ORIGINAL ARTICLE
DOI: https://doi.org/10.30932/1992-3252-2023-21-3-9

World of Transport and Transportation, 2023,
Vol. 21, Iss. 3 (106), pp. 244–253

Bifurcation Points of Carbon Regulation

Boris A. LYOVIN

Victor Ya. TSVETKOV

Nikolay V. ISAIN

Andrey L. OKHOTNIKOV

Boris A. Lyovin [1], ***Victor Ya. Tsvetkov*** [2],
Nikolay V. Isain [3], ***Andrey L. Okhotnikov*** [4]

[1, 2] *Russian University of Transport, Moscow, Russia.*
[3, 4] *JSC NIIAS, Moscow, Russia.*
✉ [2] *cvj2@mail.ru.*
[2] *SPIN-code 3430-2415, AuthorID 140020 (Russian science citation index).*
[3] *SPIN-code 6471-3356, AuthorID 1177738 (Russian science citation index).*
[4] *SPIN-code 9528-4823, AuthorID: 916989 (Russian science citation index).*

ABSTRACT

There are 1800 climate change laws around the world. In recent years, the rapid increase in carbon emissions has caused global warming and climate pollution, causing serious harm to social development and human health. Reducing carbon emissions is getting a lot of attention. Since the Kyoto Protocol and the Paris Agreement, many countries have made efforts to reduce carbon emissions.

The article describes the international processes intended to adopt regulations on greenhouse gas emissions, including the regulated market for quotas and the voluntary market for reducing greenhouse gas emissions. The emphasis is on European and Russian quota mechanisms. The stages of development of transborder carbon regulation in the EU are highlighted. It is noted that in Russia, the leader in application of ESG criteria is JSC Russian Railways, as a company that is consistently pursuing the transition to implementing the principles of sustainable development.

The conclusions on international trends in development of carbon regulation are followed by proposals on solutions regarding problematic aspects of the new Russian carbon legislation. According to the authors, the target scenario remains the transition to a new technological structure ensuring a real reducing the carbon footprint.

Keywords: transport, sustainable development, ecology, carbon market, carbon emissions, decarbonization, climate agenda, greenhouse gases, CO_2 emissions, ESG.

For citation: Lyovin, B. A., Tsvetkov, V. Ya., Isain, N. V., Okhotnikov, A. L. Bifurcation Points of Carbon Regulation. World of Transport and Transportation, 2023, Vol. 21, Iss. 3 (106), pp. 244–253. DOI: https://doi.org/10.30932/1992-3252-2023-21-3-9.

The text of the article originally written in Russian is published in the first part of the issue.
Текст статьи на русском языке публикуется в первой части данного выпуска.

INTRODUCTION

Nowadays, the terms «principles of sustainability», «ESG criteria», «carbon footprint», «climate projects», «quotas», «greenhouse gases» or «decarbonisation» are widely used in the media. In parallel, various thematic and sectoral events and forums are held on these current topics of sustainable development. New educational programs and courses are being launched, including those initiated by higher educational institutions and corporate scientific institutes. Sections and chapters on sustainable development are included in all development strategies and programs of the largest companies in the Russian Federation. In many aspects, the leader in the application of ESG criteria is JSC Russian Railways, as the operator of the most environmentally friendly mode of transport with CO_2 emissions of 0,7 % of all emissions from the Russian transport sector [1]. Russian Railways Holding company identifies one of the significant aspects of achieving its strategic goals as a consistent transition to implementation of the principles of sustainable development in accordance with ESG criteria: *Environment* (responsible attitude towards the environment), *Social* (high social responsibility), *Governance* (high quality of corporate governance).

The *objective* of the study is to analyse new Russian legislation in the field of reducing greenhouse emissions and review the current state of development of sustainable development processes in the field of decarbonisation. The main research *methods* are statistics, comparative, qualitative, and system analysis.

The article offers description of international processes of regulating greenhouse emissions and presents the general results of the study on the current status of sustainable development processes in the field of decarbonisation, as of the main ESG criterion from the point of view of regulatory impact. The article focuses on bifurcation analysis of carbon regulation from the point of view of strategic and operational planning of the «green economy» by the persons releasing greenhouse gas in the Russian Federation.

RESULTS

International Processes

International processes for regulating greenhouse gas emissions are in two planes: a regulated market for quotas and a voluntary market for reducing greenhouse gas emissions.

The global turnover of the regulated quota market (for example, the QTS – the quota trading system) is approximately 150 times larger than the voluntary market in monetary terms. To understand the scale of these processes, we note that in 2021 the global turnover of the QTS market amounted to about 260 billion US dollars. The main goal of introducing quotas is to reduce greenhouse gas emissions by 55 % by 2030 and achieve carbon neutrality by 2050, which is regulated by the international obligations of countries under the Kyoto Protocol and the Paris Agreement. The release of quotas into circulation in a few countries forms the revenue side of the budget system, and the secondary market for unused quotas forms the revenue of commercial organisations.

Quotas in the EU were initially issued free of charge. At the same time, the limit of free quotas will tend to zero by 2032–2035. There is a general gradual tendency for their value in the QTS to increase with a decrease in physical supply. Both of these factors have gradually contributed to an increase in the average price of emission allowance in the EU to 90 US dollars per tonne of greenhouse gas CO_2 equivalent. In some countries, instead of quotas, only emissions penalties are used; there are also hybrid options – a quota plus a fine if it is exceeded. In any case, according to various forecasts, the cost of quotas or fines for emissions tends to be 100 US dollars or more per ton of CO_2-equivalent greenhouse gas emissions.

There are 25 national quota systems in the world, which determines their low compatibility in case of introduction of transnational taxes, payments, fees, or special carbon certificates. In practice, this means, for example, that it is not possible to use a third country's carbon credit or its monetary equivalent instead of purchasing a European carbon certificate. This scenario will be relevant in case of introduction of transnational fees for the import into the EU market of foreign products with a large carbon footprint during their production. The list of products is already known; from 2025, the extension of the list of products imported by the EU that are subject to the transnational tax is possible.

The problem of double counting on a global scale also persists when quotas are offset by different countries. For example, now the Ministry of Economic Development of the Russian Federation is working to provide access to international verifiers to the Russian market, primarily from the PRC. This will allow Russian issuers to register their climate projects according

to Chinese standards. The Chinese side will buy and credit emission reduction units issued in the Russian Federation as a result of implementation of a certain climate project. At the same time, the Russian Federation will take credit for reduction in emissions under the same climate project.

In the framework of development of the European quota system, the *CBAM (Carbon Border Adjustment Mechanism)* mechanism was launched – transboundary carbon regulation developed within the framework of the adopted «Green Deal» (Resolution of the European Parliament and the Council approving the *CBAM* mechanism) [2]. This mechanism algorithmizes the collection of carbon tax within the framework of transboundary carbon regulation (hereinafter referred to as TCR) and is officially aimed at encouraging trading partners to reduce greenhouse gas (GHG) emissions, as well as the carbon footprint of energy-intensive products exported, primarily to Europe.

The stages of development of transboundary carbon regulation in the EU today are as follow:

1. For the period 2023–2025 the TCR mechanism is aimed at quarterly collection of data on the volume of «direct» carbon footprint from production of certain types of imported products (iron, steel, aluminium, cement, fertilisers, electricity) and does not involve payment of fees.

2. By the end of 2025, the European Commission will assess the TCR system and decide on expanding the scope of the mechanism to other goods.

Since 2026, the TCR will require suppliers to purchase greenhouse gas emissions certificates based on the carbon intensity of their products, where the cost per unit of emissions will be determined by the internal weekly average auction price of the EU emissions trading system. In theory, however, importers would be able to account for the carbon price paid within the national emissions accounting system to avoid double taxation.

In general, based on international trends, we note:

• In the future, the inclusion into the list of TCR regulated products of oil refining and petrochemical products after expiration of the transition period in 2025 is not excluded. The least losers will be those companies that effectively manage the time remaining before the levy is introduced.

• Companies should start measuring their carbon footprint, track the cost of carbon emissions and their impact on overall costs, and plan actions for various scenarios.

• It is necessary to identify sectors in which products have a carbon intensity higher than those of the main competitors supplying the EU market and analyse how to reduce the carbon footprint of products.

• One of the ways to avoid TCR payments is to switch to the export of a range of goods of higher value added and avoid the export of basic raw materials and materials. Other possible measures could be passing on additional costs to the consumer (considering TCR in pricing, if acceptable) or reducing other costs to compensate for the negative effect of transboundary carbon payments.

However, the target scenario remains the transition to a new technological structure with a real reduction in the carbon footprint.

The voluntary market, unlike the state-regulated quota market, is not mandatory. Accordingly, issuers' entry into the voluntary market may be driven by their personal need to become carbon neutral and/or a desire to create green premium products.

In the first case, the benefits of a carbon-neutral company status include rating preferences, preferential financing, or access to a previously closed financing market, including through the issuance of «green» bonds, as well as image background for a public company.

In the second case, the transition to production of «green» products can increase their cost and competitiveness and, among other things, provide access to new markets, which, more precisely, means the absence of bans on previous supplies as part of the global «green» agenda. In essence, the release of voluntary carbon units (credits, offsets; hereinafter, CU) into circulation is associated with the fact that a company planning to level out the carbon intensity of its products acquires voluntary CU from another company that has implemented a climate project (hereinafter, CP), as a result of which greenhouse gas emissions were prevented or absorbed. As a result of such a transaction, the company, investing in implementation of CP by other organisations, receives a formally neutral or low-carbon product, since the volume of greenhouse gas released during its production was offset by absorption or reduction of emissions of the same amount of greenhouse gas in another project.

The general «green» decarbonisation scheme is as follows: a company invests in an eco-

project, for example, landscaping an area or building a gas boiler house instead of a coal one, registering the project as climate-friendly according to the selected voluntary standard, then releases a certain calculated volume of carbon units, which it receives by reducing CO_2 emissions [3]. And further, from its carbon account it is possible to sell the issued emission reduction units or commensurately increase the cost of its now «premium» products. A climate project does not have to be implemented in the company as part of its core business. No one is stopping people from replanting deforested forests in Indonesia or increasing absorption of greenhouse gases by planting forests in the tundra. This is especially true for extractive industries, where the ability to reduce CO_2 emissions is significantly lower than in other industries. For example, the forced commissioning of a booster compressor station can increase the CO_2 emissions of a gas production company by 10 times.

There are about 30 voluntary CU certification programs (standards) in the world, among which the largest ones stand out:

1. Verified Carbon Standard (VCS), USA – exchange / over-the-counter platforms (OTC).
2. The Gold Standard (GS), USA – OTC.
3. Global Carbon Council (GCC), Qatar – OTC.
4. China GHG Voluntary Emission Reduction Program (CCER), PRC – exchange.
5. Clean Development Mechanism (CDM), UN – OTC.

The cost of CU when released into circulation according to different standards ranges from 3 to 20 US dollars per 1 ton of CO_2 and does not depend on the volume of investment in the climate project. From the point of view of direct payback on production and sale of CU, considering the significant costs of the climate project, the required volume of CO_2 emissions reduction should reach at least 200–300 thousand tons of CO_2. At the same time, the costs must also include the cost of registering a climate project and issuing CU. For European and American voluntary standards, the cost of issuing CU can be 200–250 thousand US dollars per 1 CP.

The main weaknesses of the voluntary carbon market include the heterogeneity of issued CU (due to significant differences in regulation of international standards and trading platforms), insufficient liquidity and opacity of pricing for CU [4]. UN and US CU issuance standards prohibit the use of voluntary CU to offset mandatory quotas. In China, in this case, there is a little more loyalty – a Chinese company can use up to 5 % of issued CU to offset quotas.

Russian Practices

As part of fulfilment of international obligations, the Russian Federation plans to reduce greenhouse gas emissions by 1,5–2 % annually until 2060. Unlike the EU, the Russian Federation has a large resource for absorbing greenhouse gases through land use and forestry. Our country wants to use this resource to offset its emissions, partially reducing them, which makes our approaches to decarbonisation similar to North America, where absorption of natural resources is also high. Accordingly, the Russian Federation is currently at the active stage of developing a national regulatory framework for carbon regulation (about 30 legal acts were adopted during the period from 2021 to 2022), systems of independent verification, circulation of carbon units and quota fulfilment units (when emissions are less than the quota).

In June 2021, Russia adopted the first key climate Federal Law No. 296 «On Limiting Greenhouse Gas Emissions» (hereinafter referred to as FZ-296), which involves regulations on reduction of greenhouse gas emissions, introduction of «green» certificates and climate projects [5]. This legal act does not imply the active use of mandatory climate regulation instruments (including introduction of a carbon tax or emission quotas) at the federal level. At the same time, participation in CP, creation and state support of which are provided for in the document, may be attractive to the corporate sector. At the same time, in accordance with the law, participants in such projects can transfer carbon units to other legal entities, which lays the foundation for trade in carbon units.

As part of development of the Russian CU trading system, on September 26, 2022, the first Russian trading started at commodity auctions held by the National Commodity Exchange (NTB, Moscow Exchange group). At the end of the first day, two purchase and sale transactions were concluded with a total volume of 20 CU. The weighted average selling price was 1000 rubles per CU [6].

It is important to note that if the CP is implemented on the territory of the Russian Federation and its results are verified according to the Russian national standard, the issued CU

will not be recognised on the international market and, accordingly, cannot be sold on the international exchange. To enter the international market for the sale of CU, certification according to international standards is required; accordingly, at present, the current legislation of the Russian Federation does not establish the possibility of recognising CU issued or purchased abroad. It should also be noted that given the current political situation, the possibility of Russian companies to enter international exchanges may be limited and complicated.

In March 2022, the second key climate Federal Law No. 34 «On conducting an experiment to limit greenhouse gas emissions in certain constituent entities of the Russian Federation» (hereinafter referred to as FZ-34) was adopted, according to which Sakhalin region will become a pilot region in which carbon neutrality will be achieved by the end of 2025 [7]. The key objectives of the experiment are formation of a system of independent verification and creation of a system for circulation of carbon units and quota fulfilment units (the excess of quotas over emissions) [8]. It is expected that in the future the experiment will be continued in the territories of other constituent entities of the Russian Federation.

Note that the first experimental region, Sakhalin region, generates 12,3 million tons of CO_2-equivalent emissions with absorption of 11,1 million tons. Pure net emission (emissions minus absorption) is 1,2 million tons of CO_2 equivalent [9]. As part of the experiment, 70 % of net emissions will be borne by the subject (implementation of budget projects on renewable energy, gasification, energy saving and waste disposal). The remaining 30 % was distributed among emitters, which together account for 75 % of emissions. New regions of the Russian Federation that have declared their desire to participate in the quota experiment already have negative net emissions (for example, Irkutsk region) or are on the border of complete absorption of 1–3 million tons of CO_2 (Kaliningrad region, Khabarovsk region, Republic of Bashkortostan, Nizhny Novgorod region). It turns out that the plans to launch the experiment and develop the quota methodology concern, first, entities with small net emissions. Each region that will join the experiment may have its own criteria for determining the list of enterprises participating in quotas. Therefore, the Federal Government will set them for each constituent entity, calculating the best model for the it to achieve neutrality. To do this, a constituent entity of the Russian Federation must conduct an inventory of emissions and absorption of greenhouse gases, assess the consequences of the experiment for the region's budget and business, word the expected trajectory for reducing greenhouse gas emissions and approaches to distribution of quotas between regional organisations subject to regulation. According to the approved «criteria for classifying legal entities and individual entrepreneurs as organisations subject to regulation, dated 14.03.22, No. 355» from 01.01.2025, enterprises with GHG emissions of more than 50 thousand tons of CO_2 equivalent per year fall under regulation [10]. From 01.01.2025, organisations subject to regulation will be required to annually issue and verify a GHG Emissions Report for the previous year.

In general, in the Russian Federation in 2020, GHG emissions amounted to 2,1 billion tons of CO_2 equivalent. Absorption through land use and forestry accounted for 0,5 billion tons of CO2 equivalent. Thus, net emissions in the Russian Federation amounted to 1,6 billion tons. The number of constituent entities where emissions exceed absorption (net positive emissions) is about 10 regions. However, for other regions with negative net emissions, if a constituent entity of the Russian Federation absorbs more than 100 % of its emissions, non-proliferation of the quota regime is not guaranteed. This is quite logical and natural, since constituent entities that are «good» in terms of net emissions have got that position due to their historical geographical location, and not because of their targeted regional investment policy. And without participation of «good» entities in the quota regime, it will be almost impossible to achieve carbon neutrality in the Russian Federation. Accordingly, a compensation mechanism for distributing quotas to regions with negative net emissions may be required.

One of the ways to formally reduce emissions by export-oriented enterprises is to restructure asset portfolios based on the intensity of carbon dioxide emissions.

Also, in recent years, the use of ESG criteria has been actively developing and becoming relevant, being implemented in the Russia Federation in the form of a «green taxonomy». This system was developed with participation of VEB.RF as a methodological centre for financial

instruments for sustainable development and is aimed at ensuring the flow of investments from high-carbon sectors of the economy to low-carbon ones, including through the provision of:

• Preferential «green financing» for eco-projects.

• Bank guarantees for «green» projects.

• Consideration of the issuer's ESG rating in its borrower rating.

VEB.RF, considering world practices (ICMA, CBI, IDFC, European Union), has developed standards for «green» financing (requirements for the verification system) and a system of criteria for «green» projects, including [11]:

• Reduction of carbon dioxide emissions.

• Increasing the rate of recycling of materials.

• Protection and restoration of biodiversity and natural sites.

For example, for implementation of a «green» project, a subsidy from the federal budget may be provided in the form of compensation for part of the interest rate for the period of the investment phase of the project. Thus, the «green taxonomy» system encourages investors to implement climate projects and is one of the existing mechanisms for reducing GHG emissions in Russia.

A landmark example of introduction of «green» technologies in non-resource sectors is the project for organising railway traffic using trains powered by hydrogen fuel cells on Sakhalin. Based on the results of consideration of the concept and results of a comprehensive financial model of the project for development of railway transportation using hydrogen fuel cells, JSC Russian Railways, the Government of Sakhalin region, Rosatom State Corporation and JSC Transmashholding signed a protocol recognising the hydrogen project as expedient and technically feasible. The launch of passenger service on hydrogen trains on Sakhalin is expected to take place before the end of 2025. It is necessary to create a small-scale hydrogen production facility and a network of fuelling complexes directly on Sakhalin, form a pilot site and launch regular passenger rail service. A competency centre will be created at the island's university to train the necessary personnel.

In a strategic plan, to assess the degree of development of the company («as it is now» and «where to go») in the field of sustainable development, including in terms of the environmental component, it is possible to take two non-mutually exclusive paths:

1. Independently assess the scale of the «disaster» if there are the competencies within the company.

2. With the help of an external consultant, make a rating assessment for all three segments of sustainable development (Environment, Sociology, Governance) in one of several Russian rating companies, considering the criteria and requirements for the verification system of sustainable development projects in the Russian Federation. The methodologies used by rating companies are publicly available on the websites of the relevant organisations [12, 13].

It is important to note that the absence of obvious direct effects from participation in the «green» agenda for small companies does not remove the relevance of this topic for them, for at least two reasons:

1. It's easier to immediately put a small company or startup on the right track than later to turn around or restructure a large business.

2. The environmental segment for business is an important component of the overall concept of «sustainable development» or ESG principles. By structuring all three segments (Environment, Social and Governance), new growth horizons and opportunities for business optimisation can open for the company.

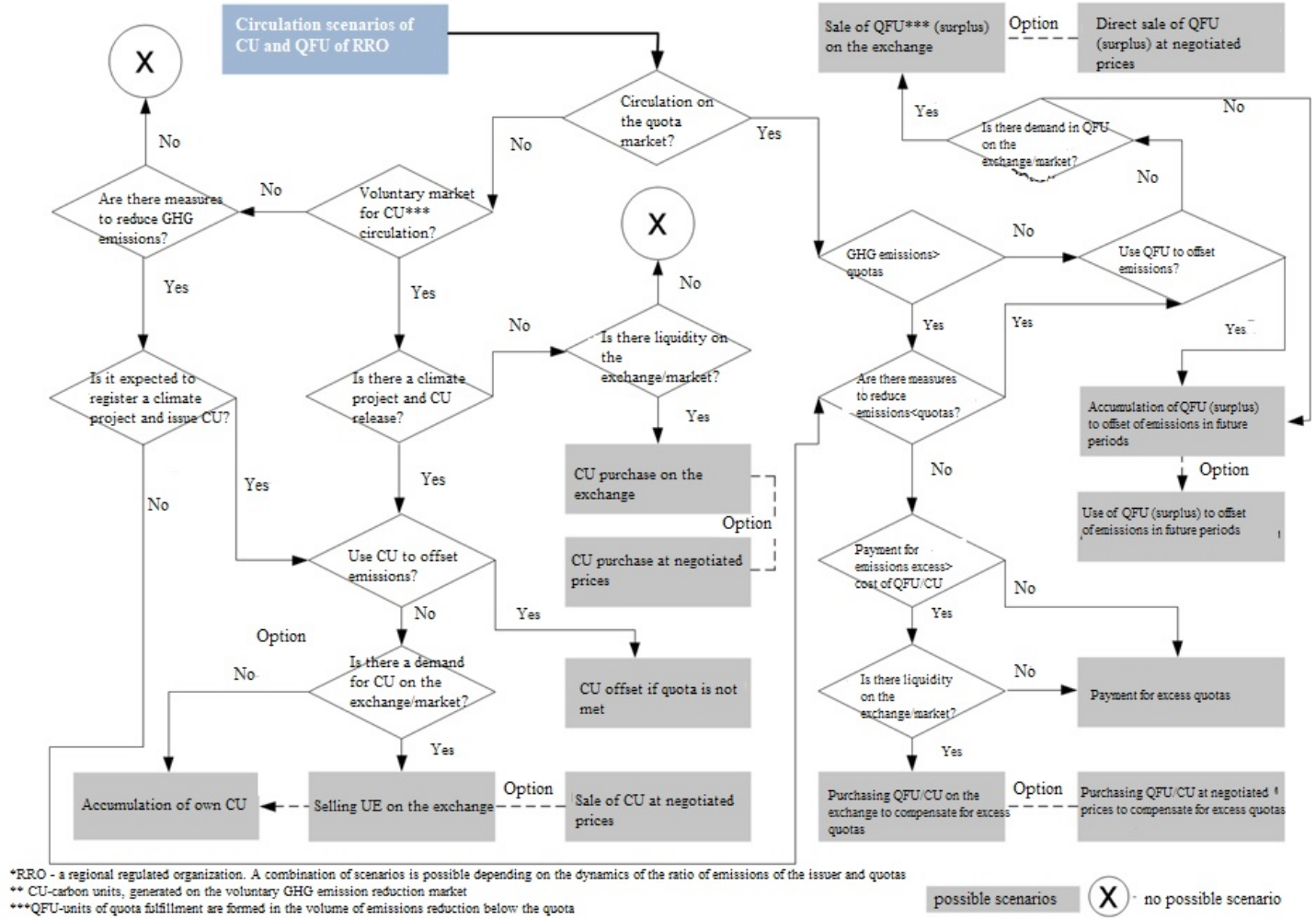
To structure the Russian processes of circulation of CU (carbon units, formed on the voluntary market for reducing GHG emissions) and QFU (units of quota fulfilment, formed in the volume of emissions reduction below the quota) and selecting a target scenario for the monetisation of greenhouse emissions, the following scheme can be considered (Figure below). A combination of scenarios is possible depending on the dynamics of the ratio of emissions and the issuer's quota in each individual case.

In general, the advantages for any company in creating a «green economy» are as follows:

• Anchor clients: the company's compliance with green principles opens access to preferential financing, scaling and opportunities to be in the supply chain of industry leaders, including large holding companies and corporations with public participation.

• Personnel: choosing the «be on trend» strategy allows receiving the best ambitious personnel and remaining an attractive employer. In this case, the phrase «employees decide everything» is quite appropriate.

• Competitiveness: a strategic advantage is maintaining competitiveness, especially for


Circulation scenarios of CU and QFU of RRO
X
No
Are there measures to reduce GHG emissions?
No
Voluntary market for CU*** circulation?
Yes
Is it expected to register a climate project and issue CU?
No
Yes
Yes
Is there a climate project and CU release?
No
Yes
Use CU to offset emissions?
No
Yes
Option
Is there a demand for CU on the exchange/market?
No
Yes
Accumulation of own CU
Selling UE on the exchange
Option
Sale of CU at negotiated prices
CU offset if quota is not met
X
No
Is there liquidity on the exchange/market?
Yes
CU purchase on the exchange
Option
CU purchase at negotiated prices
Circulation on the quota market?
No
Yes
Sale of QFU*** (surplus) on the exchange
Option
Direct sale of QFU (surplus) at negotiated prices
Yes
Is there demand in QFU on the exchange/market?
No
No
GHG emissions> quotas
No
Use QFU to offset emissions?
Yes
Yes
Yes
Are there measures to reduce emissions<quotas?
Accumulation of QFU (surplus) to offset of emissions in future periods
Option
Use of QFU (surplus) to offset of emissions in future periods
No
Payment for emissions excess> cost of QFU/CU
No
Yes
Is there liquidity on the exchange/market?
No
Payment for excess quotas
Yes
Purchasing QFU/CU on the exchange to compensate for excess quotas
Option
Purchasing QFU/CU at negotiated prices to compensate for excess quotas
*RRO - a regional regulated organization. A combination of scenarios is possible depending on the dynamics of the ratio of emissions of the issuer and quotas
** CU-carbon units, generated on the voluntary GHG emission reduction market
***QFU-units of quota fulfillment are formed in the volume of emissions reduction below the quota
possible scenarios
X
no possible scenario

tomorrow, when the next technological cycle will remove from the market companies that today do not want to invest in the responsible conduct of their business.

• Capitalisation: all companies with long-term development goals always are guided (not always publicly) by some kind of line, mission, or philosophy of movement. Even if without clear boundaries and formulations, it's a matter of time. An ESG agenda with an environmental component allows a company to publicly declare this advantageously. There are estimates that capitalisation of companies that meet ESG criteria is growing faster than all others.

We also must not forget about Russian ingenuity, which knows how to carefully replace one thing with another, evading the direct influence of regulators. Many Russian industrial companies quite rightly replace the concept of «ecology» with the word «safety». And you can't argue here since safety of operation of industrial equipment and people in the workplace is no less important and risky for the company than greenhouse gas emissions.

While setting the task of preliminary assessing the rate of a possible quota for a regional organisation subject to regulation, it is recommended to consider the following aspects:

1. The quota calculation formula for the first Russian region with approved quota, which is Sakhalin region, may retain its original methodology for other constituent entities of the Russian Federation [14]. Note that the methodology went through a public discussion stage when the regulator considered the comments of issuers. So, nothing prevents this methodology from being broadcast to all regions – those who wanted it, have already voiced their comments. If a different methodology for calculating quotas is established for each entity, then in each case the draft of this methodology will go through the stage of preliminary public approval and adjustments based on the comments of issuers. The public comment period window is only a few weeks; the main thing here is for the emission issuer to develop its own position in advance and at the same time promptly transmit comments to the regulator or the developer of the methodology [15].

2. Whether a company will be subject to quotas depends not only on greenhouse gas emissions, but also on the position of the constituent entity and the Government of the Russian Federation. However, now, it makes sense to digitise the company's possible costs in case of assigning quotas to take into account upcoming risks in the budget.

3. In addition, the methodology for calculating quotas for greenhouse gas emissions does not specify an algorithm for accounting and distribution of quotas in the presence of a carbon footprint of a company in the territory of different constituent entities of the Russian Federation, for example, the possibility of offsetting the excess of quotas in one region with the accumulated units of quota fulfilment of another region within the framework of the activities of one and the same legal entity. Here, for strategic analysis, it is also better to consider the «worst» scenario, when it is not possible to use offsets.

4. If the quota regime will apply to all constituent entities of the Russian Federation, it may be necessary to proactively develop the company's own climate strategy, considering the estimated quota for the issuer. It should be noted that for 2022, more than a hundred well-known Russian companies have announced climate plans to reduce greenhouse gas emissions, which will require adjustments to their plans and strategies when quotas are applied to them. The costs of this additional work must also be considered if a climate strategy is adopted before quotas appear in the region. Perhaps now it is worth assigning to an official of the company the entire range of «green» competencies and assessing all the risks. This will make it possible to be prepared for a sharp «tightening» of carbon regulation, for example, for a short time frame for achieving carbon neutrality for the emitter.

5. If the quota regime is extended to the corresponding region of the company, it is advisable to implement previously planned measures to reduce greenhouse gas emissions after the quota has been determined. Due to the high base effect, quota fulfilment units can be immediately released, which can then be used to offset future quota overruns or, alternatively, sold. By the time quotas are extended to all regions, market indicators for their value will already make themselves felt, so there should be no problems with liquidity.

For development of the voluntary carbon market, we note the nuances:

1. An assessment of the need to implement climate projects should take into account not only the direct economic effect (sale of premium products, sale of issued carbon units, savings on emissions fines or reduction in fees for emissions

exceeding the quota) or image benefits, but also indirect benefits at a qualitative level, which now cannot be calculated with sufficient reliability (the ability not to lose the sales market in the future, retention of developing, ambitious employees, future tightening of fiscal policy by regulators, tax preferences and preferential financing in the future, tender passing scores, etc.).

2. In case of implementing a climate project with the voluntary release of carbon units [16], the latter can be used to offset the excess emissions over quotas or be sold to avoid double counting. That is, if a regional organisation subject ot regulation issued carbon units and reduced emissions below the quota by forming quota fulfilment units, then the regulator will not credit both the CU and the QFU to the carbon account in the register. You will have to choose based on market conditions – which has greater liquidity and costs more [17]. If QFU is chosen, it is enough to implement the event without registering a climate project to save on registration fees – several million rubles for each climate project (validation plus verification of the climate project).

3. Before designing a climate event, it is worth making sure that it falls within the criteria of a climate project.

Regarding railway industry, we will briefly highlight the key areas of implementing the principles of the «green economy»:

1. Increasing the level of efficiency in resource use.

2. Reducing the negative impact on the environment.

3. Ensuring compliance of environmental activities with the current level of development of science and technology.

4. Reducing potential risks in the field of environmental protection and environmental safety when carrying out activities.

5. Improvement of the management system in the field of environmental protection and environmental safety.

6. Increasing the priority of environmental safety and environmental protection issues.

7. Improving the culture of environmental safety of production processes.

In general, consideration of the principles of sustainable development allows companies to minimise ESG risks: the risks of an irresponsible approach to the environment, social policy, and corporate governance. Underestimation of ESG risks entails significant losses in various areas of the company's activities: these are reputational risks, weakening of the company's position in the market of transport and logistics services, decreased attractiveness for potential investors, including the implementation of «green» technologies and digital transformation, disruption of supply chains and technological lag from comparable companies on the world market.

Considering the leading position of the Russian Railways holding company in the country's transport system and the principles of sustainable development, the main directions for implementation of ESG criteria in the future until 2030 are:

• In terms of creating a «green economy» – reducing the negative impact on the environment through modernising infrastructure and introducing the best available technologies in environmental activities, as well as increasing the level of efficiency in resource use with gradual introduction of elements of a circular economy.

• In terms of social responsibility of the Russian Railways holding company – ensuring safety of train traffic, technological safety, reducing the frequency of accidents and environmental disasters, promoting the values and principles of a healthy lifestyle as an element of the corporate culture of JSC Russian Railways.

• In the field of corporate governance – achieving technological sovereignty in key areas of scientific and technological development, involving employees, clients and suppliers in activities to implement the principles of sustainable development.

CONCLUSIONS

There are currently 1800 laws regarding climate change [18]. The Russian climate agenda, as a component of sustainable development processes, is supported by the international obligations of the Russian Federation and two key Russian federal laws of 2021 and 2022. Despite numerous conflicting opinions about the need to involve Russian business in climate processes within the framework of sustainable development, there are clear signals that these are not temporary processes, but a sustainable paradigm of society. The best confirmation of this will be adoption by the state of a climate package of documents. As the result, the advantage in the corporate market will remain

with systemically important companies with a minimal carbon footprint. The driving force in this matter in the domestic market is JSC Russian Railways, as a leader in the implementation of ESG criteria.

Analysis of the results of the study might allow Russian companies making a consistent transition to a «green economy» to focus their climate position as carbon regulation in the Russian Federation becomes more stringent, and to be ready to quickly make strategically correct decisions.

REFERENCES

1. Through ESG to sustainable development [*Cherez ESG k ustoichivomu razvitiyu*]. [Electronic resource]: https://gudok.ru/newspaper/? ID=1583552&archive=2021.10.21. Last accessed 10.01.2023.

2. Energy Bulletin «Transboundary carbon regulation: challenges and opportunities», Analytical Centre under the Government of the Russian Federation, No. 98, July 2021. [Electronic resource]: https://ac.gov.ru/uploads/2-Publications/energo/2021/бюллетень_№ _98.pdf. Last accessed 10.01.2023.

3. Decree of the Government of the Russian Federation «On approval of the Rules for creating and maintaining a register of carbon units, as well as conducting transactions with carbon units in the register of carbon units», dated 30.04.22, No. 790. [Electronic resource]: http://publication.pravo.gov.ru/Document/View/0001202205050004. Last accessed 10.01.2023.

4. McKinsey & Company. [Electronic resource]: https://www.mckinsey.com/business-functions/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge. Last accessed 10.01.2023.

5. Federal Law, dated 02.07.2021, No. 296-FZ «On limiting greenhouse gas emissions». [Electronic resource]: https://docs.cntd.ru/document/607142402. Last accessed 10.01.2023.

6. Exchange trading at commodity auctions has started. [Electronic resource]: https://carbonreg.ru/ru/news/2/. Last accessed 10.01.2023.

7. Federal Law, dated 06.03.2022, No. 34-FZ «On conducting an experiment to limit greenhouse gas emissions in certain constituent entities of the Russian Federation». [Electronic resource]: https://fzrf.su/zakon/2022-03-06-n-34-fz/st-1.php?ysclid=ln1oct2rxz737718612. Last accessed 10.01.2023.

8. Decree of the Government of the Russian Federation, dated 24.03.2022, No. 455 «On approval of the Rules for verification of the results of climate projects implementation». [Electronic resource]: https://docs.cntd.ru/document/350066706. Last accessed 10.01.2023.

9. Order of the Ministry of Natural Resources of the Russian Federation, dated June 30, 2015, No. 300 «On approval of methodological instructions and guidelines for the quantitative determination of greenhouse gas emissions by organisations carrying out economic and other activities in the Russian Federation». [Electronic resource]: https://normativ.kontur.ru/document?moduleId=1&documentId=264381. Last accessed 10.01.2023.

10. Order of the Ministry of Economic Development of Russia, dated May 6, 2022, No. 247 «On approval of the procedure for classifying legal entities and individual entrepreneurs as regional regulated organizations as part of an experiment to limit greenhouse gas emissions in certain constituent entities of the Russian Federation». [Electronic resource]: https://normativ.kontur.ru/document?moduleId=1&documentId=423475. Last accessed 10.01.2023.

11. Presentation by VEB.RF «Use of project financing in conditions of limited capital – an example of responsible financing and ESG», November 2021. [Electronic resource]: https://www.hse.ru/mirror/pubs/share/533820921.pdf. Last accessed 10.01.2023.

12. ESG assessment methodology. [Electronic resource]: https://www.acra-ratings.ru/criteria/2623/. Last accessed 10.01.2023.

13. Methodology for assigning non-credit ratings that assess a company's exposure to environmental and social business risks, as well as corporate governance risks (ESG ratings). [Electronic resource]: https://www.ranational.ru./sites/default/files/ESG%20Rating%20Methodology%20NRA_2020.pdf. Last accessed 10.01.2023.

14. Order of the Ministry of Economic Development of Russia, dated August 24, 2022, No. 452 «On approval of the methodology for determining projected quotas of greenhouse gas emissions as part of an experiment to limit greenhouse gas emissions in certain constituent entities of the Russian Federation». [Electronic resource]: https://normativ.kontur.ru/document?moduleId=1&documentId=432075. Last accessed 10.01.2023.

15. Federal portal of draft regulatory legal documents. [Electronic resource]: https://regulation.gov.ru/projects. Last accessed 10.01.2023.

16. Order of the Government of the Russian Federation, dated 01.03.2022, No. 367-r «On determining an authorised legal entity performing the functions of an operator of the register of carbon units». [Electronic resource]: http://publication.pravo.gov.ru/Document/View/0001202203020028. Last accessed 10.01.2023.

17. Decree of the Government of the Russian Federation, dated August 18, 2022, No. 1441 «On the rate of payment for exceeding the quota of greenhouse gas emissions as part of an experiment to limit greenhouse gas emissions in Sakhalin region». [Electronic resource]: http://government.ru/docs/all/142679/. Last accessed 10.01.2023.

18. Eskander, S. M. S. U., Fankhauser, S. Reduction in greenhouse gas emissions from national climate legislation. *Nature Climate Change*, 2020, Vol. 10, Iss. 8, pp. 750–756. DOI:10.1038/s41558-020-0831-z.

Information about the authors:

***Lyovin, Boris A.**, D.Sc. (Eng), Professor, President of Russian University of Transport, Moscow, Russia, tu@miit.ru.*

***Tsvetkov, Victor Ya.**, D.Sc. (Eng), D.Sc. (Economics), Professor, deputy director for research of the Law Institute of the Russian University of Transport, Moscow, Russia, cvj2@mail.ru.*

***Isain, Nikolay V.**, Project Manager at the Division of the Strategic Development of JSC NIIAS, Moscow, Russia, n.isain@vniias.ru.*

***Okhotnikov, Andrey L.**, Deputy Head of the Information Technology Department, Head of the Division of the Strategic Development of JSC NIIAS, Moscow, Russia, a.ohotnikov@vniias.ru.*

Article received 23.01.2023, approved 19.04.2023, accepted 15.05.2023.