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Combating or Cultivating Climate Change?

Russia's Approach to Renewable Energy as an Opportunity for the EU as a Facilitating actor

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> "I cannot forecast to you the action of Russia. It is a riddle, wrapped in a mystery, inside an enigma; but perhaps there is a key. That key is Russian national interest."
>
> Winston Churchill, October 1939

Introduction

Although Russia would be one of the first countries to be affected by climate change, and consequences will be far greater in the northern regions of the planet, concrete policies to combat climate change develop slowly. One of the long-term solutions in reducing greenhouse gas emissions would be to invest in renewable energy sources as a substitute to the current fossil-fired Russian economy. Despite Russia's vast green energy potential, the electricity generation capacity on the basis of renewable energy sources is hovering at a mere 1 percent.

Russia's unilateral decision not to take on new reduction targets under Kyoto's 2nd commitment period (Kyoto-2) at COP 17 in Durban (2011) raises questions about EU effectiveness in 'pulling in' countries to climate change commitments. EU effectiveness is difficult to measure, and is often operationalised by internal variables, such as an increased actorness, the EU's negotiation strategy or a flexible mandate of EU representatives (Van Schaik, 2013). However, EU effectiveness in the international arena is not only contingent on its own resources and strategies. In a multipolar world, the EU has to take into account a complex of interests and perceptions that influence EU's effectiveness from the outside-in (Smeets, Adriaensen, & Reykers, 2013). Especially in foreign climate change policy, the EU attempts to lead by example in convincing other players, such as Russia, to reduce Green House Gas (GHG) emissions. This paper seeks to evaluate the EU's effectiveness through Russia's green energy policy. By identifying domestic challenges Russia faces in promoting RES, EU current policy action in convincing Russia to de facto reduce GHG emissions is scrutinized. Therefore, the paper first identifies the obstacles to promoting renewable energy, whereupon possible EU approaches to help overcome these hurdles are suggested.

In 2006, Russia's government bodies estimated the economically feasible 'green energy' potential at 25% of annual domestic energy consumption (European Investment Bank, 2013;

Ministry of Economic Development and Trade, 2006: 31). According to Russian engineers' estimates, this green potential ready for economic exploitation has risen from an annual 270 million ton of coal equivalent (TCE) in 2002 to 320 million TCE/year by 2010 (Bezrukich, 2010; Lukutin, 2008). Yet this sizeable renewable resource base remains largely untapped. In 2011, 0.058 percent of electricity generation originated from renewables (World Bank, 2013). The global financial crisis sparked political attention to the usefulness of renewables in combating climate change (Henry & Sundstrom, 2012). Yet despite the Russian government aimed at 4.5 percent of the total electricity produced and consumed coming from renewables (not including hydropower plants above 25 MW) by 2020 (Government of the Russian Federation, 2009b), it was not until 2013 when a government support programme became operational to help reach this goal. As a consequence, Russia's intermediate goal of 1.5 percent by 2010 has not been reached, and by 2013 ambitions seem to have fallen further, lowering the bar to 2.5 percent by 2020 (Government of the Russian Federation, 2013). In comparison to its international peers, Russia seriously lags behind the EU's 20% and China's 15% target by the same year.

The paper makes the argument that by focusing on the means to reduce emissions is a more viable path to walk then to focus on the goal of binding climate change commitments. The obligation to achieve a certain result seem to have failed. Russia never had to actively reduce GHG emissions thanks to the 1990 base year (Henry & Sundstrom, 2007). Moreover, at COP 17 in Durban (2011), Russia decided not to take on new reduction targets under Kyoto's 2nd commitment period. However, the EU can still play the role of a facilitator in driving GHG reductions. One of the means to achieve the climate change goal is to develop Russia's largely untapped green energy resources. Therefore, the main question addressed is what the EU can do to stimulate Russia in developing this untapped green potential to *de facto* reduce GHG emissions The argument consists of two parts: first we identify which barriers keep Russia from investing in renewable energy. Second, the EU leverage over Russia's development of RES in helping to overcome these obstacles is discussed.

EU effectiveness re-appraised from an outside-in perspective

The EU seeks to "lead by example" (Schunz, 2012: 28). In EU foreign climate change policy, the EU successfully pushed for binding reduction targets with the ratification of the Kyoto protocol in 2004 and the first commitment period 2008-2012. Moreover, the EU attempted to use conditionality: the EU will reduce its emissions by 20% in 2020 compared to 1990 levels, but it will increase this reduction to 30% if other industrialised countries take up a comparable target (Van Schaik, 2013: 4).

However, the effectiveness to pull other into reduction commitments can be criticized from de facto changes on the ground. Russia did not have to reduce its GHG emissions because the target was a 0% increase in its carbon dioxide emissions relative to 1990 levels. This base year was beneficial since Russia's emissions fell by an estimated 30% between 1990 and 2000 as a consequence of industrial decline after the collapse of the Soviet Union. Russia thus had considerable room to increase its emissions by 2012, the end of the first commitment period (Henry & Sundstrom, 2007). Moreover, Russia refused to take on binding Kyto-2 reduction targets in 2011.

This failure to assess the real impact of EU climate change effectiveness results from a gap in the literature. To assess the effectiveness of EU foreign climate policy, the bulk of research has focused on the EU policy making (Van Schaik, 2013). This strand of research examines the internal EU decision making: how do policies come about and which actors are involved? To a more limited extent, EU policy implementation is addressed (Schunz, 2012). Do EU institutions execute what they have decided on? However, this paper argues, even when the institutions implement the decisions, the results of foreign climate change policy are contingent on the policies of other actors in the international arena.

In the case of foreign policies, EU institutions, effectiveness of implementations does not exclusively dependent on EU institutions. EU foreign climate policy does not take place in a political vacuum. To re-appraise the EU effectiveness, taking into account third country perceptions and interests is paramount (Smeets et al., 2013). Success or failure is contingent on other actors within the international arena. In the case of climate change, the effectiveness of the EU policy to get the Kyoto protocol ratified relied on other major

industrialised countries such as the USA[1] and Russia, since at least 55% of the total emissions of all industrialized parties had to approve the document (Article 25.1 UNFCCC). The actual implementation process how the reduction targets are achieved remained largely out of sight. Russia had enough room to increase its emissions, resulting in a decoupling of the reduction target on paper, and the process that should lead to reducing GHG emissions.

To convince other powers in reducing emissions, one should understand the rational of these third powers. The literature on the outside-in perspective invested major efforts in mapping external perceptions of the EU in multiple countries (Chaban & Holland, 2008). While acknowledging the achievements of this comparative research in bringing into account the external perspective on the EU, this article aims to go a step further in two respects. First, the author feels the need to zoom in on Russia to distinguish the internal rational with regard to renewable energy as a means to combat climate change. More than perceptions on the EU and its (climate change) policies, it focusses on the perceptions and (perceived) interests of Russia with regard to alternative energy resources. Second, this internal rational can offer new insights in how the EU can improve its effectiveness by facilitating the promotion of alternative energy sources in Russia.

Therefore, this paper is structured into two major parts. First, the paper identifies the hurdles Russia faces in developing its renewable energy resources. In a second step, we use this analysis to explain how the EU could act as a facilitator to promote green energy in Russia. This would increase EU effectiveness in a post-2012 reality in which Russia refused to take on binding reduction targets.

Methodology

This research is based on a revision of both international and Russian research about renewable energy sources (RES). Primary Russian policy documents have been assessed to identify barriers to RES development in Russia. In addition, several expert interviews were conducted in Moscow (July-August 2014) with representatives from the fossil fuel business, green energy sector, environmental NGO's, technical experts, and government regulators on

[1] The USA pulled out, raising the bargaining power of Russia.

the electricity market.[2] Three perspectives corresponding to three barriers on the road towards the development of renewables were taken under consideration: technical, economic and political. The three hurdles are interpreted as a cascade in which technical barriers constrain economic decisions, and political decisions are constrained by the former two, each adding its own rationale and interpretation. This allows us to assess to a deeper extent what the EU could do to be an effective facilitator of climate change through promoting renewable energy.

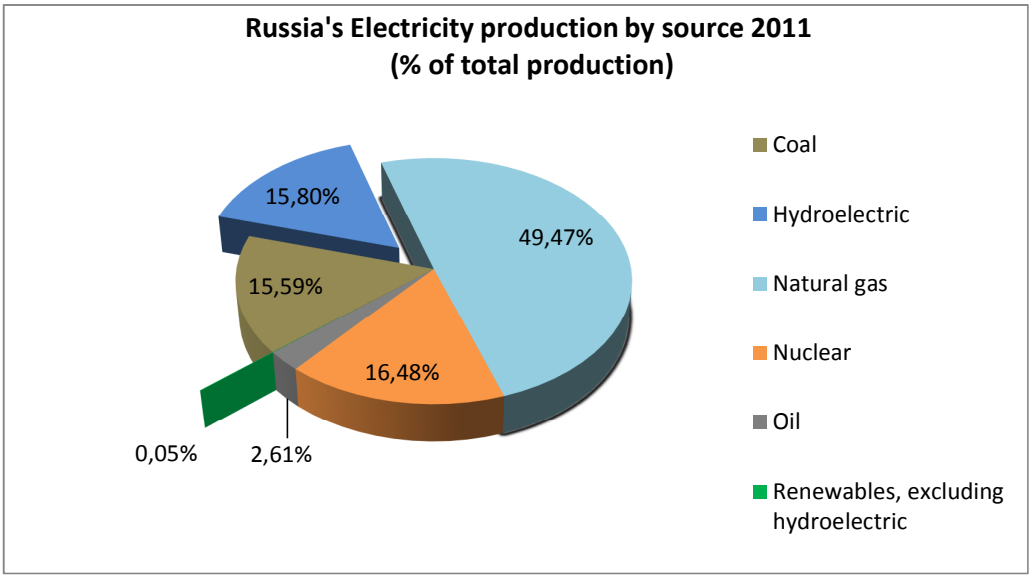
Why focus on renewable energy in combating climate change?

To reduce greenhouse gases, parties to the UNFCCC can either reduce their sources (fossil fuels) or increase sinks (vegetation cover). This article will focus on the former strategy, and more particularly on gradually substituting fossil fuels by renewables. The reason is that burning of fossil fuel is the most important source of GHG in Russia. In 2004, global anthropogenic GHG emissions from fossil fuels accounted for 56.6% expressed as CO_2eq (*IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation*, 2011: 7). In an energy producing country as Russia, this share is even higher. According to the Sixth National Communication of the Russian Federation to the United Nations Framework Convention on Climate Change (UNFCCC), the energy sector accounted for 82.7 per cent of the country's anthropogenic greenhouse gas emissions in 2011 (Ministry of Natural Resources and Ecology, 2013: 53).

On the one hand, as an energy rich state, Russia relies for 67.67 percent on fossil fuels (coal, oil, gas) in its electricity generation and renewable energy (excluding hydro power) merely accounted for 0.058 percent (Figure 1.). On the other hand, Russia abundant green resources (International Finance Corporation, 2011). In 2006, the economically feasible 'green energy' potential has been estimated 25% of annual domestic energy consumption (Ministry of Economic Development and Trade, 2006: 31). Yet this large renewable resource base remains largely untapped. Therefore, increasing the share of renewables within Russia's total energy production would have an enormous impact on reducing greenhouse emissions.

[2] The anonymised interview list can be found in annex 1.

Figure 1. Russia's electricity production by energy source (2011)



Source: World Bank, World Development Indicators

An alternative approach to GHG reduction is investing in energy efficiency. Although the Medvedev administration stipulated an ambitious 40% improvement in energy efficiency in the period 2007-2020 (Andonova & Alexieva, 2012: 618), many implementation problems remain (Korppoo, Jakobson, Urpelainen, Vihma, & Luta, 2009: 89; Millhone, 2010). Moreover, the State Duma adopted a far-reaching law "on energy conservation and increase of energy efficiency" in November 2007, establishing sweeping principles of energy efficiency covering appliances, lighting, housing, utilities, energy meters, contracting, financing, and information (Millhone, 2010: 9). Given Russia's energy consumption per unit of GDP –higher than any of the world's top ten economies– and an enormous efficiency gap –the World Bank report concluded that Russia could save 45 percent of its total primary energy consumption through energy-efficiency action– a lot can be done through energy saving policies as well (Millhone, 2010: 17). Moreover, energy efficiency and investments in renewables should not be mutually exclusive. The Federal Energy Efficiency Law considers the deployment of renewable energy as one of the energy efficiency improvement measures (Boute, 2013a: 6). For instance, renewables can be used to halt the inefficient use of diesel oil deliveries over land to isolated places by making use of the renewable sources locally available. Yet, energy efficiency measures threaten to inhibit the progress towards

promoting renewables in practice. In comparison to capital-extensive investments in alternative energy facilities, energy efficiency and saving measures are by far the cheapest way to reduce energy intensity (Millhone, 2010: 22).

Because of this reason, energy efficiency and conservation goals are considered more important in the short-run than developing renewables. Already in 2006, Russia's Kyoto progress report gives clear priority to energy efficiency measures above investing in renewables (Ministry of Economic Development and Trade, 2006). Merely one page of the 56-page document is dedicated to renewables. The document's focus lies on energy efficiency measures. For example, the document states that Gazprom significantly reduced its CO_2 emissions through energy saving policies from 880 thousand tons in 2001 to 383 thousand tons by 2004 (Ministry of Economic Development and Trade, 2006: 25). Godzimirski (2013: 25) found that Medvedev pays more attention in his discourse to energy efficiency than to renewables. Most interviewees tend to agree that energy efficiency is a priority issue. The fact that the energy programme of Greenpeace Russia sees it as her priority to focus on energy efficiency, and lacks a programme of promoting renewables, indicates that even the critics focus on the most feasible targets in the short run.

Yet, taking on a long-term perspective, these views start from the problematic assumption that fossil-fuels are still abundantly available, which might not be true within 80 years. As Apergis and Payne (2010: 1396) notice, substitution by renewables not only reduces carbon emissions, it also reduces the dependence on exhaustible fossil fuel energy sources. Gradually introducing renewable facilities along with energy efficiency measures seems to be a more sustainable approach to Russia's biggest challenge in the long run: how to diversify the economy away from the traditional energy sector, a goal put forward in the energy strategy until 2030 (Government of the Russian Federation, 2009b).

Meanwhile, progress on integrating renewables in the power grid seem to fall behind, and opportunities to replace obsolete power plants with renewables have been missed. Political targets to increase renewables are modest. Russia's 2006 progress report set the target to increase the share of renewables in the energy balance to 0.22-0.30% by 2010 (Ministry of Economic Development and Trade, 2006: 25). Although political attention to renewables

increased by 2009 (Henry & Sundstrom, 2012) and the official delegation underlined that 'renewables' were mentioned 70 times in Russia's 2009 energy strategy, the latter document raised the bar only slightly for renewables, to 4.5% TPES by 2020 (Government of the Russian Federation, 2009b). Russia's intermediate goal of 1.5 percent by 2010 has not been reached, and by 2013 ambitions seem to have fallen further, lowering the bar to 2.5 percent by 2020 (Government of the Russian Federation, 2013).

Opportunities to increase the share of renewables in Russia's energy mix turned out against reducing GHG. One of the policies that helped reduce CO_2 emissions significantly during 1990-2006 was the intensified substitution of obsolete coal plants to less carbon-intensive gas-fired installations (Korppoo et al., 2009: 89). The dominance of gas in Russia energy mix was problematized in the 2009 energy strategy. However, instead of proposing a substitution by renewables, the strategy supports the policy to switch to carbon-intensive coal production and increasing the number of nuclear plants to balance the energy mix. It must be said, the plan has been accompanied by the call for carbon-capture technologies to offset the increased CO_2 emissions it would produce. Given known implementation problems in general (Henry & Sundstrom, 2012), the chance that this expensive technology will be applied in practice, remains to be seen.

Thus, although energy efficiency measures have gained significant support within Russian politics, and in the short-run it might be the cheapest solution, the danger exists it supplants investments in renewables. From a long-term perspective, a gradual change towards renewables would be in the interest of Russia's current overdependence on the fossil fuel energy sector.

Russian scepticism on anthropogenic Climate Change

There is a persistent Russian perception that (a) climate change is not caused by anthropogenic hydrocarbon emissions, and (b) that global warming has positive effects for Russia. Even at the liberal radio station 'Echo Moskvy', Yulia Latynina often popularizes both views: climate changed throughout history, long before humans started to emit carbon dioxide on a massive scale. Moreover, she states that global warming never killed anyone, it were the chilling effects of the ice ages that wiped out entire species (Latynina, 2010).

Not all share this opinion. In 2007, about 59% of Russia's population agreed that humanity is responsible for global warming, and the same percentage expects that the effects will be in general negative for Russia (VTsIoM, 2007). Moreover, the lead negotiation body during Kyoto, and responsible actor for implementing climate change, the Federal Hydrometeorology and Environmental Monitoring Service (Roshydromet), openly recognized the anthropogenic cause of climate change, and pays attention to negative consequences for Russia, such as drought, flooding, and other natural disasters (Henry & Sundstrom, 2012). After the 2010 smog alarm in Moscow, and the destruction of one fifth of Russia's wheat harvest as a consequence of severe drought and wildfires, Dmitri Medvedev publicly agreed on the anthropogenic causes (Henry & Sundstrom, 2012).

Yet, some influential Russian elite strongly disagree. Scientists as the director of the Russian academy of Sciences' Global Climate and Ecology Institute, Yuri Izrael, stated that the Kyoto Protocol "lacks scientific validity and would not be effective." (Henry & Sundstrom, 2007: 50). The president's chief economic adviser, Andrei Illarionov (2000-2005), argued during the discussions on Kyoto's ratification that emissions reductions would merely hamper Russia's economic growth (Henry & Sundstrom, 2007).

Furthermore, one of the fiercest critics is Vladimir Putin himself, as one of the interviewees noticed.[3] Even in the aftermath of the 2010 heat wave, Putin told the scientists on the barren tundra that he was still waiting for an answer whether global climate change was the result of human activity or "the Earth living its own life and breathing"(Korsunksaya, 2010a). Indeed, Godzimirski (2013) analysed Putin's discourse, and found not a single linkage between energy and climate change. However, the same lack of associations between the largest emitter, Russia's energy sector, and climate change has been noticed in the discourse of Dmitriy Medvedev (Godzimirski, 2013: 25).

As concerns the consequences of climate changes, Putin pointed out that global warming would lower the heating bill and joked that Russians would have to buy fewer fur coats, although he also mentioned negative consequences (Henry & Sundstrom, 2007). An ecologist aptly noticed that they did not yet take into account the many air conditioners that appeared all over Moscow since the heat wave in 2010.[4] Apart from heating cost reduction,

[3] Interview with ecologist
[4] Interview with ecologist

several other positive effects are mentioned within the Russian debate on climate change consequences. The Ministry of Economic Development and Trade (2006: 46) expects expanding agricultural zones and crop production in the northern and eastern regions of Russia. Although the progress report recognizes the dangers for forest fires, it downplays the consequences, stating that "in the coming 30-40 years, climate changes do not provoke a significant worsening of conditions that would prevent normal development of forests. On the contrary, it would increase boreal forest productivity (Ministry of Economic Development and Trade, 2006: 50).

Moreover, the melting of the ice caps would not only open up a new resource base, it would also allow Russia to develop the shorter northern sea route, along which China already ships its products to Europe during summer at an increasing pace. In 2010, only four ships made the trip, by 2013 Russia already granted passage to 370 Chinese ships (McKie, 2013). Moreover, global warming would not also facilitate the extraction of natural resources in the arctic, but also in Siberia and Russia's Far East which is now covered by permafrost (Giddens, 2010). Moreover, international sources such as the IPCC confirmed some positive effects of climate change on the Russian territory (Korppoo et al., 2009).

Most authors therefore seem to agree that there was no genuine interest in combating climate change, rather, the political elite ratified the Kyoto protocol to gain financial and political benefits, such as the attraction of investments under the JI programme, and EU support for Russia's WTO accession (Andonova & Alexieva, 2012; Giddens, 2010; Henry & Sundstrom, 2007; Korppoo, 2009).

This undermining of the climate change agenda by questioning the anthropogenic causes and highlighting positive consequences has also an instrumental rational: Russia's priority lies in economic progress which may not be constrained by ecologic commitments.

As Andonova and Alexieva (2012) have argued, the main priority of Russia in climate change negotiations on the international level is influenced by Russia's domestic primary concern of economic growth. Kotov similarly warned that, despite Russia's efforts to modernise, climate policy is likely to remain 'subordinate' to economic growth and energy policy (Henry & Sundstrom, 2012: 1308).

Interviews with stakeholders in Moscow (July-August 2014) also suggest that most interviewees, including some advocates of combating climate change, agree that climate

change and investments in green energy sources should not hamper Russia's much needed economic progress. Some ecologists openly disagree that economic and ecologic goals are mutually exclusive, yet, their policy influence is limited.[5] Moreover, these environmental organisations become increasingly pressurized by the law on foreign agents. At the moment of writing, Eco Defense (Ecozashchita), a Moscow based green movement has been put on the 'foreign agents list'.

Public attention to ecology is also limited and reflects the priority of economic indicators. On the question "Please choose from the list which problems are, according to you, the most important in Russia." In June 2014, inflation, housing and corruption topped the list, while merely 18% of the population considered ecology and the environmental conditions as a national priority issue (Table 1).

Table 1. Russia's main issues of concern according to its population

% of population	June 2013	June 2014
Inflation, rising prices	47	59
Housing	55	54
Corruption & Bureaucracy	44	44
Unemployment	36	30
Influence of oligarchs on economic and political life	20	19
Ecology and the environmental conditions	22	18

Source: VTsIOM, http://wciom.ru/index.php?id=459&uid=114889

"Please choose from the list which problems are, according to you, the most important in Russia."

One interviewee went that far as to state that climate change belongs to Western propaganda with the objective to impede Russia's development. Some authors recognizes that the concept of climate change is not appropriate in the Russian context, stating that there are other priorities, mainly economic development (Forbes & Stammler, 2009). The climate change concept raises suspicion of Western transplants of 'virtual' problems that are currently not among Russia's policy priorities. The decision to retreat from the Kyoto-2 commitments was also augmented from an economic rationale. Justifying the refusal, Medvedev stated that "We have to acknowledge that we did not receive any particular

[5] Ibid.

benefits from the Kyoto protocol. We could not make use of it commercially as it should (Medvedev, 2012)."[6]

In order to avoid this contentious debate among the anthropogenic causes and the nature of consequences on Russian territory, this article argues that it would be more productive for the EU to focus on the means to achieve climate change goals, starting from Russia's own economic interest in developing renewable energy sources. This way, the EU can still operate as an (effective) facilitator of reducing emissions in the absence of binding reduction targets. To discover these interests, we now turn to the barriers on the road towards the development of renewable energy sources.

Barriers on the road to renewable energy promotion

This section discusses the current barriers that constrain the deployment of renewable energy facilities in Russia. First, the geographical limitations and technical issues are discussed, followed by economic constraints. The last subsection addresses the political hurdles to a greener energy production in a fossil fuel dominated country.

Technical barriers

Russia's geographical position and geologic composition brings about several technical constraints to the efficiency and availability of RES. As concerns solar power, except for the Northern Caucasus, Russia is located above the 50° latitude, characterised by long winters and scarce sun light, reducing solar energy's efficiency significantly. Lukutin (2008: 147) states that solar power in those regions can only be used during summer or in combination with compatible (fossil) power plants. Although sun energy might be renewable for centuries to come, the production of solar cells is dependent on the availability of silicon. Yet, silicon is the second most common material in the earth's crust after oxygen,[7] and provides more energy than the most performant fossil fuel over a longer time span. Whereas 1 kg of silicon could provide 15 MW·h over 30 years, one would need 1.25 ton oil to deliver the same

[6] "Надо признаться, что мы каких-то особых выгод от Киотского протокола не получили. В коммерческом плане воспользоваться не смогли как следует"

[7] Silicon represents 29.5% of the earth's crust mass, oxygen 47%.

amount of energy (Vissarionov, Deryugina, & Malinin, 2008: 239). Russia's soil in particular is rich in high quality silicon. The high-purity quartz layers contain silicon that does not need to be chemically purified, reducing costs and environmental damage (Vissarionov et al., 2008).

With regard to small and micro hydro plants (< 25 MW), long winters inhibit the performance because of ice formation. Yet, RusHydro possess long experience and technical know-how to overcome these restraints. Wind energy and geothermal plants are only effective in specific areas. Whereas wind is most efficient near the northern coastline and off-shore, geothermal plants have an even more limited reach: sparsely populated Chukotka with significant volcanic activity.

Given that these renewable sources are located at the outskirts of the Russian landmass, the distance to major energy consumer markets – located in European Russia – make these renewable sources' efficiency dependent on the distance-to-consumer and the quality of these transmission networks. Currently, the energy loss on high-voltage transmission cables is significant over such long distances, which would make these sources only available to consumers in the vicinity.

Despite these technical limitations that influence the distribution of RES to end-users, Russia's technical potential of RES would be able to meet five times the total Russian energy demand (Lukutin, 2008). However, the geographical and geological limitations also induce economic constraints.

Economic barriers

Although the technical potential largely exceeds the current annual Russian demand, the economic potential lags far behind, at 25% of Russia's current annual energy consumption (Ministry of Economic Development and Trade, 2006: 31). Production costs of renewable technologies significantly decreased and became more efficient during the last decades. In the case of solar power, Russia developed a unique extraction process that is ecologically clean, and reduces the production price of solar grade silicon to 25$/kg (Vissarionov et al., 2008: 247). Despite this positive evolution that increases the competitiveness of renewables vis-à-vis fossil fuels, the generation on the basis of traditional sources remains dominant. At least five economic reasons can be distinguished: regulated domestic energy prices, the

existing energy infrastructure, inflated investment costs, a monopolized energy market, and vested fossil-fuel business interests.

Regulated prices make uneven competition

According to the interviewees, the main reason for the discrepancy between technological and economic potentials is the low cost of fossil fuels (coal, oil and gas). As a major exporter of coal, oil and gas, Russia is able to provide its population with relatively cheap energy resources in comparison with countries reliant on energy imports. The International Energy Agency estimated that the fossil sector received almost 40 billion dollars in keeping end-user prices below those that would prevail in an open and competitive market in 2011 (IEA, 2012: 70). Apart from these direct consumer subsidies, another 14.4 billion dollars of quantifiable federal and regional subsidies to oil and gas upstream activities in Russia have been allocated to the fossil fuel sector in the form of tax breaks in 2010 (Gerasimchuk, 2012: 10). In comparison to these subsidies, the state support for renewables is negligible (International Finance Corporation, 2011).

Amongst these subsidies is the regulated gas price system. Gas prices are well below European netback prices, offering an effective subsidy to industrial customers (Henderson, 2011: 9). This low gas price partly explains the dominant role of gas in electricity generation, accounting for 49.47 percent of total electricity production in 2011 (Figure 1.). The flipside of the coin is that the regulated gas price pushes renewables aside as seemingly less efficient and more expensive energy sources per kWh electricity produced.

As a consequence of low input prices, the electricity price is relatively low compared with other developed countries. Average prices for Russian residential consumers were just over USD 66 per MWh, or around 38% of the OECD average of nearly USD 175 per MWh and around 27% of the OECD Europe average of nearly USD 245 per MWh in 2011.[8] The average Russian industrial electricity price is less subsidised, but nevertheless remained 10% to 40% below prices for OECD industrial customers (Cooke, 2013: 79).[9] These low electricity prices reduce the attractiveness to investments in renewables. Capital-intensive renewable

[8] Russian residential prices also compared favourably with OECD countries on a purchasing power parity basis.

[9] However, these pricing relativities were reversed on a purchase power parity basis with average Russian industrial prices significantly above comparable OECD averages.

facilities require relatively high electricity prices to ensure a competitive return on investment.

Obsolete and maladjusted infrastructure

These low energy prices have additional side effect: Russian energy concerns are not inclined to invest in domestic energy infrastructure. The low electricity price reduces incentives to invest in the electricity grid causing energy efficiency issues (Millhone, 2010). This underinvestment resulted in obsolete energy grid infrastructure that often dates back to the Soviet era.

The outdated electricity grid makes it more costly to integrate renewable facilities. The integration of renewables presupposes a strong energy grid balancing for fluctuations in energy supply and back-up capacity to cover these flexibilities (International Finance Corporation, 2011: 29). Indeed, intermittent sources such as wind and solar energy can put additional pressure on the grid and require further investment in reinforcing transmission and/or distribution capacity (International Finance Corporation, 2011: 28). Given the large distances between the potential renewable energy sites and the end-user, significant investments in the grid infrastructure are required (Bächtold, 2012).

Inflated investment costs

The additional investments in smoothing variable energy supply from wind and solar energy is perceived as yet an additional burden on an already inflated investment cost. Several interviewees mentioned that every investment in Russia comes at a corruption premium, administrative costs and associated time delays. This results in an elevated 14-15% financial discount rate for a typical energy investment project in Russia.[10] This holds true especially in the case of capital-intensive renewable sources, which require back-up power generation of additional gas or coal-fired plants. These premiums largely offset the decreased cost price of renewable technologies during the last decade. Apart from the corruption and administrative premiums, there is a risk premium involved for the general investment

[10] Interview with Business representative from the traditional energy sector

climate and the often changing and unpredictable regulatory framework (Boute, 2012).[11] The industry's lack of access to mid- or long-term capital to finance these costly investments only raises the bar to propel renewables in Russia (Millhone, 2010: 29).

These heightened investment costs sharply contrast with absence of investment costs of the existing non sustainable installations. Most existing energy installations have been built in another country, the Soviet Union, and have been fully amortized. For example, of the 33 nuclear reactors, 29 have been constructed in the USSR. Thanks to this investment inheritance, capital intensive nuclear energy blocks provide cheap energy at mere operational costs.[12]

The current elevated investment costs have international implications: it leaves Russian green energy companies uncompetitive on international markets. The first attempt at developing commercial production of polysilicon for solar modules in Russia was made by Nitol Solar Limited. The company – backed by major investors such as Sberbank, the Eurasian Development Bank, and Rosnano – invested more than 10 billion roubles in a silicon production facility in Irkutsk. In the wake of the 2008 financial crisis the company received financial and managerial support from the World Bank Group (International Finance Corporation, 2010). However, as polysilicon prices collapsed as a consequence of overproduction mainly in China, Nitol Solar Limited proved uncompetitive, and ceased its solar division production. In the Wind sector, Bächtold (2012: 4) observes that there are no major domestic producers of windmills that can compete with the major international players.

Monopolised market

One of the consequences of inflated investment costs is the relatively low number of small and medium companies (SME). The most popular form of SME financing are expensive bank loans (27%), followed by borrowings from relatives and friends (19%) (European Investment Bank, 2013). As a consequence of this lack of financing, the share of Small and Medium

[11] The Yukos case nurtured the perception of unguaranteed ownership rights, reducing the attractiveness of foreign direct investments.

[12] Interview with ecologist

Entrepreneurship in Russia's GDP is estimated at 20% to 25%, which is not only significantly lower than in developed countries, but incomparable to developing ones as well (European Investment Bank, 2013: 3).

In the energy market, the situation is even more monopolized. Less than 5% of SME turnover falls in the energy sector (European Investment Bank, 2013: 11). Most of the interviewees mentioned the flip side of this underrepresentation of SME: a highly monopolised and state-controlled energy market as an obstacle for new firms to enter the market.

As the Kremlin considers the energy sector strategic, the government not only increased its state control over the energy sector (Heinrich, 2008), it also created a new vertically integrated monopoly in the oil sector, Rosneft (Godzimirski, 2013: 16). Energy giants as Gazprom, Rosneft and RusHydro account for the lion's share of energy production. In the electricity market, the state monopoly Unified Energy System of Russia (RAO UES) was privatised, yet the market was not liberalized. The wholesale market is characterised by long-term regulated electricity prices and the participation in the wholesale market is limited to large generating facilities (International Finance Corporation, 2011: 15). As the IEA noticed, "consolidation into government ownership after unbundling and privatisation [of UES] is an unusual development"(Cooke, 2013: 4).

The retail market is dominated by regulated Guaranteeing Suppliers which have monopoly status. Moreover, limited access to information and customers and continuing uncertainty over the roles, responsibilities and rules applying to retail market entities and transactions inhibit new entry (Cooke, 2013: 8).

The dominance of major fossil fuel companies and government control is reflected in the submarket of green energy. Several subsidiary companies of fossil fuel companies are active, such as Lukoil and EN+ that both established 'green' daughter companies, ECOENERGO and EuroSibEnergo respectively. The dominant player in the production of solar panels and the construction of solar power plants, 'Hevel', is a joint venture between the state company Rosnano (49%) and the Renova Group (51%) owned by oligarch Viktor Vekselberg. There are currently no major producers of windmills in Russia, which implies these technologies have to be purchased abroad.[13]

Given this market structure, it is challenging for new Green Energy Companies to enter both the wholesale and retail markets. Government support programmes for RES are mainly

[13] Interview with wind company representative

active at the wholesale market. Investment projects of production facilities that produce less than 5 MW cannot take part in this capacity-based government support programme for renewable energy (infra.)(Boute, 2012). According to business specialists, SME are therefore mainly involved in development and consultancy of wind and small hydro projects and to a larger extent of solar projects.[14]

Vested business interests in a centralized energy supply system

In a comparative study between EU countries, Marques and Fuinhas (2012: 262) find that the larger the proportion of electricity generated from fossil fuels, the smaller the investments in RE. Since the effect of traditional energy sources on RE is always strongly negative, these results reinforce the idea of a potential conflict between economic interest groups and environmental policies, delaying RE commitments. Moreover, the industry lobbying effect is deeper for low levels of RE use than for high RE commitments, suggesting the existence of an initial barrier to the RE adoption (Marques & Fuinhas, 2012: 262).
In Russia, the dominance of fossil fuel monopolies is even more outspoken than in EU countries, and brings along vested business interests of the traditional carbon industry that slow down investments in renewables.

Even in cases where green energy projects would seem economically viable, the hydrocarbon sector outplays investments in decentralised energy renewable energy facilities. Gazprom invests large amounts of money in its Gasification policy, which foresees in extending pipelines to hard to reach areas and small villages in Russia's regions. During 2005-2013, the company invested 214 billion roubles, of which 33,9 billion roubles in record year 2013 only (Gazprom, 2014). However, in these cases, a decentralized system based on alternative energy sources might be more viable (Ivanova, Popov, Simonenko, & Tuguzova, 2004). Yet, vested business interests are involved that hamper investments in such decentralized systems. Gazprom would have to let down its traditional subcontractors such as steel and pipeline construction companies. As one of the interviewees stated, "The energy

[14] Interview with wind company representative

supply of Kamchatka could already be entirely based on renewable energy sources, but then Rosatom and Gazprom came in to build a floating nuclear plant." [15]

Political Barriers

Since the 2008 financial crisis and the subsequent collapse of oil prices, the Russian government paid a lot of attention to the development of RES (Boute, 2012: 70; Henry & Sundstrom, 2012). Several documents highlighted the need to invest in green energy as a solution to a wide range of problems. The Concept for Long-Term Social and Economic Development until 2020 refers to developing renewables as a means to save resources and improve energy efficiency (Government of the Russian Federation, 2008). The Energy Strategy until 2030 mentions the word 'Renewables' 70 times and prioritizes a long-term policy regarding the development of RES as a means to achieve a more balanced energy mix (Government of the Russian Federation, 2009b). Russia's Climate Doctrine highlights the need to develop renewable and alternative energy sources as to reduce GHG emissions (Government of the Russian Federation, 2009a).

However, as with Climate Change, this peak in discursive attention does not imply an absence of major opposition to the development of 'more expensive and less efficient' alternative energy resources. Vladimir Putin himself often criticised the use and ecologic added value of renewable energy sources. On wind energy, Putin in particular doubted that it would improve the environment, since windmills kill millions of birds every year. Moreover, he stated that "Vibration there is such that worms come out of the ground, not to mention moles. This is a real environmental problem (Korsunksaya, 2010b)."

When taking into account the actual political will to invest in RES, the picture becomes even more gloomy. The far from ambitious political targets have not been met. The intermediate goal of 1.5 percent of all electricity produced and consumed generated from renewable energy sources by 2010 has not been met, remaining below 1 percent (International Finance Corporation, 2011: 10). With the electricity production from renewables hovering around 1% in 2014, the target of 2.5% by 2015 is not likely to be met either. The IFC expects that merely

[15] Interview with ecologist

2 percent of electricity generation (not including hydropower plants above 25 MW) will be realized by 2030 under the current system of government support (International Finance Corporation, 2011: 17). Most of the interviewees anno 2014 concurred with this assessment that at the present pace of government support for renewables, the highest achievable RES share of the energy mix will be 2 percent.

Moreover, in April 2013 the State Program for Energy Efficiency and the Development of the Energy Sector aims at a reduced target of 2.5 percent by 2020, which seems to indicate that the bar might have been lowered (Boute, 2013a: 15). The result of this slow progress and modest goals suggest that the political elite is not willing to change the energy balance in favour of renewable energy, despite numerous calls for diversification away from a fossil fuel driven economy in the political discourse and official documents.

Low Energy prices as a socio-political trade-off

Energy prices entail a political dimension. Governments may decide to intervene in overcoming market failures. Government policy that attempts to reflect real costs of fossil fuels to the environment and humanity (health care) would increase the competitiveness of green energy sources. In some countries such as Sweden, the Netherlands and Finland, an ecologic tax on fossil fuels was introduced to incorporate the real cost of burning fossil fuels (Vissarionov et al., 2008: 239). In Russia, ecologic and carbon taxes that would internalise externalities do not exist. As Henry and Sundstrom (2007: 64) argue:

> *"a carbon tax is an unlikely measure due to the fact that Russia currently sells natural gas domestically at prices below that of the world market. A tax would likely prompt domestic discontent and discourage consumption in a highly energy intensive economy focused on growth."*

Indeed, the domestic prices are regulated on a level far below world energy prices (supra) because of socio-political concerns. Although Russian WTO negotiators agreed to raise energy prices gradually,[16] price increases have been politically curbed. Whereas the government allowed annual price increases by as much as 27% in the period 2006-2010

[16] As part of the political deal in the framework of EU-Russia WTO-negotiations

(Henderson, 2011: 3), the government capped increases in end-user prices at 15 percent for 2011 (International Finance Corporation, 2011: 26). In a meeting on the planning of the state budget for the period 2014-2016, Putin agreed to freeze prices of natural monopolies (including gas and electricity) in 2014. Moreover, further restrictions on price increases were introduced. From June 2015 onwards, tariffs on gas supply and the use of the electricity grid will be indexed at the level of inflation (Milyukova, 2013). Medvedev argued that these frozen tariffs will also restrict inflation to 4 – 5 per cent which would benefit the population as a whole (Medvedev, 2013). The logic behind this is mainly socio-political. Similar to the soviet regime, a social contract existed to keep energy prices low to cushion social unrest (Balmaceda, 2013: 66). Moreover, as table 1. demonstrated, rising prices are of main concern to Russia's population. Thus, there is a serious political risk involved if the government would decide to raise traditional energy prices, or when prices would rise as a consequence of government support schemes as happened to Germany (McKinsey&Company, 2014).[17] Ecology and energy efficiency concerns on the other hand are not perceived as a priority by most of the population, and NGO's have little policy influence. This lack of ecologic awareness simplifies the choice in favour of continued fossil fuel subsidies instead of supporting green energy sources that would increase electricity prices. Moreover, low domestic energy prices improve the competitiveness of many energy intensive export products such as steel and aluminium (Selivanova, 2007). As outlined in the section on economic barriers, the consequence of this price regulation policy is that investments in green energy facilities seem economically infeasible.

Slowly advancing government support

Until 2013, there was no applicable legal basis in place that would stimulate investments in renewable energy on the wholesale market.[18] A legal basis for a premium system had been developed since 2007, but has not been implemented because of fears that end-consumer electricity prices would rise (Boute, 2012: 69). It was *de facto* replaced by a capacity-based

[17] The August 2014 import ban on food items that de facto raised the price level has been presented not as a Russian government decision, but as a consequence of Western sanctions. Russia was forced to take countermeasures. The West is responsible for Russia's price increases.

[18] The Russian wholesale market consists of a electricity market and a capacity market. The latter is a guarantee that electricity producers will not reduce electricity supplies until the energy price peaks to increase profits at the expense of security of supply.

support mechanism (Boute, 2013b). The system is unique in that most support schemes aim to stimulate the production of electricity from renewable sources (expressed in megawatt hours). Yet, instead of this output-based system, Russian politicians decided to support the capacity of a 'green facility' (expressed in kilowatt) (Boute, 2012). One of the advantages would be that:

> *"financing installed capacity and not electricity output could to some extent limit the impact that the large-scale deployment of renewable energy can have on market prices and the operation of the grid"* (Boute, 2012: 69).

This is a significant step forward in moving away from the over subsidized hydrocarbon industry to supporting renewable energy. Yet, the current capacity-based system will merely add about 1 percent of RES by 2020 to the current 1 percent of energy consumption under the condition that all projects will be realised.[19] Moreover, several issues remain to be solved to reach the target by 2020.

First, the policy change from a premium to a capacity-based system, although the former was never implemented, suggested that the ruling elite are willing to radically change the 'rules of the game'(Boute, 2012). This creates investor uncertainty which raises the risk premium of green investments. The preferential price for RES capacity could be revoked at any time. Moreover, this regulative instability was endorsed by a business analyst of Administrator of the Trading System, stating that 'the regulations tend to change every year.'[20]

Second, there is a tendency to politicise the regulation of the wholesale market. The government's role in regulating the wholesale market was increased by transferring the competence to adopt the fundamental conditions of the Agreement of Accession to the Trading System of the Wholesale electricity and capacity market from the independent Market Council to the government (International Finance Corporation, 2011: 57). Moreover, expert interviews revealed that 'independent' organisations such as the System Operator and the ATS ask the government what decisions they should make.[21]

[19] Interview with wind company representative
[20] Interview with business analyst ATS.
[21] Interview with business analyst ATS; interview with business analyst of traditional energy sector

The third, fourth and fifth obstacle relate to the actual conditions of the capacity-based scheme.[22] One of the requirements states that for wind energy, 55% of the equipment used to realize the investment project must be at least partly produced in Russia in 2015. In 2016-2017, this local content requirement has to reach 65%. This system was precisely intended to protect and stimulate Russia's domestic production facilities of renewable energy from international competitors given the elevated investment costs (supra).[23] However, contrary to the solar industry, there are no Russian firms large enough to produce windmills, which leads to significant implementation problems.[24] As a consequence, the capacity agreements have been allocated during the first selection period (2013), but none of the wind projects have been developed yet because of the local content requirement.[25] The Russian government is aware of the problem, and seems to be inclined to lower the local content requirement.[26]

Fourth, the government support scheme is only available for projects with a capacity exceeding 5 MW. This *de facto* precludes SME in participating.[27] Indeed, when analysing the companies that won the tender in 2013 and 2014, no SME were represented, and typically involve 'green' daughter companies of Russian and international energy giants. For example, EuroSibEnergo won a tender to develop a solar plant in Khakassia (Globalsib, 2014). Yet, when looking at the ownership structure, 100% is owned by Deripaska's energy group EN+. In 2014, Chinese investors started to dominate the solar projects (Fomicheva & Skorlygina, 2014). The daughter company of Amur Sirius (Harbin) secured the largest 220 MW project of the 496 MW available for state support in 2014. This increasing international competition seems to take the winds out of the sails of Russian green energy companies.

Fifth, the participation in the tender is also geographically limited to projects located in the price zones of the Russian wholesale market (i.e. parts of the Russian territory where electricity is traded at free market prices) (Boute, 2013b). This excludes projects in isolated

[22] These obstacles simultaneously show that (minor) regulatory changes do not need to be negative per se, but contribute to the solution of unforeseen problems in implementing a new capacity-based system.
[23] The local content requirement might be in breach with WTO regulations.
[24] Although this was a preliminary condition of the selection process, projects seem to be allocated which later seem to be not implementable because of the local content requirement
[25] Interview with wind company representative
[26] Interview with wind company representative
[27] SME could take advantage in the retail market. The Federal Electricity Law provides that energy losses on the electricity grid have to be compensated with renewable sources. (Boute, 2013a: 6)

regions, in which renewables would contribute significantly to the expensive diesel oil deliveries (Ivanova et al., 2004).

In theory, this could be compensated by regional support mechanisms on the retail market (< 25MW). The legal basis to adopt regional support schemes for RES-E is in place, yet several hurdles remain to make it applicable. Moreover, these regional RES-E tariffs only apply to regions in the price zones, excluding isolated regions. Pilot projects in Belgorod and Vologda to install RES-E tariffs were annulled mainly because the installations were not qualified by the Market Council. As a result, investors will have no certainty regarding the financial basis of their investments when making their investment decisions (Boute, 2013a: 8). Moreover, the regional tariff regulation seems to suffer from the primacy of the federal law: regional tariffs must comply with federal tariffs. Yet, a Federal Tariff Service has not yet adopted a federal tariff methodology. Regional administrations could adopt a regional tariff, yet investors will not have the guarantee these regional tariffs will not be superseded by federal tariffs, provoking investment uncertainty (Boute, 2013a: 33).

Green energy versus economic development

Apart from government support, the widespread fear that investments in renewable energy inhibit economic development also play an important role in opposing green energy development. Although some studies find a bidirectional relationship between the consumption of renewables and economic growth (Apergis & Payne, 2010), and renewable energy investments have created jobs related to the construction, maintenance and operation of the renewable energy generating facilities (Boute, 2013a: 22), fears of renewables negatively impacting Russia's economy is widespread. The economy is in need of cheap energy resources as to allow economic development, resources that are abundantly available in Russia. Many, especially in the fossil fuel sector, believe that investments in alternative energy resources is not necessary in the short run given the abundant fossil fuel resources. One of the interviewees was convinced that GHG emissions of gas-fired plants are lower than renewables, and went that far as to state that the development of renewables in Russia is part of 'Western propaganda': since Western RES-firms are going bankruptcy on a massive scale, they are looking for new export markets for their products, amongst them in

Russia.[28] The respondent wondered whether it is ethical to propagate ineffective renewable energy facilities to countries that could use this money to build hospitals and help the poor instead. Indeed, these comments reflect the perception that the development of RES is a hindering block on the road to socio-economic development.

Moreover, RES are not considered to be a priority on the political agenda. All interviewees, including ecologists, agreed that energy efficiency improvements is currently a top priority. At the moment, energy efficiency is the cheapest and most feasible approach to reducing energy waste and reducing GHG emissions. It was indicative that Greenpeace Russia does not have a programme to develop renewables.

Yet, energy efficiency measures are mainly focused on the fossil fuel sector, attracting investments to the traditional motor of the Russian economy. This politicisation of RES might be instrumental to stick to the status quo.[29] Indeed, de facto, the energy mix will at the most change by 1% in favour of renewables by 2020 while the policy to lower the dominance of gas will be achieved by investments in nuclear power plants and coal plants (Government of the Russian Federation, 2009b). Switching from a central to a decentralised energy system would require enormous investments, breach vested business interests and endanger the holy grail of low energy prices. Fears of social unrest would touch the heart of Russia's energy security: the political risk of a colour revolution because of the inability of the state bodies to provide cheap energy sources. Therefore, politicians are interested in keeping the economy dependent on fossil fuels. In the long run, this might create enormous adaptation costs to abruptly switch to renewable energy, bring along health hazards, ecologic degradation and accelerate climate change.

Bounded Effectiveness: the EU as a facilitator

Having identified the barriers to green energy development, three major constraints tie the hands of the EU in developing renewables in Russia.

[28] Interview with political scientist specialised in energy and ecology 1
[29] Interview with ecologist

First, the main obstacles to increase the share of renewables in Russia's energy mix could be solved most effectively by Russian policymakers. The decision to reduce fossil fuel subsidies, create energy monopolies and lower the green energy ambitions to 2.5 percent by 2020 are inspired by social concerns, vested business interests and associated political risks. The EU's efforts to raise Russian domestic fossil fuel prices through WTO negotiations has been only partly successful. The political agreement to gradually increase price increases did not foresee in any binding commitments. Moreover, the aim to gradually increase energy prices has been included in Russia's energy strategy that was published in 2003, which further questions actual EU effectiveness. Domestic prices increased initially but never reached EU netback levels, partly because EU gas prices surged driven by higher oil prices (Henderson, 2011: 2). However, the decision to freeze energy prices in 2013 indicates the autonomous power of the Putin administration that is willing to act against its own energy strategy and international agreements to solve social discontent.

Second, Russia opted out of Kyoto-2 commitments, reducing the external incentive to develop green energy as a means to achieve reduction targets of greenhouse gas emissions. It is an indication that the Russian political elite are not prepared to actively reduce GHG emissions on the basis of binding agreements (Henry & Sundstrom, 2012). The EU hereby lacks potential leverage over 'greening' Russia's economy on the basis of international commitments.

Third, the degradation of EU-Russia relations on the background of the 2014 Ukrainian crisis undermines not only the political will of the EU to undertake positive actions in reforming Russia's energy mix, it also feeds negative perceptions if the EU would decide on promoting Russia's green energy potential.

Thus, the degrees of freedom to help combat climate change through stimulating renewable facilities in Russia are limited. Nevertheless, the barriers also highlight some opportunities for the EU to increase foreign climate change effectiveness. Under the constraint of Russia's opt-out of Kyoto-2 commitments and given the imposed sanctions, the EU can still play a facilitator role of green energy. Having identified the barriers on a technical, economic and political level, the article now turns its attention to specific policy actions that could reduce Russia's GHG emissions through facilitating renewable energy sources in Russia.

Technology sharing

Given the technical barrier of transporting electricity over large distances from the outskirts of Russia's territory to the majority of end-users in European Russia, technologic support regarding electric power transmission losses is needed. The DESERTEC project faces similar problems in transporting electricity from Northern Africa to the EU. Therefore, there is a common interest in developing a high-voltage direct current electric power transmission system that minimises energy losses. EU companies such as Siemens, Deutsche Bank and EON could involve Russian companies in developing new technologies that would enable electricity transmission over large distances with minimal losses.

The idea of RUSTEC to build wind generators in north western Russia, after which the green power would be transported through the existing Nordic electricity grid to EU countries faces several challenges. Although the host state must 'acknowledge' that part of the electricity produced from the joint project will be consumed domestically (International Finance Corporation, 2012), the main beneficiary of green energy will be EU countries. Since the project is mainly oriented to the EU market, it does not help Russia in balancing the energy mix from fossil fuels to renewables. Moreover, given the sensitivity to energy dependence on Russia, the project would not contribute to the EU's diversification of suppliers policy in securing energy imports.

Raising fossil fuel prices

The soft approach of a political agreement to gradually raise Russia's domestic energy prices within the WTO negotiations seems to have booked limited success. Especially residential electricity and gas prices are significantly lower than the OECD average at purchasing power parity basis. Yet, the EU could find potential allies in Russian energy business. Companies as Gazprom and Rossetey are interested in raising domestic energy prices to increase profits. It would also stimulate the much needed investments in the domestic electricity grid and gas pipelines. From a government perspective, increased energy prices would facilitate energy saving opportunities provided that households have the agency to measure and control the

use of gas, heat and electricity.[30] The main stumbling block seems to be political concerns over social unrest that could transform into political protests. EU countries with a strong social safety net such as France could provide know-how on a progressive energy price systems to cushion the socially weak from price hikes.

Green energy for growth

Renewable energy development is often perceived as hampering Russia's economic growth. At the same time, the Russian government recognized the dependence on fossil fuels as a threat to long-term economic development, seeking to diversify the economy away from the traditional fossil fuel sector (Government of the Russian Federation, 2009b). Raising the share of renewables in the energy mix could mitigate these vested business interests of the fossil fuel sector that hamper economic growth in other sectors (Dutch Disease).

Moreover, investments in renewable energy would make more gas available for export to lucrative markets (International Finance Corporation, 2011). The share of gas-fired electricity production would fall in favour of electricity production on the basis of renewable energy. Gazprom would not only be able to sell more gas on more profitable export markets, gas reserves will also expect to last longer. Thanks to reduced emissions, the Russian state budget would save on health care costs. Especially in hard to reach areas, renewable energy is already economically profitable (Ivanova et al., 2004). The establishment of decentralized electricity facilities based on renewable energy fits the Russian government's policy to develop Russia's Far East by stabilizing energy security through decreased electricity costs (affordability) and local availability.

The EU member states could help invest in green energy under the mechanism of "joint projects with third countries" to reach the binding renewable energy targets of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources (International Finance Corporation, 2011: 68). This would help create new jobs in Russia's green sector (Henry & Sundstrom, 2007).

[30] The Russian government actively supports the installation of metering devices.

Norway in particular could serve as an example, providing assistance through knowledge sharing. This EEA country generated 96.6 percent of its electricity production from (large) hydro energy in 2012 (World Bank, 2013), while at the same time exporting oil and gas.

Smart Sanctions

To differentiate between Russia's elite and its population, the EU could opt for smart sanctions in the current Ukraine crisis. Without detracting from the imposed sanctions against Russia, the EU could decide to redirect rather than to restrict EU technology and investments to the Russian market. This could be a win-win situation in which EU companies are offered new investment opportunities, while improving EU effectiveness in stimulating Russia to actively reduce GHG emissions. More importantly, the EU takes on a role of a facilitator based on its own soft power foundation: attraction of EU technology and market rather than coercion.

By imposing sanctions on Russia, the EU *de facto* acts counter to its discursive image as a soft power. It attempts to coerce Russia to comply through the restriction of deep water oil exploration and production technology and to hamper investments in general through restricting access to EU capital market (Council of the European Union, 2014). It could choose to complement these negative hard power measures: redirect rather than restrict EU investments and technology sharing. Instead of denying export licences to products destined for deep water oil exploration and production, arctic oil exploration or production and shale oil projects in Russia as such (Council of the European Union, 2014), the EU could emphasizes its non-zero-sum reputation by redirecting technologic and financial support to green energy, at the same time contributing to the interest of the population in reducing the ecologic burden and social costs of Russ0ia's fossil addiction. Apart from greening Russia, EU investments in RES would also contribute to the de-monopolisation of Russia's energy market by targeting Russian green SME companies rather than the current fossil fuel mastodons. The combination of carrots and sticks could be labelled smart power sanctions. EU effectiveness to 'green' Russia's economy is exercised in line with its own image of a soft power (Wilson, 2008). Moreover, it focuses on the EU's own attempts to de-escalate the current race to sanctions and counter sanctions.

Since the EU also plans to re-assess the EU-Russia cooperation programmes (Council of the European Union, 2014), the Partnership for Modernisation (PfM) funds could be targeted at RES projects rather than investing in the already overly subsidized fossil fuel sector. Currently, the PfM prioritizes energy efficiency measures. The energy efficiency investments that have been allocated under the PfM are focused on the traditional energy sector, such as a €200 million gas-fired combined heat power plant in Vladivostok and a district heating project in the Lomonosov municipal district (EU and Russia, 2012). By acting as a responsible actor that is genuinely interested in the long term economic development of Russia, the EU could moreover strengthen its normative power (Manners, 2002). Moreover, it would be in line with Russia's own goal to become less dependent on world oil price fluctuations (Government of the Russian Federation, 2009b). The EU could offer Russia a sustainable development package by helping the gradual introduction of renewable energy facilities in the Russian energy mix. At the same time, the EU investments would contribute to the reduction of GHG emissions, thereby strengthening its role as a facilitator in combating Climate Change. Through this positive mechanism, the EU would offer Russia a long-term development as it offered Ukraine when arguing the difference with Russia's short term development model.[31]

[31] Herman van Rompuy at KU Leuven (11.03.2014) stated that the EU offers Ukraine a long term economic development model, while Russia offers short term improvements such as a cheaper gas price.

Annex 1. Interview list

Technical expert (28.07.2014)

Political scientist 1 (30.07.2014)

Political scientist 2 (16.08.2014)

Business analyst gas sector 1 (06.07.2014; 03.08.2014)

Business analyst gas sector 2 (27.07.2014)

Business analyst Administrator of the Trading System (ATS) (10.08.2014)

Wind company representative (11.08.2014)

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