This is the post-print version of an article that was published online on 25.08.2015, and in print as:
Korppoo, Anna and Alexey Kokorin,
Russia's 2020 GHG emissions target: Emission trends and implementation
Climate Policy, Vol 17, No 2, 2017, pp. 113-130. DOI: 10.1080/14693062.2015.1075373

Russia's 2020 Greenhouse Gas Emissions Target: Emission Trends and Implementation

Anna Korppoo, Fridtjof Nansen Institute & Alexey Kokorin, WWF Russia

1 Introduction

Russia has emerged as a major player in international climate politics due to its decisive role in the entry into force of the Kyoto Protocol, its position as a major global fossil-fuel supplier and its significant share of global emissions (fourth-largest, with a share of some 5%).[1] A few studies have examined the process surrounding Russia's climate politics (Wilson-Rowe, 2009; Henry and Sundstrom, 2007; Tynkkynen, 2010; Korppoo et al., 2015; Andonova and Alexieva, 2012). Further, some non-peer-reviewed materials on Russia's climate negotiation strategies have been published (Korppoo and Vatansever, 2012; Kokorin and Korppoo, 2013). This article makes a specific, policy-relevant contribution by evaluating the feasibility of Russia's domestically adopted 2020 climate target.

Russia's performance in reducing greenhouse gas (GHG) emissions, or limiting their growth, was questionable until the end of the first Kyoto commitment period in 2012. Russia saw the post-Soviet emissions decline in the first half of the 1990s as its global contribution, and there was little political support for measures for further reducing domestic GHG emissions. Russia's Kyoto target, which would have allowed emissions to recover to the 1990 level, did not provide incentives, either. However, after Russia rejected the second Kyoto commitment period on grounds of its inadequate global coverage, discussions on adopting a domestic target intensified. A target of limiting emissions to 75% of the 1990 level by 2020 was adopted in September 2013 (Decree #752). In April 2015, Russia submitted its intended nationally determined contribution (INDC) – limitation of GHG emissions to 70–75% of the 1990 level by 2030 (including forest sinks[2]) – under the UN climate negotiation process (Intended Nationally… 2015). As Russia's emissions remained 68% below 1990 level in 2012, this growth target may seem easy to achieve. Russia also has a portfolio of ongoing policy-measures that can limit emission growth; however, several barriers remain.

This article evaluates the feasibility of achieving this domestic 2020 target. It first explores the structure of Russia's GHG emissions, and then reviews the latest updates on emissions scenarios

[1] Data from UN Millennium Goal Indicators website; http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid=. Accessed 26 May 2014.
[2] Although the INDC opens the possibility of counting in forest sinks, in this article they are excluded, in line with the position of the Ministry of Economic Development (MED) (Pluzhnikov, 2014) and the background study by Moscow High School of Economy to the President's Administration on the INDC, which formulated recommendations later accepted as the INDC without forest sinks (Russian Government, 2014).

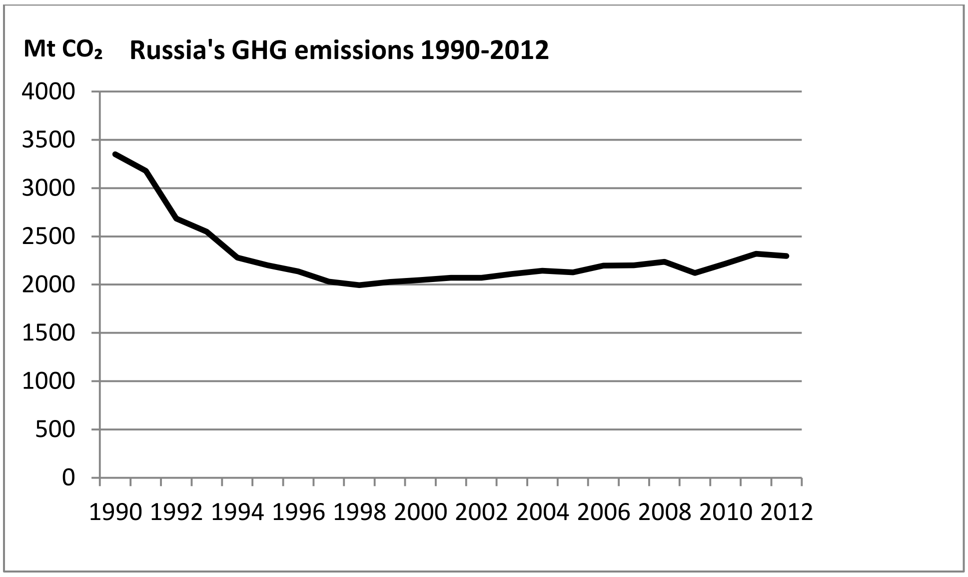
developed for Russia. It concludes by outlining existing domestic mitigation policies and measures,[3] discussing their contribution to achieving the target by 2020 in light of the barriers they face.

Main materials used include the UNFCCC data and Russian official and expert sources of the latest modelling results on Russia's GHG trends. Lack of data and the unpredictability of the political-administrative setting preclude quantitative analysis of Russia's mitigation policies on emissions. Instead, this article maps and analyses barriers to policy implementation qualitatively, adding quantitative data when available. The analysis goes beyond individual barriers that emerge from the material in order to better explain the uncertainties with the existing policies delivering emission reductions by discussing 'meta-barriers': systemic dynamics behind observable problems in policy-making and implementation.

The barriers analysis builds on newspaper articles, expert reports, official documents and 26 semi-structured interviews conducted at the UN climate negotiations in 2011 and during a field visit to Moscow in March/April 2012. Interviewees – from the involved ministries and agencies, the Duma, business, academia and NGOs – were selected on the basis of their experience with the Russian policy-making system, generally and in policy cases relevant to climate mitigation.

2. Recent emission trends: 2008-2012

Figure 1 shows Russia's emissions path since 1990; emissions remained 31.5% below 1990 level in 2012. [4] The global economic downturn which started in 2009 is evident as a clear dip in the emissions trend. Total annual emissions growth in 2000–2008 was 1.1% per annum; the first commitment period of the Kyoto Protocol, 2008–2012, basically followed this trend with an average annual emissions growth of 0.95%.
Figure 1. Russia's GHG emissions excluding forest sinks, 1990-2012

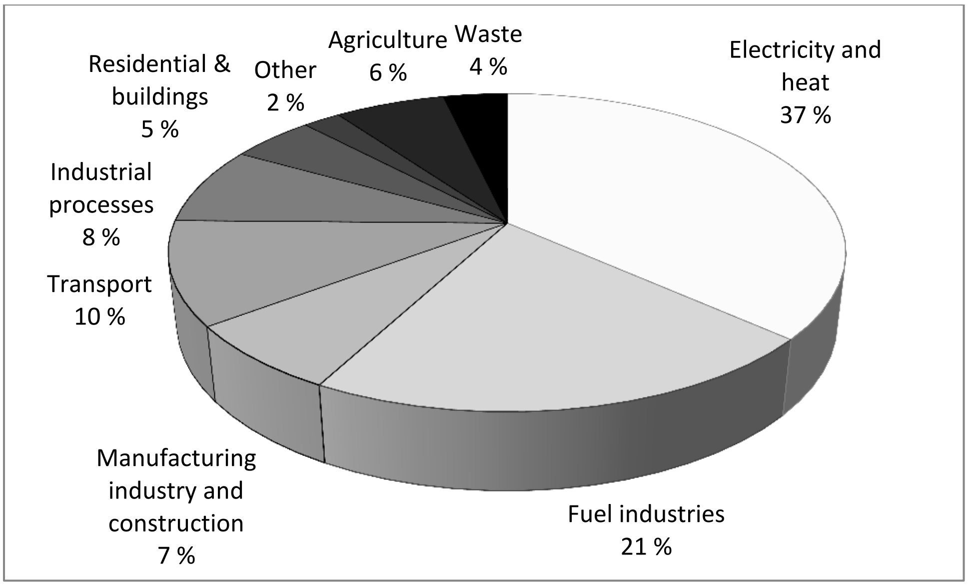


Source: www.unfccc.int → GHG data → GHG data UNFCCC → detailed data by party

[3] Only policies which can deliver concrete GHG emissions reductions are analysed. Other legislation that does not fulfil this criterion, for instance the Climate Doctrine, is beyond the scope of this study.
[4] All data below are excluding managed forests.

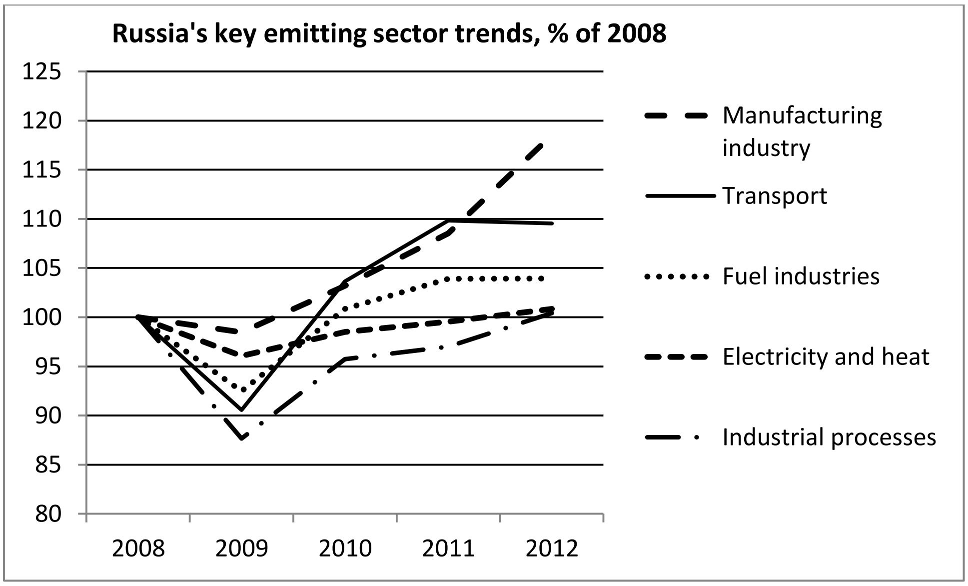
Russia's GHG emissions[5] originate chiefly from electricity and heat generation, fuel industries, transport, industrial processes and manufacturing industry, as shown in Figure 2. Figure 3 illustrates the recent (relative) emission trends in these key sectors. During 2008–2012, the manufacturing industry sector was responsible for 30.5%, transport sector of 25.5% and fuel industries 22.5% of the growth in total emissions.[6] Apart from the 2009 dip, other major emission sources have remained fairly stable, including the largest one – CO_2 emissions from electricity and heat generation, which tends to be closely correlated with GDP growth (IEA 2014, 189).

Figure 2. Russia's emissions per economic sector, 2012



Source: www.unfccc.int → GHG data → GHG data UNFCCC → detailed data by party

Figure 3. Trends, Russia's key emitting sectors 2008-2012



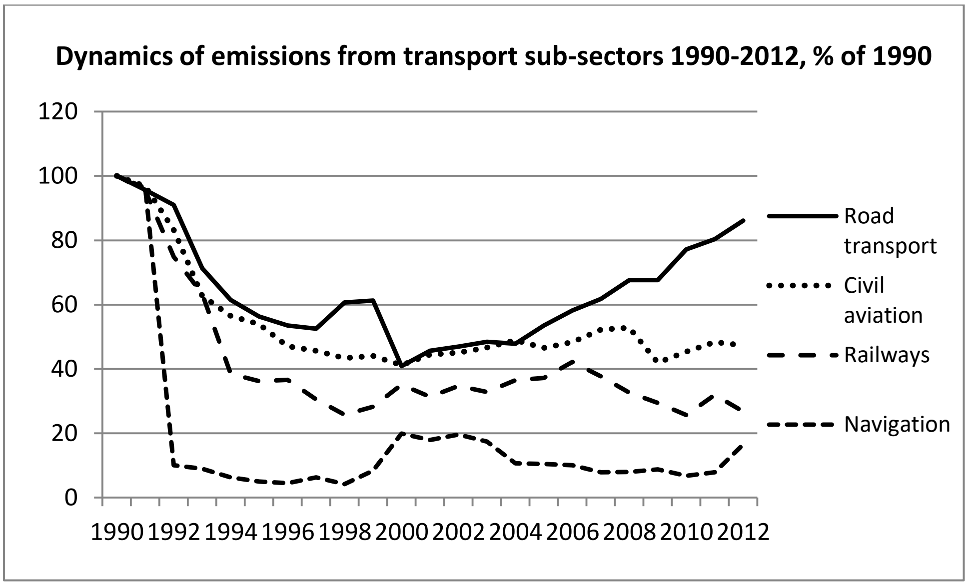
Source: www.unfccc.int → GHG data → GHG data UNFCCC → detailed data by party

[5] Authors use the UNFCCC methodology: i.e. trends and breakdowns provided are for direct emissions.
[6] UNFCCC emissions data: www.unfccc.int → GHG data → GHG data UNFCCC →detailed data by Party → Tables 1.A.3 and 1.B.2 in comparison to total emission growth.

Growth in the manufacturing industry sector is spread rather evenly among sub-sectors, making it difficult to identify particular growth sectors. Steel and iron industries account for most of the emission reductions from this sector. The increase in emissions from the fuel industries sector relates chiefly to increasing oil refinery output, up by 12.8% in 2008-2012 (IEA, 2014, p.149) and increasing associated petroleum gas flaring by the oil industries by some 46% during the same period.

Transport sector growth is mostly caused by the growing significance of private cars (Figure 4) their increasing size and their growing annual mileage (Yulkin, 2014). With often-inadequate public transport services cars become the most convenient option, even though petrol prices are high for many lower-income consumers.

Figure 4. Emissions from transport sector 1990-2012



Source: Data from *National Inventory Report of the Russian Federation to the UNFCCC*, www.unfccc.int

3 Projections of future emissions trends

3.1 Official forecast

Economic growth is a major factor driving the trend of GHG emissions, in addition to the efficiency of production and consumption infrastructure as well as the carbon intensity of the fuel mix. The 2013 government *Prognosis of Socio-economic Development until 2030* presented three economic scenarios: 'conservative', 'innovative' and 'exaggerated', with annual GDP growth of, respectively, 3.2%, 4.1% and a whopping 5.4% for 2013–2030 (Ministry of Economic Development, 2013). Politically, the 'innovative' scenario was deemed the most likely. However, in November 2013 the new Minister of Economic Development, Alexey Ulyukaev, downgraded this expectation to the 'conservative' scenario, with an even less ambitious projection of GDP growth of 2.5% ('MER uhudzila prognoz,' 2013). Similarly, in January 2014, the Annual Gaidar Economic Forum[7]

[7] The Gaidar Forum is an annual international scientific conference in the field of economics. Established in 2010, it has become Russia's central political and economic event focused on sustainable development.

followed a far more conservative approach to economic development for the coming decades. This post-crisis development – from recovery to very modest GDP growth (with oil/gas prices stable and rather high, between USD 80 to 110 for 2012–mid-2014[8]) – came as a surprise to Russian and foreign economists alike. For instance, the IEA's World Energy Outlook (WEO) 2013 still operated with more optimistic expectations for Russia (International Energy Agency [IEA], 2013).

The 2013 *Prognosis* forecasts that GHG emissions will reach 75% of the 1990 level by 2020, thereafter declining to 70% by 2030, as a result of energy-efficiency measures, increased labour productivity and renewable energy policies. In January 2013, the Ministry of Energy presented draft corrections to the State Programme on Energy Efficiency and Energy Development (Kulapin, 2014a). Unlike the original prognosis, this new version no longer includes direct estimates of CO_2 emissions, but draws up a trajectory of 40% reduction in energy intensity of the GDP for 2007–2020. Of this, 13.5% is to be achieved by technological measures[9] and 26.5% by economic structural transformations. Additional details released by the Ministry show expectations of CO_2 emissions reaching 120% of the 2010 level (79.3% of 1990) by 2035. Interpolation for 2020 indicates a level of about 75% of 1990 (Kulapin, 2014b).

3.2 Expert forecasts

Work by the Energy Research Institute of the Russian Academy of Sciences (ERI RAS), which normally develops the official energy scenarios for ministries, shows 'peak, stabilization and decline' of CO_2 emissions from fuel combustion. ERI RAS estimates emissions to reach 81–83% of 1990 level by 2020[10] with assumed GDP growth of some 3.5–4.2% and decline in energy intensity of the GDP of some 3% per annum, 2010–2020 (Makarov, 2014). The main increase in demand for energy is in the power, transport and raw materials sectors. Gas is assumed to cover most of the increase in energy demand, while the growth of renewable energy sources is forecast to accelerate considerably after 2030. However, the ERI RAS analysis does not consider all potential low-carbon measures, or assume a price for carbon.

The Institute of Economic Forecasting (ECFOR) of the Russian Academy of Sciences presents two scenarios for CO_2 emissions from fuel combustion. GDP is assumed to grow on average 3% and 5% per annum until 2030, with energy intensity of GDP declining by some 2.5% and 3.1% per annum, respectively. No particular GHG emissions reduction measures are included. The first scenario foresees stabilization of emissions, then declining to 68% of 1990 level by 2020; the second scenario forecasts 75% of 1990 level by 2020 (Sinyak, 2014).

The Moscow Center for Energy Efficiency (CENEf), a leading advisor to the Ministries of Economy and Energy, has conducted a project summarizing results of six Russian research institutes (including those described above), as well as scenarios by three foreign organizations including the IEA (Bashmakov, 2014a; Bashmakov, 2014c, 17). The alternative future GHG control policies summarized are subdivided into *current measures*, *new measures* and *vigorous measures*. Scenarios in the *current measures* assume continuation of ongoing activities: broad measures for energy efficiency and modest renewable energy measures, utilization of coal-bed methane, and cutting associated gas flaring below 5% as planned. Such a policy is expected to lead to 70% of 1990 level emissions by 2020 under a conservative scenario of 2% GDP growth, and to 75% in the innovative scenario of more rapid ~3% GDP growth.[11] The *new measures* group assumes

[8] See for instance http://www.tradingeconomics.com/commodity/crude-oil. Accessed 24 March 2015.
[9] The document also mentions cost of 400 roubles (equivalent to €10 in January 2013) for reduction by per tonne of CO_2 as a benchmark for potential additional measures, without clarifications or details.
[10] Percentage figures constructed by the authors of this article, based on the graphs provided in the ERI RAS publication.
[11] The uprated, or 'enforcement', scenario of 4–6% GDP growth was considered very unlikely, so those results are not discussed.

implementation of measures declared desirable by the government – enhanced energy efficiency, sufficient growth of labour productivity in all sectors, measures for fuel economy in road transport, etc. This scenario sees emissions reaching 70–74% of the 1990 level by 2020 and thereafter stabilizing. The *vigorous measures* group entails the introduction of progressive policies: broad support to renewable energy, biofuels, and nuclear energy; introduction of a carbon price, and use of Carbon Capture and Storage technology if the carbon price exceeds 58 USD/t CO_2. These measures could reduce CO_2 emissions to 60–65% of the 1990 level by 2020.

The scenarios from the Institute of Economic Policy (IEP) were produced in cooperation with the Russian Presidential Academy of the National Economy and Public Administration (RANEPA) (Lugovoy et al., 2014). They apply the TIMES model adjusted to Russia's economic sectors and accommodate updated assumptions regarding their future development. Unlike other scenarios, the IEP scenarios cover not only CO_2 (74% of total GHG emissions), but also CH_4 emissions from energy and industry (17% of GHG emissions)[12] – some 90% of total national emissions. The IEP's *BAU scenario* involves continuation of ongoing activities, plus a significant range of other measures declared desirable by the government. This scenario falls between the CENEf *Current Policy scenario* and *New Policies scenario;* however, the IEP approach focuses on the measures deemed economically most advantageous, without taking into account implementation barriers, whereas CENEf emphasizes feasibility of implementation.

The IEP *TAX* scenario introduces a carbon tax from 2015, with gradual growth in the price from USD 15 to 50 /t CO_2 by 2050. Both scenarios show emissions stabilizing by 2020: minor growth until 2015 and stabilization at the level of 72–75%. In the *BAU* scenario, emissions remain stable until 2050; the TAX scenario shows a decrease in GHG emissions to 60–65% of the 1990 level.

Table 1. Projections of Russian GHG emissions by 2020

[Insert Table 1 here]

Source: see references to each institute/scenario in the text.

Table 1 summarizes the scenarios by dividing them into two categories in terms of GDP assumptions: those that take into account the latest assumptions of slower GDP growth, and those based on previous higher GDP estimates. Finally, the Table separates scenarios which assume measures focused especially on reductions in carbon emissions, including the introduction of a carbon price. The main finding is that the assumption of slower GDP growth leads to slower growth in GHG emissions, making the 75% target easier to achieve. However, focused carbon emission reduction measures, like a price for carbon, can also facilitate target achievement by internalizing some of the externalized environmental costs.

Next, current policies and measures that can limit emissions growth are evaluated, to establish how likely Russia is to achieve its domestic goal in 2020. In terms of measures introduced, this roughly follows the basic idea of the *current policy* scenarios (CENEf and IEA in Table 1).

4 Policies and measures to cut GHG emissions

Russian climate mitigation measures have been driven by other interests than GHG emissions reductions (Kokorin and Korppoo, 2013; Korppoo and Vatansever, 2012). Nevertheless various federal-level policies hold a potential for reducing Russia's carbon intensity.

[12] Remaining emissions, some 9%, consist of CH_4 in agriculture and waste ~4%, N_2O and other GHGs ~5%. National Inventory Reports 2013 → the Russian Federation → CRF. https://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php.

4.1 Joint Implementation (JI)

JI projects under the Kyoto Protocol were promoted by many Russian stakeholders with high expectations of receiving investments for infrastructure modernization. However, establishing a domestic approval process was not politically prioritized, and was delayed.

The first JI approval procedures were approved in 2007 (Decree #332), led by the Ministry of Economic Development (MED), but were later cancelled as non-functional. The second set of approval procedures in 2009 involved the state-owned Sberbank as the operator of carbon units. Tenders were launched under the supervision of MED and the first projects approved (Decree #843). The third set of rules replaced tenders with ongoing project submissions, and required JI revenues to be re-invested in further emissions reduction projects (Decree #780). The approval system gradually improved as the requirements for projects were clarified and bureaucracy reduced.

4.2 Energy efficiency (EE)

Russia's economy is energy-intensive. Total primary energy consumption (TPES) per unit of GDP (2005 USD) was 0.77 toe per USD thousand, whereas in the OECD it was 0.14 and in the world 0.25.[13] In November 2009, the government adopted Federal Law #261-FZ aimed at creating a legal, organizational and economic foundation to stimulate energy saving and EE. One of its goals is to put into practice the 2008 Order #N889, cutting the energy intensity of the Russian economy by 40% between 2007 and 2020. The measures introduced can be divided into three types – awareness, regulation and economic measures.[14]

Awareness-raising focuses on information. *Energy labelling* of appliances, whether manufactured in Russia or imported, was to be introduced gradually.[15] *Metering* of water, natural gas, heat and electricity is required in buildings controlled by organizations and companies from January 2011, and in residential buildings from January 2012.[16] Further, the law requires resource suppliers to install meters for their customers. *Energy audits* are to be conducted every five years in governmental bodies on all levels, public institutions, energy-sector actors and major energy-using organizations.[17] The *state information system on EE* is to collect information on the energy-saving measures.

Regulation establishes requirements concerning energy consumption. The *ban on incandescent light bulbs* of 100W and higher took effect from January 2011; smaller sizes were to be banned by 2014; however, the State Duma has continued to discuss whether this plan should be cancelled. *Requirements for EE in buildings* have been defined on the basis of the type of building and its use, and apply to both construction and retrofitting. Goals include cutting the energy consumption of buildings by 30% between 2011 and 2020. In addition, *public-sector energy-saving targets and rules* require a 3% annual saving of energy from the 2009 level for five years in public buildings.

Economic measures establish opportunities to gain from saving energy. *Energy service contracts* allow selling services and advice to energy users on how to save energy, against the value of the energy saved. The introduction of *long-term tariff setting* for power and heat producers and network

[13] Beyond 2020 Database → Energy Balances of non-OECD countries / Energy Balances of OECD countries. Retrieved from http://wds.iea.org/WDS/Common/Login/login.aspx. Subscription required for access.

[14] The following three paragraphs summarize, and thus are based on, Order #N889.

[15] Household appliances to be labelled from 2011, computers and office appliances from 2012 and other appliances from 2013.

[16] Electricity is already mostly metered, but gas and heat distribution networks as well as production often lack metering. There are challenges involved in installing heat meters in the residential sector due to limitations in the existing infrastructure. Heat metering is required on the level of the building only, not of individual flats.

[17] Those that spend over 10 Mln RUB (some €230,000 as of August 2013) on energy per annum

operators instead of annual tariffs aims at encouraging capital investments in infrastructure by increasing certainty of payback periods of investments. *Fiscal incentives for EE investments* include investment tax credits, accelerated depreciation tools and deduction of R&D costs based on a coefficient of 1.5 for three years.

4.3 Associated petroleum gas (APG)

Associated petroleum gas (APG), a side-product of oil extraction, has traditionally been burned in flares as waste. However, there are many possible uses for this by-product.[18] In 2009, Decree #7 introduced a 5% limit to flaring of APG from 2012, and 4.5 times the *standard environmental fine* for methane emissions[19] for exceeding this limit, while non-metered flaring faced a six-fold fine. Legal revisions in 2010 aimed to encourage oil companies to comply with the target by improving access to transport infrastructure, which had been limited by Gazprom's monopoly on the gas pipeline system, and licenses (Korppoo, Sitnikov and Gutbrod, forthcoming). In 2012, Decree #7 was replaced by Government Decree #1148. It established even higher fines for exceeding the limit[20] as well as significant exemptions to previously established rules. Oilfields with low emissions as well as flaring during maintenance are exempted from the limit, as are new oilfields for the first three years of their development. Oil producers are also allowed to pool their emissions between their operational units when calculating compliance with the target, and to deduct expenses from fines to cover the costs of investments in projects that promote value-added use of APG.

4.4 Renewable energy (RE)

In 2007, the Federal Law on electricity (Federal Law #FZ-35) was amended to provide a legal basis for support to RE through adding a premium to the wholesale electricity price (IFC, 2013). In the 2009 Governmental Order #1-R on Renewable Energy, Russia aimed for 11 GW of new renewable generation capacity and generating 4.5% of its energy needs from new renewable sources of energy by the year 2020. Decree #449 (May 2013) developed a legal basis for RE (solar, wind and small-scale hydroelectricity) in Russia's capacity market in order to guarantee a 12–14% return on investment over the following 15 years. It also established limits to capital costs of investment projects and local content requirements which increase over time as well as a qualification of RE installations (IFC, 2013). Decree #47 (January 2015) established the obligation of network companies to purchase power generated by RE, now including biomass, biogas and landfill gas.

5 Implementation of policies

5.1 Joint Implementation

The difficulties involved in launching the *Joint Implementation* mechanism led to much fewer emission reductions than expected. 108 projects were approved, monetizing 310 $MtCO_2$ (by the end of 2013).[21]

The first set of JI regulations proved dysfunctional, largely due to bureaucratic power struggles. The hierarchical structure of the decision-making system led to counter-productive bureaucratic control. Initially, the final approval of projects by the government proved to be a bottleneck, and the rules undermined the importance of ownership rights to project owners and investors (Korppoo and Moe,

[18] It can be utilized locally as a fuel and raw material for the chemical industry; re-injected to increase pressure in the oil field; or collected and transported by pipeline to other users.
[19] Standard environmental fines are established for emissions within standards, and above standards by Government Decree #N344. For methane these are 50 and 250 roubles per tonne. Regional coefficients (between 1 and 2) apply in addition, depending of the specific environmental conditions.
[20] 12-fold higher for 2013 and 25-fold from 2014; non-metered flaring incurs 120 times the standard environmental fine.
[21] Sberbank JI project website, updated 22 January 2013. Retrieved from http://www.sberbank.ru/moscow/ru/legal/credits/cfinans/sozip/.

2007). The introduction of an ex-post minimum price for emissions reduction units contradicted existing contracts with foreign buyers (‘Russia to set,’ 2010).

Approval of applications by various agencies in the first set of procedures (Decree #332), an expert council review of projects under the second set of procedures (Decree #843), and the sudden involvement of the Ministry of Natural Resources in approving the investment declarations under the third set of procedures (Decree #780) demonstrated the eagerness of agencies to get involved in administering expected money flows. This caused a power struggle among agencies, delaying the process (interviews with administrative and private sector actors).

Sberbank, which eventually gained control over the process, was claimed to charge a fee for its services beyond that set by the JI regulations (‘Exclusive: Sberbank’s,’ 2011). Also, its *de facto* dominance in project selection led to speculations as to a conflict of interest, as some projects have clearly helped Sberbank customers to repay their debts (Shishlov, 2011; ‘Exclusive: Sberbank’s,’ 2011).

Material and reputational reasons reduced political support to JI. The offshore companies of some (Russian) entrepreneurs wanted to move the profits from lucrative projects out of Russia (interview with government representative). International experts questioned the additionality of the originally dominant project type – gas-distribution pipeline repairs – and there were also rumours of fraud in baseline setting in the absence of firm historical data on gas leakages (Korppoo and Moe, 2008).

5.2 Energy Efficiency

Implementation of *EE* legislation has had a slow start. The target of cutting energy intensity by 40% from 2007 to 2020 – one indicator of EE improvements – seems to be slipping away. For 2007–2011, the TPES per GDP ratio shows that the energy intensity of the Russian economy actually increased by some 2.5%.[22]

The government EE programme lacks budgetary funding: over 90% of funding is projected to originate from extra-budgetary sources (Bashmakov, 2014b; Bruk, 2012; Kozhanova, 2011). The potential and willingness of regions to finance energy-saving measures has been questioned (Loginosvkih, 2011).

The law covers only state-funded organizations, which account for just 12% of total energy consumption (Gusev, 2013), and its influence on industry and transport – important sectors in terms of total emissions as well as current emission growth– is limited (Bashmakov, 2014b).

Gusev (2013) notes how the complexity of legislation and the amount of sub-legislation required obstruct implementation. Although over 70 acts have been passed, the legal basis has failed to provide functional guidance for implementing the tools introduced. For instance, government guarantees are dysfunctional because of the excessive conditions for granting them; tax credits have suffered from methodological problems in justifying credits based on EE indicators (Tulikov, 2013); and an energy service market requires better definitions, to enable customers to establish the costs of the services of an ESCO (Gratchev, 2013). In some cases, the legislation has missed the actual implementation of EE improvements altogether. For instance, energy certificates of buildings and energy audits are seen as the final result of the law rather than practical action (Shubin and Spiridonov, 2013). Finally, the lack of specificity leaves room for fraudulent practices: when 100W and 90W incandescent light bulbs were banned, some Russian producers simply replaced these sizes with 99W or 95W models (interview with government representative).

[22] Data source: *IEA Beyond 2020 Energy Balances for non-OECD countries.* IEA/OECD 2013. Retrieved from http://wds.iea.org/WDS/Common/Login/login.aspx (requires subscription for access)

Lack of legal infrastructure and human capital constitute limitations. Following the ban on incandescent light bulbs, the lack of recycling systems for the mercury-containing energy-saving light bulbs caused serious environmental hazards (Dunaev and Morozova, 2013). Also the quality of energy audits has been low, due to the lack of qualified auditors (Shubin and Spiridonov, 2013).

5.3 Associated Petroleum Gas

Various barriers also limit the significance of Russia's *associated petroleum gas* legislation to GHG emissions. According to official data accounting for all flaring, 78.8% of APG was utilized in 2013 – significantly below the 95% target (TSDU TEK, 2014). Rostekhexpertiza has estimated that Decree #1148 allows flaring some 18–19% of APG without fines (including the 5% which is allowed), due to measurement errors, exemptions for flaring during maintenance stops, and the low quality of APG; and a further 30–40% due to the exemptions of small and new oilfields. This would indicate that some 60% of APG can be flared without fines (Aksenov, Skobelina and Tremasova, 2013). Although the political leadership rejected demands to ease or postpone the 95% target, allowing flexibilities in implementation indicates that the actual APG cuts may be less relevant than the policy process itself. Allowing this development instead of easing the target may be linked to image-related benefits towards other governments, or 'window dressing' (Kokorin and Korppoo, 2013). The policy process could be more valuable for the top leadership also in the domestic realm: when asked why Putin did not put more pressure on the oil companies to comply with the 95% goal, one interviewee (government representative) said, 'then [if they complied] he would have to think of some other policy to launch to show that he is doing something'.

The low quality of legislation opens space for potentially extra-legal practices. Lack of measuring APG gives room for manoeuvre as regards paying fines, although meters are becoming more common – approaching 60% of the total (Yezov, 2014; A. Knizhnikov, personal communication, 4 April 2014). Further, in the absence of legal guidance, company-specific negotiations with the regulator Rosprirodnadzor lack transparency and hint at unequal treatment between companies. The monitoring authority negotiates how investments in rational use of APG can be compensated from the payable flaring fines (Vygon, Rubtsov and Ezov, 2012; interviews with APG experts). Further, the possibility of deducting APG utilization investments from the fines payable may tempt companies to stretch such investments over time, extending the fee-reduced period (Yezov, 2014).

The focus of the legislation also misses relevant issues. Legislation is based on a flat-rate reduction of flaring for all stakeholders, even though 5% of the APG flared by the biggest companies is in absolute terms more than many small companies originally flared. Also, the efficiency of the APG utilization method is not touched on; inefficient combustion of APG in an old heat and power generation unit is considered equivalent to dealing with the same amount of APG in a modern gas processing utility (Yezov, 2014).

Soft budget constraints in state companies – the main flarers of APG – delay implementation. The differing approaches of state and private oil companies to compliance show that they expect to be treated unequally. While privately-owned Surgutneftegas and Tatneft reported compliance with the 5% rule already in 2012, and Lukoil was improving its performance (87.8 utilized in 2013), state-owned Rosneft and GazpromNeft first ignored the target and violated it by flaring some 30–50%, and argued for postponing it (Kiryushin, Knizhnikov, Kochi, Puzanova and Uvaro, 2013).

Monopolistic features of key buyers of APG and their ability to ignore the law has complicated implementation. Gazprom is obliged to transport dry gas[23] in its pipelines when it has free capacity, but it makes access difficult through contract negotiations and quality requirements for gas. Further, the APG processer Sibur and Gazprom basically have a monopoly as buyers of APG and dry gas.

[23] APG without fat components, more or less equivalent to methane.

For instance, selling APG to Sibur is not profitable in terms of the price paid (Delovaya Rossiya, 2013); however, by establishing partnerships with Sibur, oil companies have recently gained a share in the profits ('Rosneft and Sibur', 2014; 'Sibur and Lukoil', 2011).

5.4 Renewable Energy (RE)

Less than 1% of electricity was generated by new RE in 2011; however, new capacity has been launched, especially in solar power. Launching the RE purchase obligation was considerably delayed: it was introduced in 2007 but launched only in 2015.

Some regulatory gaps on tariff methodologies still remain. The Market Council's failure to 'qualify' a facility once it has been constructed and commissioned leads to exclusion of the facility (IFC, 2012). Not meeting the local content requirements, which tighten over time to a level described as unrealistic in the absence of domestic producers of RE equipment, results in halving the subsidy. The decreasing value of the rouble, the reference currency of the CAPEX limits, also make RE projects less viable (IFC, 2012; expert interview). Finally, restricting purchases of RE to 5% of the forecast amount of electricity that grid companies lose when transporting electricity to customers undermines the development of the volume of RE-generated electricity (expert interview). Such regulatory gaps are likely to reduce the interest of private investors into RE in Russia, and thus, undermine the implementation of this policy.

6 Discussion

The first overarching meta-barrier is the marginality of the policies that can generate emissions reductions. Issues that are not central to the political agenda can lose support from the top level in case of complications, for instance conflict with more important policies, or reputational hazards to the political elite, such as misuse of the policy (JI, EE) or international (JI) or domestic criticism (EE: light bulbs). Such policies receive less funding and less political attention. They also tend to be used to achieve other goals. For instance, RE was used for 'window dressing' in international arena despite its delayed implementation; and the limits on implementation due to fear of price hikes dwarf the expected results. APG appears important as a process in domestic politics regardless of the exemptions it allows to powerful actors to increase their emissions as shown by the emission data. Finally, economically important sectors or actors can in some cases be exempt from goals of marginalized policies altogether (EE), and large state companies can gain liberties in terms of compliance with their goals (APG).

The second meta-barrier consists of Russia's clear problems with law-making: dysfunctionality and complexity of legislation was detected in all cases. Legislation is often of low quality, and even 'nominal regulations' (i.e. regulations that are ignored in terms of implementation) routinely appear (RE, parts of EE). The lack of human resources to plan and draft legislation was noted by one government level-interviewee, who explained the origins of patchy pieces of legislation by saying that 'something is better than nothing'. Here the understanding was that passed legislation can be revised once a basic agreement on establishing a policy has been achieved, as shown in all cases. Also other support structures to successful policy implementation are sometimes missing (EE).

Bureaucratic tradition constitutes the third meta-barrier. Hierarchy in public administration secures power to the more traditional wing. The low quality of legislation can also be linked to bureaucratic control, as lower-level officials with better analytical skills on specialist fields tend to have less power than higher-level officials who may have more to gain from bureaucratic control. Strong bureaucratic control is often also an undertone in legislation; ensuring that a law can be nullified if implementation goes wrong tends to lead to overregulation, which can block meaningful policy implementation (JI, RE, EE). Bureaucratic tradition is also evident in the unnecessarily broad participation of administrative agencies in law preparation and implementation (JI, RE).

The final meta-barrier is the informality of the legislative and implementation systems. The relative freedom administrative units enjoy to pursue the issues as they see fit facilitates profitable extra-legal practices, also known as using the 'administrative resource' or 'grazing-fields' (Ledeneva, 2013). As a result, consultations amongst government agencies during legislative processes often lead to power struggles. These interests can override attempts to draft (JI) and implement (JI, APG) functional legislation. There is also a link to the dysfunctionality of legislation: complicated regulatory structures involving a number of agencies (typical of the Russian tradition) can facilitate extra-legal practices.

In view of these barriers, Russian domestic policies and measures are unlikely to achieve any significant emissions reductions by 2020. Much of the emissions reductions that current policies and measures have the potential to generate will probably be 'filtered out' by these problems, and never materialize.

Having said this, Russia's 2000–2012 emission trend – on average 0.95% emission increase per annum, at average 5.3% GDP growth[24] – would only lead to an emission level equivalent to 75.33% of 1990 level in 2020 in the absence of additional measures. Thus, Russia would still fulfil its target with equivalent growth if domestic policies and measures could deliver some 10 MtCO2e reduction during 2013–2020. Such reduction may be possible if Russia manages to reduce the barriers identified here. However, current policies fail to address some of the main sectors of emissions growth: transport and manufacturing industries.

The slow-down in GDP growth at the time of writing is likely to limit emissions growth in comparison to earlier expectations. Emissions scenarios based on the most recent GDP data consistently forecast that emissions will reach about 70–75% of 1990 level by 2020. The difference is significant in comparison to previous higher GDP expectations, projected to lead to 78–83% of 1990 levels (Table 1). In reality, growth in GDP slowed down even more dramatically – to 1.3% in 2013 – than forecast by the data underlying the emissions scenarios released in January 2014. Russia's involvement in the Ukrainian crisis has had a further negative impact on GDP, down to 0.6% for 2014 (BOFIT, 2015).

7 Conclusions

From the emissions scenarios, which are based on the downgraded GDP estimate, the 75% target set domestically appears realistic indeed. As the lower GDP expectation adjusts the emissions from economic activity downwards, it does not necessarily differ much from the BAU trajectory if existing emissions-reductions measures are taken into account. There is not much deviation among scenarios. From a foreign policy perspective, adopting a deeper target would be more credible than the current commitment, even if it were not fully achieved.

However, in the longer term Russia will need to implement policies to curb GHG emissions as its economy remains carbon-intensive and GDP together with emissions will start growing. Also the 2030 INDC target would be jeopardized without functional policy measures. Current policies show which sectors most reductions are expected to come from – but these do not include all of main emission growth sectors: transport and manufacturing industries. Policies and measures should be introduced in these sectors for more effective implementation of the domestic target.

Systemic problems with policy implementation – meta-barriers – constitute a major uncertainty to policy outcomes. They will limit the emissions reductions that can be gained through mitigation policies. The growing emissions from oil industry's APG flaring regardless of the climate

[24] IMF, World Economic Outlook Database, April 2014. Russia: gross domestic product, constant prices (percentage change).

mitigation policies launched provide an example. It is impossible to fix mitigation policy processes without a wider administrative reform, so any attempts to improve implementation of mitigation policies in isolation will remain ineffectual until this can be done.

References

Aksenov, A., Skobelina, V. & Tremasova, I. (2013). Dolgo ‘zapriagali’ – poedem li? [‘Harnessing’ took for a long time – shall we go?] [Undated report], Roztechekspertiza. Retrieved from http://www.rostehexpertiza.ru/analytics/dolgo-zapryagali-poedem-li/.

Antonova, L. & Alexieva, A. (2012). Continuity and change in Russia's climate negotiations position and strategy. *Climate Policy* 12(5), 614–629.

Bashmakov, I. (2014a, 16 January). *Scenarios of Russian socio-economic development by low-carbon trajectories.* Presentation at the Gaidar Economic Forum, Moscow.

Bashmakov, I. (2014b). Za schet chego snizaetsia energoemkost VVB Rossii [This is why the energy intensity of the Russian GDP is declining]. *Energosberezenie,* 1/2014.

Bashmakov, I. (ed.) (2014c). Costs and benefits of low-carbon economy and society transformation in Russia: 2050 Perspective. Center for Energy Efficiency, Cenef. BOFIT (2015, 6 February). *BOFIT weekly* 2015/6. Helsinki: Bank of Finland Institute for Economies in Transition.

Bruk, K. (2012, 10 April). Energy efficiency laws in Russia – Starting the journey. Retrieved from http://www.themoscowtimes.com/business/business_for_business/article/energy-efficiency-laws-in-russia--starting-the-journey/456427.html

Decree #7 (2009, 8 January). On measures to stimulate the reduction of air pollution from associated gas flaring products. Moscow: Government of Russia.

Decree #47 (2015, 23 January). Changes made to the acts of the Russian Federation to incentivize the use of renewable energy sources in the retail market of electricity. Moscow: Government of Russia.

Decree #332 (2007, 28 May). On the procedure for approval and verification of the implementation of projects undertaken in accordance with Article 6 of the Kyoto Protocol to the UN Framework Convention on Climate Change. Moscow: Government of Russia.

Decree #344 (2003, 12 July). On normative payments for emissions of air pollutants from stationary and mobile sources, discharges of pollutants into surface and ground water bodies, waste production and consumption. Moscow: Government of Russia.

Decree #332, (2007, 28 May). On the procedure for approval and verification of the implementation of projects undertaken in accordance with Article 6 of the Kyoto Protocol to the UN Framework Convention on Climate Change. Moscow: Government of Russia.

Decree #449 (2013, 28 May). On mechanism to stimulate the use of renewable sources of energy in the wholesale market of electric energy and capacity. Moscow: Government of Russia.

Decree #752 (2013, 30 September). On greenhouse gas emission reduction. Moscow: President of the Russian Federation.

Decree #780 (2011, 15 September). On measures for the implementation of Article 6 of the Kyoto Protocol to the UN Framework Convention on Climate Change. Moscow: Government of Russia.

Decree #843 (2009, 28 October). On measures for the implementation of Article 6 of the Kyoto Protocol to the UN Framework Convention on Climate Change. Moscow: Government of Russia.

Decree #1148 (2012, 8 November). About features of calculus of payment for spikes of the polluting substances which are forming in case of combustion on torch installations and (or) dispersion of associated petroleum gas. Moscow: Government of Russia.

Delovaya Rossiya. (2013). *Poputnyi neftianoi gaz 2013* [Associated petroleum gas 2013] Report from conference held 15 April 2013. Retrieved from http://www.deloros.ru/main.php?doc=25090&mid=19.

Dunaev, A. & Morozova, K. (2013). Chto delat s otrabotannymi rtutsoderzascshimi lampami: problem i reshseniia [What to do with the waste mercury-containing light bulbs: problem and solution]. *Energosberezenie*, 2/2013.

Exclusive: Sberbank's CO2 role questioned after huge issuance. (2011, 9 August). *Reuters.* Retrieved from http://www.reuters.com/article/2011/08/09/us-sberbank-point-carbon-idUSTRE7781ME20110809.

Federal Law #261-FZ (2009, 23 November). On energy efficiency and energy savings and on introducing amendments to certain laws of the Russian Federation. Moscow: State Duma.

Government of Russia (2014). Analysis of different issues relevant to international negotiation process on preparation of new global climate agreement. Report by Higher School of Economics. Moscow.

Gratchev, I. (2013). Normativno-pravovoe obespechnie gosudarstvennoi politiki energosberezeniia [Regulatory support to government energy saving policy]. *Energosberezenie*, 2/2013.

Gusev, A. (2013, 16 June). Energy efficiency policy in Russia: Scope for EU–Russia cooperation. *SWP Comments*. Berlin: Stiftung Wissenschaft und Politik.

Henry, L. & McIntosh-Sundstrom, L. (2007). Russia and the Kyoto Protocol: seeking an alignment of interests and image. *Global Environmental Politics* 7 (4), 1–18.

IFC (2012). Financing Renewable Energy Investments in Russia: Legal Challenges and Opportunities. IFC Advisory Services in Europe and Central Asia. International Finance Corporation.

IFC (2013). Russia's new capacity-based renewable energy support scheme. An analysis of Decree No. 449. IFC Advisory Services in Europe and Central Asia. International Finance Corporation.

IEA (2013). *World Economic Outlook WEO 2013*. Paris: IEA/OECD.

IEA (2014). *Russia 2014. Energy Policies Beyond IEA Countries.* Paris: IEA/OECD.

Intended nationally determined contribution of the Russian Federation. 31 March 2015. Retrieved from: http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx.

Kiryushin, P., Knizhnikov, A., Kochi, K., Puzanova, T. & Uvaro S. (2013). *Associated gas in Russia: 'Don't flare, utilize!': Analytical presentation of economic and environmental costs of associate gas flaring in Russia*. Moscow: WWF.

Kokorin, A. & Korppoo, A. (2013). Russia's post-Kyoto climate policy: Real action or merely window-dressing? *FNI Climate Policy Perspectives* 10 (May). Lysaker: Fridtjof Nansen Institute.

Kokorin A.& Korppoo A. (2014). Russia's greenhouse gas target 2020: Projections, trends and risks. Friedrich Ebert Foundation, Berlin.

Korppoo, A. & Moe, A. (2007, June). Russian JI procedures: More problems than solutions? Climate Strategies Briefing Paper.

Korppoo, A. & Moe, A. (2008, March). Russian gas pipeline projects under Track 2: Case study on the dominant project type. Climate Strategies Briefing Paper.

Korppoo, A. & Vatansever, A. (2012, August). A climate vision for Russia: From rhetoric to action. *Carnegie Policy Outlook*. Moscow: Carnegie Endowment.

Korppoo, A. Sitnikov, S. & Gutbrod M. (forthcoming). Russian law on climate change. In C. Carlarne, K. R. Gray, and R. Tarasofsky (eds), *Oxford handbook of international climate change law*. Oxford: Oxford University Press.

Korppoo, A., Tynkkynen, N. & Hønneland, G. (2015). *Russia and the Politics of International Environmental Regimes. Environmental encounters or Foreign Policy?* Cheltenham: Edward Elgar.

Kozhanova, L. (2011, 13 September). *Implementation of the governmental programme 'Energy savings and energy efficiency up to 2020' in 2011 in the Russian Federation*. Presentation at the Second International Energy Efficiency Forum of the UN Economic Commission for Europe, Dushanbe. Retrieved from http://www.unece.org/index.php?id=25461.

Kulapin, A. (2014a, 27 January). *New version of the state programme on energy efficiency and energy development*. Presentation by the Ministry of Energy at the Analytical Centre of the Russian Government, Moscow.

Kulapin, A. (2014b, 17 February). Presentation by the Ministry of Energy at the Analytical Centre of the Russian Government, Moscow.

Ledeneva, A. (2013). *Can Russia Modernize? Sistema, Power Networks and Informal Governance.* Cambridge: Cambridge University Press.

Loginovskih M. (2011, 7 February). Development and funding of regional and municipal energy efficiency programs: Discussion. Gozbuk. Retrieved from http://www.gosbook.ru/node/15681.

Lugovoy, O., Potashnikov, V. & Gordeev, D. (2014, 16 January). *Prognostic scenarios of greenhouse gas emissions in Russia*. Presentation at Gaidar Economic Forum, Moscow.

Makarov, A. (2014, 16 January). *Scenarios of Russian energy strategy*. Presentation at Gaidar Economic Forum, Moscow.

MER uhudzila prognoz sotsialno-ekonomicheskogo razvitiia Rossii do 2030 goda [Ministry of Economic Development downgraded the forecast of social-economic growth of Russia until 2030]. (2013, 7 November). *Forbes*. Retrieved from http://www.forbes.ru/news/246985-mer-ukhudshilo-prognoz-sotsialno-ekonomicheskogo-razvitiya-rossii-do-2030-goda.

Ministry of Economic Development. (2013). Prognosis of Social Economic Development of the Russian Federation by 2030. Adopted by the Prime Minister on 26 March 2013.

Ministry of Energy. (2014, 25 April). The Government of RF adopted programme 'Energy efficiency and development of energy'. Retrieved from http://minenergo.gov.ru/press/min_news/18340.html.

Order #1-R (2009, 8 January). Main routes of state policy in the sphere of raise of energy efficiency of power industry on the basis of usage of renewable energy resources for the period till 2020. Moscow: Government of Russia.

Order #N889 (2008, 4 June). On measures to make the Russian economy more energy and environmentally efficient. Moscow: President of Russia.

Pluzhnikov, O. (2014). Presentation at the Round Table on Problems of GHG Regulation. Ministry of Economy, 21 January 2014.

Rosneft and Sibur sign new contracts for APG and dry gas supplies (2014, 7 March). Sibur. Retrieved from http://investors.sibur.com/investor-news/2014/mar/07-03-2014.aspx.

Russia to set 10 euro carbon floor price: Sberbank. (2010,19 August). *Reuters*. Retrieved from http://www.reuters.com/article/2010/08/19/us-carbon-russia-idUSTRE67I2B020100819.

Shishlov, I. (2011). *Joint Implementation in Russia: On track to overtake Brazil as the third largest supplier of Kyoto offsets*. Climate Brief No 8, CDC Climate Research.

Shubin, I. & Spiridonov, A. (2013). Problemy energosberezeniia v rossiiskoi stroitelnoi otrasli [Problems of energy saving in the Russian construction sector]. *Energosberezenie*, 1/2013.

Sibur and Lukoil have signed a long-term agreement for the supply of associated petroleum gas. (2011, 21 March). Sibur. Retrieved from http://sibur.com/press_center/company/7038/.

Sinyak, Y. (2014, 16 January). *Technological factor in long-term forecasting of the Russian fuel-energy complex*. Presentation in the Gaidar Economic Forum, Moscow.

TSDU TEK (2014, 26 March). *Central dispatching Department of Fuel Energy complex*. Presentation by the Federal State Unitary Enterprise. CREON conference, Moscow.

Tulikov, A. (2013). Vnebiudzetnye istotsniki investitsii v energosberezenie [Extrabudgetary sources of investment in energy efficiency]. *Energosberezenie*, 3/2013.

Tynkkynen, N. (2010). A great ecological power in global climate policy? Framing climate change as a policy problem in Russian public discussion. Environmental Politics 19(2), 179–195.

Vygon, G., Rubtsov, A. & Ezov, S. (2012, February). Utilizatsiia popytnogo neftnogo gaza: problema 2012 [Utilization of associated petroleum gas: problem 2012]. Energy Centre of Skolkovo.

Wilson-Rowe, E. (2009). Who is to blame? Agency, causality, responsibility and the role of experts in Russian framings of global climate change. *Europe-Asia Studies* 61(4), 593–619.

Yezov, S. (2014). Poputnyi neftianoi gaz: ispolzovanie i utilizatsiia [Associated petroleum gas: utilization and use]. *Gazovnaia promyshslennost*, 2/2014.

Yulkin, M. (2014, 21 January). Sectoral structure and dynamic of GHG emissions in the Russian Federation in 2011. Presentation at the round table 'Problems of GHG Regulation', Ministry of Economic Development of Russia.