renewable energy sources, limiting production, abandoning coal generation, capturing, using and storing dioxide, hydrogen energy;

– carbon markets and pricing: CO2 tax (carbon tax, cross-border carbon tax), greenhouse gas emissions trading system, and a combination of these approaches; carbon reporting;

– consumers: abandonment of internal combustion engines, limiting emissions in the aviation sector, limiting emissions in shipping,

– investments.

Therefore, as the basis for the reconstruction and further development of a modern “green” economy in Russia, it is necessary to create new industrial bases and means of production that do not rely on fossil fuels. In general, the Russian green economy development program should include:

– providing financial assistance for the restoration and launch of production, that is, the use of the latest technologies (for example, electrothermal steel smelting instead of open-hearth production), the abandonment of coal and minimizing the use of natural gas in technological processes, the use of renewable energy sources and energy products with low CO2 emissions ;

– refusal of coal, reduction of CO2 emissions, use of renewable energy sources, in particular waste, hydrogen, etc.;

– refusal of traditional fuel for public transport. In cities, it should be replaced by electric and biofuel transport, as well as water transport.

To implement this point, it will also be necessary to create networks of electric charging stations for public and private electric transport.

Some scientists propose introducing a new segment of environmental insurance - insurance against man-made losses. This segment of insurance represents a certain system of relations that arise in the course of man-made (production) activities between the insurer and the insured to prevent damage and compensate for it in the event of emergency situations and includes compensation for both property damage and damage caused, population and damage caused to the natural environment.

To implement and regulate the environmental insurance market, it is necessary to create appropriate financial institutions at the state level, organize a functional structure - the “National Environmental Insurance System” and develop a “Functional Model for the Development of Environmental Insurance” in order to apply a holistic approach to the formation of the environmental insurance market in Russia.

The key issue in the development of the environmental insurance system is determining the volume of tariff rates. The size of the insurance tariff in the system of environmental insurance of industrial enterprises is influenced by the following factors: the frequency of environmental and man-made accidents, the number of enterprises with a high degree of environmental hazard located in a certain territory; the maximum damage that can be caused to the environment as a result of an insured event; high probability of an insured event; level of environmental hazard of equipment, etc.

The mathematical apparatus of the insurance tariff is determined as follows, so that it is enough for the insurer to fulfill its obligations to the policyholders (i.e., make payments) and cover the costs of maintaining the insurance organization, as well as make a profit. Thus, the total insurance rate (gross rate) contains the net rate, load and risk premium. Gross – the rate differs from the net rate in the size of the load and the risk premium. This is because the insurance company bears certain obligations for insurance, and forms a reserve at the expense of part of the load to ensure property liability to third parties.

The insurance rate (gross rate, T_n) is determined as the sum of two parts: main part (T_{mp}) and risk premium (T_r)

$$T_n = T_{mp} + T_r \quad (1)$$

The main part of the net rate T_{mp} is formed and sent to compensate for insured events that have occurred and depend on the possibility of the occurrence of an insured event; (q) the average amount of the insured amount S and the average amount of insurance compensation S_{ic} and are determined by the following formula:

$$T_{mp} = 100\,\frac{Sic}{S}\,q \text{ (from 500 rub. sum insured)} \quad (2)$$

The risk premium (T_r) depends on several parameters, which include: the number of concluded contracts (n) depending on the insurance period, the number of insured events that have occurred (taking into account their frequency), the total amount of insurance premiums sufficient to pay insurance compensation, and also R_c - the average spread of compensation and φ the necessary probability (guarantee) at which the volume of collected insurance payments will be sufficient to pay compensation for insured events. The value of T_r is determined by the formula:

$$T_r = 1{,}2\ T_{mp}\ a\ (\varphi)\sqrt{\frac{1-q}{nq}} \quad (3)$$

The tariff rate is calculated using the formula:

$$T = \frac{T_n * 100}{100 - H_o} \quad (4)$$

H_0 – share of load in the tariff rate in actuarial calculations; it is usually taken at 30%.

An environmental audit allows you to solve the main methodological and practical issues of environmental insurance, which determines the degree of environmental risk, which will allow you to classify a production facility into the appropriate category of environmental safety.

From the above, conclusions can be drawn regarding the practical development of the environmental insurance market in the Russian Federation, namely:

– improving the legislative framework for environmental insurance;

– a priority in the development of environmental insurance should be mandatory liability insurance for owners of sources of increased environmental hazard in the event of harm to third parties as a result of emergency environmental pollution;

– develop voluntary and compulsory environmental insurance;

– introduce state support for the environmental insurance market;

– create a National Environmental Insurance Fund, a National Environmental Insurance Pool, state and joint-stock insurance companies;

– using the example of foreign experience within the framework of National Environmental Insurance, take into account the risk of gradual environmental pollution;

– to improve the mechanism for using environmental audit, which serves as a powerful information resource in the implementation of environmental insurance.

At newly built enterprises it will be necessary to introduce basic energy saving measures: organization of accounting of energy resource costs at all stages of the production process and automated energy consumption management; use of secondary energy resources for the production of thermal and electrical energy, use (utilization) of heat from waste gases and waste steam, cooling energy of units, etc.; introduction of energy-efficient production technologies, installation of highly energy-efficient equipment.

4 CONCLUSIONS

The study made it possible to determine the stages of development of climate policy in the world. The focus was on decarbonization, which allowed it to identify its main areas, in particular resources, infrastructure, markets and carbon pricing, consumers and investments. Such actions became the basis for characterizing direct and indirect environmental impacts. The results obtained made it possible to give recommendations for the development of a "green" economy in the regions of Russia. In general, the results of the study indicate that in the field of "green" development in the future it is necessary to place emphasis on environmental insurance taking into account risks, practical experience of which is lacking in Russia. In addition, there should be a reduction in energy consumption through constant monitoring and regulation of the ventilation system; optimization of lighting using LEDs, etc. It is even possible to replace the heating system from oil to geothermal. In such conditions, we can talk about favorable conditions for policyholders on the part of insurers.

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