

Implementation of Carbon-neutral Projects as a Tool for Sustainable Development

Tamilla Magomadova¹^a, Tamerlan Magomaev¹^b and Elman Akhyadov²^c

¹Grozny State Oil Technical University named after Academician M. D. Millionshchikov, Grozny, Russian Federation

²Chechen State University, Grozny named after A.A. Kadyrova, Grozny, Russian Federation


Keywords: Global changes, modern globalized workplace, low-carbon development, carbon neutrality, greenhouse gas emissions, construction, projects.


Abstract: The turn of the Russian economy towards low-carbon development will lead to the fact that in the near future all major infrastructure programs and projects will be evaluated in terms of their contribution to achieving the goal of carbon neutrality. Obviously, the closest attention will be paid to projects in the electric power industry. And if now investors are mainly guided by the ESG factors of companies' activities, then in the future this will become characteristic of regulators and support institutions. The problem of developing uniform methods and approaches to calculating the carbon footprint of infrastructure projects is undoubtedly relevant. In most cases, companies in Russia do not yet disclose non-financial reporting at all, and if they do, they use foreign corporate methods (GRI, TCFD, and others). In the summer of 2021, the Bank of Russia issued recommendations on the disclosure of non-financial reporting by issuers, which are built in compliance with the most common global corporate standards (GRI). Orientation to established practices allows companies to reduce the time and cost of reporting, if they already report publicly according to foreign standards. The methods implemented in Russia for calculating the carbon footprint of infrastructure projects should also be based on the most common corporate standards in the world and strive for international unification. Another important problem that does not yet have a solution is the verification of calculations and reporting. And here, to increase confidence in the indicators, digital technologies should come to the rescue. The Industrial Internet of Things, distributed systems for monitoring the condition of equipment, video monitoring, and analysis tools without human intervention make it possible not only to generate gigantic arrays of data on the contribution of this or that equipment to total emissions, but also to obtain objective, unbiased results of their processing.


1 INTRODUCTION

Large investment projects are designed for decades to come, therefore, when planning them, a large number of risks are analyzed - from demand or the level of planned load to environmental impact assessment (especially when it comes to infrastructure development). Different participants in the implementation of the project - operators, financial institutions, regulators - may be interested in various aspects of risks. In view of the ongoing dynamics in setting carbon neutrality targets, both at the country and company levels, it is becoming increasingly

important to assess the carbon footprint of a project. In particular, Russia aims to achieve carbon neutrality by 2060 (Evangelista, 2020). A lot will depend on what kind of infrastructure to introduce. Disclosure of data on the carbon footprint of a project, that is, the total amount of greenhouse gas (hereinafter referred to as GHG) emissions associated with its implementation, is not widespread. It is less common than company-wide or product-by-product GHG emissions disclosures, but quite promising. It should be kept in mind that the carbon footprint of the project will directly affect the GHG emissions of the company implementing it. Estimates related to taking

^a <https://orcid.org/0000-0002-0146-8989>

^b <https://orcid.org/0000-0001-5817-4191>

^c <https://orcid.org/0000-0002-0793-1727>

into account GHG emissions during project implementation are mainly typical for climate projects aimed at reducing emissions or increasing absorptive capacity. Along this line, the first approaches and standards for such reporting were formed. The harmonization of the rules for the sustainable development mechanism of the Paris Agreement can give a new impetus to international climate projects, and the adoption of by-laws to the Federal Law on "Restriction of GHG Emissions" - for Russian ones (Surowiecki, 2021; Souter, 2019). There is a growing interest in the world in assessing the GHG emissions of projects when making investment and financing decisions. Such requirements for a number of projects are already being made by most International Financial Institutions (IFIs) and are very likely to be further extended to the financial sector, both private and public. First in Europe, and then in other regions. The European Central Bank plans to set requirements for EU banks to report on the carbon footprint of their portfolio (which may include the need to obtain data on the emissions of borrowers in certain sections - by company or by project) (Souter, 2019). The carbon footprint of infrastructure projects includes GHG emissions at the stages of construction and maintenance of facilities, which can be influenced by the investor, and emissions at the stage of operation, which the investor often cannot influence (with the exception of the stage of making an investment decision on technological solutions in the project). The assessment of such projects includes a so-called baseline comparison (eg potential reduction in GHG emissions from combustion engines to electric vehicles with the development of appropriate infrastructure and renewal of the vehicle fleet).

2 RESEARCH METHODS

Rapid digitalization is affecting every aspect of life, including how we interact, work, shop and receive services, as well as how value is created and shared. In this process, data and cross-border data flows become increasingly important for development. Reflecting the large disparities in willingness to use data that exist between and within countries, the traditional digital connectivity divide is exacerbated by what might be called the data divide. Countries with limited capacity to digitize data and business opportunities and use them for economic and social development are clearly at a disadvantage. This Digital Economy Report 2021 highlights the challenges of managing data and cross-border data

flows in a way that can benefit sustainable development (Egorova, 2020). It also highlights that the state of the international debate on how to regulate cross-border data flows is deadlocked and positions tend to be polarized. The current legal and regulatory framework is heterogeneous and reflects the very different approaches taken in different countries, with the strong influence of major economic powers. An international framework is urgently needed to resolve this situation. While the report does not provide a "solution", its comprehensive, fact-based analysis aims to rethink and expand the international policy debate. The growing problems of interconnection and interdependence in the global data economy require a shift from a piecemeal approach to a more holistic, coordinated global approach. This may require new and innovative ways of global governance, as old ways may not be appropriate to respond to the new context. It may also require the creation of a new international body that focuses on data governance with the full participation of developing countries and all stakeholders. The report reflects UNCTAD's commitment to informing member states on how to use and get more value from data and the digital economy (Meckling, 2020). It will also facilitate much-needed global dialogue on how to set the rules for a more inclusive digital outcome. It is my hope that a holistic approach to managing global data will ultimately lead to increased sustainable development and economic benefits from the digital economy for people and businesses in countries at all levels of development.

Despite the importance of data in the emerging digital economy, there is no generally accepted understanding of the concept of data, which can lead to confusion and complicate analysis and policy debate. Data is a special resource with specific characteristics that distinguish it from goods and services. They are intangible and non-competitive, meaning that many people can use the same data at the same time or over time without draining it. At the same time, access to data may be restricted by technical or legal means, resulting in varying degrees of exclusivity. For example, data collected by major global platforms is not available for use by others, giving platform owners a monopoly position to benefit from the data. Moreover, the aggregated value can often be greater than the sum of the individual values, especially when combined with other additional data. The collected raw data can also have significant "optional" value, as it can become valuable if new problems that were not there can be solved based on this data. The more detailed and detailed the data, the more purposes it can be used in

filtering, aggregating and combining in various ways to obtain various information. In addition, the data is multidimensional. From an economic point of view, they can provide not only private value for those who collect and control data, but also social value for the entire economy. And the latter cannot be provided by markets alone. In addition, the distribution of data private income gains is highly skewed. As a result, policy development needs to support the goals of efficiency and equity. However, non-economic aspects also need to be taken into account, since data is closely related to privacy and other human rights, as well as national security issues, all of which need to be addressed (Hibbard, 2019).

To understand data and its flows, you need to look at it from different angles. First, there has always been data and information associated with commercial transactions, such as payment details, bank details, names and shipping addresses, which are mostly provided voluntarily and rarely create political problems, while new players in the digital economy work on those the same rules as normal economics. Second, raw data collected from individual actions, products, events, and behaviors has no value in and of itself, but can create value when aggregated, processed, and monetized or used for social purposes. Third, the processing of raw data into digital information—in the form of statistics, databases, ideas, information, and so on—results in “data products” that can be thought of as services in trade statistics for international sales. There are also various taxonomies that classify data types according to various criteria. Important differences relate to whether the data is collected for commercial or government purposes; used by companies or the public sector; are instantaneous or historical; sensitive or insensitive; or are personal or non-personal (Vladimirov, 2019; Molchanova, 2019). The categorization of data is important as it can have implications for the kind of access each type needs to be granted, both nationally and internationally, and how data and its cross-border flows are handled from a political perspective.

3 RESULTS AND DISCUSSIONS

The carbon footprint is usually defined as the total amount of GHG emissions associated with the activities of an individual or organization, or accumulated as a result of the production of goods and services, as well as the implementation of projects. It takes into account both direct and indirect GHG emissions. According to the GHG Protocol

widely used in the world, there are three scopes of GHG emissions (Braverman, 2019).

The main interest in disclosing the carbon footprint of projects at the current stage is shown by international financial organizations. Leading organizations, including the World Bank, the European Investment Bank, the European Bank for Reconstruction and Development, the Asian Development Bank, the African Development Bank, the Inter-American Development Bank, and since 2012 have been collaborating in the format of the Technical Working Group on Carbon Reporting to improve and harmonize approaches to accounting for GHG emissions when evaluating projects (Korchagina, 2019). In 2015, when the Paris Climate Agreement was reached, the UNFCCC Secretariat joined the group and agreed approaches were presented for projects for renewable energy, energy efficiency and transport. The European Investment Bank positions itself as a leader in accounting for GHG emissions and sees accounting as a key step in understanding the climate impacts of an organization's project portfolio. At the same time, IFIs have not set targets for reducing GHG emissions for their portfolio of projects. The European Investment Bank provides a list of industries for which projects are generally required and not required to disclose their GHG emissions (in order to receive funding from this institution). Regulators at the national and regional levels are only looking at the possibilities of assessing the carbon footprint of projects. For example, when conducting environmental impact assessments or when making decisions on the financing of large infrastructure projects (as in the EU). It can be recalled that the refusal to support coal generation projects also began to be broadcast by IFIs, and then other financial institutions and regulators began to join it. Recommendations of international associations on conducting a voluntary assessment of the carbon footprint of infrastructure are being formed. An example of a regional association is the Climate Leadership Cities (C40), which, as part of the Transforming Cities initiative, has published guidelines for low-carbon and sustainable projects. An example of an industry association is the International Union of Railways, which offers reviews, recommendations and best practices for estimating GHG emissions at all stages of the provision of railway services, including construction. Finally, there are individual climate-responsible investors and companies that also voluntarily disclose the GHG emissions associated with their projects (Braverman, 2019).

The carbon footprint of the project, along with the carbon footprint of the company, as well as the goods and services it produces, is an integral part of corporate carbon reporting, which is usually used to assess and manage climate risks (regulatory, reputational, etc.) of the company. At the company level, the carbon footprint of projects is usually measured by their operators. Estimating a project's carbon footprint is a relatively new development in corporate carbon reporting, reflecting the gradual shift in business from reactive to proactive climate risk management (Gakaev, 2020). A distinctive feature of the carbon footprint of projects is its predominant use for assessing future climate risks. The motivation for the calculation may be the need to provide such reporting in order to attract concessional or cheap financing in international or domestic capital markets, the need to demonstrate the benefits or the level of the project's environmental impact to potential clients or other persons influencing decisions on the project. Also, such a calculation can become a demonstration of the company's responsibility in the field of sustainable development - as an indicator that GHG emissions are taken into account at all key levels of business operation. The main target audience of such reporting are investors, financial institutions, counterparties of companies and regulators (Vladimirov, 2019). The company's management is also interested in the formation of carbon reporting, since the availability of accurate data on GHG emissions allows improving the quality of strategic planning in this area and monitoring its performance, including in comparison with competitors (Molchanova, 2019).

In this case, the criteria for the need to report are financial performance and the number of employees (that is, the size of the company) or participation in regulated markets. If the new legislation and standards are adopted by the end of 2022, then European companies will apply the new reporting standards for the first time in 2024, following the results of 2023. After leaving the EU, the UK also stated that it intends to make ESG disclosure mandatory in a phased manner by 2025. At the same time, there are no unified ESG reporting standards at the international level, and aggregators of this information (for example, CDP or Trucost) use different methods to evaluate and compare issuers, so it is difficult for regulators, as well as investors, to assess the real impact of companies on climate change. In Russia, mandatory ESG reporting, despite a discussion that has been going on for about 10 years, has not yet been introduced. Nevertheless, as part of the implementation of the Federal Law "On the

Limitation of GHG Emissions", new regulations are being prepared directly on carbon reporting. In particular, criteria have been prepared for classifying legal entities and individual entrepreneurs as regulated organizations, that is, those that must submit reports on GHG emissions on a mandatory basis. From the infrastructure sector, only enterprises with the type of activity "Transportation of oil through main pipelines", "Transportation of natural gas" and "Treatment, incineration and disposal of solid waste" (if this industry is broadly referred to as infrastructure), emitting more than 150 thousand tons of oil, should report. tCO₂-eq per year until 2024 and more than 50 thousand tCO₂-eq per year from 2024 (Egorova, 2020).

A certain element of indirect regulation of the carbon footprint of a project, product or service is stimulating its reduction through "green" or low-carbon public procurement (Green Public

Procurement). In the EU, for a number of goods and services, criteria for their classification as "green" have been established - for the inclusion of environmental requirements in open tender documents. However, these are not mandatory requirements, but recommendations for national government authorities. There are also such criteria for infrastructure projects - for the design, construction and maintenance of roads, as well as water disposal systems (sewerage and treatment facilities). At the same time, in the criteria for roads there is an explicit indicator of the carbon footprint, and for wastewater systems, the goal of reducing GHG emissions is regulated through energy efficiency indicators. Such an integrated (project) approach as in the EU is rare - more often requirements are set for individual goods or services, and it is the carbon footprint that has not yet become the main element of "green" public procurement. The United States also defines "green" criteria for procurement by public authorities, however, in terms of the implementation of infrastructure projects (road construction), requirements are set only for individual materials (products) used, and not for the project as a whole, while there are no requirements for GHG emissions, and the main features are associated with the use of bio-based materials in materials. If an infrastructure project qualifies for debt or grant funding, low or reduced GHG requirements often become a mandatory selection criterion. However, in most cases, such requirements are set not by government agencies, but directly by financing structures - funds, banks and other development institutions and investors (Meckling, 2020).

For example, in the EU, the climate impact of projects is taken into account when selecting the so-called Projects of Common Interest (PCI) - these are key cross-border infrastructure projects linking the energy systems of the Union countries. By definition, such projects should contribute to the EU's climate and energy goals. All projects have certain (depending on sectoral affiliation) sustainability requirements, including for some the level of sustainability must be measured by directly assessing the reduction of GHG emissions. A project included in the approved list receives a number of support measures, including: accelerated approvals and issuance of permits, improved regulatory conditions, lower administrative costs due to streamlined environmental assessment processes. An even more important benefit of PCI status is the right to apply for grant funding from the Connecting Europe Facility (excluding oil projects and commercially viable projects). In addition to Connecting Europe Facility funding, PCIs can also apply for support under other EU programs such as the European Strategic Investment Fund and the European Structural and Investment Funds, in particular the European Regional Development Fund. It is also possible to obtain concessional financing in the EU through the main financial and credit institution - the European Investment Bank.

4 CONCLUSIONS

Approaches to calculating the carbon footprint of an investment project have not yet been established and are not fully standardized. They may differ and cover different stages of the project life cycle depending on the motivation of the company and the type of project (climatic or not, which industry it belongs to). In addition to the purpose of calculating the carbon footprint of a project, the choice of methodology may also depend on the type of investment project (Egorova, 2020; Meckling, 2020):

1. As a result of the project implementation, GHG emissions will be reduced compared to the baseline. In this case, the methodology should answer not only the question of the possible carbon footprint of the project, but, more importantly, the contribution of the project to the reduction of GHG emissions compared to the baseline. Such calculations, for example, can be found in projects for the development of the use of railways (compared to road and air transport), the transfer of the fleet to electric vehicles (compared to internal combustion

engines on liquid hydrocarbons), the construction and operation of nuclear power plants (especially, compared with thermal). At the same time, calculations of avoidable GHG emissions should be accompanied by monetary metrics to compare different options. For example, in some methodologies, it is proposed to provide a calculation of the specific effect (reduction in kg of CO₂-eq. per year for every dollar invested) (Molchanova, 2019).

2. As a result of the project implementation, GHG emissions will increase. For such projects, they usually proceed from the principle of the best available technologies (how to achieve the best socio-economic effects from the implementation of the project with its optimal cost, if it cannot be implemented using other technological solutions, but in general to achieve the smallest contribution to GHG emissions) (Molchanova, 2019; Egorova, 2020).

Driver of sustainable development, introducing environmental impact indicators, including targets for reducing greenhouse gas emissions, into the risk assessment and project selection system. For the purposes of developing investment activities and attracting extrabudgetary funds to sustainable development projects and mainly projects to reduce greenhouse gas emissions, the Government of the Russian Federation in 2021 approved the criteria for sustainable (including green) development projects in Russia, as well as the requirements for their verification system. But a significant part of infrastructure projects (including transport ones) remains outside the parameters of the taxonomy. In doing so, they can make a significant contribution to achieving the goal of carbon neutrality (Egorova, 2020). The carbon footprint calculation tool could become one of the elements of the methodology for evaluating such projects, including as part of attracting government funding. Climate change is one of the major challenges facing the world community today. To counter this challenge, developed countries have taken a course towards decarbonizing their economies. The European Union's measures to introduce cross-border carbon regulation and the refusal to implement large, including infrastructure, projects in the field of traditional energy are controversial. There are risks that decarbonization instruments will be used to protect domestic markets, promote own technologies by non-market methods. At the same time, it is obvious that without calculating the carbon footprint, it will not be possible to reduce the anthropogenic impact on the climate in

the future. The Russian Federation fully supports and shares the need to implement measures to combat climate change. To achieve the goals of decarbonization and maintain the country's competitiveness in foreign markets, it is necessary to develop our own systems for calculating and capturing greenhouse gas emissions, as well as their recognition at the international level, including in Europe, which will avoid negative consequences for Russian exports and double taxation. At the same time, of course, the priority should be the principle of economic expediency in the implementation of the energy transition. World practice shows that the financial sector is a driver of sustainable development, introducing environmental impact indicators, including targets for reducing greenhouse gas emissions, into the risk assessment and project selection system. For the purposes of developing investment activities and attracting extrabudgetary funds to sustainable development projects and mainly projects to reduce greenhouse gas emissions, the Government of the Russian Federation in 2021 approved the criteria for sustainable (including green) development projects in Russia, as well as the requirements for their verification system. But a significant part of infrastructure projects (including transport ones) remains outside the parameters of the taxonomy (Meckling, 2020). In doing so, they can make a significant contribution to achieving the goal of carbon neutrality. The toolkit for calculating the carbon footprint could become one of the elements of the methodology for evaluating such projects, including as part of attracting public funding. Climate change is one of the major challenges facing the world community today. To counter this challenge, developed countries have taken a course towards decarbonizing their economies. The European Union's measures to introduce cross-border carbon regulation and the refusal to implement large, including infrastructure, projects in the field of traditional energy are controversial. There are risks that decarbonization instruments will be used to protect domestic markets, promote own technologies by non-market methods. At the same time, it is obvious that without calculating the carbon footprint, it will not be possible to reduce the anthropogenic impact on the climate in the future. The Russian Federation fully supports and shares the need to implement measures to combat climate change (Meckling, 2020; Hibbard, 2019; Mauritzen, 2016; Monasterolo, 2018). To achieve the goals of decarbonization and maintain the country's competitiveness in foreign markets, it is necessary to develop our own systems for calculating and

capturing greenhouse gas emissions, as well as their recognition at the international level, including in Europe, which will avoid negative consequences for Russian exports and double taxation. At the same time, of course, the priority should be the principle of economic expediency in the implementation of the energy transition.

REFERENCES

- Evangelista, R., Guerrieri, P., Meliciani, V., 2020. *The economic impact of digital technologies in Europe*. pp. 802–824.
- Surowiecki, J., 2021. *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies, and nations*. p. 89.
- Souter, MacLean, Okoh and Creech. ICTs, 2019. *Internet and Sustainable Development: Towards a new paradigm*. IISD, Winnipeg, Manitoba Canada.
- Braverman, A., Saulin, A., 2019. Integral assessment of the performance of enterprises. *Economic issues*. 6(1). pp. 108 -121.
- Korchagina, E. V., 2019. Economic sustainability of the enterprise: types and structure. *Problems of the modern economy*. 3(15). pp. 68-71.
- Gakaev, R. A., Bayrakov, I. A., Bagasheva, M. I., 2020. Ecological foundations of the optimal structure of forest landscapes in the Chechen Republic. *Environmental problems. Looking into the future*. pp. 50-52.
- Vladimirov, A. M., Imanov, F. A., 2019. *Principles for assessing the ecological flow of rivers*. pp. 225-229.
- Molchanova, Ya. P., 2019. *Hydrochemical indicators of the state of the environment*. p. 192.
- Egorova, N. I., Mityakova, O. I., 2020. *Environmental Innovation and Sustainable Development*. pp. 209-215.
- Meckling, J., Hughes, L., 2020. Protecting Solar: Global Supply Chains and Business Power. *New Political Economy*. pp. 88–104.
- Hibbard, K. A., Archer, S., Schimel, D. S., Valentine, D. W., 2019. Biogeochemical changes accompanying woody plant encroachment in a subtropical savanna. *Ecology*. p. 82.
- Mauritzen, J., 2016. *Cost, Contractors and Scale: An Empirical Analysis of the California Solar Market*. pp. 105-214.
- Monasterolo, I., Raberto, M., 2018. The EIRIN Flow-of-Funds Behavioural Model of Green Fiscal Policies and Green Sovereign Bonds. *Ecological Economics*. 144. pp. 228–243.