Status and Trends in Transboundary Carbon Management

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Abstract: Currently, the human environment associated with the consumption of energy, carbon-intensive products, is one of the most pressing problems in the implementation of climate programs in various countries. The introduction of a carbon pricing mechanism is the most fundamental tool for solving the problem of reducing greenhouse gas emissions. The plan announced by the Union to introduce a mechanism to address the issue of carbon pricing of an international nature, while avoiding additional risks and challenges for the cross-border energy-intensive economy. The purpose of the article is to study trends in the field of cross-border carbon regulation, to identify possible negative consequences for Russian producers of carbon-intensive products.

1 INTRODUCTION

The main trend in the implementation of the program aimed at reducing greenhouse gas emissions into the atmosphere is set by the European Union. The data published by some independent international research companies show negative trends in the impact of industrial production on the ecosystems of various countries and regions. Thus, in mid-2021, the contribution of the European Union economy to the volume of carbon dioxide emissions into the atmosphere amounted to 881 million tons. This is slightly lower than the volumes recorded before the start of the COVID-19 crisis. These data were published by Eurostat at the beginning of 2022.

If we consider the structural composition of greenhouse emissions by sectors of the economy in the countries of the European Union, it can be seen that the manufacturing industry accounts for up to 23% of emissions, electricity supply - 21%. Households and agriculture in European countries together account for up to 28%. The positive dynamics observed in recent years in terms of emissions in some European countries is associated with recovery economic trends. At the same time, the researchers agree that, despite the recovery effects of the economies of individual countries, the trend of greenhouse gas emissions in the European Union shows a steady decline in the direction of the EU targets.

Studies within the framework of international projects conducted in 2021 indicate the continuing negative trend in atmospheric pollution with greenhouse gases. Thus, according to a research project, the growth rate of greenhouse gas pollution worldwide in 2021 was 4.9%.

2 MATERIALS AND METHODS

The methodological basis of the study is such methods of general scientific knowledge as classification, definition, axiomatic method, graphical, statistical, comparative legal analysis, synthesis and analogy, generalization and justification, system method, extrapolation, methods of induction and deduction. The information base was the publications of domestic and foreign researchers in the field of cross-border regulation. To substantiate certain provisions of the study, data from the statistical office of the European Union (Eurostat) and the Russian Federal Statistics Service (Rosstat) were used (Cross-border carbon tax in the EU: a challenge to the Russian economy, https://econs.online/).

3 RESULTS

At the end of 2021, the countries of the European Union proposed measures to reduce greenhouse gas

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emissions with targets up to 2030. By 2050, according to the developed package of proposals, the European Union should become a carbon-free territory. To achieve carbon neutrality in the EU by 2030, it is necessary to reduce greenhouse gas emissions by 55% compared to 1990 levels.

The implementation of grandiose plans to reduce greenhouse gas emissions will definitely lead to transformational changes in the economies of countries based on carbon-intensive industries (decrease in GDP, job cuts, etc.). For example, energy-intensive products traditionally remain the basis of Russian exports: fuel and energy products, which accounted for 54.3% of total exports in 2021. At the same time, machinery and equipment account for the largest share of imports (49.2% in 2021).

Thus, some countries, including the Russian Federation, will face the problem of the lack of technologies and equipment to reduce the concentration of greenhouse gases. The existing risks and threats of the mechanisms proposed by the European Union to combat greenhouse gas emissions are the main argument, due to which individual countries are in no hurry to assume obligations under international climate agreements (Bazhan, 2020). However, the economic rhetoric of the "green" transition of the EU countries is not based on the thesis of the possibility of sustainable development against the backdrop of a decrease in the carbon intensity of industries. Thus, since 1990, according to Eurostat data, the GDP of the European Union has grown by more than 50%, while the intensity of greenhouse emissions (the ratio of emissions to GDP) has halved, to 271 g of CO2-equivalent. According to EU policymakers, these statistical observations show that decarbonization and sustainable economic growth are thus not mutually exclusive (CO2 braucht einen Preis – mit einer wirtschaftspolitischen Flankierung. Zukunft Soziale Marktwirtschaft Policy Brief #2021/02).

The European Union is currently in the implementation phase of the Transboundary Carbon Management Mechanism (CBAM) (CBR). In essence, CBAM regulation is a continuation and extension of the European Emissions Trading System (EU ETS). Its main idea is to prevent carbon leakage. Carbon leakage refers to the movement of carbon-intensive industries to countries or regions that do not use tools to reduce greenhouse emissions. The carbon tax on imports is one of the main tools of the EU climate program "EU Green Deal" (Vaganov, 2021).

The initial stage of the introduction of carbon regulation assumes an insignificant industry coverage and includes the following products: ferrous metallurgy, aluminum (including products from it), cement, nitrogen fertilizers, and electricity (Makarov, 2017).

The key instruments of the transboundary carbon correction mechanism have not been finally defined. However, it is clear that the calculation of the cross-border tax will be based on the volume of carbon emissions attributable to products imported into the EU. At present, the European Union has not decided on the final configuration of the transboundary carbon correction mechanism: 6 options for introducing transboundary carbon regulation are being considered.

Table 1: Suggested options for introducing transboundary carbon regulation.

Option	Description
Option 1	A tax imposed on high carbon-intensity products imported into the EU. The basis for calculating the amount of the tax is supposed to use the average emissions of greenhouse gases in the EU countries. At the same time, importers are required to disclose the actual carbon intensity of imported products.
Option 2	It involves the sale to importers of certificates, the cost of which will be calculated based on the average greenhouse gas emissions of the ENC countries. At the same time, importers are required to disclose the actual carbon intensity of imported products.
Option 3	The cost of importing products into the territory of the EU countries for producers of carbon-intensive products will be determined based on the actual volumes of greenhouse gas emissions. It is assumed that CBAM regulation sectors will not have access to free allowances under the European Emissions Trading Scheme (EU ETS)
Option 4	It is a variant of Option 3 and involves the phased introduction of CBAM regulation with a gradual phasing out of free quotas from 2025.
Option 5	The fundamental difference from other options lies in the depth of impact of the CBAM mechanism due to the expansion of the volume of regulated products down the value chain. This will cover the main materials as part of the components and finished products.
Option 6	It involves the establishment of an excise tax on both carbon-intensive imported products and products of European manufacturers. At the same time, the mechanism for distributing free emission allowances will be preserved.

Option 4 is considered the most preferred. According to the forecasts of the European Commission, this scenario has clear advantages in terms of reducing greenhouse gas emissions in the EU and preventing carbon leakage in sectors that fall within the CBAM zone. The phasing out of free emissions allowances under the preferred scenario would reduce greenhouse gas emissions by 1% in the EU and 0.4% globally in CBAM-regulated industries by 2030. leakage up to 29% (Motosova, 2014; Troyanskaya, 2018).

4 DISCUSSION

The transitional option is more preferable for Russia, given that the first stage includes only a limited number of carbon-intensive products - the most vulnerable to carbon leakage. The absence of the oil and gas sector in the sectors subject to CBAM regulation is explained by some experts by the fact that accelerated measures for the transition to environmentally friendly production, transport and energy will lead to the fact that the need for products of the fuel and energy complex in its traditional form will objectively decrease.

An analysis of the proposed approaches to cross-border carbon regulation in any of the proposed options allows us to draw objective conclusions about the presence of serious challenges and threats to Russian exports, in the structure of which the main share traditionally remains with the fuel and energy complex (54% in 2021) (The structure of exports and imports, http://government.ru/). The export of metals and products from them also occupies significant volumes in exports (10.4% in 2021). The chemical industry accounts for 7.7% of exported products. The total revenue of exporters in 2021 amounted to $492 billion (Estimation of the economic consequences of the introduction of the EU cross-border carbon tax., https://ecfor.ru/en/: Russia's Climate Agenda: Responding to International Challenges, https://roscongress.org/en/).

Serious transformational consequences for the Russian industry and exporters are predicted by authoritative international independent research groups. Thus, according to Boston Consulting Group experts, the volume of carbon-intensive products that fall into the CBAM-regulation zone will amount to 100-160 million tons. At the same time, experts emphasize that at the first stage, CBAM regulation is introduced only in relation to a limited range of products. However, it is noted that this will lead to an additional financial burden on Russian exporters in the amount of $3-4.8 billion, provided that the entire volume of greenhouse gas emissions is taxed.

When analyzing the implications of a cross-border tax, different research groups approach the issue from different methodological platforms. Thus, the KPMG research group analyzes three scenarios for the introduction of cross-border carbon regulation, each of which has its own specific impact on Russian producers: optimistic (the tax will be introduced only in 2028); basic (CAR will be introduced in 2025); negative (CAR will be introduced in 2022). An optimistic approach to forecasting the introduction of CAR is based on the notion that it will be charged as the difference between the actual greenhouse gas emissions of domestic producers and the benchmark in the EU sectors of the economy. In this case, the exporters of natural gas, nickel, copper will become the most vulnerable, since the energy intensity of these products is much higher than European indicators. The fiscal burden is expected by experts in the amount of 6 billion euros for the period 2028-2030). The baseline scenario for the introduction of CAR assumes that this will happen in 2025. Only direct greenhouse gas emissions will fall within the CBAM regulation zone. The fiscal burden is expected in the period 2025-2030. in the amount of 33.3 billion euros. The introduction of a cross-border tax this year characterizes the most negative scenario for Russia and will provide for CBAM regulation not only of direct emissions, but also of indirect ones. By indirect means emissions of greenhouse gases in the sectors of production that are directly related to exporters. The fiscal burden under this scenario is expected in the period 2022-2030. in the amount of 50.6 billion euros, which is approximately 10% of the revenue of Russian exporters in 2021.

Representatives of the Institute for Economic Forecasting of the Russian Academy of Sciences, assessing the economic consequences of the introduction of the EU cross-border carbon tax, identify the following key goals for the introduction of CBAM regulation: structural changes to stimulate the intensification of economic growth; increasing the competitiveness of European manufacturers; reducing the negative impact on the environment. The following threats to Russia stand out. First, the introduction of cross-border carbon regulation will lead to a reduction in demand for traditional Russian exports (carbon-intensive). Secondly, the growth of export costs and the cost of using borrowed capital. Thirdly, the ratification of commitments to reduce greenhouse gas emissions that are incommensurable with the economic damage.

Considering that the mechanism of the cross-border carbon tax has not been fully developed, it is very difficult to make forecasts regarding the formation of the fiscal burden on domestic producers. The contours of future prices for greenhouse gas emissions are not yet clear. Currently, the cost of buying emissions allowances on the European trading floor varies from 45 to 100 euros per tonne of CO2 equivalent.

In our opinion, when integrating the Russian Federation into international mechanisms for carbon regulation, it is necessary to proceed from the fact that the TUR and the prospect of a phased increase in prices for greenhouse gas emissions have a number of negative institutional consequences for Russia:

- increased social tension. The economic condition of the Russian population is currently characterized by a decline in real disposable income over the past years. Socially disadvantaged groups of the population and low-income households will lose purchasing power as a result of a sharp increase in the prices of energy and carbon-intensive consumer goods. If the negative scenario (accounting for indirect CO2 emissions) of the introduction of CAR is implemented, the decline in the consumer ability of the population will deepen further down the value added chain;
- for the corporate sector, the introduction of CAR sectoral difficulties are associated with a decrease in profitability and job cuts. First of all, we are talking about the capital-intensive sectors of the Russian economy, since high capital costs are also characterized by large volumes of energy consumption, which results in an increase in greenhouse emissions;
- the introduction by the European Union of a unilateral transboundary carbon regulation with the prospect of higher prices for emissions will lead to a decrease in the international competitiveness of Russian producers. Countries that already have national mechanisms for carbon regulation (for example, China) can become more competitive and force Russian suppliers out of international markets;
- the absence of a national system of carbon regulation in the Russian Federation may in the future lead to a “carbon leak” from countries falling under the CBAM regulation and having or starting to implement carbon regulation mechanisms, which will lead to a further increase in the carbon intensity of the sectors of the Russian economy and increase the intensity of greenhouse gas emissions;
- lack or limited access to technologies that allow reducing, capturing and using carbon emissions. It should be noted that the promotion of non-energy exports in Russia is included in the roadmap of national priorities. The development and implementation of high-tech and low-carbon technologies for the supply of products to international markets and the domestic market, according to experts, should become one of the significant growth points for the domestic economy. Companies should become the driver of technological progress, as the increase in carbon prices creates objective prerequisites for taking measures to reduce carbon emissions technologically. Companies' technology incentives are fueled by the desire of consumers to use products with a lower carbon footprint, as this reduces their consumer costs. Thus, market competition allows significant technological advances to be made to reduce the carbon intensity of products. However, it is obvious that the development of basic technological innovations in the field of carbon regulation is impossible without state participation. Many sectors of the economy cannot be imagined without basic technologies. For example, these are aviation, Internet technologies, nuclear energy, etc. Due to the great economic uncertainty and limited financial resources, private enterprises are not interested in investing in such sectors of the economy. Market maturity and the required level of profit when investing in basic technologies is achieved over an extended period of time. Government support for investments in basic technologies to reduce the carbon intensity of products has a high multiplier potential, as they extend to other sectors of the economy or longer along the value chain (Dorsey-Palmateer, 2020).

5 CONCLUSIONS

Conclusion and conclusions. Given the negative expectations, in our opinion, the Russian Federation needs to provide response measures in the following areas:

- development and implementation of a domestic system for reporting and monitoring of emissions and removals of greenhouse gases. It is believed that the current accounting mechanism for carbon emissions and removals does not fully reflect the actual picture. This

problem is especially relevant for developing countries. The development of a national emission accounting system for the Russian Federation is necessary in order to ensure the comparability of international data;

- creation and development of domestic carbon markets in order to ensure the receipt of carbon fees in the country's budget system, which will make it possible to subsequently compensate domestic producers for payments made through various government programs (subsidizing the industry, concessional lending, tax preferences (the most preferable, in our opinion, option etc.).

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