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The Impact of the EU Carbon Border Adjustment Mechanism on Russian Exporters

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Abstract

The European Union's commitment to achieve carbon neutrality by 2050 led EU states to develop a new legal stimulus mechanism allowing to reduce greenhouse gas emissions: the 'Carbon Border Adjustment Mechanism' ('CBAM'). First introduced in July 2021, the CBAM anticipates an imposition of a special carbon import duty on companies that import certain goods and materials into the EU, with the amount of such duty calculated based on the amount of GHG emissions emitted into the atmosphere in relation to such products.

CBAM constitutes a part of today's environmental agenda of the EU, but it obviously places additional financial burden on the shoulders of exporters, including those from Russia, for many of whom the EU has been a strategic market for a long period of time.

This article provides a summary of findings made as a result of research of available publications that addresses a potential impact of CBAM on the value and financial metrics of those Russian exporters. The authors aim to demonstrate the results of calculations of the additional burden placed on the exporters which arise from CBAM through an analysis of the structure of the export, identification of the economic sectors most affected by CBAM, calculation of a carbon export duty to be potentially paid at the border of the Eurasian Economic Union, as well as calculation of required government support for the exporters.

This article further evaluates the impact of CBAM while factoring in amendments that were still not covered in comprehensive research papers at the time of publication of the particular research analysed herein. Additionally, a detailed analysis of goods exported to the EU and impacted by CBAM is conducted for the first time, including a list of significant commodity nomenclature codes which are stipulated in the relevant legislation. Finally, recommendations on potential reactions to the impositions of CBAM and their effects on the future growth of the Russian economy are also provided.

In December 2021, the European Commission proposed a set of stringent amendments to the CBAM draft legislation, expanding the list of goods affected, broadening the emissions scope and accelerating the timeline for implementation of the CBAM. In June 2022 the European Commission agreed to compromise on less-stringent wording which goes outside the scope of this article. The details of proposed amendments assessed in this article thus represent the stricter version of language considered during the review process of the European Commission.

Keywords: economics of regulation, trade and environment, environmental taxes and subsidies, government policy, valuation of environmental effects, international fiscal issues

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Introduction

In July 2021 the European Commission of the EU presented a legislative initiative package regulating environmental protection as a part of the strategic package of climatic measures known as ‘Fit for 55’ [1]. The primary objectives of ‘Fit for 55’ are the reduction greenhouse gas emissions in the EU 55% from 1990 levels, and achieving carbon neutrality by 2050.

The Carbon Border Adjustment Mechanism (CBAM) initiative occupies the central position in the package. Officially, CBAM is an instrument promoting decarbonization of European imports, but in practice it is a mechanism for tax burden leveling aimed at making companies which export their products to the European Union pay for greenhouse gas emissions which take place during the manufacture of such products. The price calculated is equal to the one paid by EU domestic manufacturers according to the EU Emission Trading System. The intention is to arrange payment of the carbon duty through selling special environmental certificates to third country importers. The number of certificates will be calculated on the basis of the declared carbon footprint of the imported products.

The proposals of the European Commission were presented in draft legislation 2021/0214(COD) of 14.07.2021 [2] (hereinafter the “Draft Legislation”). However, as early as 21.12.2021 an official speaker on CBAM of the Committee on the Environment of the European Parliament – Mohammed Chahim – offered a series of amendments to the Draft Legislation [3] which scaled-up regulation, reduced the time period for its implementation, and strengthened the role of the single central authority regulating CBAM in decarbonization of the European economy (hereinafter referred to as the “Amendments”).

The final drawing up and approval of the wording of the CBAM was one of priorities defined by the government of France when it held the presidency of the Council of the European Union in the first half of 2022 [4, p. 5], and it will remain one of the main issues on the agenda in the second half of the year when the Czech Republic holds the presidency. At the beginning of January 2022 a project of stricter Amendments was presented for consideration in the European Parliament. However, as a result of arduous discussions on 22.06.2022, a compromise on the articulations of formulas to take effect in the short term were approved, which provided for the reduction of emissions to a greater extent by 2030. The next step is discussion of the Draft Legislation in autumn of 2022 in the form of a tri-ologue – negotiations between the European Committee, European Parliament and the Council of the European Union. This paper considers a tougher version of the relevant Amendments discussed during the first half of 2022.

CBAM is applied to certain goods from eight sectors: aluminium, cement, steel, electricity production, fertilizers and ammonia, plastic, hydrogen, and organic chemistry. It cannot be ruled out that later on the list of the sectors covered by CBAM will be expanded. According to resolution of the European Committee 2019/708 [5] coal min-

ing, crude oil production, extraction of ferrous metal ores, nonferrous metal ores, mineral raw materials for chemical industry and fertilizer manufacturing, manufacture of chemical pulp, paper and carton, basic chemical compounds, and glass were all added to the list of sectors with the highest risk of greenhouse gas leakage between 2021 to 2030.

Initially the Draft Legislation contemplated the following three-phase implementation of the mechanism [6, p. 16]:

- 2023–2025 – a transition period when importers have to report the carbon footprint of the imported products;
- 2026–2034 – a period of CBAM development (partial application) when the tax load on the importers is gradually increased simultaneously with abolition of free allowances for carbon dioxide emissions;
- after 2035 – a period of full effect of CBAM when the carbon duty is imposed on importers and is calculated on the basis of a 100% carbon footprint of the imported products.

According to the Amendments considered in this paper (with tougher measures proposed than those finally adopted by the European Commission) a fast-track implementation of CBAM was planned in line with the same logic: 1) a transition period (2023–2024); 2) a period of CBAM development (2025–2028); 3) the full effect of CBAM (after 2028). Although the compromise reached in June 2022 establishes the time limits of the transition period of 2027–2032 it cannot be ruled out that the EU will embark on a course of a fast-track implementation of the mechanism taking into consideration the ambitious character of the objectives to be achieved according to the strategy of European economic development articulated in the ‘Green Deal’ [7].

The emission trading system (hereinafter “ETS”) was established and started functioning in the EU in 2005, and the current fourth phase of its development (targeted for completion in 2030) began in 2021. Manufacturers located in the EU are participants of the ETS. They are obliged to declare annually the carbon footprint of produced products and pay for it on the basis of the market emission allowance price for 1 ton of CO₂ equivalent defined by the ETS after deduction of the free allowances allocated by the European regulator. The amounts of free allowances differ depending on the industry sector and are reduced by the regulator each year.

According to the Amendments considered in this paper it was proposed to phase out free allowances completely by the end of 2028 applying a special “CBAM factor” to the established target emissions (benchmarks): 90% – in 2025, 70% – in 2026, 40% – in 2027 and 0% – by the end of 2028. An update of benchmark values for the years 2021–2025 of Phase 4 of the EU ETS published by the European Committee on 12.10.2021 (the latest update at the time of this research) [8] states the list of product benchmarks for 2021–2025.

The carbon footprint of imported products is defined on the basis of the methodology first proposed as early as 2001 in the Greenhouse Gas Protocol [9] by the World Resources Institute together with the World Business Council for Sustainable Development) [10]. According to the offered methodology, greenhouse gas emissions are conventionally divided into direct and indirect ones and are broken down into three categories. Scope 1 covers direct emissions released during the company's operations in the manufacture of products. Scope 2 encompasses indirect emissions associated with electric power generation which has been used to manufacture products/conduct corporate operations. Scope 3 covers other indirect emissions released from secondary processes, for example, product warehousing, logistics, waste disposal.

In compliance with the Amendments, the whole carbon footprint is subject to declaration and payment: Scope 1, 2, and 3. Under the initial wording of the Draft Legislation importers did not pay for energy-related emissions (Scope 2). At the same time, they plan to apply CBAM not just to carbon dioxide emissions (CO_2) but sometimes to nitrogen oxide (NO) and to perfluorocarbons (C_xF_y). Therefore, emissions of these compounds will be converted into CO_2 equivalent to calculate the unified equivalent taxation basis (the so-called CO_2 equivalent).

The accompanying document [11] to the Draft Legislation defined the principle of carbon duty calculation and relative to each imported product it may be written in a simplified form as follows:

$$CBAM_i = (e_i - f_{CBAM} \cdot \beta_i) \cdot P \cdot V_i,$$

where $CBAM_i$ – the carbon duty paid by the importer on the basis of the declared carbon footprint of product i , in Euro;

e_i – the actual (declared) specific level of greenhouse gas emissions related to imported product i converted into carbon dioxide applicable to product i in tons of CO_2 equivalent per 1 ton of the imported product;

f_{CBAM} – “CBAM factor” in %, the share of free EU allowances for emissions which corresponds to the CBAM factor offered by the Amendments to the Draft Legislation. The number of free allowances is reduced in the period of CBAM development and equals zero in the period when the mechanism comes to full effect;

β_i – the benchmark, target CO_2 emissions for product i (carbon intensity) defined by the European Committee for 2021–2025, i.e. before the period of partial effect of CBAM, t of CO_2 equivalent per 1 t of imported product;

P – the price of the EU environmental certificate for CBAM (in Euro) which allows to “discharge” the amount of emissions equal to 1 t of CO_2 ;

V_i – the quantity of import of product i in relation to a certain commodity nomenclature code of the EU classification (combined commodity nomenclature (CN codes)).

If the importer can provide to the European regulator the evidence that a part of the carbon footprint has been paid in

the country of manufacture of the product imported in the EU, the volume of the carbon footprint subject to payment will be reduced correspondingly. In fact, this is possible only for the countries with their own emission trading system or a domestic carbon export tax which have been acknowledged by the EU or the countries with the functioning EU ETS (Iceland, Liechtenstein, Norway, Switzerland).

The top-level logic (the calculation “roadmap”) which guided the authors was implemented through an eight-step sequence, each step deriving from the previous one.

Step 1: calculation of indicators of Russian export of the products subject to CBAM. As long as CBAM is applied to certain products instead of industry sectors, in this research we analyzed the volume of Russian export and the corresponding volume of European import, export and domestic production related to such products (hereinafter the “Products”) including valuation of Trade Import and Export Classification (TIEC) of databases of the Russian Federal Customs Service and CN codes and European Committee of PRODCOM classification which correspond to them. Data analysis showed that in relation to the products covered by CBAM Russian export in 2021 amounted to: 0.049 mln tons of cement products; 13.017 TWhr; 2.309 mln tons of fertilizers and 0.637 mln tons of ammonia; 11.511 mln tons of ferrous metallurgy products – semi-finished products of iron and flat-rolled products accounted for 24% of them, direct reduced iron products – for 19%, cast iron and cast iron products – for 5.3%; 2.153 mln tons of aluminium and aluminium products while raw aluminium accounted for 90% of the whole amount; 3.184 mln tons of organic chemistry products; 0.823 mln tons of plastic materials and plastic products; hydrogen was not exported.

Step 2: evaluation of import dependency of the EU economy. Analysis of two publicly available databases of the Statistical Office of the European Union (Eurostat): sold production, exports and imports by PRODCOM list (NACE Rev. 2) [12] and total production by PRODCOM list (NACE Rev. 2) [13] provided understanding of the volume of total consumption of the Products in the EU on the basis of data on import, export and domestic production, allowed to calculate dependency on import of each item separately and in aggregate for each of the eight sectors covered by CBAM.

There is a high import dependency of the EU on aluminium and aluminium products, organic chemistry, fertilizers. There is a serious share of Russian products in import of electricity, fertilizers and ammonia, steel, cast iron and iron, organic chemistry, aluminium and aluminium products, however, in the amount of consumption of the EU export from Russia is not of much importance, so dependence of the EU on Russian export of Products may be discussed with some reservations (Table 1).

Table 1. The Russian export content in the EU's import and consumption, %

Sector	Share of Russian export in the total import of the EU	Share of Russian export in the total consumption of the EU
Electricity	46.8	0.2
Fertilizers, ammonia	41.0	6.2
Ferrous metallurgy	34.6	5.0
Organic chemistry	24.1	4.2
Aluminium	15.0	4.9
Plastic materials	7.8	1.2
Cement	1.1	0.0
Hydrogen	0.6	0.0

Source: Authors' calculations on the basis of data provided by the Russian Federal Customs Service and Eurostat / PRODCOM.

We used results of historical data analysis as the starting point to make the basic and alternative scenario of supply within the forecast period of 2022–2028.

Step 3: making the basic and alternative scenario of export of Russian products to the EU. The assumption that new non-market restraints of 2022 related to export of Russian products will not be taken into account due to the pending character of the situation and uncertainty of the final list of limitations was made as the principal assumption for making the basic scenario.

The basic scenario of export of aluminium and aluminium products, fertilizers and ammonia, cast iron, iron, steel and organic chemistry was made in reliance on a macroeconomic poll conducted by the Bank of Russia in March 2022 [14] according to which in 2022 it is expected that GDP in Russia will decrease by 8%, in 2023 it will grow by 1%, in 2024 – by 1.5%. A long-range forecast of annual GDP growth for Russia in the basic and alternative scenario, except for the best-case scenario, is 1%. The forecast of electricity export to the EU (mainly to Latvia, Lithuania, Finland) took into account the plans of the Baltic states to withdraw from the power grid formed by Belarus, Russia, Estonia, Latvia, and Lithuania (BRELL) by 2055, and the plan of Finland to stop electricity imports from Russia by 2030. It is important to note that as long as free allowances for CO₂ emissions are not allocated for the power sector in the EU the tax burden in all scenarios is defined only on the basis of export volumes. The forecast of growth of plastic materials' export to the EU is based on project parameters and dates of commissioning of new largest Russian plants manufacturing polyethylene and polypropylene. In spite of the fact that currently hydrogen is not produced and manufactured in the EU in significant amounts, the Energy Strategy of the Russian Federation for the Period up to 2035 [15, p. 47] contemplates rise of hydrogen production to 0.2 mln tons by 2024 and to 2.0 mln tons – by 2035. The forecast of hydrogen export is based on the assumption that 50% of output will be supplied to the European market.

Flat 2021 Scenario. This scenario contemplates preservation of export volumes at the level of 2021. The scenario is made exceptionally for comparison in order to get an understanding of the amount of carbon duty the Russian economy would pay if within the forecast period of 2022–2028 the volume of export of Russian Products remained unchanged at the level of 2021.

The best-case scenario is based on the conservative scenario of GDP growth in Russia made by the Ministry of Economic Development of the Russian Federation in 2021 [16]. According to the forecast GDP is expected to grow by 2.5% in 2022, by 2.6% – in 2023, and by 2.7% – in 2024. The long-range forecast of Russian GDP growth is 2.7%. Additionally, the forecast of dynamics of export volumes is increased by 5% in comparison to the basic scenario.

The worst-case scenario is constructed on the basis of the results of a macroeconomic poll of the Bank of Russia conducted between 01.03.2022 to 09.03.2022 (minimum of the central tendency) according to which GDP in Russia is expected to decrease by 16% in 2022, by 5% – in 2023, and to grow by 0.9% – in 2024. Additionally, the forecast of dynamics of export volumes is reduced by 5% in comparison to the basic scenario.

The stress scenario is based on the results of the abovementioned poll of the Bank of Russia. The minimum values which show respondents' expectations concerning GDP decrease in Russia by 23% in 2022, by 7.3% – in 2023 and a 0.7% growth in 2024 are taken as the basis. The scenario presupposes an additional decrease of export volumes by 20% compared to the basic scenario.

The scenario analysis shows that total volumes of Products supplied are smaller in the basic scenario than in the Flat 2021 scenario, the stress scenario shows reduction of Russian exports in the majority of sectors by 38% in comparison to the basic scenario, the worst-case scenario – by 18%, and the best-case scenario shows growth by 23%. Obtaining of forecasting data on volumes of Russian export allows to go to the next step – calculation of the specific volume of CO₂ emissions which is subject to CBAM.

Step 4: evaluation of carbon intensity of the Products exported to the EU, calculation of the base of emissions taxable under CBAM. Several components influence the specific volume of greenhouse gas emissions liable to the carbon duty in the EU. They are the actual level of emissions of Russian exporters, target emissions (benchmarks) defined by the European Commission [17] and the share of free emission allowances which is to be decreased within the period of partial effect of CBAM and reduced to zero by the end of 2028 according to the proposed Amendments to the Draft Legislation.

The specific volume of emissions liable to the carbon duty in all the sectors covered by CBAM except for electricity and cement (free allowances for cement products will be reduced to zero completely by 2025) will grow gradually by the date of full effect of CBAM at the end of 2028. Consequently, the burden on Russian exporters will increase. The last step to calculate this requires making a forecast of the price of EU CBAM allowances for emissions of 1 ton of CO₂ equivalent.

Step 5: generation of price forecast for an emission certificate for 1 ton of CO₂ by the EU ETS. The price of the

allowance for 1 ton of CO₂ equivalent is defined on the basis of offer and demand at the trading platform of the EU ETS and at the date of calculations amounted to 88.99 Euro per 1 ton of CO₂ equivalent [18]. Consensus of long-range forecasts of analysts from Bloomberg New Energy Finance (BNEF) [19], taken as the basis in this research, indicates that taking into consideration the ambitious signs related to implementation of the environmental agenda given by the European Commission, further growth of the allowance is expected over the long term, up to 108 Euro per 1 ton of CO₂ equivalent emissions by 2030.

Step 6: calculation of the total burden on Russian exporters in the context of described scenarios and economic sectors. Taking into account a wide variability of fields of the results which may be obtained due to the collected data within this research we took a decision to single out three indicators which provide a vivid presentation of carbon duty influence on Russian exporters. They are the medium duty amount per year within the period of 2025–2028, the carbon duty amount in 2028 and the total amount of the carbon duty within the period of 2025–2028. See Table 2.

Table 2. Additional burden on Russian exporters, Euro bln

Scenario	Medium burden	Burden in 2028	Total burden
Basic	3.77	6.20	15.07
Flat 2021	3.79	5.91	15.17
Best-case	4.56	7.61	18.22
Worst-case	3.19	5.23	12.77
Stress	2.48	4.06	9.94

Source: Authors' calculations.

The medium amount of the carbon duty imposed on the Russian economy according to the basic scenario within the forecasting period amounts to 3.77 bln Euro and varies from 2.48 to 4.56 bln Euro depending on the scenario. In general, the amount of the duty within the period of 2025 to 2028 in the basic scenario amounts to 15.07 bln Euro and varies from 9.94 to 18.22 bln Euro, which is comparable with the market capitalization of the largest Russian companies such as PAO Severstal, PJSC NLMK, United Company RUSAL etc.

It is of special importance to single out from the sectors covered by CBAM the ones which will suffer the most from imposing the carbon duty. The results of the evaluation conducted on the basis of the basic Russian export scenario show that the maximum burden falls on the ferrous metallurgy sector: in total, the supply of iron, cast iron, steel, and products to the EU account for 34.2% of the carbon duty. Plastic materials account for 20.4% of the burden, aluminium and aluminium products – for 14.0%, organic chemistry – for 13.7%.

Table 3. A carbon duty split by economic sectors in the base case scenario

Sector	Share in the total carbon duty, %	Cumulative share, %	Medium amount of the duty in 2025–2028, bln Euro	Medium amount of the duty in 2025–2028, bln RUB
Ferrous metallurgy	34.2	34.2	1.29	126.2
Plastic materials	20.4	54.6	0.77	75.0
Aluminium	14.0	68.6	0.53	51.6
Organic chemistry	13.7	82.4	0.52	50.5

Sector	Share in the total carbon duty, %	Cumulative share, %	Medium amount of the duty in 2025–2028, bln Euro	Medium amount of the duty in 2025–2028, bln RUB
Fertilizers and ammonia	12.0	94.3	0.45	43.8
Electricity	4.1	98.5	0.16	15.0
Hydrogen	1.5	99.9	0.05	5.4
Cement	0.1	100.0	0.00	0.2
Total	100	100	3.77	367.8

Source: Authors' calculations.

Applying the carbon duty to the Products imported to the EU may potentially entail a commensurable increase in the price for such products, thus nullifying the negative effect of the carbon duty. However, the results of calculations of this research based on the pro-rata principle of import dependence indicate that price increment as a result of CBAM does not compensate for the additional burden on Russian companies. Moreover, implementation of CBAM will make Russian organic chemistry, ammonia, cement, and fertilizers noncompetitive in the European market.

Step 7: calculation of the economic effect from implementation of the export carbon duty at the level of the Eurasian Economic Union. It is beyond dispute that it is necessary to take preventative actions which would mitigate the negative effect of CBAM on Russian exporters, but the discussions concerning the path to be taken are still ongoing.

One of the discussed issues was the issue of the efficiency of introducing an immediate analogue of CBAM in Russia – a carbon export duty which would be considered by the European regulator to be paid by the Russian exporters when importing Products to the EU. Thus, the proceeds from the carbon duty would go to the budget of the Russian Federation, and could be used to create new plants in the country which are economically and environmentally more efficient. The authors think that without measures such as government support for exporters comparable in scope, such initiatives will be inefficient because the export duty should cover all exports of the products subject to CBAM. Otherwise, introducing such duty will violate WTO regulations and will provide grounds to third countries for filing actions against Russia, or will entail comparable blocking-off measures in relation to the importation of Russian products. Taking this into consideration, even introducing a carbon duty on Russian products exported beyond the EAEU would be the optimal decision to a greater extent than introducing the Russian internal export duty. Yet, it is not an acceptable solution, because the burden on the exporters is still significantly greater than the burden on the exporters in case of CBAM. If the duty is imposed on the Products exported beyond the EAEU, the exporters of organic chemistry will suffer least of all because export to the EU amounts to 77% of the total Russian export of organic chemistry beyond the EAEU, consequently, the export duty will cover 23% of export volumes. An EAEU

carbon duty would cover 34% of export of electricity, 54% of ammonia, 65% of cement and aluminium, 66% of iron and steel, 69% of plastic materials, 75% of fertilizers, 78% of hydrogen and 84% of cast iron.

In case of introducing of the EAEU carbon duty according to the basic scenario, it will be 1.2–5.8 times higher for various types of exported products. On average, the burden on exporters will be 2.8 times higher in case of the EAEU export duty. Obviously, the government of the Russian Federation will have to compensate for their losses applying alternative, non-mirror measures such as tax benefits for construction of new plants or modernization of existing ones which correspond to the most rigorous world ESG standards for manufacture of products with the minimum carbon footprint or implementation of environment protection initiatives.

Step 8: influence of the burden on Russian GDP and calculation of the necessary amount of government support for the exporters. It should be noted that from the point of view of influence on the gross domestic product of the Russian Federation payment by exporters of duties under CBAM and an alternative duty will have completely different consequences.

Payment under CBAM constitutes an outflow of funds from the budget of the country, while introducing an export duty is meant to impede such outflow. The results of calculations show that in order to compensate exporters for the burden of the EAEU export duty in comparison to the CBAM burden even for 2025–2028, the government will have to provide an indirect support to the exporters equivalent in total to 2% of forecasted GDP for this period (2.67 tln RUB) or on average – 0.5% of GDP per year (667 bln RUB). Based on forecasts of a long-term growth rate of the Russian economy of 1% per year according to the basic, worst-case and stress scenario, the necessary minimal government support may decrease the GDP growth twice in the long time horizon which is an unreasonable price for support of a limited number of Russian exporters.

It looks more logical that it is better to comply with CBAM and at the same time – to support Russian manufacturers in order to decrease the carbon footprint of the exported products, improve their competitiveness in the European market and, consequently, reduce the CBAM duties for Russian exporters.

Conclusions

The carbon border duty of the EU may potentially deprive a series of Russian exporters of competitive advantages if they do not or cannot adapt to the requirements of the current European environmental agenda and fail to take measures to reduce the carbon footprint of the exported products.

In the basic scenario, the average annual amount of the CBAM duty during the partial effect of the mechanism in 2025–2028 will amount to 3.77 bln Euro (367.8 bln RUB), however, the burden on the exporters will be 2.8 times more if the government chooses to introduce the export EAEU carbon duty. Besides this, introducing such duty will require the government to provide an additional support to exporters which will entail sacrifice of a half of the Russian economy's growth over the long term.

As long, as such price may be unjustifiably high for the state, the optimal solution for Russian exporters is investment in modernization of existing productive facilities and construction of new ones which meet the best-in-the-world ESG standards aimed at decreasing the carbon footprint of the exported products and, consequently, improving competitiveness of Russian exporters in the European market. A lot of Russian companies have been working towards this objective for some time now but there is still a lot to be done.

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