DEEP DECARBONIZATION PATHWAYS

CLIMATE AMBITION BEYOND EMISSION NUMBERS

Taking stock of progress by looking inside countries and sectors

RUSSIA

George Safonov, Vladimir Potashnikov, Alexandra Dorina, Mikhail Safonov, Andrey Stetsenko

SEPTEMBER 2021

IDDRI

ВЫСШАЯ ШКОЛА ЭКОНОМИКИ

РАНХиГС
РОССИЙСКАЯ АКАДЕМИЯ НАРОДНОГО ХОЗЯЙСТВА И ГОСУДАРСТВЕННОЙ СЛУЖБЫ ПРИ ПРЕЗИДЕНТЕ РОССИЙСКОЙ ФЕДЕРАЦИИ

Citation

G. Safonov, V. Potashnikov, A. Dorina, M. Safonov, A. Stetsenko (2021). *Climate ambition beyond emission numbers, Taking stock of progress by looking inside countries and sectors, Russia*. Deep Decarbonization Pathways (DDP) Initiative-IDDRI. Paris.

Contact

Henri Waisman, henri.waisman@iddri.org

The report is available online:
https://ddpinitiative.org/wp-content/pdf/DDP_AmbitionReport_RUS.pdf

Financial support from

The report "Climate Ambition Beyond Emission Numbers" is made possible thanks to an array of projects supporting in-country capacity on climate mitigation research across the targeted geographies. It is also is financially supported by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) as part of the "Climate Action After Paris" project (nr. 18_I_326) and the French government as part of the programme "investissements d'avenir" under the reference ANR-10- LABX-01.

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

Production: IDDRI.
Editing: Marta Torres Gunfaus, Anna Pérez Català, Lola Vallejo, Henri Waisman.
Layout: Ivan Pharabod.

CLIMATE AMBITION BEYOND EMISSION NUMBERS

Taking stock of progress by looking inside countries and sectors

George Safonov, National Research University Higher School of Economics (HSE)
Vladimir Potashnikov, Russian Presidential Academy of National Economy and Public Administration (RANEPA)
Alexandra Dorina, National Research University Higher School of Economics (HSE)
Mikhail Safonov, University of California, Irvine
Andrey Stetsenko, Moscow State University

Disclaimer

The results presented in this report are outputs of the academic research conducted under the DDP BIICS project as per the contractual agreement. The academic work does not in any way represent our considered opinion for climate negotiations and also does not reflect the official policy or position of the Government of Russia.

How is this document relevant to the Global Stocktake?

This document is part of a collective report that assesses the evolution of climate ambition in 26 countries and 3 hard-to-abate sectors through a granular and context-specific analysis of trends and progress of national and sectoral transformations.[1] This approach allows identifying what hinders and spurs action in countries and sectors, and understanding the conditions that can support enhanced ambition, which could be political, social, economic, governance.

These insights are directly relevant to four overarching functions of the Global Stocktake in support of its desired outcome, i.e. "to inform Parties in updating and enhancing, in a nationally determined manner, their actions and support in accordance with the provisions of the Paris Agreement, as well as enhancing international cooperation for climate action" (Article 14.3 of the Paris Agreement):

- Create the conditions for an open and constructive conversation on global cooperation (on e.g., technology, trade, finance, etc.), based on an in-depth understanding of the international enablers of enhanced country ambition.
- Organize a process for knowledge sharing and collective learning, based on concrete examples of actions already in place or being discussed, including best practices.
- Create space for open dialogues across different stakeholders to support better coordination of actions, based on a detailed understanding of the levers to be activated to enhance ambition in national and sectoral transitions
- Facilitate ownership by decision-makers of the climate challenge and the risks and opportunities of the low-emission and resilient transition, based on context-specific and granular analysis of barriers and enablers.

More specifically, the collective report in general – and this document in particular – can contribute to address some of the key guiding questions for the Global Stocktake[2], notably:

- What actions have been taken to increase the ability to adapt to the adverse impacts of climate change and foster the climate resilience of people, livelihoods, and ecosystem? To what extent have national adaptation plans and related efforts contributed to these actions (Decision 19/CMA.1, paragraph 36(c))?
- How adequate and effective are current adaptation efforts and support provided for adaptation (Article 7.14 (c) Paris Agreement)?

1 The full report « Climate ambition beyond emission numbers - Taking stock of progress by looking inside countries and sectors" can be found at: https://www.iddri.org/en/publications-and-events/report/climate-ambition-beyond-emission-numbers-taking-stock-progress

2 Draft Guiding Questions for the Technical Assessment of GST1 (version 20th October 2021), available at: https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf

- What are the barriers and challenges, including finance, technology development and transfer and capacity-building gaps, faced by developing countries?
- What is the collective progress made towards achieving the long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions referred in Article 10.1 of the Paris Agreement? What is the state of cooperative action on technology development and transfer?
- What progress been made on enhancing the capacity of developing country Parties to implement the Paris Agreement (Article 11.3 Paris Agreement)?
- To achieve the purpose and long-term goals of the Paris Agreement (mitigation, adaptation, and finance flows and means of implementation, as well as loss and damage, response measures), in the light of equity and the best available science, taking into account the contextual matters in the preambular paragraphs of the Paris Agreement:
  - What are the good practices, barriers and challenges for enhanced action?
  - What is needed to make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development?
  - What are the needs of developing countries related to the ambitious implementation of the Paris Agreement?
- What is needed to enhance national level action and support, as well as to enhance international cooperation for climate action, including in the short term?
- What is the collective progress made by non-Party stakeholders, including indigenous peoples and local communities, to achieve the purpose and long-term goals of the Paris Agreement, and what are the impacts, good practices, potential opportunities, barriers and challenges (Decision 19/CMA.1, paras 36(g) and 37(i))?

Foreword

Henri Waisman, Marta Torres Gunfaus, Anna Perez Catala, IDDRI.

Country commitments as reflected in enhanced Nationally Determined Contributions submitted to the UNFCCC are insufficient to put the world on track to achieve the collective objective of the Paris Agreement to hold temperature increase below 2 °C or 1.5 °C above pre-industrial levels. Furthermore, concrete policies and actions adopted by countries on the ground are often not sufficient to achieve these NDC targets. These conclusions highlight the need to increase ambition and to provide convincing evidence to accelerate action in the immediate and short term to give effect to this ambition. Yet these assessments are not sufficient to effectively guide the progressive increase of ambition, as organized by the cyclical process of the Paris Agreement.

APPROACH

With this imperative in mind, this report adopts a different, complementary, perspective on climate ambition. It seeks to open the box of emission pathways, by considering multiple dimensions of the conditions that will make these pathways possible. These are technical, economic, political, social and governance considerations in need of attention to enable the required far-reaching and systemic transformation towards the long-term goal. On the one hand, the revision of emission targets needs to be directed by an assessment of how drivers of emissions should change to trigger transformation. On the other hand, converting emissions' targets into pertinent concrete implementation requires well-designed policy packages and investment plans that are also informed by a clear and detailed understanding of the starting point, priorities and interplays between the available levers of transformation.

This bottom-up assessment aims at contributing to the process of collective learning in support of the progressive increase of collective ambition, as inserted at the core of the Paris Agreement paradigm. Approaching climate ambition through the lens of underlying transformations calls for reflecting the heterogeneous nature and the multi-faceted aspects of transitions in different sectors and countries. This forces a move away from a purely global perspective and adopts a more granular approach based on country and individual sector perspectives. Thus, the report explores trends and progress on these transformations, as locally observed over the past years, notably since the Paris Agreement. This 'backwards looking' approach can help identify where developments are going in the right direction, where they should be accelerated and where major tensions remain that should be addressed as a priority to avoid undermining the transition. The picture of the state of the ambition discussion, firmly embedded in the country and sectoral realities, can provide means for reflection and action within the international climate community, particularly to inform focus areas for advancing the collective ambition agenda.

STRUCTURE OF THE REPORT

This country report describes the recent evolutions of domestic discourses on climate ambition, national climate policy, national governance and concrete policies and actions with a significant effect on GHG emissions. The chapter highlights a selection of striking and structurally important elements to advance the transformation towards carbon neutrality from an in-country perspective.

This report is part of a full series of 26 country chapters and three sectoral chapters. The full report includes a "summary for decision-makers" to present 10 cross-cutting messages emerging from the country and sector analysis, as a guide to the selection of priorities for collective action in the post-COP26 period.

You will find the full report at: https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/DDP_beyond%20emissions%20report.pdf

RUSSIA

AMBITIONS IN COMBATING CLIMATE CHANGE,THE PROGRESS AFTER PARIS

This chapter has been written thanks to the support of the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

CLIMATE TREATIES AND VISION BY 2050

Russia's role in climate change mitigation should and can be substantial. It is the world's largest country by territory with 20 per cent of global forests, 10 per cent of the world's arable land, 350 billion tons of oil equivalent (toe) of fossil fuels. Russia's greenhouse gas (GHG) emissions peaked in 1990 at 3087 $MtCO_2e$ and since then declined by 49 per cent to 1585 $MtCO_2e$ by 2019 (including LULUCF).[1] Russia's relatively cheap and abundant resources

1 Roshydromet (2021), The national GHG inventory submission to the UNFCCC by the Russian Federation. https://unfccc.int/ghg-inventories-annex-i-parties/2021

of fossil fuels pose strong barriers to decarbonizing the national economy. At the same time Russia owns huge resources of renewable energy sources (RES) that can provide zero-carbon alternatives to fossil fuels both for domestic supply and exports. The RES technological potential is estimated at 16,955 Mtoe per year in power and heat generation. All these considerations are important for understanding the country's climate policy challenges and, specifically, the behavior of Russian climate policy makers.

Historically, Russia contributed a lot to international scientific programs on climate issues since the 1970s, played a meaningful role in the development of the UNFCCC in the early 1990s, it was crucially important for the entry into force of the Kyoto Protocol in 2004, and supported the Paris Agreement in 2015. However the country was reasonably criticized for the weak emission reduction target in the Nationally Determined Contribution (NDC) and overall lack of ambition in mitigation efforts. Evidently, the national Energy Strategy by 2035[2] and other related programs implied a further increase of production and export of fossil fuels, metals and other carbon intensive commodities without any serious plans for carbon emissions reduction. Some industry lobbyists insist on revising methodologies and recalculating carbon sequestration by Russian forests, which could "add" 1.5-2 billion tons of CO_2 of carbon sinks.

Probably, the main driver of change in Russia's perception of the climate change mitigation issue is the potential threat of the EU Green Deal's carbon border adjustment mechanism (CBAM) for Russian exports of carbon intensive goods, such as metals, chemical fertilizers, electricity, and, likely, fossil fuels. In 2020 the carbon footprint of Russian exports to the EU exceeded 1 billion tons of CO_2e.[3] The carbon fee at the European border would essentially mean huge losses for the exporters and the Russian State budget, especially if the fee's level would be equal to the EU ETS price (above 50 Euro/tCO_2e). The announcement of mid-century climate neutrality targets by the US, Canada, China, Japan, Korea in late 2020 – early 2021 also affected decision making in Russia, as the carbon footprint of exports to these countries amounts to over 650 mln tCO_2e in 2020.[4] Carbon pricing and other "climate protectionism" measures may cause additional losses for the domestic producers in the near future. Governments of over 100 other countries have been adopting or preparing their decarbonization plans and strategies, so the need for urgent action in Russia became more and more obvious.

In 2020 the Ministry of Economy presented the draft strategy for low carbon development by 2050, which included several scenarios of economic development. Surprisingly, GHG emissions in all these scenarios were supposed to rise substantially by 2030, and the projected emissions by 2050 were 5-42 percent above the baseline level of 2017. The discussion of the draft strategy continued until April 2021, when President Putin announced the new national target 2021-2050 of emitting cumulatively less than the EU's emissions. Soon after, the presidential decree requested development of the decarbonization plan by October 1st, 2021.[5]

CARBON REGULATION

The federal law on carbon regulation was adopted on July 2nd, 2021. It provides regulatory power to the government, determines the annual reporting of the large carbon emitters over 150 thousand tons of CO_2e beginning in 2023, and allows voluntary implementation of carbon projects to offset emissions.

All provisions regarding the allocation of emission quotas to energy and industrial sources, carbon fees, the creation of a targeted climate fund, and a domestic carbon market disappeared from the original text, as provided by the Ministry of Economy in early 2020. The government is authorized to set the target level of emission reduction for specific periods, which will depend on dynamics of socio-economic development and progress in accounting of forest carbon removals.

The provisions on voluntary carbon projects are considered as a platform for generation of emissions offsets which could be used by the Russian emitters to

2 Ministry of Energy of Russia (2020), The energy strategy by 2035 https://minenergo.gov.ru/node/1026

3 The authors' estimate based on the Russian export data by Federal Customs Service.

4 Ibid.

5 https://rg.ru/2021/06/27/putin-poruchil-sostavit-plan-po-dekarbonizacii-ekonomiki.html

compensate their emissions and, potentially, reduce the impact of the EU's CBAM regulation.[6] For that, the rules and procedures for the development of project documentation, its validation and verification, registry and issuance of credits are to be adopted by the Ministry of Economy.

On December 28th, 2020 the Russian government adopted a roadmap for the implementation of an experiment on the regulation of carbon emissions in the Sakhalin region[7], aiming at creating special conditions for the introduction of low- and zero-carbon technologies, reporting and verification of greenhouse gas emissions and removals, support of carbon projects, and the creation of the green finance mechanisms. The new status requires significant amendments to the Sakhalin strategy of socio-economic development by 2035 as well as developing the Climate Program and Action plan for its implementation.

The first steps include: 1) GHG inventory and identification of the main sources of emissions and removals in 2021; 2) launch of the information system with the registry of emitting companies, climate projects and carbon units by April 2022; 3) registration of the carbon project results and trading deals in 2022-2023.

The law on the Sakhalin experiment on a carbon trading mechanism was submitted to the parliament in July 2021. The federal deputy prime minister has been coordinating the work of the ministries on economic development, energy, industry and trade, agriculture, and the Sakhalin government, as well as some financial and industrial majors, including the Bank of Russia, Sberbank, Rosneft, and the state development corporation "VEB.RU". These business partners wish to participate in the creation ofgreen financing and carbon trading schemes which, as expected, may help reducing the risks of the EU carbon border adjustment mechanism. International energy companies, such as Shell, Exxon Mobile, Mitsui, Mitsubishi, could also be interested in offsetting greenhouse gas emissions via the purchase of the local carbon credits.

Some other provinces of Russia expressed interest in joining the Sakhalin's experiment, including the Kaliningrad region (the western exclave of Russia), Khanty-Mansiisk district (the oil rich Northern region), and Altai krai (Southern Siberia).

Subnational activities have also expanded in launching the "carbon polygons":areas for planting forests, carbon storage in agricultural soil, and some other measures. The Ministry of Science is supporting these initiatives at the federal level. Eight provinces have already committed to establishing such polygons and provide finance for scientific research and measuring of carbon flows in the pilot territories.[8]

POTENTIAL FOR DECARBONIZATION

Russia possesses huge resources of renewable energy sources (RES) such as solar, wind, geothermal, tidal, wave, as well as biofuels. The total "technologically available" potential of these RES is 25 times higher than total primary energy produced in the country annually.[9] The costs of green power generation have been declining in the last decades, which allow utilizing green energy sources much more effectively. However Russia's RES are generating 0.3 percent of the total electricity so far (excluding large hydro). By 2024, the government plans to rise RES's capacity from below 1 GW up to 5.9 GW, mostly focusing on of wind, of solar, and small hydro. The barriers to RES expansion in Russia include continuous pressure from fossil fuel lobbyists, excessive technical requirements for RES installations, and strict standards for RES equipment localization.

Probably the biggest potential in emission reduction in Russia is with energy efficiency. The national target of 40 percent reduction of energy intensity of GDP in 2007 through 2020 was missed (only about 12 percent reduction was achieved).[10] The policy targets were postponed to 2030. The overall potential is estimated at 45 percent of Russia's total primary energy consumption.[11]

6 The EU consultations on the Carbon Border Adjustment Mechanism https://ec.europa.eu/taxation_customs/news/commission-launches-public-consultations-energy-taxation-and-carbon-border-adjustment-mechanism_en

7 Ministry of Economic Development of Russia (2020) The Roadmap of Sakhalin regional experiment in carbon regulation https://economy.gov.ru/material/file/faf1abaae1e3f2be140971c9e934d0ab/dorozhnaya_karta.pdf

8 Ministry of Science and Education, Carbon polygons https://minobrnauki.gov.ru/action/poligony/

9 Bezrukikh et al (2007) The reference book on renewable energy sources in Russia [in Russian].

10 Ministry of Energy of Russia. https://minenergo.gov.ru/node/5195

11 WB/IFC (2014) Energy Efficiency in Russia: Untapped Reserves.

Another "decarbonization pillar" for Russia is the rising demand for hydrogen in the world. In late 2020, Russia adopted a plan on developing its hydrogen energy strategy by 2024, setting a highly ambitious target of 20 percent share of the world's market in this decade.[12] There are some technological and scientific foundations for boosting hydrogen production in Russia, and the existing gas pipeline network may help with transportation to export markets. The question is which color this hydrogen should have? "Grey" and "blue" hydrogen produced from natural gas are currently the easiest options for Russia. "Orange" one made by using nuclear power is also possible due to the excessive power generation by the domestic Rosatom corporation. However the EU, Japan, Korea and North America prefer "green" hydrogen based on zero-carbon electrolysis using RES.

Second generation biofuels based on organic matter are highly demanded in the world markets. Russia has huge amount of biomass that can be used for that, including woodwaste, low grade wood, and agricultural residues. The technologies are known and available: the production of energetic biocharcoal as a substitute for traditional energetic coal for power plants with much less pollution and zero carbon footprint, the production of bio-kerosene (extremely important for reduction of CO_2 emissions in international and domestic aviation) and bio-gasoline for automobiles (corresponding to Euro-5 standards, but with zero carbon emissions) and based on the Russian innovative technologies, the biogas production from organic waste as alternative to natural gas.

DECARBONIZATION PATHWAYS

Long term targets on climate neutrality for the national economy have not been adopted in Russia so far. As mentioned above, the draft decarbonization strategy by 2050 is due by October 2021. However, some research has been done byleading think tanks in recent years, which may shed some light on the opportunities for deep decarbonization in the country.

The analysis of energy CO_2 emissions in key sectors of the Russian economy based on the TIMES-RUSSIA model showed that oil and coal supplies will continue playing a leading role in the domestic energy mix by 2030, but the situation substantially changes in 2030-2050. The Active decarbonization scenario with emission reduction by over 85 percent below 2010 levels by 2050 (**Figure 1**) requires dramatic restructuring of energy supplies, leading to a 70 percent reduction of gas consumption by 2050 (compared to 2010), a deep decline in oil and coal use, a boost in biofuel use, solar and wind energy supplies, as well as introduction of CCS in about 40 per cent of fossil fuel-based power plants (**Figure 2**).

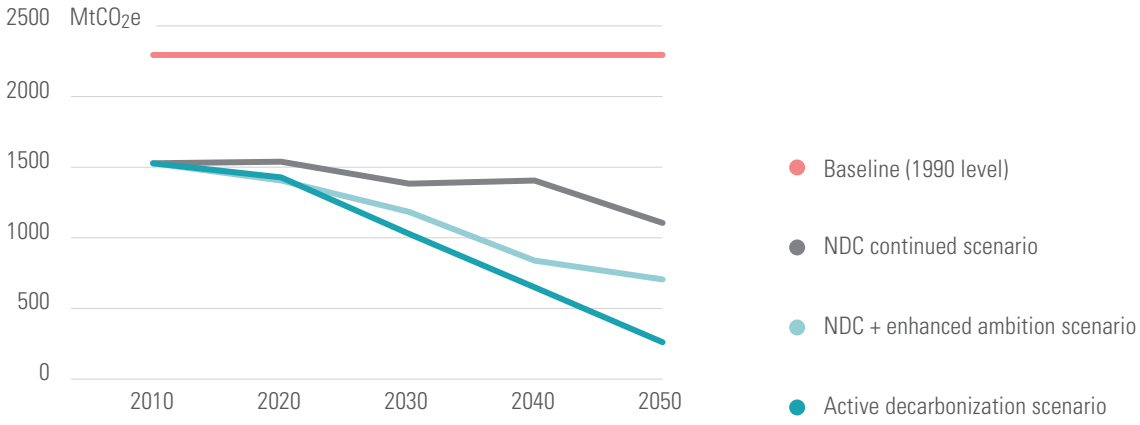
The conservative estimates of economic impacts of different scenarios are based on: 1) the investment and operational (mostly, fuel use) costs of decarbonization in power and heat, industries and other relevant sectors, and 2) revenue loss fromfossil fuel exports. The decarbonization costs are rising dramatically after 2030 in scenarios of enhanced ambition and active decarbonization, which can be explained by increasing costs of modernization and switching to low carbon technologies as well as higher losses of revenue from fossil fuel exports.

The costs of carbon emission reduction are expected to rise depending on the ambition and decarbonization targets. By 2030, emission reduction will unlikely cause any meaningful costs in the NDC scenario, which actually means the continuation of weak mitigation targets and mostly business-as-usual development. In more ambitious scenarios, emission reduction costs can reach 33-50 USD/tCO_2 by 2030 and then rise up to 110 USD/tCO_2 by 2040 and 145 USD/tCO_2 by 2050 (**Figure 3**).

The modeling provides quantitative estimates of decomposition of CO_2 emissions from energy use by the main sectors, including electricity, industry, buildings and transport. The total emissions are declining with different speed depending on the ambition of the scenarios: a relatively slow reduction in the NDC scenario; more rapid reductions in the "NDC + enhanced ambition" scenario mostly in electricity, industry and transportation sectors; and a sharp decrease of 87 per cent in the "Active de-

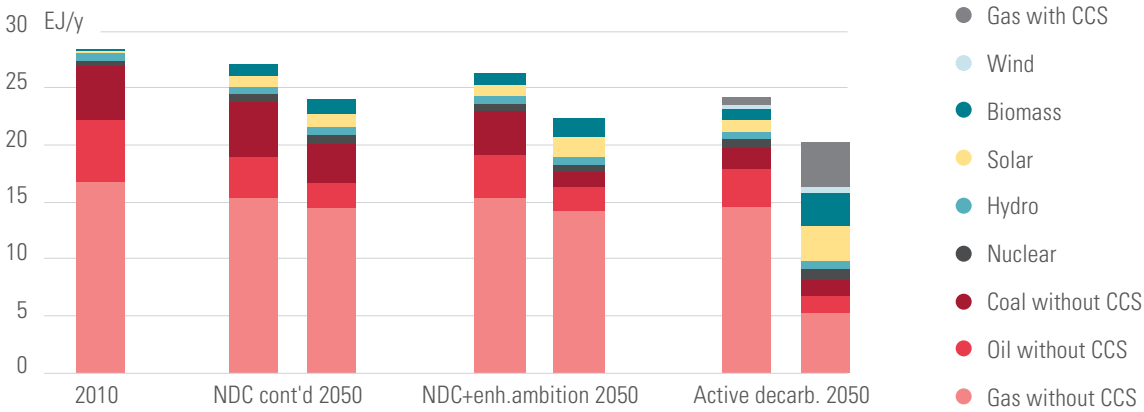
12 Ministry of Energy of Russia. https://minenergo.gov.ru/node/19194

Figure 1. Projections of CO_2 emissions from energy use in Russia, 2010-2050



Source: 2010 – national GHG inventory data; 2020-2050 – authors' calculations.

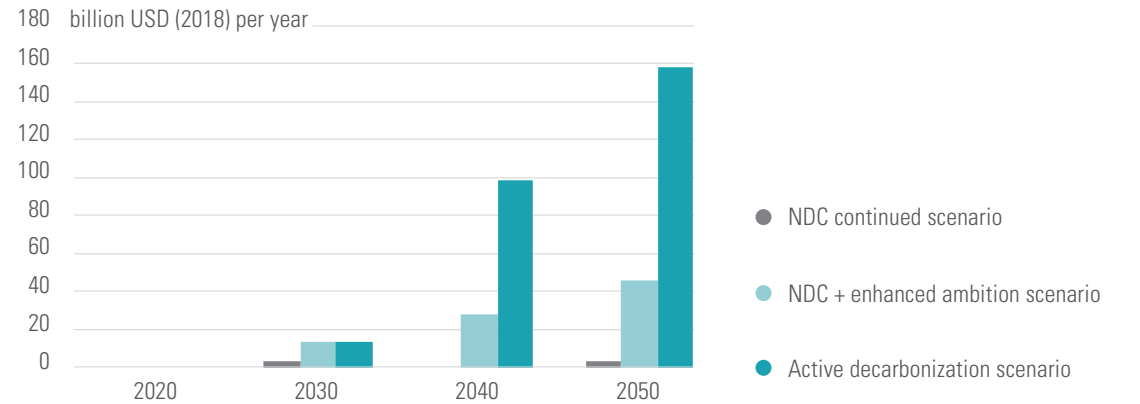
Figure 2. Total primary energy supply in Russia by energy source, by scenarios, 2010-2050



Source: 2010 – IEA data; 2030-2050 – authors' calculations.

Figure 3. Estimates of incremental annual cost for decarbonization in energy-related sectors of Russia in 2020- 2050

(compared to 2020 level)



Source: authors' estimates.

carbonization" scenario, in which emissions decline dramatically in all sectors.

These trends raise some outstanding questions for Russia on green export alternatives. If global demand for coal is shrinking, could gas substitute for coal, extending state giant Gazprom's business in Europe and Asia? The latest modeling results from the CD-LINKS project database[13] suggest that the role of natural gas as a bridge into a new energy future will be short-lived. In the most ambitious scenarios, demand for gas may decline in the EU by 22 percent, in China by 12 percent, and in Japan by 28 percent by 2030.

Russia's potential as a provider of green energy resources can become a big part of the national strategy for climate neutrality, which would allow the country to play an important role in decarbonizing the world's economy and avoid risks related to carbon regulation in the near term.

13 IIASA, CD-LINKS Scenario database https://data.ene.iiasa.ac.at/cd-links/#/workspaces

The DDP is an initiative of the Institute for Sustainable Development and International Relations (IDDRI). It aims to demonstrate how countries can transform their economies by 2050 to achieve global net zero emissions and national development priorities, consistently with the Paris Agreement.. The DDP initiative is a collaboration of leading research teams currently covering 36 countries. It originated as the Deep Decarbonization Pathways Project (DDPP), which analysed the deep decarbonization of energy systems in 16 countries prior to COP21 (deepdecarbonization.org). Analyses are carried out at the national scale, by national research teams. These analyses adopt a long-term time horizon to 2050 to reveal the necessary short-term conditions and actions to reach carbon neutrality in national contexts. They help governments and non-state actors make choices and contribute to in-country expertise and international scientific knowledge. The aim is to help governments and non-state actors make choices that put economies and societies on track to reach a carbon neutral world by the second half of the century. Finally, national research teams openly share their methods, modelling tools, data and the results of their analyses to share knowledge between partners in a very collaborative manner and to facilitate engagement with sectoral experts and decision-makers.
www.ddpinitiative.org

The Institute for Sustainable Development and International Relations (IDDRI) is an independent, not-for-profit policy research institute based in Paris. Its objective is to identify the conditions and propose tools to put sustainable development at the heart of international relations and public and private policies. IDDRI is also a multi-stakeholder dialogue platform and supports stakeholders in global governance debates on the major issues of common interest, such as actions to mitigate climate change, protect biodiversity, strengthen food security, and to manage urbanisation. The institute also participates in work to build development trajectories that are compatible with national priorities and the sustainable development goals.

www.iddri.org