

# Decarbonization and its Influence on the Russian Economy

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**Keywords:** Decarbonization green sectors, global transition, global climate change, energy sources consumption, low-carbon development, morphological features, energy resources.

**Abstract:** Global decarbonization i.e. The global transition to low-carbon development is a response to global climate change caused by anthropogenic greenhouse gas (GHG) emissions into the atmosphere. The goal of decarbonization is to reduce, and ideally eliminate, these emissions, thereby mitigating (slowing down) climate change and minimizing the damage it causes. The realization of this goal will have a most serious impact on the economy of the world and Russia. The changes will affect the energy sector, transport, construction, industry and agriculture. The requirements for land and forest management will become more stringent. One of the outcomes of the transition to low-carbon development will be a reduction in the demand for fossil fuels and an increase in the role of renewable and other green energy sources. In the recently adopted Strategy for Russia's Economic Security, the change in the structure of world demand for energy resources, the development of energy-saving and green technologies are classified as the main challenges and threats to the country's economic security. However, these trends are considered in the strategy without linking to global actions to mitigate climate change and with the achievement of established goals to limit the increase in average temperature within limits that exclude catastrophic consequences for nature and humans. This creates the danger of misinterpreting these trends as harmful or even malicious, directed against the interests of Russia, while in fact they are objective and reflect the desire for the common good.


## 1 INTRODUCTION


The digitalization of various aspects of the functioning of the economy and human life entails the transformation of both nature itself and the volume of data on socio-economic phenomena. The demand for statistical data is changing and at the same time new opportunities are emerging due to the development of digital communications and the emergence of big data arrays suitable for statistical processing and analysis. In addition, there is a need for statistical measurement of the development of the digital economy, while international standards in this area have not yet been established (Global Energy and CO2 Status Report – 2017).

The spread of digital technologies over a long period determines the trajectories of economic development and society and more than once led to cardinal changes in people's lives. The formation of the digital economy is one of the priority areas for

most countries - economic leaders, including the United States, Great Britain, Germany, Japan, etc. As a rule, they are characterized by a long period of implementation of the "digital development agenda" and the continuity of priorities - from building a basic infrastructure to the formation of a coordinated policy in this area and programs to support the widespread introduction of digital technologies (Global Energy and CO2 Status Report – 2017; Global Trends in Renewable Energy Investment 2018).

In recent years, another wave of transformation of business and social activity models has been unfolding, caused by the emergence of new generation digital technologies, which, due to the scale and depth of influence, have been called "end-to-end" - artificial intelligence, robotics, the Internet of Things, wireless communication technologies and a number of others. Their implementation is estimated to be able to increase labor productivity in companies by 40%. In the near future, it is the

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effective use of new digital technologies that will determine the international competitiveness of both individual companies and entire countries that form the infrastructure and legal environment for digitalization (McKinsey (2017c)).

The Green Agenda was a development of the instructions that were announced by President Putin during his State of the Union address, which in turn are rooted in the growing anxiety of politicians and the public caused by global climate change, of which the climate agreement has become an expression. For ordinary people, the expression of the climate agenda and the fight against global warming was the extremely emotional speech of the Swedish schoolgirl Greta Thunberg with her passage that "we [people] are all on the verge of extinction (Medium (2018))." In Russia, the words of the Swedish schoolgirl were skeptical, but 6 days before that, the government - by that time after 3.5 years of waiting - decided to join the Paris climate agreement. Nevertheless, neither in 2016, nor in subsequent years, politicians, regardless of their level, treat the climate agenda with skepticism, which was expressed in the words of President Putin that climate change depends not only on human activities, but also on global processes, but human influence should be minimized. By the middle of 2021 (Medium (2018); Sukhinina, 2013), the discussion about whether global warming is real and what is the contribution of mankind to warming the Earth's atmosphere through carbon emissions is irrelevant: the need to reduce carbon dioxide emissions has been recognized by the leading politicians of the countries of the world and framed in a mass of regulatory legal acts. These acts are aimed not only at reducing the volume of carbon dioxide emissions into the Earth's atmosphere, but also at a radical transformation of the economies of the leading countries of the world, and can also cause future trade wars under the guise of fighting for the environment (Federal Law No. 174-FZ, 1995).

The calculation of the absorptive capacity of Russian forests for providing data to the UN is carried out using "Regional Forest Carbon Budget Estimation System" (ROBUL) based on scientific research 60–90s last century. For a long time, starting from the preparatory measures for Russia's accession to the Paris climate agreement, business fought against this method, criticizing it for underestimating the absorption capacity of forests, which turns out to be many times lower than in the developed countries of the world. The Ministry of Natural Resources, in turn, tried not to notice this struggle, and officials did not pay much attention to the criticism of ROBUL. The methodology for determining what should be

considered a forest is also of great importance: in Russia, for example, there are 2.4 times more forests than in the United States, but their specific absorption of carbon dioxide is 2.5 times less due to the peculiarities of the accounting methodology. Critics of the ROBUL methodology noted that ROBUL reduces the predicted absorption of carbon by Russian forests to almost zero over the next 20–25 years, which makes it impossible for economic growth in Russia without violating obligations under the Paris Agreement. According to ROBOUL, the absorbing capacity of Russian forests from 1990 to 2030 will increase from 370 million tons to 400–650 million tons of carbon, depending on the dynamics of logging. An alternative methodology from the All-Russian Research Institute of Forestry and Forestry Mechanization (VNIILM) predicts that carbon absorption by Russian forests will increase from 1.945 billion tons to 2.4 billion tons in the same period (Sukhinina, 2013). However, in mid-February 2021, the Ministry of Natural Resources still adjusted ROBUL in order to "clarify the initial data of calculated indicators to increase the accuracy and reliability of calculations of the absorptive capacity of Russian ecosystems (Federal Law No. 174-FZ, 1995)."

## 2 RESEARCH METHODS

For the first time, the Kyoto Protocol defined quantitative goals (obligations) to limit and reduce GHG emissions for industrialized countries and countries with economies in transition from Annex 1 of the UNFCCC, as well as flexibility mechanisms that allow these countries to interact with each other (mechanisms for international emissions trading and joint implementation of projects) and with developing countries (Clean Development Mechanism) and through this achieve reduction of GHG emissions in the most economically viable way, i.e. reducing emissions, first of all, in those countries and in such a way, where and in what way it is cheaper. At the first stage (2008–2012) (Medium (2018)), the task was to test the proposed approaches and mechanisms for reducing GHG emissions in order to gain the necessary practical experience and then move on to more decisive actions. Hence the relatively modest goal of reducing GHG emissions from industrialized countries and countries with economies in transition by an average of 5% relative to 1990. However, already at this stage, difficulties arose. First, it turned out that UNFCCC Annex countries are no longer the main source of GHG emissions, as they were in the

early 1990s (Federal Law No. 174-FZ, 1995). The bulk of emissions (over 60%) come from developing countries (Federal Law No. 174-FZ, 1995).

Accordingly, reducing GHG emissions in developed countries and countries with economies in transition alone does not solve the problem. Secondly, in terms of economic development (GDP per capita), some developing countries, such as, for example, Saudi Arabia, Singapore, South Korea and a number of others, surpass many countries with economies in transition. To demand emission reductions from some and not demand from others is at least unfair. Finally, thirdly, by the end of the first period, the flexibility mechanisms of the Kyoto Protocol stopped working. There were shortcomings in the methodology for preparing carbon projects adopted for implementation under the protocol, weak control over their assessment, selection, approval and implementation, as well as insufficiently strong commitments to reduce GHG emissions established by a number of countries of Annex 1 of the UNFCCC (in particular, Russia and Ukraine). With this in mind, at the Conference of the Parties to the UNFCCC in Doha (Qatar) in 2012, it was decided to extend the Kyoto Protocol until the end of 2020 (Kadner, 2021), and then replace it with a new, better and more comprehensive agreement. At the same time, in the second period of the Kyoto Protocol, it was planned to tighten the targets for reducing GHG emissions for the countries of the UNFCCC, namely, to set them at a level not exceeding the average level of GHG emissions in the respective countries for 2008-2010. However, the corresponding amendment was ratified by less than half of the countries participating in the protocol. At the same time, three countries - New Zealand, Russia and Japan - chose not to take on any quantitative obligations to limit and reduce GHG emissions for the second period of the Kyoto Protocol, and Canada withdrew from the protocol. Nevertheless, the Kyoto Protocol as a whole fulfilled its task. Developed countries have introduced various GHG emission control schemes and implemented measures aimed at their reduction, which allowed these countries to achieve an absolute reduction in GHG emissions while increasing GDP and thus create prerequisites for the transition to low-carbon development (Maliene, 2010).

The largest developing countries - China, India, Brazil - also assessed the benefits and benefits of switching to a low-carbon development path and took a number of measures in this direction, which led, if not to an absolute reduction in GHG emissions in these countries, then at least to a significant slowdown in their growth. Despite the fact that the

United States is not a party to the Kyoto Protocol, President Barack

Obama held in 2009-2016. climate policy, which generally met the goals and objectives of the Kyoto Protocol. In particular, in 2013, The President's Climate Action Plan was adopted, and in 2015, The Clean Power Plan. In 2016, GHG emissions in the United States decreased compared to 2005 by 11% excluding LULUCF and by 12% with despite the fact that US GDP grew over the same period by 17.4%. This was facilitated by the initiatives of individual states. Thus, since 2009, nine states - Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont - have been operating a single quota and emissions trading scheme RGGI, which regulates CO2 emissions in the electric power industry (Shakhgiraev, 2019).

In 2012, a cap-and-trade scheme covering all sectors of the economy, including energy and out-of-state products, was launched by the authorities in California. In Canada, despite the withdrawal from the Kyoto Protocol, much is also being done to reduce GHG emissions. The country's current prime minister, Justin Trudeau, is active on the climate agenda and has consistently advocated for the regulation of GHG emissions. This is already happening in many Canadian provinces. For example, British Columbia and Alberta levy taxes on GHG emissions, while Quebec, Ontario and Manitoba have introduced cap-and-trade schemes.

### 3 RESULTS AND DISCUSSIONS

In Russia, ensuring the accelerated introduction of digital technologies in the economy and the social sphere is one of the national development goals (Decree of the President of the Russian Federation dated May 7, 2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024", hereinafter - Decree No. 204). For this, Decree No. 204 defines the following tasks (Eurostat, 2021):

- increase in domestic costs for the development of the digital economy from all sources (in terms of share in gross domestic product) by at least 3 times compared to 2017;
- creation of a sustainable and secure information and telecommunications infrastructure for high-speed transmission, processing and storage of large amounts of data, accessible to all organizations and households;

- the use of predominantly domestic software by state bodies, bodies local government.

Accelerated introduction of digital technologies in the economy and in the social sphere is an ambitious goal, which is successfully realized only in a very few leading countries. It is achievable only if a number of essential conditions are met. Firstly, business and the social sphere must be ready for digital transformation, development strategies must mature and take shape, involving a fundamental change in the way of organizing and doing business through the planned intensive introduction of digital technologies, demanded by organizations and promising stakeholders a return on investing their own funds. Secondly, the country should develop a relatively mature technology supply sector, which, if not claiming to be an international leader, is at least capable of quickly transferring and adapting foreign technological solutions and rapidly increasing the scale of its own activities. Thirdly, the demand of the population for digital technologies should constantly grow, since it is the needs and capabilities of consumers that ultimately determine the adequate demand for digital technologies from organizations, primarily in the field of B2C (Shakhgiraev, 2019; Kadner, 2021).

For the successful solution of these tasks, moderately favorable conditions have developed in terms of the technological proposal. Thus, the ICT2 sector is one of the most dynamically developing segments of the Russian economy. For the period 2010–2017 it grew by 17%, almost doubling GDP growth. The share of the sector in GDP is 2.7% [NRU HSE, 2018]. However, in most developed countries, the ICT sector plays a more important role - its share in the value added of the business sector in OECD countries is 1.6 times higher than in Russia (5.4 and 3.4%, respectively). According to the HSE ISSEK, our country is 2-3 times behind the leaders of the technological proposal - Korea, Sweden, Finland - in this indicator (Federal Law No. 174-FZ, 1995).

Russian business is extremely alarmed by EU plans for the introduction of a cross-border tax on carbon, therefore, it acts in several directions at once: Actively negotiates with the EU to clarify the details of the upcoming tax, methods for accounting for greenhouse gas emissions, on which further actions of capital will depend. Carries out restructuring to turn non-environmentally friendly enterprises into separate structures. Prepares for the implementation of environmental projects. Modernizes production and masters the production of new products. Vygon Consulting estimates direct and indirect emissions, as well as emissions from the use of products in Russia,

at 3.1 billion tons of CO<sub>2</sub> equivalent, of which 54% is accounted for by exported products. One of the ways to reduce the losses from the introduction of the TUE is to launch its own system of trading in quotas, copying the EU ETS. But, according to Vygon Consulting, the total burden on the business from the introduction of such a system will not be comparable with the savings on TOUR payments. Thus, the total payment from the fuel and energy sectors will amount to 14.6-18 billion euros per year, of which 74-90% will fall on the electric power industry. Based on export parameters to the EU in 2015-2020 at the level of 6-13 billion kWh per year, companies can pay 80-180 million euros per year. In the case of launching your own system at a price of 40 euros per tonne of CO<sub>2</sub> equivalent, the total payment will increase by 13.3 billion euros, increasing the average electricity prices for businesses by 30-40% (Sukhinina, 2013). Moreover, the estimate includes only emissions from electricity generation in the price zones of the wholesale market. In case of inclusion in the base of emissions from the production of electricity outside the price zones and heat (now in the EU ETS, most of the heat produced is either excluded from the perimeter or exempt from payment), payments can increase by 1.5–2 times (Shakhgiraev, 2019).

Enterprises of the Russian fuel and energy complex, realizing their own vulnerability in connection with the desire of the EU to abandon the use of oil and gas, they resorted to a dual strategy, which is based on criticism of the rapid energy transition and preparation for a new, hydrogen, reality. Since 2019, PJSC TATNEFT has been taking active steps to reduce emissions; in February of this year, the company strengthened its positions by joining the international initiative Science Based Targetsinitiative. PJSC TATNEFT plans to achieve carbon neutrality by 2050 with a gradual reduction in emissions: by 10% by 2025, by 20% by 2030. PJSC Gazprom follows sustainability trends by pursuing a policy of energy saving and energy efficiency within the framework of the environmental management system. Domestic fuel and energy complex represented by the head of Rosneft, Igor Sechin, criticizes supporters of an aggressive energy transition, including even the International Energy Agency, which advocates curtailing all new oil and gas projects after 2021, emphasizing two points (Sukhinina, 2013):

1. Obvious economic advantages of fossil fuels, in particular, its large reserves, well-established extraction technologies and high calorific value (Federal Law No. 174-FZ, 1995).



2. Environmental friendliness of hydrocarbons in comparison with coals (black and brown) and even shale oil production through hydraulic fracturing. In addition, due to the lack of technologies for the mass production of hydrogen, companies note the threat of underinvestment in the oil and gas industry. In particular, this is exactly what the head of Rosneft, Igor Sechin, spoke about when he warned during SPIEF-21 about a possible shortage of energy resources.

## 4 CONCLUSIONS

In the coming years, TUR will become as much a reality as global warming. It is already too late to talk about what humanity's contribution to warming is, and it is useless to protest against TUR. TOUR will become as much a part of economic activity as tagging and traceability systems. What is more in the desire of the European bureaucracy - the struggle for the environment or pragmatic calculation to increase competitiveness and reduce dependence on hydrocarbon fuel supplies, is also no longer important. Other aspects are important for Russia, among which it is worth highlighting both negative and positive ones. Negative (Shakhgiraev, 2019; Kadner, 2021):

1. The losses of each individual industry subject to the TIP, as well as the costs that will be incurred by the business to adapt to the new reality with strict regulation, and the reduction in the volume of dividends.
2. State losses due to reduced exports and lower taxes collected, as well as increased costs associated with the threat of deterioration of the socio-economic situation in single-industry towns.
3. The transition to a "green" economy will spur global inflation - as a result, the final consumer of industrial products will pay for the modernization of enterprises.

Positive (Federal Law No. 174-FZ, 1995):

1. The implementation of climate and environmental projects by businesses will increase the attractiveness of domestic forests: And allow completion of forest inventory work by pushing the bureaucracy to perceive the forest not as a source of problems due to forest fires, but as an economic asset; And also increase the area of forest plantations due to the implementation of climate change by business projects (Shakhgiraev, 2019; Kadner, 2021).

2. Together with the tightening environmental responsibility for environmental crimes, TOUR will launch a cycle of industrial infrastructure modernization across Russia, which will have a positive impact both on reducing the overall accident rate and on the environmental situation in single-industry towns (Mednogorsk, Norilsk) and million-plus cities (Krasnoyarsk, Omsk, etc.). as well as in entire regions<sup>61</sup> (Kemerovo Oblast and the Komi Republic), which will contribute to an increase in the life expectancy of Russians.
3. R&D will reduce dependence on foreign equipment and (possibly) make scientific discoveries and technological breakthroughs (inert anode).

Also, the positive factors include a high margin of financial strength, which allows both to carry out the modernization of production, and to compensate for the shortfall in income due to TOUR. It is worth noting that domestic business, together with the state, managed to avoid a number of unpleasant excesses of the "green" agenda that European companies go through, in particular lawsuits obliging businesses to reduce CO<sub>2</sub> emissions at any cost. The key risk of the TOUR - drawing the Russian Federation and other countries into a trade war with the EU - has not yet been removed. It is worth considering that Russia, as a major exporter of mineral raw materials, low-processed goods and energy carriers, will not be able to get out of this confrontation without losses, so the state and business have chosen a line to minimize potential losses, as well as adapt to new realities. Nevertheless, trade confrontations will not be avoided, as evidenced by the history of the adoption in the EU of the aviation emissions directive 2008/101 / EC, aimed at extending the European emissions trading system to foreign airlines flying to / from the EU through the introduction of TOURs in the civil sector. Aviation (Maliene, 2010; Eurostat, 2021). Practice has shown that through the collective efforts of 23 countries, it was possible to postpone the implementation of the European environmental initiative for an indefinite period. Approximately the same thing happened with the TOUR - its final version turned out to be much softer than expected. Nevertheless, the European bureaucracy does not stop trying to force the airlines to "greening", the proof of which are the plans to introduce a tax on jet fuel. Consequently, trade disputes caused by disagreements in environmental and climate regulation will be inevitable, which (together with the slide of the great powers into the state of Cold War 2.0) makes it extremely necessary, in addition to

climate regulation, to develop the domestic market (gasification program at the expense of Gazprom is just such an example). A separate risk is the growth in requests from eco-activists and the falling under the TUR of new sectors of the economy, for example, telecom operators that already emit 64 CO<sub>2</sub> twice as many airlines. Compared to other developing countries (not to mention the developed countries that initiated tougher environmental regulation), Russia has lagged behind in the creation of a regulatory framework and the creation of a national system for accounting for CO<sub>2</sub> emissions. At the same time, this lag is not critical, as it allows not to run ahead of the European steam locomotive (Kadner, 2021).

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