Research article **Научная статья**

https://doi.org/10.17073/2072-1633-2025-1-1428

Influence of international climate regulation on economic development strategies of Russian Federation and People's Republic of China

K.L. Astapov[1], **Shen Chuang**[2]

[1] *Lomonosov Moscow State University, 1 Leninskie Gory, Moscow 119991, Russian Federation*

[2] *Inspur Group Co., Ltd., 1036, Lang Chao Road, Jinan, Shandong 250101, China*

✉ *ast_k@mail.ru*

Abstract. This article is devoted to impact of international climate agreements, particularly the Paris Agreement, on the economic development strategies of the Russian Federation and the People's Republic of China. By analyzing how these countries have adjusted their economic strategies in response to global climate obligations, the study reveals distinct approaches: Russia's gradual integration of climate initiatives into its traditional energy-focused economic framework, and China's active transition towards renewable energy and sustainable practices on both internal market and globally. The research highlights the complexities of balancing national strategy of economic growth with environmental sustainability requirements and the frameworks of international climate agreements, which sometimes have inconsistent interpretations. The article evaluates the strategic adjustments and policy shifts undertaken by Russia and China, which are critical in shaping national responses to climate change challenges, as well as necessary leadership role of these countries in modifying international climate agenda, enhancing partnership, especially with developing countries and Global South, as well as BRICS, Shanghai Cooperation Organization (SCO), UN Climate Change Conference (UNFCCC), other multilateral fora, One Belt One Road Initiative (for China). Also important to promote economic incentives for green investments, which might include some financial stimulus, for example subsidies, blended finance, tax break to encourage investments in renewable projects and energy-efficient upgrades, as well transitional financing, which requires modernization of existing international financial monetary system, based on Russian proposals in BRICS in 2024. At both supply and demand side it is important to promote reasonable consumption via sharing, longer usage period and re-cycling economic approaches.

Keywords: economic development strategy, strategizing, climate change, the UN sustainable development goals, climate finance, New Collective Quantified Goal (NCQG), BRICS, Russia, China

For citation: Astapov K.L., Shen Chuang. Influence of international climate regulation on economic development strategies of Russian Federation and People's Republic of China. *Russian Journal of Industrial Economics*. 2025;18(1):35–48. https://doi.org/10.17073/2072-1633-2025-1-1428

Влияние международного климатического регулирования на стратегии развития Российской Федерации и Китайской Народной Республики

К.Л. Астапов[1], **Шэнь Чуан**[2]

[1] *Московский государственный университет имени М.В. Ломоносова, 119991, Москва, Ленинские горы, д. 1, Российская Федерация*

[2] *Компания Инспур, 250101, провинция Шаньдун, Цзинань, дорога Ланг Чао, 1036, Китай*

✉ *ast_k@mail.ru*

Аннотация. В статье оценено влияние международных соглашений по климату, в частности Парижского соглашения, на стратегии экономического развития Российской Федерации и Китайской Народной Республики. Анализируя, каким образом две страны

корректировали свои экономические стратегии в свете глобального климатического регулирования, авторы выявили различные модели развития: постепенная интеграция Россией климатической повестки в традиционную экономическую систему, ориентированную на энергетику, и активный переход Китая к возобновляемым источникам энергии и устойчивым практикам как на внутреннем, так и на внешнем рынке. В исследовании проанализированы возможные проблемы соответствия национальной стратегии экономического роста с требованиями экологической устойчивости и международными соглашениями по климату, которые иногда имеют различные интерпретации. Выработаны стратегические инициативы и предложения по корректировкам политики в России и Китае, которые имеют решающее значение для формирования национальных мер реагирования на вызовы изменения климата, а также активизации роли этих стран при совершенствовании международной климатической повестки, укреплении сотрудничества с развивающимися странами и Глобальным Югом, а также в Группе Двадцати, БРИКС, Шанхайской организации сотрудничества (ШОС), Рамочной конвенции Организации Объединенных Наций об изменении климат (РКИК ООН), других многосторонних форумах, а также инициативы «Один пояс, один путь» (для Китая). Также важно развивать и совершенствовать экономические стимулы для «зеленых» инвестиций, которые могут включать в себя финансовые стимулы, например субсидии, льготное финансирование, налоговые льготы для поощрения инвестиций в энергоэффективную модернизацию, сокращение выбросов, расширение переходного финансирования, а также в проекты по возобновляемым источникам энергии, что требует модернизации финансово-монетарной системы (инициатива, продвигаемая председательствующей в БРИКС Россией в 2024 г.) Как со стороны предложения, так и со стороны спроса важно поощрять разумное потребление посредством экономики совместного использования, переработки и цикличного использования ресурсов, а также увеличение периода эксплуатации предметов длительного потребления.

Ключевые слова: стратегия экономического развития, стратегирование, изменение климата, цели устойчивого развития ООН, климатическое финансирование, новая коллективная количественная цель, НККЦ, БРИКС, Россия, Китай

Для цитирования: Астапов К.Л., Чуан Шэнь. Влияние международного климатического регулирования на стратегии развития Российской Федерации и Китайской Народной Республики. *Экономика промышленности*. 2025;18(1):35–48. https://doi.org/10.17073/2072-1633-2025-1-1428

国际气候治理对俄罗斯联邦和中华人民共和国发展战略的影响

K.L. 阿斯塔波夫[1], 沈创[2]

[1] 莫斯科罗蒙诺索夫国立大学、119991，俄罗斯联邦莫斯科列宁山1号

[2] 浪潮云Insupur公司, 250101，中国山东省济南市高新区浪潮路1036号

✉ *ast_k@mail.ru*

摘要：本文评估了国际气候协议，特别是《巴黎协定》对俄罗斯联邦和中华人民共和国经济发展战略的影响。作者通过分析这两个国家如何根据全球气候治理调整其经济战略确定了两个不同的经济发展模式：俄罗斯逐步将气候议程纳入传统的能源导向型经济体系，而中国则积极向可再生能源转型并在国内外市场进行可持续实践。本研究分析了使国家经济增长战略与环境可持续性要求和国际气候协议相协调方面可能面临的问题。这些气候协议有时会有不同的解释。俄罗斯和中国制定了战略倡议和政策调整建议，对于形成国家应对气候变化挑战的措施，以及加强国家在完善国际气候议程、增强与发展中国家和全球南方国家以及二十国集团、金砖国家、上海合作组织（上合组织）、联合国气候变化框架公约》（UNFCCC）、其他多边论坛以及“一带一路”倡议（中国）中合作方面的作用。制定和完善绿色投资的经济激励措施也很重要，其中可能包括财政激励措施，如补贴、优惠融资、税收激励等，以鼓励对节能改造、减排、扩大转型融资以及可再生能源项目的投资，这需要金融和货币体系的现代化。(俄罗斯在2024 年担任金砖国家主席国期间推动的一项倡议）。在供需双方，重要的是通过共享、回收和循环利用资源来鼓励智能消费，以及延长耐用品的使用寿命。

关键词：经济发展战略、战略化、气候变化、联合国可持续发展目标、气候融资、新集体量化目标、NCQG、金砖国家、俄罗斯、中国

Introduction

In addressing climate change the significance of international climate agreements becomes more important. These aspects influence economic strategies of many countries, including Russia and China. Their strategic responses to these challenges are important for efficiencies of global climate initiatives, shaping economic and financial strategies on both national and corporate levels.

Long-term trends connected with change of climate and sustainable development influence economic strategies on national and regional, industries and local levels. Highlight importance of Paris Agreement[1], the United Nations Framework Convention on Climate Change (UNFCCC) dated back to May 9, 1992[2] and other international climate agreements, which have goals to limit global warming, establish mandates and tailor responsibilities and contributions from nations to mitigate climate impacts.

Based on international climate policy, some strategic initiatives for China and Russia will be considered. Such initiatives are based on national goals, visions and national interests as well as new trends [1; 2]. Current challenges, especially for the Russian economy, associated with increased external pressure from a number of developed countries, require new approaches to formulating a macroeconomic strategy, a financial system strategy, regional and industry strategies, as well as integrating into them environmental and climate long-term priorities taking into account national specifics. Existing legislation in Russia, particularly Federal Law dated back to June 28, 2014 No. 172-FZ "On Strategic Planning in the Russian Federation"[3], provides conditions for establishing socio-economic strategies at the state and regions levels, as well as industry strategies.

Serious external pressure associated with breakdown of traditional logistics channels, regionalization, increase of tariffs, and in some cases the use of unilateral sanctions, as well as environmental and climate challenges require step-by-step modifying national, regional and corporate strategies. Need for strategic vision, implementing strategies in different time horizons, including roadmaps, ability to quickly adapt to changes in the external environment as well as incremental changes (sanctions, conflicts, pandemic etc.) are becoming fundamental competitive advantage not only on national level, but also at supranational level (for example for BRICS countries) [3]. It should be noted that some countries use climate agenda to aggressively promote their national interests and increase competitiveness of their economies in conditions of individual resources' shortage. Thus, leadership in the "green" transformation and related economic transformations mainly belongs to the European Union (EU) [4], however, the presented article is aimed at changing the current situation and increasing importance of BRICS countries on climate track.

Methods

Strategizing methodology by Academician Vladimir Kvint implies, that strategies on different level should analyze long-term trends [1; 2]. Due to change of climate is a long-term trend, national and other strategies should take it into account, and more efficient if the countries would also actively participate in international climate negotiations, which have influence on climate and economic future and sharing their experience with other, first of all developing countries. Important role in research plays analyses of international regulation, including UNFCCC, the Group of Twenty, BRICS, as well as national legislation in Russia and China.

This research is based on mentioned methodology, suggested combining strategic vision, long-term quite stable trends (demographics, climate, environmental, technological etc.) with BANI concept, proposed by Jamais Cascio in the beginning of the 21st century[4], principles of adaptive-stable development [5]. Combi-

[1] United Nations Framework Convention on Climate Change. United Nations 1992. Available at: https://unfccc.int/resource/docs/convkp/conveng.pd (accessed: 04.03.2025).

[2] Ibid.

[3] Federal law of June 28, 2014 No. 172-FZ "On Strategic Planning in the Russian Federation". (In Russ.). Available at: http://www.kremlin.ru/acts/bank/38630 (accessed: 04.03.2025).

[4] Cascio J. Open the Future: anticipatory mythologies by Jamais Cascio. 2024. Available at: http://www.openthefuture.com/ (accessed: 04.03.2025).

ning some stable long-term factors, while many other factors are changing quite fast and unpredictably (BANI concept), increase importance of long-term vision, competitive advantages methodology (Opportunity, Threats, Strong and Weak sides or OTSW), adaptive-stable development and agile management, which will support long-term competitiveness, optimize business models and organizational processes etc., at the same time continuing experiment, introducing innovations, relying on intuition, creating influence on external environment through negotiations, sharing experience, leading in technologies.

In these conclusions we relied on the principles of strategic theories and researches by M. Porter [6], J.A. Schumpeter [7], R.R. Nelson [8], C.K. Prahalad and G. Hamel [9], M. Castells [10], O. Kenici [11], A. Toffler [12], V.L. Kvint [1, 2], R.M. Grant [13], R.S. Kaplan and D.P. Norton [14], and others, as well as a number of other research about economic influence of climate change, regulatory legal acts on both international and national levels. Economic-mathematical model [15] is applied for considering hypothesis about influence of climate agreement on national economies development.

Strategies with ESG vision and climate finance scaling

Developing national strategies as well as strategies on all levels are becoming more complex, because some long-term strategic goals, including green transformation, are set at the supranational level.

Strategic initiatives should be based on agility approach, consider risks, associated with climate change and environmental protection in times of instability of BANI world.

The UN Sustainable Development Goals[5] дshould become not only national goals for countries, regions and cities, but businesses also should consider integrating them in their ESG strategies or already have integrated some Sustainable Development Goals in the form of ESG strategies (strategies, which are based on Environmental, Social and efficient and transparent Governance).

The principles of the consumption economy are changing, which is largely due to the climate and environmental agenda, which are becoming more and more essential over time. Although the main goals of reducing the impact of climate change and combating global warming remain the same, specific mechanisms for reducing emissions are being seriously adjusted. The UN Framework Convention on Climate Change stipulates that countries, taking into account their common but differentiated responsibilities and their specific national and regional priorities, aim to stabilize the concentration of greenhouse gases in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system. Countries pursue national policies and take measures to mitigate the effects of climate change by limiting emissions of greenhouse gases. The Kyoto Protocol to the United Nations Framework Convention on Climate Change[6] (Article 2), dated back to December 11, 1997, established certain quantitative commitments to limit and reduce greenhouse gas emissions in order to promote sustainable development. However, these targets were not achieved. Moreover, at the 15th UNFCCC Conference in Copenhagen in 2009[7], it was not possible to extend the fixed greenhouse gas emission limits and an alternative more flexible approach was approved in Paris agreement. Wide economic influence of Paris Agreement is clearly determined in Point 1(c) Article 2, which establishes making finance flows consistent with a pathway towards low greenhouse emission and climate-resilient development [3; 16].

Implementation of climate adaptation and mitigation climate policies, which we could consider among ESG factors for corporate level, in strategies of different actors becomes more difficult, particularly because of absence

[5] Transforming our world: the 2030 Agenda for Sustainable Development. UN General Assembly Resolution of September 25, 2015. Available at: https://sdgs.un.org/2030agenda (accessed: 04.03.2025).

[6] United Nations. What is the Kyoto Protocol? Available at: https://unfccc.int/kyoto_protocol (accessed: 04.03.2025).

[7] COP 15 – Decisions. Available at: https://unfccc.int/process-and-meetings/conferences/past-conferences/copenhagen-climate-change-conference-december-2009/cop-15/cop-15-decisions (accessed: 04.03.2025).

of mutual trust between states, especially developed and developing, contradictions of current economic interests, despite existing international legal framework. For example, the United Nations Framework Convention on Climate Change (Article 4, paragraphs 3 and 4) and the Paris Agreement (Article 9) establish obligations for developed countries to provide financial support USD 100 billion to developing countries in the implementation of national climate strategies [16]. Despite the fact that this obligation was initially enshrined in 2010 at the 16th session of the Conference of the Parties to the UNFCCC, it has not been implemented for a long time. Only in 2022, according to a number of estimates, including the OECD, it was possible to achieve the set target of USD 115,9 billion. However, this amount includes various financial instruments, including commercial financing. If we take into account only grants (bilateral and multilateral), then, according to Oxfam estimates, the amount of support for developing countries in 2022 amounted to between USD 27,9 and 34,9 billion[8]. Thus, the uncertainty in the methodology for assessing financial flows, different approaches to defining climate financing, as well as growth of inflation require re-assessment of achieving the stated quantitative goal. In 2024 the obligation for support of developing countries, which was called New Collective Quantified Goal on Climate Finance (NCQG), was reconsidered.

During more than 2 years there were negotiations between UNFCCC parties and different proposals were considered. Developed countries insisted on the use of formulas and multi-level approaches for calculating volume of support, and, above all, expanding the number of parties financing the efforts of developing countries to combat climate change. Despite logic behind using some clear and transparent criteria (formulas of NCQG calculation) for official development assistance (ODA) in fighting with climate change, these approaches were considered mostly as counterproductive and undermining confidence in the current international agreements. Clearly, ODA is the responsibility of developed countries, which was fundamental basis for Paris agreement and other climate agreements[9]. TNevertheless, due to efforts of many countries, including Azerbajan, which had a role of presidency of 29th session UNFCCC, as well as China, Russia, India, Brazil, the United Arab Emirates and others, a more balanced approach for ODA in climate was adopted: formally decided[10] to set a NCGG, in extension of the existing goal, with developed country Parties taking the lead, of at least USD 300 billion per year by 2035 for developing country Parties for climate action[11]. According to the agreement NCQG includes not only public funds, but diverse funds from a wide variety of sources, including private, bilateral and multilateral, alternative sources[12].

Such formulations as result of reached consensus and compromise most probably will require further clarifications, especially determining the role of Global South, which will influence economic strategic long-term goals in China as well. NCQG agreement states that developing country should also make contributions, including through South–South cooperation, on a voluntary basis. NCQG highlights that climate needs reported in nationally determined contributions (NDC) of developing

[8] Report of the Standing Committee on Finance. Item 11(b) of the provisional agenda. Second report on progress towards achieving the goal of mobilizing jointly USD 100 billion per year to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation. Available at: https://unfccc.int/documents/641042 (accessed: 04.03.2025).

[9] Tan E., Pettinotti L. Informing the new collective quantified goal quantum. ODI. September 2024. Available at: https://media.odi.org/documents/ODI-SM-QuantumNCQG-WP-Sep24-Proof09.pdf (accessed: 04.03.2025).

[10] In accordance with Article 9 of the Paris Agreement and in extension of the goal referred to in paragraph 53 of decision 1/CP.21.

[11] New collective quantified goal on climate finance. Available at: https://unfccc.int/cop29/auvs; https://unfccc.int/sites/default/files/resource/CMA_11%28a%29_NCQG.pdf (accessed: 04.03.2025).

[12] COP29 UN climate conference agree to triple finance to developing countries, protecting lives and livelihoods. November 24, 2024. Available at: https://unfccc.int/news/cop29-un-climate-conference-agrees-to-triple-finance-to-developing-countries-protecting-lives-and (accessed: 04.03.2025).

country are estimated at USD 5,1–6,8 trillion for up until 2030 or USD 455–584 billion per year[13].

Argument, that existing international financial and monetary system (IFMS) is not efficient enough for financing climate and environmental projects, could be used for promoting position for reforming IFMS. That approach became quite important during Russian presidency in BRICS in 2024[14], but in our interests target and consistent strategic initiative on promoting an alternative more effective IFMS for many reasons, including as a way for supporting "green" transformation.

Climate changes as well as economic mechanisms to combat climate change increase risks of redistribution of wealth and financial flows at the global level in the interest of some developed countries. So, other countries should not underestimate risks of gaining by some countries additional competitive advantages in the long term perspective due to international climate regulation at the expense of less developed countries. Furthermore countries with significant share of extractive industries in their national economies, including the Russian Federation, will bear additional economic, social, and labor costs.

Previously many countries stick to the point, that financial flows aimed at implementing NCQG, include grants, long-term loans with subsidized interest rates, and other types of non-commercial financing provided by developed countries and international financial organizations to developing countries on a non-commercial basis as ODA. During 29th session of UNFCCC it was decided that NCQG includes not only blended (or subsidized) finance, but also all kind of private finance[15]. Updated approach to NCQG is more consistent with position about financial flows for the implementation of climate goals, because paragraph 1(c) of Article 2 is aimed at financing domestic efforts (as well as international support) to implement national climate change, and also implies a wider range of climate financing instruments (including private investments and financial flows). Nevertheless, additional efforts are necessary in order to find a more balanced approach to climate finance that takes into account the interests of different countries. So increasing the ambition of climate policy is important, but not at the expense of other the UN Sustainable Development Goals and economic development in general, as well as without re-distribution of ODA to climate goals. Much more realistic is focusing on the practical implementation of the Paris Agreement and the UN Framework Convention on Climate Change in accordance with existing mandates and obligations. Russia is also promoting idea that investments in traditional industries aimed at reducing emissions should be included in climate finance (so called transitional finance), because consistent with ESG strategy implementations within the framework of paragraph 1(c) of Article 2 of the Paris Agreement. Such ideas were discussed during Russian Presidency in BRICS in 2024. However, the presented concept of transitional climate finance is just beginning to be considered at various multilateral fora, primarily with the BRICS countries.

The Paris Agreement does not directly limit investments in traditional sectors of the economy, including the so-called "brown" sectors of the economy, does not establish bans on investments in raw materials and mining companies ("carbon lock-in"). Investments in "brown" sectors might be in line with sustainable development goals, for example if such investments aimed at reducing energy consumption, reducing greenhouse gas emissions, environmental projects, or generally ESG strategy implementation.

So, national strategies in climate finance should include following elements.

1. Russia as well as other countries with extractive industries should continue to protect their national interests in UNFCCC, as well as in other multilateral fora.

[13] CMA 6 agenda item 11(a). New collective quantified goal on climate finance. Version 22.11.2024. Available at: https://unfccc.int/sites/default/files/resource/NCQG_4.pdf (accessed: 04.03.2025).

[14] BRICS Finance Ministers and Central Bank Governors Joint Statement. Available at: https://minfin.gov.ru/common/upload/press_center/2024/10/BRICS_FMCBG_Statement.pdf?ysclid=m8e6tfja6s195126133 (accessed: 04.03.2025).

[15] New collective quantified goal on climate finance. Available at: https://unfccc.int/sites/default/files/resource/CMA_11%28a%29_NCQG.pdf (accessed: 04.03.2025).

China and Russia are actively involved in promoting the sustainable economic development agenda in multilateral fora, including the UN, UNFCCC, the Group of Twenty, BRICS, SCO and others [3]. So optimal national strategies are based on applying general sustainable and inclusive economic principals in accordance with national circumstances, taking into account energy balance, share of mining industry, climate factors. National strategies might more efficiently complement hierarchical principles of international strategies in fast changing world, especially when some leading countries do change their positions. For example, the US President Donald Trump recently signed an executive order to withdraw the United States from the Paris Agreement[16]. Despite the fact that international climate strategies should be long-term oriented, international climate architecture is flexible and could be transformed (Paris agreement, UNFCCC, Kyoto protocol). Furthermore, different financial mechanisms are implemented under each climate agreement, which create additional difficulties. Such issues are being discussed by G20 Sustainable Finance Working Group[17], the Task Force for the Global Mobilization against Climate Change (TF CLIMA) , as well as other fora[18].

2. National economic strategies of big countries, as well as regional and corporate strategies, should be consistent and partly independent on international climate policy in order to respond to national businesses possibilities. And appropriate regulation basis is developed in Russia and includes: the Federal Law of July 2, 2021 "On Limiting Greenhouse Gas Emissions"[19], the Order of the Government of the Russian Federation of October 29, 2021 No. 3052-r approves the Strategy of socio-economic development of the Russian Federation with low greenhouse gas emissions until 2050[20], the Order of the Government of the Russian Federation of July 14, 2021 No. 1912-r establishes goals and main direction for sustainable development[21]. Besides strategic level there are operational plans, including some government programs, intended for stimulation of some industries and infrastructure development, national projects "Ecology"[22] etc.

Incentives for implementing ESG goals might include different mechanism, not only regulations and prohibitions, but also some market mechanism, tax stimulus, government support, subsidized interest rates etc. For example, market stimulus might support forestry industry as a major greenhouse gases absorber. In that regard Russia might promote brand of "Russian (or Siberian) green forest", especially taking into account that appropriate market infrastructure, including a register of carbon units, organized market for carbon units on basis of the National Commodity Exchange (part of the Moscow Exchange Group) is already functioning[23].

3. Risks assessments of climate challenges for national economies and national financial systems should be focused on long-term horizons and including different scenarios. Bank of Russia already preliminarily estimated impact of climate risks on banks and Russia's major companies. The results of stress testing demonstrate that banks should comply with the regulator's recommendations to organize the management of climate risks. Also important that Bank of Russia supports commercial banks in

[16] Bearak M. Trump orders a U.S. exit from the world's main climate pact. The New York Times. January 25, 2025. Available at: https://www.nytimes.com/2025/01/20/climate/trump-paris-agreement-climate.html (accessed: 04.03.2025).

[17] G20. Finance working group. Available at: https://g20sfwg.org/ (accessed: 04.03.2025).

[18] The G20 taskforce on a global mobilization against climate change. Available at: https://g20.utoronto.ca/2024/TF-CLIMA_Outcome_Document.pdf (accessed: 04.03.2025).

[19] Federal law of July 2, 2021 No. 296-FZ. (In Russ.). Available at: http://www.kremlin.ru/acts/bank/47013 (accessed: 04.03.2025).

[20] Order of the Government of the Russian Federation of October 29, 2021 No. 3052-r. (In Russ.). Available at: http://static.government.ru/media/files/ADKkCzp3fWO32e2yA0BhtIpyzWfHaiUa.pdf (accessed: 04.03.2025).

[21] Order of the Government of the Russian Federation of July 14, 2021 No. 1912-r. (In Russ.). Available at: http://static.government.ru/media/files/sMdcuCaAX4O5j3Vy3b1GQwCKfa9lszW6.pdf (accessed: 04.03.2025).

[22] National project "Ecology". (In Russ.). Available at https://www.mnr.gov.ru/activity/np_ecology/?ysclid=m7u95b2rpx860210808 (accessed: 04.03.2025).

[23] Russia hosts first major auction of carbon units. Vedomosti. November 30, 2023. (In Russ.). Available at: https://www.vedomosti.ru/esg/green_finance/news/2023/11/30/1008789-v-rossii-sostoyalsya-pervii-krupnii-auktsion-po-prodazhe-uglerodnih-edinits (accessed: 04.03.2025).

their efforts to help their clients from "brown" sectors of economy rearrange their business models amid energy transition and diversify their own loan portfolios. In negative scenario of energy transition, financial condition of third of the analyzed companies in the real sector will deteriorate over the horizon of 2030–2040. Banks may incur significant losses if the structure of their credit portfolio does not change[24]. And that scenario does not assume the most strict implementation of climate agreements.

4. The climate agenda should be integrated and considered as an element of the broader UN Sustainable Development Goals. In this regard, it is important not only to reduce emissions, but also to continue transform economies, promote reasonable consumption through the sharing economy, as well as the recycling economy, and reduction of plastic consumption. A number of these initiatives were considered during India's presidency of the Group of Twenty in 2023[25]. However, it is important to expand the practical application of these strategic initiatives, including through the possibility of longer use of long-term consumer goods, applying new business models, digital transformation, basket offers (goods and warranty service). In this case, it is possible to cascade these strategic initiatives from international documents into national legislation (taking into account the specifics of countries).

According to strategizing methodology efficient "green" transformation requires cascading some government strategic initiatives into the regional, industry and corporate levels. Kuzbass regional strategy is a good example of such strategic approach, which applies specific environmental regional challenges [17; 18].

The unilateral measures and sanctions imposed on a significant part of Russian business, economic sectors and the financial system seriously complicate the implementation of climate projects. Under sanctions acceleration of decarbonization will be too expensive for Russia[26]. That is why additional flexibility and ability react to changes, greater possibility for maneuver (which is usually called agility or adaptive-stable development [5]) in terms of national climate obligations are essential.

Economic development of Russia and China, taking into account climate change challenges

Based on econometric model test hypothesis that international environmental policies creates a strong impact on economic strategies.

Government regulation and economic shifts in Russia and China are being more correspondent to their commitments under Paris Agreement.

Bilateral cooperation between Russia and China in environmental sustainability and combating climate change (and including other BRICS countries in the future) will bring mutual economic benefits, including through the promotion of a strategic initiative on cross–border trade of greenhouse gas emissions.

As big economies and substantial greenhouse gas emitters, China and Russia play active role in climate change fighting through national strategies and affecting global climate change efforts.

Concerning economic challenges we should mention that committing to climate agreements requires from Russia and China fundamentally alter their industrial and energy sectors to enhance low-carbon economies. Russia's dependence on oil and gas exports exposes vulnerabilities and is a factor of external pressure as the world shifts towards renewable energy, necessitating diversification and development of sustainable energy solutions amidst financial and technological challenges. In contrast, China has experienced rapid industrial expansion that has driven its economic progress and increased carbon emissions. The Paris Agreement compels China as well as other growing economies of developing counties to find a balance

[24] Bank of Russia estimates impact of climate risks on banks and Russia's major companies. February 7, 2024. Available at: https://cbr.ru/press/event/?id=18405 (accessed: 04.03.2025).

[25] G20 high level principles on lifestyles for sustainable development. Available at: https://dwgg20.org/ (accessed: 04.03.2025).

[26] The authorities considered forced decarbonization unprofitable under sanctions. RBC. February 08, 2025. (In Russ.). Available at: https://www.rbc.ru/economics/08/02/2025/67a49faf9a7947d44b2c1bc3?from=from_main_11 (accessed: 04.03.2025).

between economic advancement and environmental sustainability. This requires substantial transformations across various sectors including industry, technology, and energy policies, all while ensuring the economy, labor and social spheres remain stable [19].

Both Russia and China encounter significant environmental challenges as they strive to fulfill their international treaty commitments. Russia faces the challenge of permafrost melt due to global warming, which releases substantial methane emissions and threatens the stability of infrastructure. China deals with intense air and water pollution, which poses risks to public health and the diversity of ecosystems. This necessitates robust environmental regulations and effective enforcement to balance these issues with ongoing economic growth [20; 21].

The global role of Russia and China requires implementation of strategic initiatives for overcoming environmental challenges, which will significantly affect their international reputation and as well as effectiveness of worldwide climate agreements. Furthermore, there is a potential to transform environmental and climate challenges into leadership opportunities for actors from China and Russia, which could set the tone for global environmental strategies.

The involvement of these nations in climate treaties is essential not only for their own national interests but also for the global goal of achieving a sustainable future. Their proactive measures could lead international efforts in environmental governance, serving as models for other nations, especially developing countries.

The strategizing methodology provides a structured approach to formulate strategies. This involves assessing opportunities and threats, analyzing internal and external factors, and leveraging strengths while mitigating weaknesses (OTSW framework) to evaluate how Russia and China strategize their economic policies in response to international climate agreements' changes. OTSW analyses for climate strategic initiative for Russia and China are presented in **Tables 1** and **2**, correspondently.

Consider that analyses in details.

Opportunities: Russia's push towards energy source diversification, including limited transition from coal and oil to gas, nuclear and renewables like wind and solar for some regions, opens new markets and enhances energy security , taking into account big distance in the country. Investments in green technologies promote economic innovations and reduce vulnerability to global oil price fluctuations. Furthermore, climate and environmental agenda are considered as perspective opportunities for industrial structure modernization, increasing of energy efficiency, reduction of GHG emission, preserving eco-systems and tradition activity of indigenous peoples, forestry which will later lead to development of recreational industry, as well as promoting an alternative international financial and monetary system.

Threats: Macroeconomic instability is caused by heavy dependence on fossil fuel exports, and green transition can undermine economic development, especially in some regions. In this regard, the negative impact of transformational changes, primarily on traditional and extractive industries, should be taken into account, and the transition to renewable energy sources should be gradual, taking into account the potential decline in income and social tension.

Table 1

OTSW for Russia's carbon emissions reduction strategy

External	Internal
Opportunities Diversification of energy sources taking into account regional circumstances Traditional industry modernization Forestry and recreation development Promoting an alternative international financial and monetary system	*Strong* Natural resources endowment Traditional industries Scientific potential
Threats High proportion of extractive industries Accelerated green transformation in order to reduce emissions Sanctions	*Weak* High dependency of internal economy on fossil fuel Ineffective regulation

Excessive acceleration and shifts towards green technologies in Russia can lead to job losses in traditional industries, a decrease in GDP, and therefore will require verified plans. At the same time, a tough scenario should be considered as a backup, focusing on the adopted international obligations. In addition, economic sanctions increase vulnerability factors, negatively affect investment opportunities, including in implementation of climate projects.

Strengths: Russia benefits from a natural resource endowment, with extensive oil, gas, and mineral reserves that support gradual transition to sustainable practices. Its well-established traditional industries, research and expertise in energy technologies support potential leadership in environmental innovations including nuclear, natural gas, hydrogen (which can be produced using coal), whenever transition improves living conditions and health on the nation.

Weaknesses: High dependence on fossil fuels increases risks and opportunities for external pressure and financial stability due to fluctuations in commodity markets. Regulatory problems and ineffective implementation of policies hinder the implementation of environmental standards.

Table 2

OTSW for China's low carbon strategy

External	Internal
Opportunities Leadership in renewable technologies, especially in the production of solar panels and batteries Improving air quality and public health	*Strong* Advanced production facilities in the field of renewable energy technologies Government support ESG strategies in private business
Threats High initial costs for the transition to advanced eco-friendly technologies The threat to competitivenes s for traditional industries	*Weak* Ambiguous impact on the environment, including due to extraction of rare earth minerals Socio-economic imbalances

Consider analysis in Table 2 in details.

Opportunities: China's global leadership in renewable technologies, particularly in manufacturing solar panels and batteries, enhances its domestic innovation and job creation. Strategy for environmental protection and fighting climate change improves air quality and public health through increased use of cleaner energy sources. Activation of cooperation under "One Belt – One Road" initiative [22].

Threats: The high initial costs of transitioning to advanced green technologies could challenge competitiveness of China's manufacturing sector globally, as well as job and income losses in traditional industries.

Strengths: Advanced manufacturing capabilities in renewable energy technologies position China as a key player in the global green technology market. Governmental support is evident through robust policy frameworks and substantial investments in green technology development, demonstrating a strong commitment to environmental sustainability and expanding ESG strategies for private businesses.

Weaknesses: Potential environmental degradation such as air and water pollution, which is associated with high growth rate, including the extraction of rare earth minerals, even growth is localized in green sectors. Socio-economic disparities need to be addressed as economy transitions towards greater environmental sustainability.

In order to evaluate Paris Agreement's effects on Russia and China economies econometric methods particularly Ordinary Least Squares Regression (OLS) is applied.

Ordinary Least Squares Regression applies to time-series data from Russia and China, OLS evaluates the direct effects of climate policies adopted after the Paris Agreement on economic metrics like GDP growth, renewable energy use, and carbon emissions reduction. This model is crucial for determining the causal links between policy initiatives and economic performance in each country.

The results of OLS modes for China demonstrate that such indicators as Industrial value added (Industrial Production), GDP unit energy consumption, Portion of renewable energy power

generation [23; 24] do not have significant influence on GDP growth rate in China. Such ambiguous results in our opinion, may be due to the fact that China is introducing moderate restrictions in traditional energy sector, while increasing production in new industries, including renewable energy, accumulators, electric vehicles, etc.

For Russia results demonstrate statistical significance, which are given in **Table 3**.

Commenting data in Table 3, for example, Industrial Production (as % of GDP) in OLS model the coefficient is 1.6, the standard error is 0.75, the t value is 2.1, which shows that Industrial Production has a significant positive impact on GDP growth rate.

For Net foreign direct investment inflows in the OLS model the coefficient is 2.27, the standard error is 0.8, the *t* value is 2.84, which confirm the hypothesis that the net inflow of foreign direct investment has a significant positive impact on GDP growth rate.

Interpreting the results of that model in terms of economic influence, Russia's industrial sector significantly contributes to its GDP growth. Energy consumption per unit of GDP in Russia significantly accelerates GDP growth, due to its high dependence on energy. This is not a significant factor for China, which indicates a lower dependence on energy. Foreign direct investment in both countries has a significant positive impact on GDP growth, underscoring their role as a key driver of economic growth. In both countries, an increase in the share of renewable energy sources in the energy mix has a negative impact on GDP growth, which is likely due to higher costs. In any case, econometric models have some limitations, taking into account limited observations, and it is unlikely that the Paris Agreement will not have a significant impact on the economic growth of GDP in the two countries in the long term.

Conclusion

Political and economic measures for fighting with climate change should consider higher risks of fast changes in modern BANI world, which require adaptive-stable and agile development and more complex national,

Table 3

OLS results for GDP growth rates for Russia

OLS Model Linear regression analysis results n = 15							
Coefficients of econometric model	**Unstandardized coefficient**		**Standardized coefficient**	***t***	***R*²**	**Adjustment *R*²**	***F***
	B	**Standard error**	**Beta**				
Constant	−57.845	51.233	–	−1.129	0.57	0.332	F = 2.39 P = 0.121
Paris Agreement dummy variable	6.124	3.72	0.867	1.646			
Industrial value added (% of GDP)	1.608	0.751	0.671	2.142			
GDP unit energy consumption	22.449	12.025	1.002	1.867			
Net foreign direct investment inflows	2.273	0.801	0.927	2.839			
Proportion of renewable energy power generation	−674.219	261.944	−1.843	−2.574			
Dependent variable: GDP growth rate (annual %)							

industry and corporate strategies. These strategies should take into account many factors, including changing global, regional and industry trends, technological changes, international climate and environmental regulation, as well as national interests of different groups of countries [4] and dynamics of international negotiations.

Despite the fact, Russia and China implementing their climate strategies differently, they have common long-term interests and visions in sustainable and climate development.

Based on strategizing methodology and OTSW-analyses some strategic initiatives for two countries might be considered, which enhance industrial policy, boost sustainable technology investments, and foster global cooperation in this area.

Common strategic initiatives for both countries include:

1) Strengthening global partnerships, first of all in BRICS, SCO, UNFCCC and UN, international climate collaborations to exchange best practices, support access to new technologies and investments for environmental projects. It is also desirable to intensify bilateral cooperation in the field of energy and the synchronization of roadmaps for "green" transformation (with Russia aiming for a longer period of transformation).

2) More deep integration of environmental goals, in particularly environmental sustainability investments and reduction of carbon emission, in economic strategies and industrial planning, as well as expanding ESG principals in traditional industries, improving coordination among different government levels and sectors, developing products and materials with longer product life and higher additional value.

3) Applying more effective economic incentives for green investments, which might include some financial stimulus, for example subsidies, blended finance, tax relief to encourage "green" investments. At the same time especially for Russia it is important not just accelerated transformation, but about stimulating emissions reduction in traditional industries.

4) Using climate and environmental agenda for proposing an alternative international financial and monetary system and authority of BRICS New Development Bank among multilateral development banks, promoting transitional climate finance concept.

5) Development of national carbon unit markets, as well as the formation of a common market for the two countries (for example, the acceleration of a pilot project in the Far East), and subsequently a common carbon unit market and related infrastructure for the BRICS countries.

6) Promoting reasonable consumption via sharing economy, as well as the recycling economy, and supporting a longer period of use of long-term consumer goods, including through the use of new business models and package offerings (goods and warranty services).

Some additional strategic initiatives for Russia include:

1) Diversifying energy sources depending on regional development through increase investment in renewable energies like solar, wind, hydro, nuclear and hydrogen to reduce vulnerability to fluctuating global oil prices.

2) Strengthening regulatory frameworks and enforcement to set quantifiable emissions and environmental targets, as well as continue improving quality of air, water, energy efficiency standards across key sectors, especially oil and gas.

3) Promoting research and technological development to advance clean technologies, including nuclear and hydrogen technologies, that integrate smoothly with existing energy infrastructures and support cutting-edge solutions for environmental remediation.

Strategic initiatives for China include:

1) Enhancing Renewable Energy Funding, including solar and wind power generation to reinforce China's leadership position globally in these sectors. Promoting a steady growth in green manufacturing and exports to retain Chinese leadership in green technology market internationally.

2) Playing leadership role in global climate dialogue and enhance partnership, as well as providing assistance to developing nations, particularly in One Belt One Road Initiative, for climate change adaptation and mitigation.

3) Promoting education and public campaigns to enhance awareness for renewable energy and sustainability, culture of environmental responsibility.

These strategic recommendations are tailored to strategies of Russia and China towards sustainable future taking into account national circumstances, consistent with their Paris Agreement and other international climate commitments. Many developing countries can apply these principles in their own strategies towards resilient and sustainable future.

References / Список литературы

1. Kvint V.L. *The global emerging market: Strategic management and economics*. New York: London: Routledge; 2009. 522 p. https://doi.org/10.4324/9780203882917
2. Kvint V.L., Bodrunov S.D. *Strategizing societal transformation. Knowledge, technologies, and noonomy*. USA (Palm Bay): Canada (Burlington): United Kingdom (Abingdon): Apple Academic Press; 2023. 228 p. https://doi.org/10.37930/978-5-00020-086-5
3. Astapov K.L. Innovative strategizing for sustainable development: Russian patterns. *Strategizing: Theory and Practice*. 2023;3(4):403–415. (In Russ.). https://doi.org/10.21603/2782-2435-2023-3-4-403-415
4. Dechezleprêtre A., Fabre A., Kruse T., Planterose B., Chico A.S., Stantcheva S. *Fighting climate change: International attitudes toward climate policies*. National Bureau of Economic Research. Cambridge, July 2022. Working Paper 30265.
5. Astapov K.L. *Post-industrial challenges to the Russian economy*. Moscow: TEIS; 2009. 270 p. (In Russ.)
6. Porter M. The five competitive forces that shape strategy. *Harvard Business Review*. 2008;86(1):78–93.
7. Schumpeter J.A. *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press; 2011. 244 p.
8. Nelson R.R., Winter S.G. An *evolutionary theory of economic change*. Cambridge, Massachusetts: London, England: The Belknap Press of Harvard University Press; 1982. 452 p.
9. Prahalad C.K., Hamel G. *The core competence of the corporation*. Harvard Bisuness Review; 1990. 14 p.
10. Castels M. *The information age: Economy, society and culture*. 625 p.
11. Kenichi O. *The mind of the strategist: The art of Japanese business*. McGraw Hill; 1982. 283 p.
12. Toffler A. *Future Shocks*. USA: Random House; 1970. 198 p.
13. Grant R.M. *Contemporary strategy analysis: Text and cases edition*. Chichester: John Wiley & Sons; 2016. 776 p.
14. Kaplan R.S., Norton D.P. Using the balanced scorecard as a strategic management system. *Harvard Business Review*. 1996;74(1):75–85.
15. Akaev A.A., *Sadovnichy V.A. Mathematical models for forecasting the large digital cycle of global economic development (2020–2050)*. Moscow: Lomonosov Moscow State University Publ. House (Printing House); 2023. 680 p. (In Russ.)
16. Astapov K.L. On the influence of international climate regulation on national strategies in Russia. In: *VII Int. Scientific-Practical Conf. "Theory and practice of strategizing". Moscow, February 21–22, 2024*. Moscow: Lomonosov Moscow State University Publ. House (Printing House); 2024. P. 72–76. (In Russ.)
17. *Conceptual future of Kuzbass: Strategic contours of development priorities until 2071. 50-year perspective*. V.L. Kvint (Ed.). Kemerovo: KemSU; 2022. 283 p. (In Russ.)
18. *Fundamentals of the strategy of environmental development of Russia*. V.L. Kvint, V.A. Fetisov (Eds). Moscow: Lomonosov Moscow State University Publ. House; 2021. 77 p. (In Russ.). https://doi.org/10.29003/m2447.978-5-19-011631-1
19. Jia Q. The impact of green finance on the level of decarbonization of the economies: An analysis of the United States', China's, and Russia's current agenda. *Business Strategy and the Environment*. 2022;32(1):110–119. https://doi.org/10.1002/bse.3120
20. Porfir'ev B.N. Low-carbon development paradigm and strategy for reducing the risks of climate change for the economy. *Problemy prognozirovaniya = Problems of Forecasting*. 2019;(2):3–14. (In Russ.)
21. Liu Z., Li X. The economic impact of air pollution in China: National and regional perspectives. *Environmental Economics and Policy Studies*. 2018;20(3):539–558.

22. Jiang Q., Ma X. Wang Y. How does the One Belt One Road initiative affect the green economic growth. *Energy Economics*. 2021;101:105429. https://doi.org/10.1016/j.eneco.2021.105429

23. Chen Y., Wang Z., Zhong Z. CO_2 emissions, economic growth, renewable and non-renewable energy production and foreign trade in China. *Renewable Energy*. 2019;131:208–216. https://doi.org/10.1016/j.renene.2018.07.047

24. Mahadevan R. Sun Y. Effects of foreign direct investment on carbon emissions: Evidence from China and its belt and road countries. *Journal of Environmental Management*. 2020;276:111321. https://doi.org/10.1016/j.jenvman.2020.111321

Information about the authors

Kirill L. Astapov – Dr.Sci. (Econ.), Professor, Moscow School of Economics, Lomonosov Moscow State University, 1-61 Leninskie Gory, Moscow 119991, Russian Federation; ORCID: https://orcid.org/0000-0003-4766-4421; e-mail: ast_k@mail.ru

Shen Chuang – Inspur Group Co., Ltd., 1036, Lang Chao Road, Jinan, Shandong 250101, China

Информация об авторах

Кирилл Леонидович Астапов – д-р экон. наук, профессор, Московской государственный университет имени М.В. Ломоносова, Московская школа экономики, 119991, Москва, Ленинские горы, д. 1, стр. 61, Российская Федерация; ORCID: https://orcid.org/0000-0003-4766-4421; e-mail: ast_k@mail.ru

Шэнь Чуан – Компания Инспур, Компания Инспур, 250101, провинция Шаньдун, Цзинань, дорога Ланг Чао, 1036, Китай

Received **31.01.2025**; Revised **04.03.2025**; Accepted **10.03.2025**

Поступила в редакцию **31.01.2025**; поступила после доработки **04.03.2025**; принята к публикации **10.03.2025**