No. 185 20 June 2016

russian analytical digest

www.css.ethz.ch/en/publications/rad.html www.laender-analysen.de

CLIMATE CHANGE

German Association for East European Studies

Institute for European, Russian, and Eurasian Studies The George Washington University

Research Centre for East European Studies University of Bremen

Center for Security Studies ETH Zurich

Institute of History University of Zurich

ANALYSIS

Challenges of the Changing Climate: A Case Study of Russia

By Oleg Anisimov, St. Petersburg, Russia

Abstract

Russia is facing climatic changes that are more pronounced than in many other parts of the world. While such changes have already led to environmental and socio-economical impacts, it is still debatable whether climate change should become a matter of concern for the policymakers, business society, and population in Russia, and whether development of the climate adaptation policies should be given high priority. The problem is complicated by distinct differences in recent climate changes across the country, and by the absence of societal preparedness to dedicated efforts to combat potentially detrimental consequences of the changing climate. Impacts from climate change differ by region across Russia and range from damage to infrastructure built upon thawing permafrost in the Russian North, flooding from unusually heavy rains, to potential benefits in some regions, such as reductions in the heating energy demand, better conditions for agriculture, an increase in the water resources of great Siberian rivers and a more navigable Northern sea route. However, despite key regional concerns associated with climate change, regional adaptation policies are yet to be developed.

International Context of Climate Change

There is a growing international recognition of the challenges of the changing climate, largely due to the activities of the Intergovernmental Panel on Climate Change (IPCC). IPCC is an international body with the dedicated mission of providing a comprehensive assessment of climate change and informing decision-makers around the world about climate risks and adaptation policies.

Whether the recommendations of the IPCC can be implemented in Russia is questionable. Despite its involvement in many international climate initiatives, until recently Russia paid little attention to the matter because it faced more pressing economic, financial, societal, and political problems.

In contrast to the situation in Russia, by the early 2000s other developed countries formulated the task of identifying key regional and national climate concerns and finding the optimal balance between the mitigation of climate change through reductions of greenhouse gas emissions, geoengineering and other technological advancements, and adaptation to climate change impacts by adjusting the economy, infrastructure, land use, traditional practices, and legislation and governance to the new conditions. Implementation of this task was supported by significant intellectual and financial resources, and in 2008 European scientists presented a comprehensive assessment of climate change impacts for Western Europe. Using results and findings of this assessment, the EU formulated a strategic plan aimed at limiting climatic warming to a 2°C threshold above the pre-industrial level[1]. In December 2015, the UN climate conference in Paris imposed an even lower threshold of 1.5°C as a goal of international climate change mitigation policy. Unfortunately, until now no such analysis was conducted for all economic sectors and regions of Russia. Additionally, no assessment of the balance between, and relative importance of, positive and negative climatic impacts in relation to different rates of projected warming for the diverse Russian regions and the country as a whole have ever been attempted.

In 2008 Roshydromet made a step towards changing this situation to the better by publishing the first assessment report on climate change and its consequences in Russia. Two volumes of this publication mirrored the IPCC assessment reports. The first volume was dedicated to the analysis of the ongoing and projected changes in the physical parameters of climate in Russia, while the second volume was focused on the impacts such changes may have on the economic sectors. Soon after the release of this report, Roshydromet prepared the so-called Climate Doctrine[2], which was officially endorsed by the Russian government in December 2009. It was the first-ever document presenting Russia's vision of the road map leading to the development of the national climate adaptation and mitigation strategies. However, implementation of these strategic tasks in Russian realms is difficult, first of all because of the climate skepticism dominating the Russian business community, policymakers and general public. Despite this difficulty, further efforts were made to put Russia in line with the other developed countries on climate change issues. In November 2011 Roshydromet and the Russian academy of sciences, in collaboration with the World meteorolog-

1 For more information, see <http://www.climateemergencyinstitute.com/uploads/EU_2C_2008.pdf>

2 For more information, see <http://global-climate-change.ru/index.php/en/officialdocuments/climate-doctrine>

ical organization and World Bank, organized an international conference "Problems of adaptation to climate change"[3], the first time such a conference was organized in Moscow. The conference admitted the importance of the problem for Russia and formulated a three-fold task, (1) to narrow the uncertainty of climate prediction in Russian regions, (2) to assess the full range of impacts of climate change on the economy, natural, and human systems in Russia with a special focus on the identification of levels of warming leading to the optimal balance between climate mitigation and adaptation costs, and (3) to develop effective national adaptation strategies that would minimize the negative consequences for different climate-change thresholds. Through the present time, only a few of these tasks have been addressed at a sufficient level of detail and key findings were presented in 2014 in the Second assessment report issued by Roshydromet[4].

Realms of the Changing Climate in Russia

Beginning from the mid-1970s, the annual-mean air temperature over the Russian territory was rising at an average rate of 0.43°C per decade, which is 2.5 times the global rate. Temperature changes were not uniform across space and through the seasons. Warming was more pronounced in the Russian Arctic and subarctic, including the permafrost regions, where the mean-annual temperature was rising by 0.5–0.9°C per decade. The European part of Russia demonstrated warming of 0.2–0.6°C per decade with relatively small variations over seasons. In the rest of the country, the rate of warming differed by season and was the highest in the spring and in the summer (up to 1.0–1.2°C per decade in the North of Siberia) and moderate in the fall (0.4–0.6°C per decade with the least pronounced regional differences). Winter temperature changes had a complex regional pattern and ranged from a rise by 0.4–0.8°C per decade in Central and Northern Siberia, Yakutia and the Russian Far East, to a decline of 0.2–0.6°C per decade in southern Siberia and Chukotka.

Annual sums of precipitation in the past four decades rose in most Russian regions at the average rate of 0.8 mm/month per decade with large interannual and regional variations. In accord with these changes, annual renewable water resources, i.e. river runoff, increased in all federal districts of Russia on average by 4.8 percent, or by 204 km^3 per year, and up to 10 percent on great Siberian rivers. The impacts of a moderate increase of precipitation were exacerbated by the changes in the regional precipitation regime and increase of the extreme events. Several regions demonstrated a shift towards higher frequency and duration of extra heavy rains, which led to catastrophic floods with the damage and loss of infrastructure in some regions. At the same time, there was a notable increase in the frequency and severity of droughts in other regions. Recent examples include the flood in the Krasnodarsky Krai in the south of Russia in June 2012 that affected more than 34,000 people in the cities of Krumsk, Gelendzik, and Novorossiisk, and lead to 172 deaths. This flood was caused by extra-heavy rain, which continued 2 days on 4–6 July and delivered 3 to 5 monthly precipitation norms in different parts of the affected region. A catastrophic flood on the Amur river in the Russian Far East was caused by heavy precipitation in June–September 2013. It led to 84 deaths, 105 people missing, and more than 860,000 people permanently relocated to new houses. At the peak of the flood on 3–4 September the water flow of the Amur river increased more than twice above the norm. Such long periods with nearly continuous heavy rains have never happened in this region during the whole period of observations, i.e. at least 115 years. Model-based analysis showed that the return period of such a flood is once in 200–300 years.

In contrast to the sequence of recent catastrophic floods, in July and August 2010 the European parts of Russia and Yakutia were affected by unusual drought and hot weather that caused a cascade of environmental (i.e. forest fires, loss of crops, etc.) and societal impacts, which included human health consequences, such as a rise of respiratory and cardiovascular diseases and extra heat-related deaths, and damage to the infrastructure and support systems. The total economic losses were estimated at more than 450 billion rubles (ca. 1.5 billion USD at the 2010 exchange rate). According to a Roshydromet statement, such a summer heatwave had not happened in Russia over the past 1,000 to 5,000 years. In Moscow alone, about 15,000 extra deaths, mostly from cardiovascular problems, have been attributed to this unusual extremely hot weather. In the vicinity of St. Petersburg, the interference of the air masses led to a strong tornado in the late evening of 31 July, an event that had never happened in this area before. The wide track of the tornado was traceable over more than 40 kilometers in the densely populated area. It led to a massive destruction of pine trees over large forested areas and in the suburbs. The disaster took place in the middle of the vacation season when tens of thousands of people were visiting their summer and country houses around the city. Falling trees damaged hundreds of private summer houses, cars, electric power

3 For more information, see <http://www.climatechange.ru/node/559>

4 For more information, see <http://downloads.igce.ru/publications/OD_2_2014/v2014/pdf/resume_ob_eng.pdf>

lines, and made many roads in the forested area unusable. In some settlements it took nearly two months to restore the power supply due to the shortage of technicians in the emergency services.

There is increasing evidence that the ongoing climatic changes in many Russian regions have already exceeded the level of natural variability accounted for in construction and management practices and norms regulating many types of human activities. Perhaps the most illustrative is the situation in the Russian permafrost regions. Permafrost occupies more than 60 percent of Russia, and particular concerns are associated with the fate of the structures built upon the frozen ground. Rising temperature led to a decrease in the permafrost bearing capacity on average by 17% and at selected locations up to 45% since 1970s. Thawing permafrost caused deformation and damage to numerous buildings in northern cities, pipelines, roads, and other structures. Most of these structures were built in the 1960s and 1970s, and the effect of climate change had not been incorporated into their design. A survey of structures conducted in selected cities in the Russian Arctic in the early 2000s indicated that a significant number of structures were already affected by deformations due to thawing permafrost, i.e. about 10 percent of buildings in Norilsk, 22 percent in Tiksi, 55 percent in Dudinka, 35 percent in Dikson, 50 percent in Pevek and Amderma, 60 percent in Chita, and 80 percent in Vorkuta. Russia has an extensive network of pipelines with a total length of about 350,000 kilometres, of which more than 71,000 kilometers traverse permafrost regions. Thawing permafrost leads to the deformation and damage of pipelines, exacerbates the problems of pipeline maintenance, and increases operational costs. About 55 billion rubles are spent annually to fix the mechanical deformations resulting from uneven settlement of the thawing permafrost.

Climate change affects transportation routes in the Russian High North. In the absence of a well-developed network of all-season roads, winter ice roads are particularly important to keep small settlements connected with the mainland. Duration of the winter road operational period depends on winter temperature and snow fall, which have changed significantly and unevenly in the Russian North since the 1960s. While in Yakutia and selected regions in Central Siberia the operational period of the winter roads has increased on average by several days, in most industrialized areas of West Siberia, including the oil and gas extracting provinces on Yamal, it has dropped by more than 10 days. Models indicate that by the mid-21st century, the accessibility of remote settlements currently served by winter roads will fall on average by 13 percent. Other Arctic nations are facing similar problems, but unlike the case with Alaska and Northern Canada, Russia does not have a developed network of local airlines effectively serving routes in the High North.

Balancing Climate Risks and Potential Benefits

To the extent that scientists, the business community, and policymakers around the world focus on the problem, their perception of climate change's impacts highlights the potentially detrimental consequences. In contrast to this, many consequences of the ongoing and projected climatic changes in Russia create new opportunities. Potential benefits have received significant attention in Russian studies, but are yet underrepresented in international publications. They are exemplified by less severe climatic conditions in the Russian High North with direct implications for human health; a northward shift of the productive vegetation zones and a larger range of ecosystem services; the northward advance of land suitable for agriculture; a 3–5 day per decade average increase in the duration of the warm period with daily-mean temperatures above 10 °C (the higher summer temperatures favoring crop yield in most agricultural regions); reduced demand for heating energy, with up to 5 days per decade reduction in the duration of the heating period in the past four decades; dramatic reduction of the sea ice in the Arctic, at the average rate of 13 percent per decade, leading to a more navigable northern sea route; and increased water resources and a longer ice-free season on Great Siberian rivers, which in the absence of the developed road network serve as transportation corridors. The winter temperature rise led to a more homogeneous seasonal distribution of runoff with less water accumulated as snow during the low flow period. Immediate positive implications of such changes for the electric power generation are exemplified by the Volga and Kama rivers traversing the densely populated industrial and agricultural regions in Central and Southern Russia. In the last three decades, the annual water inflow to reservoirs of the Volga-Kama system increased by 8–26%, while the winter inflow increased by 70–120%. The gross cumulative output of the nine hydropower plants increased by 13%. Notably, most of the increase took place in the winter period when energy demand is high. Another positive implication of more homogeneous seasonal runoff distribution is the 20 to 40 percent decrease of the maximum water levels during the spring high flow on most rivers in the European southwestern and western regions of Russia.

A comprehensive assessment of the balance between the negative and positive climate-induced changes for Russia is essentially lacking. The interplay of potential losses and gains complicate an objective evaluation of the net climate change effect in Russia. The assertion of worldwide challenges presented by climate change becomes questionable, and is no longer accepted unequivocally by different population groups and stakeholders, especially those gaining immediate and often short-term benefits from the new regional opportunities. Although climate change is global in nature, the impacts are region-specific, and require adaptation options designed for the specific circumstances of regional systems, their susceptibility to climate change, and their ability to adapt. From this prospective, adaptation to climate change at the legislative level becomes a puzzle with no single approach across all settings. Large contrasts across the Russian regions in the rate and magnitude of, and vulnerability to, current and projected climate change further complicate the development of the climate adaptation strategy at the national level. In some regions, exemplified by the Russian permafrost regions, the rate rather than the magnitude of climate change may become the key factor leading to dramatic impacts on natural and social systems, particularly if it exceeds the rate of their adaptation.

Uncertainty in climate projections remains large, which further complicates adaptation planning. Under these circumstances most profitable are regional adaptation strategies that generate net social and economic benefits at no cost to other regions and sectors and irrespective of uncertainty in future forecasts (no-regret measures).

About the Author

Oleg Anisimov chairs the department of climatology at the State Hydrological Institute in St. Petersburg and serves as the Coordinating Lead Author of the IPCC. Anisimov's work is supported by the Russian Science Foundation, project 14-17-00037 to the State hydrological institute in St. Petersburg.

ANALYSIS

Russia's Climate Mitigation Policies: How to Get Them Implemented?

By Anna Korppoo[1] and Anton Orlov, Oslo

Abstract

Russia is a major emitter of greenhouse gases, but so far efforts to reduce emissions have had little impact. Finding effective solutions will require more efficient pricing for energy on the domestic market, among a variety of other measures.

A Key Player

Russia is a key player in international climate politics and diplomacy. In 2012, it was the fourth-largest emitter of greenhouse gas (GHG) emissions globally (fifth-largest if the European Union is considered as one emitter) with a share of some 5.1%, or a total of 2,322 Mt CO2e. Further, as Russia is the world's second-largest oil exporter and the largest gas exporter, its engagement in international climate cooperation is essential to ensure sufficient reductions in global emissions to halt dangerous climate change.

Russia's GHG emissions without Land Use, Land-Use Change and Forestry (LULUCF) have been slowly growing since 2000, on average by 1% per annum.[2] In 2012, its per capita emissions were 16.22 tCO2e, compared to the world average of 6.36 tCO2e. In 2013, its carbon intensity was 1.55 metric tons of kCO2/USD [2005 USD] of GDP, as against the world average of 0.57.[3] Over the years, Russia has adopted various GHG emissions limitation targets: first to keep emissions below the level of the final years of the Soviet Union (1990) under the first commitment period of the Kyoto Protocol, 2008–2012; then, through domestic legislation in 2013, to limit the growth of emissions beyond 75% of the 1990 level by 2020. These targets have basically allowed the economy to develop along business-as-usual lines.[4] Some existing policies (on energy effi-

1 Anna Korppoo's work is funded under Project 235588 of the Research Council of Norway's KLIMAFORSK program.

2 Authors' own calculation based on UNFCCC GHG emissions data. <http://unfccc.int/2860.php> → GHG Data → Old reporting requirements → Detailed data by Party

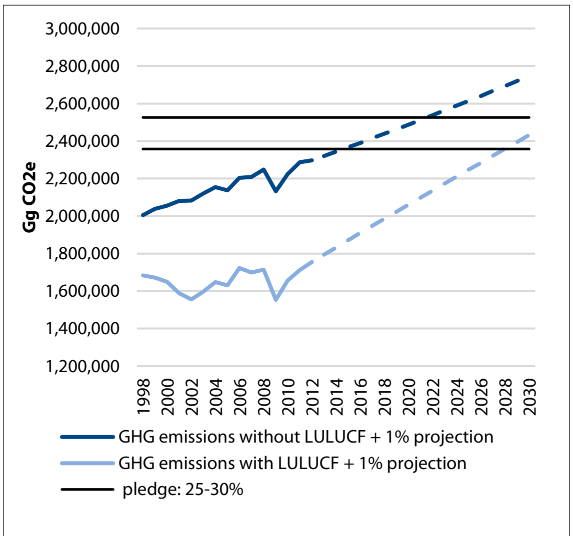
3 International Energy Agency Data Services 2015. CO_2 from fuel combustion.

4 A. Korppoo & A. Kokorin (2015). Russia's 2020 GHG emission target: Emission trends and implementation. *Climate Policy*, pub-

ciency, renewable energy, and associated petroleum gas flaring limitations) aim at curbing Russia's growing carbon emissions as one of their goals.

Figure 1 shows Russia's emission trends with an assumed 1% annual emission growth until 2030, which we base on the historical average annual GHG emission growth of ca. 1% for 2000–2012. Actual future emission trends are difficult to foresee; factors like structural change, autonomous energy-efficiency improvements, energy-efficiency programs and their success, and the pace of economic growth—will all have an impact. Already around 2020, and given 1% average annual emissions growth but without accounting for the carbon absorption by LULUCF, Russia's GHG emissions would exceed the range of its 25–30% National Determined Contribution by 2030 in comparison to 1990 level under the Paris Agreement. Taking into account the estimated LULUCF, projected to decline by some 40% in comparison to 2010s levels by 2030,[5] Russia would still exceed the more ambitious end of its target before 2030. However, official Russian emission trends show more rapid growth in GHG emissions: the "without measures" scenario in Russia's sixth National Communication to the UN Framework Convention on Climate Change expects 2.2–2.5% annual increase in GHG emissions (excluding LULUCF) between 2015 and 2030.[6] There are also uncertainties in connection with LULUCF projections and the implementation of GHG emissions reduction policies. Further, the Paris climate agreement introduced a review of national commitments every five years, which indicates that Russia, like other countries, will be expected to tighten its target levels well before 2030. The World Bank has estimated that Russia could reduce its energy use by approximately 45% of primary energy consumption from 2005 levels,[7] so it would make economic sense to use climate-change policies to achieve such potentials.

Figure 1: Russia's Total GHG Emission Projections in the Context of Paris Commitments



Data sources: UNFCCC country data; forest sinks scenario data Russia's 6th National Communication to the UNFCCC. NB.: please see the Note on p. 13 for further clarifications on the data.

Climate Mitigation Policies

Russia's 2009 energy efficiency law aimed to mandate new measures on energy saving and energy efficiency, and create the legal, organizational, and economic foundations for stimulating energy saving and energy efficiency. The law covered measures such as energy labeling of appliances, metering of energy use, energy audits, ban on most incandescent light bulbs, targets for reducing energy use in public buildings, energy-saving contracts, longer-term tariff setting for power and heat producers, some tax breaks, and regional energy efficiency programs.[8]

Associated petroleum gas (APG), a side-product of oil extraction, has traditionally been flared as waste. However, it can be utilized locally as a fuel and raw material for the chemical industry; it can be re-injected to increase pressure in the oil field; and it can be collected and transported by pipeline to other users—reducing GHG emissions as a side benefit. In 2009, the Russian government introduced a 5% limit to flaring of APG from 2012, with 4.5 times the standard environmental fine for methane emissions for exceeding this limit, while non-metered flaring faced a six-fold fine increase. The 2012 amendments partly established even higher fines for exceeding the limit, but at the same time introduced significant exemptions. Oil fields with small emissions as well as flaring during maintenance are totally exempted from these limits, as are new oil fields for the first three years of their development. Furthermore, oil producers are allowed to pool their emissions between their operational units when calculating compliance with the law, and to deduct expenses from fines to cover the costs of investments in projects that promote value-added use of APG.

lished online: <http://www.tandfonline.com/doi/abs/10.1080/14693062.2015.1075373>

5 Russia's 6th National Communication to the UNFCCC. Moscow 2013. Available (in Russian) at: <http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/7742.php>

6 Ibid.

7 World Bank (2008). Energy efficiency in Russia: Untapped Reserves.

8 Paragraphs on energy efficiency, APG and renewable legislations are based on A. Korppoo, M. Gutbrod, & S. Sitnikov (2016), "Russian Law on Climate Change," in C. Carlarne, K.Gray & R. Tarasofsky (eds.). *The Oxford Handbook of International Climate Change Law.* Oxford University Press.

Until recently, the Russian leadership has focused less on renewable energy. In the 2009 Governmental Order, Russia aimed for 11 GW of new renewable generation capacity and for generating 4.5% of its electricity needs from new renewable sources of energy by the year 2020: that target has since been downgraded. In 2013 Russia developed a legal basis for renewable energy (solar, wind, and small-scale hydroelectricity) in its capacity market in order to guarantee a 12–14% return on investment over the ensuing 15 years; this legal basis also enacted various limitations and requirements on the investors, who were to be selected through government tenders.

Difficulties with Implementation

However, the feasibility of these policies seems questionable, as their implementation has encountered various difficulties. Over 90% of the funding of the government energy efficiency program is projected to originate from extra-budgetary sources. The deadlines for the implementation of several elements, for instance meter installations and light bulb bans, have been prolonged, and some activities, such as fulfilling public sector targets and launching regional programs, have had a slow start. This legislation has also been deemed to be overly complex, given the substantial amounts of sub-legislation required for its implementation. Finally, the law covers only state-funded organizations—and these account for a mere 12% of total energy consumption.

Rostekhexpertiza[9] has estimated that the APG legislation excludes some 18–19% of APG flaring (including the 5% which is allowed), due to measurement errors, the exemptions for flaring during maintenance stops, and the low quality of APG. In addition, estimated flaring due to the exemptions of oil fields categorized as "small" and "new" accounts for approximately 30–40% of the total. This would indicate that, even with significantly higher fines for flaring exceeding the 5% target, the legislation would in practice allow some 60% of the APG produced to be flared, without fines. Another major barrier is the lack of metering: according to official statistics, only 24% of APG is flared, whereas expert evaluations set the total much higher, at 70%. It remains unclear how fines are calculated in the absence of accurate flaring data. Some companies, especially privately-owned ones (Surgutneftegas, Tatneft), reported compliance with the 5% rule in 2012; by contrast, state-owned companies (Rosneft, Russneft, Gazprom neft) blatantly violated the law by flaring some 30–50%. Rosneft accounts for almost half of the total APG produced in Russia.

Finally, in 2012, less than 1% of electricity was generated from renewable sources of energy other than large hydro. The target of 1.5% by 2010 was missed, and in April 2013 the target of 4.5% by 2020 was reduced to 2.5%. The renewable energy purchase obligation, introduced in 2007, was not launched until in 2015. Some regulatory gaps on tariff methodologies still remain, and local content requirements have gradually tightened to levels described as unrealistic, in the absence of domestic producers of renewable energy equipment. The low value of the ruble—the reference currency of the capital expenditure limits—may make renewable energy projects non-viable. Moreover, obtaining all the necessary licenses and permits following a successful tender places a considerable onus on the companies in question. Three tenders have been run; however, the worsening economic conditions since 2015 have led to cancellations of agreed projects from the investors' side.

Obstacles to Success

Many reasons can be cited for the low success rate of the above policies, such as economic conditions, existing support structures of fossil fuel industries, and legal complexities. However, it seems clear that the long chains of implementation activities in terms of stakeholders and interests involved serve to reduce the feasibility of policy implementation in Russia, at least in the case of climate-change mitigation. Such chains provide more opportunities for lobbyists of the targeted stakeholders. Also ongoing restructuring and changes in the administration can mean that responsibility is delegated to agencies with little or no relevant expertise, few resources, and, in some cases, a lack of interest in the issue-area. Finally, network and personal interests, which are often the driving force of administrative actors, can open the way to watering down existing policies—by promoting loopholes in regulations and failing to monitor implementation.[10]

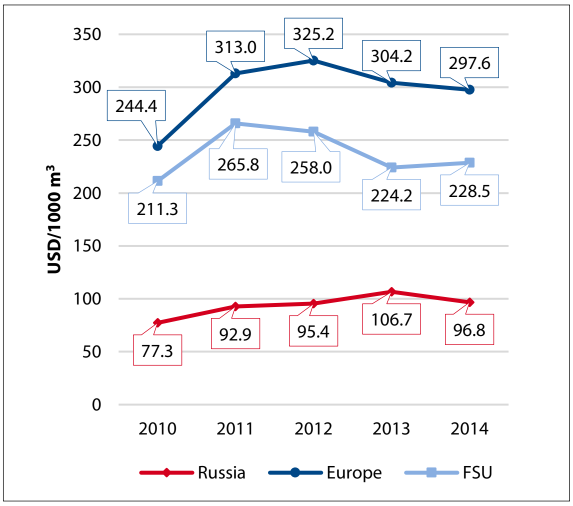
Seeking Solutions

An optimal climate policy must combine various policy instruments, and the climate policy measures existing in Russia today are important components here. That being said, Russian climate policy lacks more fundamental mechanisms, such as efficient pricing for energy resources. Domestic gas prices are administratively regulated, and have remained substantially lower than export netback prices (see Figure 2). On average, from 2010 until 2014,

9 A. Aksenov, V. Skobelina, and I. Tremasova (2013). Dolgo "zapryagali"—poyedem li? <http://www.rostehexpertiza.ru/analytics/dolgo-zapryagali-poedem-li/>

10 A. Korppoo (2015). Who is driving Russian climate policy? Applying and adjusting veto player theory to a non-democracy. *International Environmental Agreements*—published online, May 2015. <http://link.springer.com/article/10.1007%2Fs10784-015-9286-5>

Figure 2: Domestic and Export Prices for Gas in Russia



Data source: Gazprom Report 2014. Available at: <http://www.gazprom.ru/investors/disclosure/reports/2014/>

the average price of domestic gas in Russia was approximately 32% of the export price for gas sold to Europe and 40% of the export price for gas sold to FSU countries. Moreover, there is an export tax on natural gas, with a tax rate of 30%, as well as high export taxes on crude oil and oil products. The regulation of domestic gas prices and export taxes on fossil fuels functions as implicit subsidizing.[11] Eliminating these energy subsidies might yield welfare gains, encourage energy efficiency, and lead to reduced GHG emissions.[12] For instance, policy simulations (2007 data) show that an 87% increase in the domestic gas price—which would bring the domestic gas price to 60% of the export netback price—could lead to a 10.2% reduction in Russia's total CO_2 emissions.[13] Increasing domestic energy prices typically results in adverse income distribution effects and losses in the competitiveness of many energy-intensive sectors. In particular, poor household groups are adversely affected by higher energy prices. We hold that the Russian government could reap a double dividend from climate policy by focusing on a simpler, more centralized approach. One measure could entail a "subsidy swap," rebalancing today's energy subsidy and income tax policies. Cutting the subsidies on fossil-fuel use would lead to reduced consumption, and thereby lower GHG emissions. Earmarking the money saved for support to household groups that suffer most from the price hikes, and further supporting the energy-efficiency improvement investments of affected industries, would bring benefits on the level of the national economy.

This approach could also address the fiscal constraints, a major barrier to successful implementation of existing and planned energy-efficiency programs in Russia. The private sector is unable to undertake large-scale investments in energy efficiency on its own, and the government faces budget constraints. Eliminating subsidies on domestic energy consumption could raise substantial funds to encourage energy-efficiency improvements, leading the economy onto a more energy-efficient, sustainable path. This approach could also circumvent the problems of long command chains during implementation. A centralized solution with optimized subsidies and taxation practices, for instance reducing income taxation on the poorest households, requires no further implementation, with the attendant chances of things going wrong.

Eliminating domestic subsidies on energy consumption in Russia would be the first step towards sustainable and efficient energy consumption. A "subsidy swap" could significantly reduce the adverse income distribution effects arising from higher energy prices. Furthermore, it could improve the effectiveness and political feasibility of existing energy-efficiency programs and encourage production from renewable energy sources. However, abolishing energy subsidies is only a medium-term solution. In the longer run, Russia will need additional policy measures, such as a carbon tax and/or an emissions trading system, if it is to raise the ambition level of its GHG emissions reduction target under the Paris climate agreement.[14]

About the Authors

Dr. *Anna Korppoo* is senior research fellow at the Fridtjof Nansen Institute.

Dr. *Anton Orlov* is senior researcher at the Center for International Climate and Environmental Researcher (CICERO).

11 In line with profit maximization strategy, producers aim to equalize the marginal profit from the export and domestic market so that the domestic supply price and the export netback price will be equal. Imposing an export tax reduces the export netback price. As a result, export supply declines, whereas supply to the domestic market increases. In turn, higher domestic supply leads to a lower domestic price.

12 A. Orlov (2015). An assessment of proposed energy resource tax reform in Russia: A static general equilibrium analysis. *Energy Economics* 50, 251–263.

13 A. Orlov (2015). An assessment of optimal gas pricing in Russia: a CGE approach. *Energy Economics* 49, 492–506.

14 A. Orlov, H. Grethe, H. and S. McDonald (2013). Carbon taxation in Russia: Prospects for a double dividend and improved energy efficiency. *Energy Economics* 37, 128–140.

ANALYSIS

Russia's Post-Paris Climate Policy: Slow Progress and Problems

By Alexey Kokorin, Moscow

Abstract

The Paris Agreement is exerting a positive influence on Russia's climate policy: the country's response is in the right direction, but progress is significantly slower than what is actually possible. Although the main problem is that Russia relies on a fossil-fuel-based national economy, the slow progress is also the result of objections from high-carbon businesses, and complications in figuring out how to account for forest CO_2 absorption and large methane emissions in the natural gas sector.

Background Aspects

The Paris Agreement reflects a growing global desire to lower carbon emissions, though it did little to guarantee enforceable commitments. Nevertheless, the agreement catalyzes domestic activities in countries, including Russia, that do not accept the climate problem as a primary policy driver.[1]

In recent years, the Russian government has gradually accepted warnings that burning coal is no longer desirable and that the post-oil era is coming. Nevertheless, there is considerable room for improvement. Firstly, the government response is rather slow and limited mainly to preparations for the future.

Secondly, the official response is focused on implementing a wide range of more modern technologies as part of a comprehensive effort enforced by carbon regulation (i.e. regulation is accepted only as a tool for implementing new technologies). The Ministry of Energy has undertaken some efforts to expand the use of renewable energy, but after Paris it did not significantly accelerate this process because it was not recognized as a priority. Low-carbon development is mainly considered to be a mixture of increasing energy efficiency and energy-saving measures through the expansion of large hydro and nuclear energy generators.

Thirdly, there are at least two issues adding complexity: accounting for CO_2 fluxes in managed forests and the problem of huge methane emissions by the gas sector. Therefore this brief article firstly describes the recent steps taken by the government; and secondly addresses the forest and methane problems.

Creation of a "Platform" and First Steps

Before 2016 there was no official body in Russia for brainstorming and consensus-building in finding ways to address carbon issues. The "Interagency working group on questions of climate change and ensuring sustainable development" established under the Administration of the President brought together mainly representatives of federal bodies to coordinate a wide range of efforts, including issues related to BRICS and the G20[2]. Therefore, it was important that, just before the Paris conference, the Ministry of Economy established a special "Interagency working group on economic aspects of environmental protection and regulation of greenhouse gas emissions" (WG)[3]. This group brought together officials, a variety of businesspeople, and experts. The WG was "born" in hard debates, because high-carbon business (mainly coal and metallurgy producers) strongly objected to the narrow focus on carbon regulation. After Paris the group works in an atmosphere of debates between economists and the businesses that emit large amounts of carbon in the course of their activities. Despite the differences, the WG has become a real platform for consensus-building.

The WG continues the activities of the Ministry of Natural Resources and Ecology (MNRE), Ministry of Economy, and Ministry of Energy in 2014–2015 to organize mandatory carbon disclosure, i.e. full and transparent reporting by large (>150kt CO_2-eq/yr.) and middle size (>50kt CO_2-eq/yr.) enterprise-emitters beginning in 2016 and 2018 respectively. The decision was made as a pre-Paris policy[4], but its implementation has to be monitored and improved on a continual basis. One shortcoming is that the current reporting system excludes auto transport and gas and oil pipelines. However, significant improvements were made in May 2016, when the MNRE ordered that guidelines describing how to account for indirect energy greehouse gas (GHG)

1 A.O. Kokorin. New Factors and Stages of the Global and Russian Climate Policy. *Economic Policy*. 2016. Vol. 11. No 1. pp. 157–176 DOI: 10.18288/1994-5124-2016-1-10. <http://www.ep.ane.ru/pdf/2016-1/kokorin.pdf>

2 Responsibilities and content of the group: <http://www.kremlin.ru/structure/administration/groups#institution-1003>

3 Order of the Ministry of Economy defining the responsibilities and membership of the group (author of the given article is a member of the group) <http://merit.consultant.ru/documents/78256?items=1&page=6>

4 Decision of the Government No 716-p 22.04.2015 on adoption of the "*Concept for system of monitoring, reporting and verification of greenhouse gas emissions in the Russian Federation*".

emissions (i.e. electricity bought by an enterprise from an external grid) should be put in place by June 2017[5].

Going forward, the first step to be taken is to amend the "Law on environmental protection" to provide definitions, reporting and monitoring mechanisms, and regulations for GHGs, because currently CO_2 and other GHGs, which do not pose a direct hazard for health and the environment, are absent from the national system of laws. Following strong objections from high-carbon business, the proposed amendment was revised and now excludes regulation. Currently it is under final consideration by the office of the prime-minister and will eventually be passed to the State Duma. The parties have come to a consensus that "carbon" will be regulated by a new law. This consensus took concrete form in May 2016, when the government made the decision that "the draft concept carbon regulation law" should be prepared by the middle of 2018 (the long drafting process is also a matter of consensus)[6].

A second step is the development and introduction of standards for specific GHG emissions (i.e. per unit of product) for a wide range of energy and industrial activities. These standards should solve the problem that Russia only recognizes carbon regulation as a tool for implementing technologies. By 2014 the best available technologies (BAT) for environment protection were collected into a set of about 30 volumes organized by sectors of the economy and adopted as national standards for 2015–2018. The relevant amendment was included in the "Law on environmental protection"[7], but with an exclusive focus only on air or water pollution, waste, human health, etc., because the law does not include GHGs yet. On the other hand, the concept of BAT is currently the only legal norm which the Ministry of Economy can use for regulation. Currently there is a deadlock, which high-carbon business tries to maintain by insisting that future regulations follow the BAT model. It is likely that specific GHG standards will be introduced, but it will take 2–3 years to develop a set of quantitative parameters, ensure that businesses accept them, and finally adopt the necessary regulations.

The third step is the Paris Agreement plan. The Working Group, Ministry of the Economy and MNRE are proceding now in accordance with the "Plan of measures to ensure GHG emission reduction to 75% of the 1990 level by 2020" and plan to amend this document[8], but it cannot provide enough reduction in terms of scope and time period to meet the Paris requirements. National activities that include adaptation and national goals to be achieved by 2030, should be included in the Paris Agreement plan. The draft of the "Plan of activities on ratification and further implementation of the Paris Agreement" was prepared by the MNRE and includes the necessary items, but it drew heavy criticism from business lobbyists, who charged that the document was a tool to destroy the national economy[9]. On the other hand, economists and ecologists generally support the plan, noting only that deadlines for some items are too far in the future[10]. By the middle of May 2016, the draft had been affirmed by all relevant ministries and sent to the prime-minister's office on May 23. There is a good chance that it will be adopted soon. As a result, Russia will make the decision that its National Adaptation Plan should be developed by the middle of 2018, the national GHG goal for 2030 adopted in 2019, and the relevant system of measures developed by 2020. Thus, the first practical measures for carbon regulation are expected after 2018, though it is still not clear what form they will take—tax, fees, trading systems, or something else.

Accounting for Forests

The second part of Russia's Paris commitment (Intended Nationally Determined Contributions, INDC), which is listed in the following way, "Limiting anthropogenic greenhouse gases in Russia to 70–75% of 1990 levels by the year 2030 might be a long-term indicator, *subject to the maximum possible account of absorbing capacity of forests*,"[11] generates questions from different audiences. Does the 70–75% *include* or *exclude* land-use, land-use change and forestry (LULUCF)? What is the *maximum possible account?* In 2015 Russian forest experts encountered significant misunderstandings with the government and media, and they undertook efforts to clarify the situation. They delivered a special report to the World Forestry Congress[12] and a Russian side event at

5 Decision of the Government No 877-p 11.05.2016.

6 Decision of the Government No 877-p 11.05.2016 on adoption of the correction to the Decision 504-p 02.04.2014.

7 Federal Law No 219-FZ 21.07.2014 "*On amendments to the Federal Law on Environment Protection*"

8 Adopted by Decision of the Government 504-p 02.04.2014, amended by Decision No 807-p 06.05.2015 and Decision No 877-p 11.05.2016.

9 Lobbyists also illegally leaked the plan to the media (<http://regnum.ru/news/2104864.html>) and criticized the signing of the Paris Accord in April 2016 (<http://regnum.ru/news/society/2121936.html>).

10 For more details, opinions and citations see: <http://kommersant.ru/doc/2951538>

11 <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>

12 D. Zamolodchikov, A. Kokorin, E. Lepeshkin. Dynamics and projection of carbon deposition function of Russian forests in relation to Climate Change problem. 8 pp. Proceedings of the XIV World Forestry Congress, Durban, South Africa, 7–11 September 2015 <http://foris.fao.org/wfc2015/api/file/

the Paris Conference was focused on answering these questions.

The key point is that the difference between "including" and "excluding" is large now (between 56% and 69% of the 1990 level in 2014)[13], but it will decrease to about 5% of the 1990 level by 2030 and then to zero if Russia continues routine forestry practices. The reason is the gradual shift in the age structure of managed forests combined with fires and poor cutting practices. In the case of very large-scale measures on approximately 100Mha, the difference may be larger and up to 10% of the 1990 level in 2030. However, such a situation requires a ban on commercial clear-cutting in all primary forests (intact forest landscapes) with a simultaneous increase in the efficiency of secondary forest-use by 2–3 times. This is an enormous task, which is recognized by ecologists, foresters and the Federal Forestry Agency (FFA), but it requires outstanding efforts over the course of many years. It is likely that the difference will be close to zero already by 2030, if fires, clear-cutting and pathological disease will follow the business-as-usual (BAU) path[14]. Therefore, the Ministry of the Economy, MNRE and Ministry of Energy prefer to use the goal as "70–75% *excluding* LULUCF" for planning of *domestic* measures (see Figure 1 on p. 13). On the other hand, the political authorities prefer to keep the goal as "70–75% *including* LULUCF". It is a "safety cushion" for *international* purposes, which does not generate problems or spoil domestic measures.

The *"maximum possible account"* means only the absence of any artificial limitations on the offsetting of results (as it is in the Kyoto Protocol for forest management projects in Art. 3.4). Special modalities for specific forests are not required; instead, the science-based principle "*what the atmosphere sees*" should just be applied to any anthropogenic activities on lands[15]. The Russian delegation is not going to carry on special LULUCF negotiations because nothing new is required. Evidently the *"maximum possible account"* will not increase CO_2 uptake above numbers already reported in the Russian National Inventory Report (NIR) to the UN Framework Convention on Climate Change (UNFCCC).

On the forest issue, the WG sees two needs: firstly, to develop and adopt a detailed methodology for CO_2 accounting ("*what the atmosphere sees*") for different types of national measures and projects, which are above business as usual[16]; secondly, create incentive for forestry projects, i.e. induce businesses to use emission reductions in forestry projects for compensation of emissions in the industrial sector. Simultaneously MNRE, FFA and many others, including the World Wildlife Fund, are going to do their best to ensure the survival of most valuable forests, improve forestry practices, and protect the forest carbon sink to the extent possible.

The Methane Problem

According to the recent submission to the UNFCCC[17], in 2014 methane (CH_4) contributed 45% of Russia's GHG emissions, including LULUCF (36% excluding LULUCF), while the global contribution of methane to GHG emissions is 20–25%. Russian methane emissions are more than 1,000 MtCO_2-eq. or about 2% of all global GHG emissions, which is compatible to global international aviation. This fact is not clearly understood by Russian authorities, who are used to speaking only about CO_2. Moreover there are two complications. The first is the high level of uncertainty in the oil and gas sector that is the main CH_4 emitter; and second is the UNFCCC decision-making by 2030 based on the most recent reports of the Intergovernmental Panel on Climate Change (IPCC).

The gas and oil sector contributes up to three-quarters of all CH_4 emissions in Russia (see Table 1 on p. 14). It is important to note that recently emissions from this sector increased dramatically. In the NIR submitted in October 2014, CH_4 emissions as a whole were about 500 Mt CO_2-eq., but in the NIR of February 2015 they rose to more than 1,000 Mt CO_2-eq. mainly due to use of other emission coefficients[18] recommended by the UNFCCC for the oil and gas sector. The UNFCCC

552d70ba9e00c2f116f8e5fa/contents/618f549a-1e69-4a1e-952a-988103f27f2a.pdf>

13 The National Inventory Report to the UNFCCC (CRF-common reporting format tables submitted 15.04.2016) <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php>

14 See footnote 12.

15 Seminar "Optimization of Russian forests protection and use as part of the national contribution to the Paris Agreement" Centre for Forest Ecology and Productivity of the Russian Academy of Science, 29.03.2016. The resolution developed by the seminar was reported and adopted by the Science Council of the MNRE (section responsible for GHG issues) at 14.04.2016.

16 Experts are going to use internationally approved methodologies of the Verified Carbon Standard <http://www.v-c-s.org/methodologies/find> as a basis (one of them, VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, has been used by the WWF in the Russian Far East).

17 Common Reporting Format (CRF) tables to the National Inventory Report submitted 15.04.2016) <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php>

18 The UNFCCC or IPCC method is the following: (Activity data, e.g. gas transported by pipeline, Mm^3)*(Emission coefficient, e.g. %) = (Emission, Mt CH_4), while direct measuring is encouraged to get more precise results.

proposed using such coefficients for *developing and transition economies*, if these countries do not develop their own parameters and publish results in scientific journals. Gazprom strenuously objects to the estimates submitted to the UNFCCC in 2015–2016, stressing that emission coefficients for natural gas extraction and transportation in *developing* countries are not applicable to Russia. According to the company, its CH_4 emission is just one-eighth or less of what was reported in the recent NIR, while Greenpeace insists on an independent assessment of results by a third party[19].

Considering the goals for 2030 and beyond, we have to predict the use of modified coefficients for the conversion of 1 ton of CH_4 to 1 ton of CO_2-equivalent. Currently, the UNFCCC uses Global Warming Potential (GWP) at 25 as the appropriate conversion factor (according to the IPCC Fourth Assessment Report, AR4), while several years ago it was 21 as it was in the Third IPCC report. Evidently, in the future, the UNFCCC will use a figure from the most recent AR5 report and it is GWP = 28 or 34 depending whether indirect effects are taken into account. A conversion of 34 is scientifically more correct and likely. Use of this number will produce significant "growth" for Russian CH_4 and GHG emissions.

However, there is a larger problem. The AR5 directly shows that GWP is not the right approach to achieve the goal of the Paris Accord. GWP is based on average effect in a period, e.g. GWP_{100} *means average in XXI century*, GWP_{20} means effect in next 20 years. The Paris goal is "<2 C deg." (i.e. limitation of global warming *at the end of the XXI century*), which requires another coefficient—Global Temperature change Potential (GTP_{100}). Its value is only 4 or 11 depending on whether indirect effects are taken into account[20]. Thus, the UNFCCC decisions on GWP or GTP can crucially influence Russian climate policy (see Table 2 on p. 14).

Conclusion

Russia is part of the global trend toward low-carbon development, but progress is slower than possible due to the influential objections from high-carbon businesses (coal, metallurgy, etc.) as well as the continuation of fossil fuel development as a whole[21]. Moreover, there are specific problems in measuring the contributions of forests and methane, which have to be addressed in decision-making on the CO_2/GHG goal by 2030; and in the long-term low-carbon strategy required according to the Paris accord. The main recommendation is to speed up movement in the right direction toward carbon regulation and forestry measures. It is clear that such a policy requires a balance of interests among the different businesses and government. Finding the right mix is not an easy task, but it is one that has to be solved.

About the Author

Alexey Kokorin serves as the head of the "Climate and Energy" Program of the World Wide Fund for Nature (WWF Russia) since 2000 and cooperates with the project "Russian Ecological Initiatives" of the Russian Academy of National Economy and Public Administration. He has more than 20 years experience in activities relevant to the UNFCCC.

Further Reading

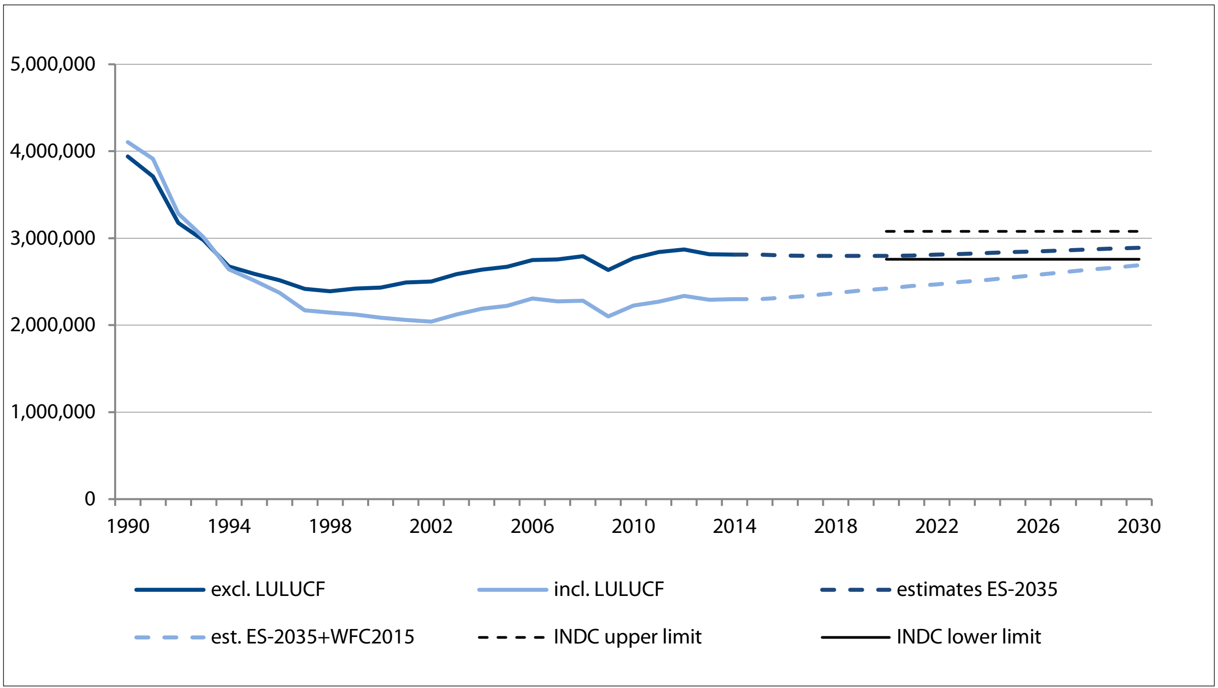
Korppoo A., Kokorin A., Russia's 2020 Greenhouse Gas Emissions Target: Emission Trends and Implementation. *Climate Policy*, 2015, 20 pp. DOI: 10.1080/14693062.2015.1075373 <http://www.tandfonline.com/doi/pdf/10.1080/14693062.2015.1075373#.Vd2ZzrkVg5s>

19 More on disputes on methane emissions and opinions see: <http://kommersant.ru/doc/2984626>

20 IPCC AR5. Climate change 2013: The physical science basis. Contribution of working group I to the Fifth assessment report of the Intergovernmental panel on climate change. T. F. Stocker et al. (eds.) Cambridge and New York: Cambridge University Press, 2013. pp. 710–714. <www.ipcc.ch>

21 Problems of the Russian fossil-fuel-based economy as a whole are not considered in the given article; see the recent publication Korppoo A., Kokorin A., Russia's 2020 Greenhouse Gas Emissions Target: Emission Trends and Implementation. *Climate Policy*, 2015, 20 pp. DOI: 10.1080/14693062.2015.1075373 <http://www.tandfonline.com/doi/pdf/10.1080/14693062.2015.1075373#.Vd2ZzrkVg5s>

Figure 1: Russian GHG emissions and projections in comparison with INDC



Sources: 1990–2014: Russian NIR (CRF) submitted 15.04.2016 <www.unfccc.int>*; ES-2035: most recent draft of the RF Energy Strategy by 2035. Ministry of Energy (first dep. Minister A.L. Teksler) Presentation of the draft of the RF Energy Strategy by 2035. Analytical Center of the Government. 18.09.2015. WFC2015: report of the RF on the XIV World Forestry Congress. D. Zamolodchikov, A. Kokorin, E. Lepeshkin. Dynamics and projection of carbon deposition function of Russian forests in relation to Climate Change problem. 8 pp. Proceedings of the XIV World Forestry Congress, Durban, South Africa, 7–11 September 2015* <http://foris.fao.org/wfc2015/api/file/552d70ba9e00c2f116f8e5fa/contents/618f549a-1e69-4a1e-952a-988103f27f2a.pdf> *INDC: calculated on the basis of Russian NIR (CRF, 15.04.2016) and INDC submission* <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>

Note on the Data

The data on p. 6 are from the 6th Russian National Communication (2013). The data on p. 13 are from the most recent official data submitted by Russia in 2016 (CRF) to the UNFCCC. Therefore, the data on p. 13 covers the years up to 2014, while the data on p. 6 only goes up to 2012. In 2015–2016 Russia recalculated the whole sequence of GHG data from 1990 up to the recent years (mainly due the new global warming potential—GWP—for methane, as discussed in the Kokorin article). Therefore, there are differences between the data up to 2012 on p. 6 and p. 13. The p. 13 data is more correct, but it is not a crucial difference and the conclusions drawn from the p. 6 data in the article are correct. The projections on p. 6 are the suggestions of the authors. The projections on p. 13 are the expectations of the Russian ministries expressed in draft (current) version of the Energy Strategy to 2035 (excluding the LULUCF). The LULUCF projections are those of the Russian scientists who prepare the National Inventories (all references are provided in legend).

Table 1: Russian Methane Emissions in 1990, 2008 and 2014 Made by "Old" and "New" Recommendations of the UNFCCC on Emission Coefficients

Mt CH4/yr.	Data from NIR submitted in 2010 (UNFCCC rules before 2015)		Data from NIR submitted in 2016 (UNFCCC rules from 2015)		
	1990	2008	1990	2008	2014
Oli and gas sector	*16.0*	*15.4*	*32.0*	*31.4*	*31.8*
Coal sector	3.6	2.5	3.5	2.4	2.4
Fuel combustion	0.5	0.15	0.55	0.15	0.15
Agriculture (mainly dairy cattle)	5.2	2.1	5.5	2.2	2.2
Managed forests and other lands	1.0	0.9	0.85	1.0	0.9
Waste	2.5	3.3	3.0	3.65	4.35
Total	*28.8*	*24.4*	*45.4*	*40.8*	*41.8*

Source: Common Reporting Format (CRF) tables of the Russian National Inventory Reports submitted to the UNFCCC in 2010 and 2016, <www.unfccc.int>

Table 2: Influence of the UNFCC Decisions on Russian Methane Emissions

The UNFCCC purpose (potential decisions made by 2030)	CH_4 in CO_2-eq.[a]	Impact on Russian climate policy
Minimize climate impacts for the *21st century as a whole (on average)*	GWP_{100}= 34	Methane is about ½ of national GHG emissions. Emissions in the gas sector should be clarified in all details; effective measures to reduce all CH_4 emissions should be included in the Paris plan of implementation
Minimize climate impacts *on average for the next 20 years* (as the period for current financial support of adaptation and mitigation measures)	GWP_{20}= 86	Methane is about ¾ of national GHG emissions. Urgent investigation of methane sources and emission reduction options should be undertaken (as top priority of the Paris plan of implementation)
Precisely follow the goal of the Paris agreement (i.e. minimize global warming *at the end of XXI century* as well below 2 C deg.)	GTP_{100}= 11	Share of methane is about ¼. Gradual measures to reduce emissions in the gas sector should be included in the Paris plan of implementation

[a] *Source: IPCC AR5 with accounting of indirect effects as more science-based option*

ABOUT THE RUSSIAN ANALYTICAL DIGEST

Editors: Stephen Aris, Matthias Neumann, Robert Orttung, Jeronim Perović, Heiko Pleines, Hans-Henning Schröder, Aglaya Snetkov

The Russian Analytical Digest is a bi-weekly internet publication jointly produced by the Research Centre for East European Studies [Forschungsstelle Osteuropa] at the University of Bremen (<www.forschungsstelle.uni-bremen.de>), the Center for Security Studies (CSS) at the Swiss Federal Institute of Technology Zurich (ETH Zurich), the Resource Security Institute, the Institute of History at the University of Zurich (<http://www.hist.uzh.ch/>), the Institute for European, Russian and Eurasian Studies at The George Washington University, and the German Association for East European Studies (DGO). The Digest draws on contributions to the German-language Russland-Analysen (<www.laender-analysen.de/russland>), the CSS analytical network on Russia and Eurasia (<www.css.ethz.ch/en/publications/rad.html>), and the Russian Regional Report. The Russian Analytical Digest covers political, economic, and social developments in Russia and its regions, and looks at Russia's role in international relations.

To subscribe or unsubscribe to the Russian Analytical Digest, please visit our web page at <http://www.css.ethz.ch/en/publications/rad.html>

Research Centre for East European Studies at the University of Bremen
Founded in 1982, the Research Centre for East European Studies (Forschungsstelle Osteuropa) at the University of Bremen is dedicated to the interdisciplinary analysis of socialist and post-socialist developments in the countries of Central and Eastern Europe. The major focus is on the role of dissent, opposition and civil society in their historic, political, sociological and cultural dimensions.
With a unique archive on dissident culture under socialism and with an extensive collection of publications on Central and Eastern Europe, the Research Centre regularly hosts visiting scholars from all over the world.
One of the core missions of the institute is the dissemination of academic knowledge to the interested public. This includes regular e-mail newsletters covering current developments in Central and Eastern Europe.

The Center for Security Studies (CSS) at ETH Zurich
The Center for Security Studies (CSS) at ETH Zurich is a Swiss academic center of competence that specializes in research, teaching, and information services in the fields of international and Swiss security studies. The CSS also acts as a consultant to various political bodies and the general public. The CSS is engaged in research projects with a number of Swiss and international partners. The Center's research focus is on new risks, European and transatlantic security, strategy and doctrine, area studies, state failure and state building, and Swiss foreign and security policy.
In its teaching capacity, the CSS contributes to the ETH Zurich-based Bachelor of Arts (BA) in public policy degree course for prospective professional military officers in the Swiss army and the ETH and University of Zurich-based MA program in Comparative and International Studies (MACIS); offers and develops specialized courses and study programs to all ETH Zurich and University of Zurich students; and has the lead in the Executive Masters degree program in Security Policy and Crisis Management (MAS ETH SPCM), which is offered by ETH Zurich. The program is tailored to the needs of experienced senior executives and managers from the private and public sectors, the policy community, and the armed forces.
The CSS runs the International Relations and Security Network (ISN), and in cooperation with partner institutes manages the Crisis and Risk Network (CRN), the Parallel History Project on Cooperative Security (PHP), the Swiss Foreign and Security Policy Network (SSN), and the Russian and Eurasian Security (RES) Network.

The Institute for European, Russian and Eurasian Studies, The Elliott School of International Affairs, The George Washington University
The Institute for European, Russian and Eurasian Studies is home to a Master's program in European and Eurasian Studies, faculty members from political science, history, economics, sociology, anthropology, language and literature, and other fields, visiting scholars from around the world, research associates, graduate student fellows, and a rich assortment of brown bag lunches, seminars, public lectures, and conferences.

The Institute of History at the University of Zurich
The University of Zurich, founded in 1833, is one of the leading research universities in Europe and offers the widest range of study courses in Switzerland. With some 24,000 students and 1,900 graduates every year, Zurich is also Switzerland's largest university. Within the Faculty of Arts, the Institute of History consists of currently 17 professors and employs around a 100 researchers, teaching assistants and administrative staff. Research and teaching relate to the period from late antiquity to contemporary history. The Institute offers its 2,600 students a Bachelor's and Master's Degree in general history and various specialized subjects, including a comprehensive Master's Program in Eastern European History. Since 2009, the Institute also offers a structured PhD-program. For further information, visit at <http://www.hist.uzh.ch/>

Resource Security Institute
The Resource Security Institute (RSI) is a non-profit organization devoted to improving understanding about global energy security, particularly as it relates to Eurasia. We do this through collaborating on the publication of electronic newsletters, articles, books and public presentations.

Editors: Stephen Aris, Matthias Neumann, Robert Orttung, Jeronim Perović, Heiko Pleines, Hans-Henning Schröder, Aglaya Snetkov
Layout: Cengiz Kibaroglu, Matthias Neumann, Michael Clemens
ISSN 1863-0421 © 2016 by Forschungsstelle Osteuropa, Bremen and Center for Security Studies, Zürich
Research Centre for East European Studies • Publications Department • Klagenfurter Str. 3 • 28359 Bremen •Germany
Phone: +49 421-218-69600 • Telefax: +49 421-218-69607 • e-mail: fsopr@uni-bremen.de • Internet: <www.css.ethz.ch/en/publications/rad.html>