Regulatory framework for decarbonization and greenhouse gas emission reduction projects in Russia

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Abstract. As a result of the alarming rise in environmental pollution in numerous developed nations since the mid-20th century, there has been a reevaluation of nature conservation laws, the establishment of new environmental legislative frameworks, stricter regulation and oversight in this field, and the creation of governmental bodies to enforce compliance with these laws. In several countries, the reduction of greenhouse gas emissions has emerged as a primary focus within climate and energy policies and development strategies. This emphasis is evident in various legislative acts and standards that promote the execution of projects aimed at diminishing CO₂ emissions.

One of the most important tasks in combating greenhouse gas emissions is the implementation of systems for monitoring and regulating the emissions of carbon dioxide and other associated harmful substances from sources into the atmosphere. This article is dedicated to analyzing the regulatory and legal framework and legislative system in the field of environmental protection and nature conservation activities in Russia and foreign countries. Using the example of Russian legislation, the mechanisms for the practical implementation of sustainable development strategies through the control of CO₂ emissions will be demonstrated.

1 Introduction

The analysis of the regulatory and legal framework and legislative system in the field of environmental protection and nature conservation in foreign countries allows us to identify various administrative and organizational tools for control and regulation. For instance, one can consider different approaches, including environmental quality standards, impact standards, and technological standards [1, 2]. These approaches have the common goal of controlling the optimal condition of natural elements in the environment, such as air, water, soil, and more. They establish limits for pollutants or toxins released from specific sources, while also outlining specific criteria that production methods or technologies must meet in order to be in compliance.
Among the administrative instruments, regulatory and prohibitive measures (laws), environmental certification, permits and licenses, and subsidies can also be distinguished. Administrative instruments represent non-market solutions that differentiate only between permissible and impermissible use of the environment. Another type of regulation and control over rational nature conservation activities includes economic mechanisms such as taxes and fees, emissions trading schemes, and legislative provisions for liability for environmental damage. Compared to administrative instruments, economic instruments provide more opportunities for choice of actions as they represent indirect methods that incentivize efficient use of resources. Organizational instruments for regulating nature conservation activities include environmental insurance, environmental information, and environmental education.

While these approaches may not provide immediate results or explicit rewards, they create an institutional framework that encourages individuals to willingly embrace environmentally-friendly choices [1, 2].

Currently, in several foreign countries, there are certain political initiatives and a regulatory framework aimed at stimulating the implementation of carbon capture and storage (CCS) projects. However, it is not sufficiently developed everywhere and does not contribute to the widespread adoption of such projects. Among the foreign instruments of government regulation for carbon capture and underground sequestration projects, the following legislative mechanisms can be mentioned [1, 3-7]:

- innovative approaches for the development of climate and energy solutions;
- governmental actions and strategies for implementing carbon capture and storage (CCS) initiatives, reducing emissions, and creating roadmaps for climate action;
- legislation specifically targeting the successful implementation of CCS projects;
- laws pertaining to environmental protection, water resource management, air quality control, and waste disposal;
- standards aimed at limiting CO₂ concentrations during hydrocarbon extraction operations;
- implementation of carbon dioxide taxes to encourage emission reduction;
- tax advantages provided to companies engaged in CCS projects;
- initiatives promoting emissions trading;
- direct financial support from government funds and organizations for the implementation of CCS projects;
- methods of international government collaboration to address climate change;
- incentives for businesses engaging in environmentally conscious practices;
- educational resources and tools for promoting environmental awareness at all educational levels.

Let's provide a brief overview of these regulatory instruments based on legislative initiatives in foreign countries (USA, Canada, and Europe).

2 Foreign experience in regulatory and legislative regulation of CCS projects and greenhouse gas emissions.
CO₂ emissions and climate and energy policies often facilitates the implementation and integration of CCS projects, furthering their adoption and effectiveness. Some countries have enacted specific laws regarding carbon capture, transportation, and offshore and marine CO₂ storage. The purpose of these laws is to establish a legal structure and minimize ambiguity for investors engaged in CCS projects. Nonetheless, in certain countries, there exist laws that hinder the execution of such initiatives, such as legislation that bans CO₂ storage. Promoting corporate engagement with environmental initiatives is made easier through the advancement of environmental legislation, the implementation of air pollution emission targets, the enforcement of regulations on industrial activities' impact on water resources, and the strict adherence to waste management protocols aimed at minimizing detrimental ecological impacts.

Certainly, a carbon tax can serve as a viable tool to effectively curb carbon emissions and provide incentives for the adoption of CCS projects in certain scenarios. Many countries have even established provisions to lower tax rates, such as royalties and income tax, for companies involved in CCS initiatives. Moreover, emissions trading schemes have emerged as a crucial global climate strategy to mitigate CO₂ emissions, proving to be an effective mechanism in fostering the implementation of CCS projects.

The crucial role of government financial support in promoting the progress and widespread acceptance of low-carbon technologies cannot be overstated. Nonetheless, achieving a harmonious equilibrium between governmental aid and the industry's own investments in this field is of utmost importance. This delicate balance will enable us to achieve sustainable growth and development, while actively fostering the transition towards a low-carbon future.

International collaboration among countries in the development and implementation of CCS technologies is of paramount importance. Many countries provide funding for CCS projects through various international programs and organizations. Government programs and policies influence companies, encouraging them to incorporate environmentally responsible business practices. Such initiatives help companies understand their impact on the environment and motivate them to take measures to protect nature.

Across every educational level, a crucial aspect of governmental education strategies involves equipping students with the understanding, competencies, principles, and mentality necessary to comprehend the significance and function of CCS initiatives in promoting sustainable progress and the conscientious utilization of our planet's resources. This aims to empower students with the necessary tools to contribute to a more sustainable future. As can be seen, a wide range of regulatory tools can be applied to regulate CCS projects. However, predictability and flexibility in the regulatory framework are of paramount importance to companies.
reduced royalty rates for projects aimed at increasing oil production through carbon dioxide storage. Canada also has a technology support fund and a Clean Energy Fund, which provide partial financing for the implementation of carbon capture and storage projects [3, 9]. These initiatives demonstrate the commitment of Alberta and Canada to advancing carbon capture and storage technologies in the pursuit of sustainable and environmentally responsible energy practices.

Among European countries, Norway has achieved the greatest success in implementing CO$_2$ sequestration projects. The Norwegian government has embraced a comprehensive strategy that focuses on the utilization of gas energy, specifically emphasizing the incorporation of CO$_2$ capture and storage technologies. This strategic approach showcases Norway's commitment to sustainable energy practices and its proactive stance in addressing carbon emissions and climate change concerns. The strategy entails providing financial support for gas energy projects incorporating CO$_2$ capture and storage, allocating government funding for the establishment of a cutting-edge center focused on the development of environmentally-friendly gas technologies, and considering potential government participation in the creation and operation of CO$_2$ infrastructure [10].

One of the most important tasks in combating greenhouse gas emissions is the implementation of emissions control and regulation systems for carbon dioxide and other harmful substances emitted into the atmosphere from sources. There are several regulatory instruments for carbon dioxide emissions worldwide that establish a price for direct emissions. Firstly, there is the establishment of a direct carbon tax. This involves directly setting a specific rate and subsequently collecting funds added to the selling price of products, depending on the volume of emitted gas during the production process. Carbon taxes can be applied at different stages of the value chain and can be oriented towards both the producer or company directly, as well as the end consumer [2].

Another mechanism for regulating greenhouse gas emissions is the Emission Trading System (ETS). This method is based on quantitative emissions indicators and represents a specific mechanism that establishes obligations for emission reductions for all market participants and distributes emission allowances, the cap of which has been set. Participants in this market have the opportunity to purchase allowances to compensate for their own excessive emissions associated with their activities or sell their allowances to other participants, which also contributes to the collective efforts to reduce emissions [2].

In the world, funds have been allocated for the implementation of 57 projects on carbon pricing. Out of 46 national projects, 17 apply both ETS and carbon taxes, 8 jurisdictions solely use a tax system, and 21 solely use ETS. Together, these initiatives in carbon pricing cover 11 GtCO$_2$ equivalent, or approximately 15% of greenhouse gas emissions [11].

In an array of regions, including Canada, Portugal, Spain, the United Kingdom, Iceland, Switzerland, Slovenia, Denmark, Norway, Sweden, Finland, Estonia, Singapore, Poland, and Latvia, the fusion of emissions trading systems (ETS) and carbon taxes is commonly employed to enhance environmental sustainability. The use of only emissions trading systems is applied in Central and Southern Europe, Kazakhstan, China, Japan, California and Washington (USA), South Korea, Australia, and New Zealand. Carbon taxes are in use in South Africa and Argentina [2].

According to The World Bank Group's experts, the minimum carbon price in 2020 ranged from $40 to $80 per ton of CO$_2$ equivalent emissions. However, most countries did not fall within this range, let alone the higher cost. The cost per ton of carbon emissions exceeded the necessary range only in Sweden ($127), Switzerland and Liechtenstein ($96), Finland ($70), Norway ($59), and France ($50) also fell within the desired range [2].

Hence, the apparent benefits of employing carbon taxation as a means of carbon regulation lie in its straightforward implementation— it does not necessitate the establishment of additional institutional frameworks, as tax payments seamlessly integrate...
3 The analysis of the regulatory framework within the framework of reducing greenhouse gas emissions in the Russian Federation

The focus on controlling and decreasing Russia's greenhouse gas emissions has been a topic of discussion since the country's admission to the Kyoto Protocol in 1997. In April 2015, the Russian Government laid out plans to assess and track emissions, as well as devised a framework for establishing a robust system to monitor, report, and verify the country's greenhouse gas emissions [13]. This Concept encompasses voluntary reporting for major organizations that are significant emitters of greenhouse gases, requiring them to report annually if their emissions exceed 150,000 metric tons of CO2-equivalent.

The discussion on carbon regulation mechanisms in Russia has been dragging on due to active opposition from supporters of carbon-intensive industries. However, currently, the E3S Web of Conferences 458, 04003 (2023) EMMFT-2023 https://doi.org/10.1051/e3sconf/202345804003
issue of the impact of greenhouse gas emissions on climate change has reached the most serious level of public debate. For Russia, the question of increasing global temperatures and subsequent climate change is particularly relevant as the country's economy is currently among the top five countries with the highest carbon dioxide emissions, ranking fourth (4.6%) based on current reporting. The emission structure of the Russian economy is distributed as follows: carbon dioxide – 63.1%, methane – 32.4% [17].

According to climate observations from Roshydromet [18], the increase in temperature in Russia is progressing at a rate that exceeds the global average. According to Roshydromet's estimates, climate warming in Russia in 2017 occurred at a rate approximately 2.5 times more intense than the global average.

The Russian Federation diligently fulfills its obligations to provide national greenhouse gas emissions reporting, which constitutes a significant contribution to the establishment of a global monitoring system [2]. Reporting is based on the assessment of greenhouse gas emissions and absorption conducted by Roshydromet under the direction of the Government of the Russian Federation [19], in accordance with Russia's commitments under the United Nations Framework Convention on Climate Change.

During his speech at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris in December 2015, the President of the Russian Federation announced the country's plans to reduce its greenhouse gas emissions to 70% below the 1990 level. This national commitment was confirmed when the Russian Federation signed the Paris Agreement at the United Nations in April 2016 [20].

In order to prepare for the ratification of the Paris Agreement, the Government has approved a “plan for implementing measures to improve state regulation of greenhouse gas emissions and prepare for ratification” of the Paris Agreement. This plan serves as a kind of “roadmap”, including a series of key actions, the development and adoption of which are aimed at creating a comprehensive system of state control over greenhouse gas emissions.

[2]

Following its official participation in the Paris Agreement within the United Nations, Russia has seen significant developments in its national environmental legislation. These changes align greenhouse gas emissions with adverse effects on the environment and climate. The Russian Government Resolution No. 1228 of September 21, 2019, titled “On the Adoption of the Paris Agreement” [21], signifies the country's commitment to this cause. To further this commitment, Russia is currently engaged in enhancing its legislative framework to establish and operate a state system dedicated to monitoring and controlling greenhouse gas emissions.

In adherence to Resolution No. 1228 [21] and Presidential Decree No. 666 [22], Russia has pledged to decrease its greenhouse gas emissions by 70% compared to the 1990 level by 2030. Moreover, Russia is determined to shift towards a carbon-neutral path of development by 2060, wherein emissions will be counterbalanced by absorption. These ambitious goals signify Russia's comprehensive endeavours to tackle the issue of climate change as detailed in the aforementioned resolutions.

Almost one year after the introduction of Presidential Decree No. 666 [22], the Russian Federation has now given its approval to a groundbreaking roadmap entitled “Socioeconomic Development Strategy with a Low Level of Greenhouse Gas Emissions until 2050” [23]. This visionary plan, in alignment with the decree, places great emphasis on directing Russia's socioeconomic growth towards achieving a substantial decrease in greenhouse gas emissions. The primary emphasis of the strategy lies in the incorporation of measures aimed at limiting emissions in both of Russia's economic growth projections: the inertial projection and the target (intensive) projection.

The set of rules for verifying the results of implementing climate projects is approved by the Government of Russia's Resolution "On Approval of the Rules for Verification of the Results of Implementing Climate Projects" [26]. The rules for creating and maintaining a registry of carbon units, as well as conducting operations with carbon units in the carbon unit registry, are approved by the Government of Russia's Resolution "On Approval of the Rules for Creating and Maintaining a Registry of Carbon Units, as well as Conducting Operations with Carbon Units in the Carbon Unit Registry" [27]. The list of greenhouse gases, for which emissions are subject to state accounting and the creation of a register, is contained in the Government of Russia's Order No. 2979-r "On Approval of the List of Greenhouse Gases Subject to State Accounting of Greenhouse Gas Emissions and the Creation of a Register of Greenhouse Gases" [28].

Federal Law No. 296-FZ introduces a new term - "regulated entities." This includes legal entities and individual entrepreneurs engaged in economic and other activities that result in greenhouse gas emissions equivalent to 150,000 tonnes of carbon dioxide per year until January 1, 2024 (during the period from 2022 to 2023), or 50,000 tonnes or more after January 1, 2024 [24, 29]. This two-stage division of economic subjects based on emission levels is due to the lack of precise information on greenhouse gas emissions from these subjects, with only expert estimates available. Therefore, it is expedient to initially define regulated entities with emissions masses equivalent to 150,000 tonnes of carbon dioxide per year, and then, by amending the legislation, move on to other significant sources of greenhouse gas emissions [30].

The criteria for the participation of legal entities and individual entrepreneurs in regulated organizations is based on how they carry out their economic and/or other activities that are accompanied by greenhouse gas emissions [29]. At the same time, legal entities and individual entrepreneurs who are not part of regulated organizations have the opportunity to voluntarily report on greenhouse gas emissions.

The industries that are subject to regulation encompass oil and gas extraction, the coal industry, ferrous and non-ferrous metallurgy, mineral materials production, the chemical and petrochemical industry, waste management, as well as the transportation sector, which includes maritime, railway, aviation, and automotive transport [24].

Since 2006, the Russian Federation has been engaged in the inventorying of greenhouse gases (GHG), as well as the assessment and calculation of emissions and absorptions at the national level. This was established by the Order of the Government of the Russian Federation No. 278-r, which created the Russian system for evaluating greenhouse gas emissions from sources and absorptions by sinks that are not regulated by the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in Montreal on September 16, 1987 [31]. The primary goal of this order is to establish a national registry that records the volume of greenhouse gas emissions and absorptions. The national-level greenhouse gas report is compiled using data from state statistical reporting and is submitted annually in line with international requirements and procedures established by the Intergovernmental Panel on Climate Change (IPCC) in 2006. This report serves as evidence of the state's commitment to regulating greenhouse gas emissions and evaluating the effectiveness of its internal climate policy. Since 2015, Russian regions have also been providing information...
on greenhouse gas emissions voluntarily, following the methodological recommendations for conducting these inventories in the country. However, the available statistical data at the national level have become insufficient to fully assess the impact of the national economy on the climate, establish corresponding targets for different sectors of the economy, and formulate a list of measures to achieve them. This required more detailed data at the regional level and from individual organizations.

Starting from 2023, companies that are key contributors to Russia's climate policy will be mandated to report their annual greenhouse gas emissions. This requirement is essential in gathering up-to-date data for the country's greenhouse gas registry and establishing a unified information system. These individual companies, as major emitters, are vital in shaping Russia's climate doctrine.

From March 1, 2023, in accordance with the decision of the Government of the Russian Federation dated October 29, 2022, No. 1924 “On the submission of mandatory reports by regional regulated organizations” [33], new rules for reporting by organizations related to the experiment on reducing greenhouse gas emissions are introduced. These rules determine the procedure for submitting reports by legal entities and individual entrepreneurs who belong to regional regulated organizations according to Federal Law No. 34-FZ dated March 6, 2022 “On conducting an experiment on reducing greenhouse gas emissions in certain regions of the Russian Federation” [34]. At the same time, the required reporting form at for regional regulated organizations is also determined.

Thus, regulated organizations are required to annually submit a report on greenhouse gas emissions to Rosprirodnadzor by July 1 of the year following the reporting year, in accordance with the prescribed form [35] established by the Government of the Russian Federation.

To prepare the report, in addition to methodological calculations, the following data will need to be provided [32]: basic information about the organization; information about economic and other activities accompanied by greenhouse gas emissions (a list of applicable production processes and types of activities, codes of objects with negative impact, and information about the capacity of the equipment used, if applicable); data concerning the inventory of sources responsible for emitting pollutants into the atmosphere; information describing the instrumental and computational techniques utilized for assessing the magnitude of greenhouse gas emissions, along with the conversion coefficients for economic and other activities designated by the Russian Ministry of Natural Resources, along with a rationale for their selection.

Rosprirodnadzor is conducting an examination of the aforementioned reports and maintaining a registry of greenhouse gas emissions in the state information system. In the following year, 2023, a full-scale launch of the Registry of Greenhouse Gas Emissions is planned, which will be managed by the Ministry of Economic Development. In this registry, organizations will provide their carbon reporting.

Non-compliance with the submission of reports on greenhouse gas emissions, submission of incomplete reports, or provision of false information may lead to administrative fines. For individuals, the fines range from 100,000 to 150,000 rubles, while legal entities may face fines ranging from 200,000 to 1 million rubles [24, 30].

Commencing on March 1, 2023, an innovatively endorsed approach for measuring the discharge and absorption of greenhouse gases by establishments is now in full force. This approach received formal approval from the Ministry of Natural Resources and Environment of the Russian Federation via Order No. 371 on May 27, 2022 [36]. The methodology furnishes comprehensive directives and instructions to precisely ascertain the magnitude of greenhouse gas releases by establishments.

In summary, the methodology for evaluating greenhouse gas emissions involves determining the mass of emissions using a specific algorithm. Firstly, an indicator related to the production process or type of economic activity is identified for the reporting period,
which typically spans from January 1 to December 31. Examples of indicators include total fuel consumption, total volume of product output, or volume of incinerated waste.

Next, the identified indicator is multiplied by a corresponding specific coefficient. This coefficient serves as a conversion factor, converting the indicator into tons of emissions per unit of the specific activity or process. For example, it may convert fuel burned or product released into emissions in tons.

It is crucial to consider that different processes generate distinct greenhouse gases. To account for this, a conversion coefficient, also referred to as a "conversion factor" or "global warming potential" (GWP), is applied. This conversion factor determines the total amount of greenhouse gas emissions in equivalent carbon dioxide units.

As mentioned earlier, legal entities and individual entrepreneurs not classified as regulated organizations are allowed to voluntarily report greenhouse gas emissions. When it comes to big corporations, particularly those that sell their products in global markets, it becomes crucial to take into account and openly communicate their climate influence by quantifying indirect emissions. Expanded voluntary carbon reporting is a strategically important step for companies to interact with stakeholders, including investors, the public, and government bodies. It is seen as a vital part of companies' environmental policies within the framework of sustainable development and ESG transformation.

Emphasizing the significance, it is crucial to note that the calculation of greenhouse gas emissions, as per the methodological guidelines provided by the Ministry of Natural Resources and Environment of the Russian Federation on June 30, 2015 (No. 300), exclusively incorporates the direct emissions stemming from the company. In other words, only the emissions originating from the organization's internal sources are accounted for.

Nevertheless, the true extent of emissions from an organization covers a much wider scope. Besides direct emissions, there are also indirect emissions associated with various stages of product creation and supply chains. To capture the full spectrum of processes involved in assessing and calculating greenhouse gas emissions, the concept of "Scope" is used.

It is important to identify the following coverage categories:

1. Direct greenhouse gas emissions (Scope 1) - these are greenhouse gas emissions that occur directly from an organization's own sources.
2. Indirect greenhouse gas emissions from energy (Scope 2) - these are greenhouse gas emissions that occur as a result of an organization's consumption of energy obtained from external sources.
3. Other indirect greenhouse gas emissions (Scope 3) - these are all other greenhouse gas emissions that arise from the economic and other activities of an organization.

Therefore, following voluntary standards, an organization's report must take into account and incorporate both direct emissions and energy-related indirect emissions (Scope 1 and Scope 2). Other indirect emissions (Scope 3) may be taken into account to the extent necessary and practical. It's important to remember that it is only possible to provide an approximate estimation of an organization's carbon footprint.

The assessment of a product's carbon footprint is a concept similar to inventorying greenhouse gas emissions in an organization's activities. The carbon footprint of a product is determined in a similar way to that of an organization and often relies on the assessment of the organization's carbon footprint. The calculation of a product's carbon footprint shows how many metric tons of carbon dioxide equivalent were emitted into the atmosphere in the production of one unit of a specific product.

The carbon footprint assessment of a product relies on the principles of Life Cycle Assessment (LCA) throughout the entire supply chain. It encompasses various stages, including the sourcing and extraction of raw materials, as well as the proper management of waste generated during product usage and disposal. The main challenge and distinctive feature of such calculations is the consideration of upstream processes.

...
and downstream GHG emissions along the supply chain, and allocating them to different product types within the company [32].

To substantiate an organization's commitment to addressing climate change issues, it is not sufficient to solely conduct calculations of direct and indirect emissions or assess the carbon footprint of products. Voluntary carbon reporting should be validated and verified by an independent third party. The verification process ensures the accuracy of the data through validation and verification procedures. These procedures provide confidence and instill trust in the applicant to stakeholders and potential consumers. Validation refers to a systematic, independent, and documented process of assessing a GHG project plan's compliance with agreed-upon validation criteria. Validation is considered the process of evaluating the justifiability of assumptions, limitations, and methods that support the claim of future activity results based on projected information (confirming plausibility).

Verification, on the other hand, refers to a systematic, independent, and documented process of assessing a GHG statement's compliance with agreed-upon verification criteria. Verification is applied to events that have already occurred or to results that have already been obtained (confirming truthfulness) [32].

The new accreditation criteria approved by the Ministry of Economic Development of Russia encompass requirements for bodies responsible for the verification and validation of greenhouse gases. These requirements are outlined in the order number 707, dated 26.10.2020, which also includes a list of documents confirming the applicant’s and accredited entity’s compliance with the accreditation criteria [38]. These organizations should primarily comply with the provisions of the relevant national standards (GOSTs) concerning greenhouse gases. This includes having employees with relevant educational backgrounds, skills, and at least three years of experience in the field, among other qualifications.

4 Conclusion

The enactment of Federal Law No. 296-FZ "On Restricting Greenhouse Gas Emissions" [24], which came into force on December 30, 2021, in combination with associated subordinate acts and regulations from Government Resolutions as well as relevant Ministries, aims to promote the sustainable and fair development of the Russian economy by reducing greenhouse gas emissions. The current set of regulations in place provides a thorough system for overseeing and controlling the release of greenhouse gases in Russia, recognizing the importance of measuring the nation's carbon footprint as a significant measure of its economic progress. This legislation introduces essential terms like greenhouse gases, carbon footprint, climate projects, carbon units, and others to support the adoption of environmentally-conscious practices and initiatives.

The registry for greenhouse gas emissions will collect and store information regarding carbon reporting, acting as the foundation for monitoring progress in decreasing specific greenhouse gas emissions. Furthermore, the legislation establishes a legal structure for implementing climate initiatives and facilitating the exchange of carbon credits. Criteria for climate projects, verification procedures for project results, and the operation of the carbon unit registry are expected to be established. The emergence of a new carbon unit market will allow Russian organizations to reduce the carbon footprint of their products and services and attract sustainable investments for the modernization of their production facilities.

To assess the long-term prospects of reducing greenhouse gas emissions in Russia, it is necessary to refer to the decree of the President of the Russian Federation, dated November 4, 2020, No. 666, "On the Reduction of Greenhouse Gas Emissions." This decree instructs the government of the Russian Federation to [22]:
– achieve a 70% reduction in greenhouse gas emissions by 2030 compared to the 1990 level (taking into account the capacity of forests and other ecosystems to absorb these gases and assuming sustainable and balanced socio-economic development of Russia);

– develop a strategy for the socio-economic development of Russia with a low level of greenhouse gas emissions until 2050 (taking into account the characteristics of various sectors of the economy);

– create conditions for the implementation of measures to reduce and prevent greenhouse gas emissions, as well as increase the absorption of such gases.

Based on the above, the reduction of greenhouse gas emissions and the utilization of carbon dioxide are valuable areas of focus in Russia and worldwide. A rational solution to the problem of reducing anthropogenic impact on the environment also involves the effective implementation of Russian national standards for quality management systems (GOST R ISO), which are harmonized with the standards of the International Organization for Standardization (ISO). Therefore, in February 2022, the Federal Agency for Technical Regulation and Metrology, with the support of the Ministry of Energy of the Russian Federation, established Technical Committee No. 239 for standardization on "Carbon Capture, Transport, and Storage" (TC 239) [39]. The main objective of this technical committee is to develop a collection of documents for the national standardization system in the field of technologies aimed at reducing carbon dioxide emissions, as well as the design, construction, and operation of technological facilities for the capture, transport, and storage of carbon dioxide. TC 239 serves as a platform for collaboration among relevant organizations and government bodies in carrying out work on national, interstate, and international standardization.

Simultaneously, a carbon regulatory framework must not compromise the competitiveness of enterprises; instead, it should serve as a catalyst for inspiring them to enhance energy efficiency and promote resource preservation. This applies not only to businesses but also holds true for the welfare of the state. Regardless of the chosen model of carbon regulation, it should incentivize companies to invest in low-carbon development rather than creating additional complexities and barriers. Hence, it is crucial to take into account a transitional phase and compensation measures, particularly for industries that are most vulnerable, in order to mitigate the consequences of implementing carbon regulations. A successful illustration of addressing these challenges is seen in the province of British Columbia, Canada, where the implementation of a carbon tax resulted in the elimination or reduction of other taxes related to social and income.

An alternative strategy could entail the creation of a dedicated environmental reserve, where carbon payments would be collected. Using this reserve, we could finance initiatives aimed at safeguarding the environment, enhancing energy efficiency, and fostering climate adaptation.

The described regulatory and legislative initiatives, using the example of the Russian Federation, and their planned implementation give hope for the practical implementation of reducing anthropogenic pressure on the environment within the framework of global strategies for rational use of natural resources and sustainable development.

5 Acknowledgments

The work was carried out within the framework of the state task of the Oil and Gas Research Institute of the Russian Academy of Sciences (OGRI RAS) on the topic number 122022800272-4 "Improvement of modeling methods, laboratory and field research for the development of new technologies for efficient and environmentally friendly hydrocarbon extraction in complex geological conditions".
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