

MTMSD 2022**I International Conference «Modern Trends in Governance and Sustainable Development of Socio-economic Systems: from Regional Development to Global Economic Growth»****AGRICULTURAL BUSINESS IN THE CARBON MARKET**

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Abstract

The aim of this research is to examine the motivation and benefits of participating in voluntary carbon offsetting schemes in agricultural business. The article analyzes the reasons driving companies to join such schemes, including the desire to enhance attractiveness for investors and gain advantages in local markets. The position of Russia in response to global environmental challenges was intermediate position, however recent developments, such as the European Union's introduction of a border adjustment carbon mechanism, have elevated the discussion to a new level. The study highlights that Russia officially joined the Paris Agreement, setting a national goal to reduce emissions to 70% of the 1990 level by 2030, considering the absorption capacity of forests. The study also explores how engagement in voluntary carbon offsetting schemes can help companies achieve their environmental goals and improve business performance. Research methods involve analyzing the motivation of companies participating in voluntary carbon offsetting schemes and examining existing data and outcomes of investment projects. A notable result is the identification of key factors encouraging companies to participate in voluntary carbon offsetting schemes and the determination of benefits and potential challenges. The findings of the research will contribute to understanding how these schemes can be effective tools for achieving both environmental and business objectives for companies.

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1. Introduction

Projects cover areas ranging from reducing agricultural emissions by reducing the use of chemical fertilizers to improving the energy efficiency of production and switching to cleaner energy sources. Recently, projects in the field of forestry and land use have become increasingly popular. The projects have a fairly wide geography and are being implemented in more than 80 countries, but the majority are concentrated in India, China, the USA, Turkey and Brazil (Zhuravleva & Kazazaev, 2017).

The main principle for the implementation of such projects is the principle of “additionality”, compliance with which means that emission reduction units are the result of project activities leading to a reduction in emissions in a particular area of the economy compared to the baseline project implementation scenario (without the introduction of emission reduction measures) for a certain period of time period. An emission reduction project is financed by a company when the reduction in its own emissions is more expensive than the implementation of third-party projects that allow offsetting the equivalent amount of emission reduction (Pinyavina, 2021). Accounting and verification standards for emission reduction units bring together and provide an interface between regulators, buyers and sellers. Project emission reductions are calculated by collecting and aggregating field data into a set of equations that represent emission reductions and/or by using conservative common reference information (eg a national soil database) (Gunya & Gakaev, 2022). For example, to obtain baseline N fertilizer rates, site-specific data on nitrogen fertilizer management practices could be collected, or N fertilizer rates derived from country-level records and site-specific adjustments made (Bayrakov & Bagasheva, 2006). The implementation of emission reduction projects is controlled by a set of international standards for verification of reduction units, which vary depending on the type and geography of the project activity, as well as on the details of the emission reduction accounting methodology. Several standard bodies have emerged since mid-2010 and currently dominate voluntary carbon market transactions. In 2016, the top standards were Verified Carbon Standard - Verra (58% of transactions), Gold Standard (17%), Climate Action Reserve (8%), ISO-14064 (4%) and American Carbon Registry (3%).

2. Problem Statement

The problem statement revolves around the evolution and functions of the VCS (Verified Carbon Standard) program. Established in 2005, the VCS program resulted from the amalgamation of organizations dedicated to emissions trading and sustainable development. Initially designed to certify and support voluntary emission reduction projects, it has expanded its scope to include national schemes. The updated standard in 2019 restricted eligible emission reduction activities, excluding renewable energy sources due to reduced demand for additional financing. The VCS initiative actively strives to align its standards and verification activities with global agreements like the Paris Agreement and the UN DDG. Currently, it serves as the predominant accrediting body, influencing over 50% of voluntary carbon markets and a substantial portion of emissions markets governed by mandatory regulatory systems (Gakaev, 2022; Hansen et al., 2020; Vorontsova et al., 2019).

This standard was developed by the non-profit organizations HELIO International and SouthSouthNorth in conjunction with the World Wildlife Fund (WWF) in 2003 for non-governmental

emission reduction projects, voluntary carbon market projects and other climate initiatives. It was developed with social impact in mind and primarily assesses co-benefits such as job creation and improved health of local communities. Later, the standard was brought into line with the trading mechanism under the Paris Agreement and the UN DAS (Leggett et al., 2008). The Gold Standard methodology for low-tillage land is globally accepted for projects in the agricultural sector. Since 2001, The Climate Action Reserve, an environmental non-profit organization, has been developing sustainable market-based climate change solutions that benefit economies, ecosystems and society. Initially working on projects in California, she later expanded to all US states, Canada and Mexico, developing her own standard⁴ and taking over as registrar (Institute of Scientific Communications Conference, Cham). In 1996, the non-profit organization Winrock International became the first in the world to develop a methodology and procedure for carbon accounting and launch a voluntary greenhouse gas registry. Buyers and sellers of quotas are offered the opportunity to conclude contracts both within the established exchange (register) and on the basis of an over-the-counter procedure.

3. Research Questions

The research questions focus on the growing interest of various participants in the agricultural market in the carbon market. Major players, including Bayer, Nutrien, and Cargill, along with emerging startups, are actively contributing to the development of carbon market architecture. The strategic plans of new US President Joe Biden indicate intentions to provide funding to farmers, especially through the Department of Agriculture (USDA), who implement practices to capture more carbon in their fields. The study also outlines key market players, with Bayer standing out as a global influencer in major agricultural markets. Bayer's \$50 billion capitalization underscores its significant impact on the sector's organization. In 2020, Bayer initiated an incentive program in Brazil and the United States, targeting farmers adopting environmentally friendly practices. The program, covering areas like no-tillage and cover crops, involved 1,200 farmers in its inaugural season, focusing on corn and soybeans. Bayer emphasizes project verification according to standards such as the Gold Standard, Verra, and Climate Action Reserve, while also utilizing its proprietary Bayer FieldView platform to collect participants' activity results (Verfaillie & Bidwell, 2000).

4. Purpose of the Study

The study aims to explore and evaluate the effectiveness of remote sensing as a tool for monitoring emissions. Remote sensing involves scanning the Earth's surface using satellites or aircraft to gather information about the environment or atmosphere. This technology offers notable advantages over traditional methods such as field studies and standardized approaches, presenting benefits like relatively low costs and access to remote locations. These features contribute to overcoming potential manipulation by different governmental levels and point emission sources like industrial plants and illegal dumps. Machine learning and big data technologies now enhance this method, allowing for the integration of recorded energy emissions with existing databases. The study will highlight two leaders in real-time emissions monitoring and examine two initiatives—one focused on an environmental services platform

integrating monitoring and verification, and the other on an agricultural platform emphasizing soil quality and carbon emissions (Klishina et al., 2017; Taranova et al., 2021; Verfaillie & Bidwell, 2000).

5. Research Methods

The study employs a multifaceted approach, combining technical assessments and considerations of the balance of emissions in the Russian Federation. The focus is on creating a climate monitoring system, with an emphasis on technical aspects that may require a capable contractor. The system is expected to partially overlap with Roshydromet's developments, with an anticipation that it could potentially improve upon them Sugaipova and Gapurov (2018).

The research delves into the current state of emissions in Russia, highlighting energy as the primary source. The study proposes practical measures to potentially reduce emissions in the energy sector by 100-200 million tons. It advocates for the support of existing intra-industry mechanisms, including those fine-tuning the electricity market and guaranteeing investments, such as the "alternative boiler house" mechanism. The study emphasizes the importance of achieving a balance between the public effect of such regulations and their economic viability. Preliminary calculations by Gazprom Energoholding suggest potential impacts on the price of a kilowatt-hour in different price zones. Additionally, the study explores projects aimed at enhancing the avoidance of coal combustion, particularly in Siberia, to achieve further reductions of up to 100 million tons. In total, this reserve could contribute to a 25–30% reduction in emissions from the energy industry (Podkolzina, Belousov, et al., 2021; Podkolzina, Taranova, et al., 2021; Shmatko et al., 2016).

6. Findings

The findings suggest that Russia has not fully recognized the potential of carbon markets for economic development and environmental solutions. Despite its high carbon intensity and low energy efficiency in industrial processes, as well as significant potential for emissions reduction in forestry and agriculture, the country has yet to fully engage in international market mechanisms. The study notes that it is cheaper to reduce emissions in Russia compared to many other countries, providing an opportunity for the country to benefit from participating in international market mechanisms. Under the Kyoto Protocol, Russian companies previously received additional income of \$600 million through participation in joint implementation projects.

The study explores Russia's strategy in responding to environmental challenges, emphasizing the alignment of national projects like "Ecology" with emission reduction goals. Additionally, measures aimed at increasing energy efficiency, primarily to reduce costs, are seen as contributing to emission reduction. The study suggests that the natural movement of businesses towards competitiveness should also lead to emissions reduction.

The report considers whether Russia should view emissions control as an important long-term goal, requiring accurate monitoring and verification systems. The impending launch of orbital monitoring systems, such as the European CO₂ M1 and the American OCO-2, is expected to provide objective global

control over industrial emissions by 2025. The study predicts that these systems will limit the ability to manipulate country reporting on emissions.

The third perspective focuses on Russia's international position and the art of presenting its stance, emphasizing the need to develop and defend the Russian position in the international arena. This includes considerations of labeling exported gas as a "greener" fuel compared to coal or as "the future of energy" in the case of gas as a feedstock for industrial hydrogen production (Elbuzdukaeva et al., 2019; Podkolzina, Belousov, et al., 2021).

7. Conclusion

The conclusion emphasizes the evolving position of Russia in response to global environmental challenges. Despite previously holding an intermediate position, recent developments, such as the European Union's introduction of a border adjustment carbon mechanism, have elevated the discussion to a new level. The study highlights that Russia officially joined the Paris Agreement, setting a national goal to reduce emissions to 70% of the 1990 level by 2030, considering the absorption capacity of forests.

The Ministry of Economic Development's 2020 "Strategies for the long-term development of Russia with low greenhouse gas emissions until 2050" formalizes Russia's response, aligning with the second perspective discussed in the findings. The strategy presents two main low-carbon development scenarios, aiming to reduce the carbon intensity of Russian GDP by 9% by 2030 and 48% by 2050 compared to 2020. The conclusion notes that the effectiveness of the strategy will depend on the creation of a legal and methodological basis for technological transformation, the introduction of national regulations on greenhouse gas emissions, and the establishment of a climate monitoring system.

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