IFC Advisory Services in Europe and Central Asia

IFC Russia Renewable Energy Program

Renewable Energy Policy in Russia: Waking the Green Giant

In partnership with

IFC
International Finance Corporation
World Bank Group
Renewable Energy Policy in Russia: Waking the Green Giant

Green paper for discussion
# Table of Contents

## Introduction .................................................................................................................................................. 3

### 1. Renewables on the National Policy Agenda ...................................................................................... 5
    1.1. Overview ............................................................................................................................................. 5
    1.2. The National Renewable Energy Target ......................................................................................... 7
    1.3. Economic, Social and Climate Change Policy ................................................................................ 10

### 2. The Russian Energy Sector: Opportunities and Challenges for Renewables .................................. 13
    2.1. Electricity Sector Reform ................................................................................................................ 13
    2.2. Opportunities for Renewable Energy Sources .............................................................................. 15
        2.2.1. Power Sector Investment Requirements .............................................................................. 15
        2.2.2. Isolated Zones ......................................................................................................................... 17
        2.2.3. Momentum for “Greening” the Heat Supply ........................................................................ 17
        2.2.4. Export Potential ....................................................................................................................... 21
    2.3. Challenges ......................................................................................................................................... 21
        2.3.1. Unlevel Playing Field .............................................................................................................. 22
        2.3.2. Externalities ............................................................................................................................. 23
        2.3.3. Price Control ............................................................................................................................ 24
        2.3.4. Variability ................................................................................................................................. 26

### 3. Financing Renewables in Russia ......................................................................................................... 29
    3.1. The National Support Scheme for Renewable Energy .................................................................. 29
        3.1.1. Historical Background ............................................................................................................. 29
        3.1.2. The Electricity Premium Scheme ............................................................................................ 31
        3.1.3. The New Capacity-Based Scheme .......................................................................................... 35
        3.1.4. The Premium and Capacity Schemes: Exclusive or Combined Support? .......................... 41
        3.1.5. Compensation of Connection Costs ....................................................................................... 41
    3.2. Regional support .............................................................................................................................. 43
    3.3. Kyoto Protocol Mechanisms: Joint Implementation ...................................................................... 43

### 4. Assessment of the Russian Support Scheme from the Perspective of the Russian Government and Private Investors ........................................................................................................ 45
    4.1. Government Perspective ................................................................................................................ 45
        4.1.1. Effectiveness of Support / Cost-Efficiency .......................................................................... 45
        4.1.2. Reinforced Government Control ............................................................................................ 46
    4.2. Investors’ Perspective ...................................................................................................................... 47
        4.2.1. Regulatory Instability and Unpredictability .......................................................................... 47
        4.2.2. Investment / Project Risks ...................................................................................................... 50
        4.2.3. Contractual Guarantees and Investment Protection ............................................................. 51
        4.2.4. Connection and Access to the Network Infrastructure ........................................................ 52
        4.2.5. Reliability Issues ...................................................................................................................... 52
        4.2.6. Lack of International Experience with Capacity-Based Support Schemes ...................... 53
        4.2.7. Lack of Independence from Short-Term Political Interests .................................................. 53

### 5. Waking the Green Giant: Possible Way Forward .............................................................................. 56
    5.1. Fine-Tuning the National Support Scheme: Issues for Consideration ........................................ 56
        5.1.1. Stability and Predictability of Support .................................................................................... 56
        5.1.2. Reliability .................................................................................................................................. 57
        5.1.3. Mandatory Targets ................................................................................................................ 58
        5.2.1. Guaranteed Access to the Network: Prioritisation of Electricity Produced from Renewables 59
        5.2.2. A Renewable Energy Friendly Long-Term Competitive Capacity Market ....................... 60
        5.2.3. A Renewable Energy Friendly Balancing Market ................................................................. 62
    5.3. Regional Approach .......................................................................................................................... 62
    5.4. Greening the Russian Combined Heat and Power Sector ............................................................ 63
    5.5. Improving the Investment Climate for Renewable Energy Investments ..................................... 64
    5.6. Environmental Legislation ............................................................................................................ 64
    5.7. EU Joint Renewable Energy Projects: a Russian WINDTEC to Green Europe’s Electricity Consumption ................. 65
Introduction

In Russia, the subject of renewable energy is far from straightforward. On the one hand, Russian leaders have shown a strong political will to support the development of renewable energy by adopting a target of 4.5 per cent of all electricity generation and consumption from renewable sources by 2020. National legislation on the electricity sector has been amended to move towards meeting this target. These steps have sent positive signals to potential investors and the international community. However, on the other hand, specific support measures have been slow to develop. Today, more than two years after the announcement of the 4.5 per cent target, there is still no functioning regulatory framework at the federal level to make investments in renewable energy commercially viable.

The institutions tasked with developing support schemes are concerned about many issues, from the cost of state support to ensuring the safe operation of the national electricity grid. At the same time, the government is worried about the sharp electricity price increases for end-users and has recently introduced price control measures. In view of this trend, it could be argued that supporting renewable energy, which is perceived to be more expensive than producing electricity from fossil fuels, would lead to higher electricity prices. Such concerns among Russian policymakers are understandable, particularly at a time when many other countries have reduced their support for renewables in the context of the economic slowdown and the resulting budget constraints. However, the use of renewables in Russia has clear environmental, economic and energy security benefits. Any further delays in adopting the support measures announced will ultimately raise the costs of meeting the renewable energy target. There will also be indirect costs resulting from the “missed opportunities” to reap the benefits of renewables-based generation.

This green paper is intended to contribute to the ongoing debate on renewable energy policy in Russia. It provides information about policy developments for potential investors and other stakeholders. More importantly, it considers the following questions: i) why should Russia support investment in renewable energy? ii) should it do so urgently? and iii) how might these investments be facilitated? Conclusions and recommendations are preliminary; further analysis will be carried out based on the feedback from stakeholders.

The paper starts by looking at the place of renewable energy on the broader national policy agenda and in the energy sector. It then describes the current status of renewables policy development. It concludes by examining different elements that must be taken into account when fine-tuning the renewable energy policy. The paper highlights relevant experience from other countries, mainly European Union members. The main focus of the paper is on the wholesale market. Investment opportunities in retail markets and distributed generation will be analysed in more detail in the future.

This paper has been prepared by the Russia Renewable Energy Program of IFC, which is part of the World Bank Group. The Russia Renewable Energy Program was launched in Moscow in December 2010 to facilitate the emergence of a sustainable market for renewable energy in the Russian Federation by supporting the development of enabling policies, institutional capacity, market facilitation and financing. While the development of renewable energy policy and the choice of measures are entirely the responsibility of the Russian government, the Russia Renewable Energy Program is prepared to provide its expertise and resources as additional tools for government decision making. The program has the capacity to conduct further work on issues that Russian stakeholders might consider relevant. Therefore, IFC welcomes comments, questions and suggestions on this paper. They should be addressed to Natalia Golovko, Public Outreach Officer, at NGolovko@ifc.org.
1. Renewables on the National Policy Agenda

1.1. Overview

In the last few years, renewable energy has received significant attention on the Russian national policy agenda. This has been reflected in many official policy documents, including: the Energy Strategy to 2030 (Nov. 2009), the Concept for Long-Term Social and Economic Development to 2020 (Nov. 2008), the Climate Doctrine (Dec. 2009), and the State Energy Efficiency Programme (Dec. 2010). For example, the Concept for Long-Term Social and Economic Development expects Russia to achieve “a leading position in the development of renewable energy sources”. These documents show that Russian policymakers do recognize that renewable energy has environmental, social, economic and energy security benefits. For instance, Russia’s Energy Strategy to 2030 outlines strategic objectives for the use of renewable and local energy sources, including:

- reducing the anthropogenic impact on climate change while meeting growing energy demand;
- the rational use of available fossil fuels;
- maintaining the health and quality of life of the population; reducing government health expenditure;
- reducing the rate of increase in the costs of electricity transmission and distribution and related electricity losses; diversifying the country’s fuel and energy mix;
- enhancing security of energy supply through decentralization.

Although these societal benefits are difficult to monetize, preliminary studies suggest that, overall, the benefits of renewables outweigh the costs. According to the Russian energy company RusHydro, Russia would need to spend 90.19 billion rubles on renewables by 2015 to achieve economic benefits of up to 112.36 billion rubles. Furthermore, this trend of benefits outweighing costs would continue after 2015. Therefore, a failure to stimulate the deployment of renewable energy technologies would

---

not only undermine the implementation of several strategic policy directions, but would also entail indirect costs resulting from “missed opportunities” to stimulate the Russian economy and improve the well-being of the Russian population.

However, reaping the benefits of renewables is not an easy task. The Russian government is aware that many barriers must be overcome to make investments in renewables financially viable. According to Russian Government Resolution No. 1-r, which establishes the framework for renewable energy policy, the development of renewables is being hindered by the following barriers:

- the lack of competitiveness vis-à-vis traditional fossil fuels in the current market environment;
- institutional and regulatory barriers, the lack of a legal and regulatory framework to stimulate the use of renewable energy in the electricity sector;
- the lack of federal and regional renewable energy support programmes;
- the lack of the necessary infrastructure for the successful development of electricity generation from renewables;
- the inadequate level and quality of scientific support;
- the lack of appropriate information, including information about available renewable energy resources and reliable data about the results of implemented projects;
- the lack of the necessary regulatory, technical and methodological documentation and software for the design, construction and operation of renewable energy generating facilities; and
- inadequate human resources.

Many of these barriers are not unique to Russia; they exist in other countries also. Chapter 2 looks at some of the key barriers in more detail.

**SPOTLIGHT**

- Renewable energy is high on the national policy agenda.
- Key policy documents recognize the benefits of renewables and the barriers to their deployment.
- The benefits outweigh the costs of support, according to RusHydro:

  - 90.19 billion rubles needed to support renewable energy deployment
  - 112.36 billion rubles – estimated economic benefits

---

1.2. The National Renewable Energy Target

Federal Law No. 35-FZ dated 26 March 2003 “On the Electric Power Industry” (hereafter, the “Federal Electricity Law”), as amended in 2007, requires the Russian government to adopt strategic national targets for the development of renewable energy. It also provides for support mechanisms for electricity generation from renewable energy, as discussed in Chapter 4.

To fulfill its obligation, on 8 January 2009 the government adopted Resolution No. 1-r “On the Main Areas of Government Policy to Raise the Energy Efficiency of Electric Power from Renewable Energy Sources for the Period to 2020”. In accordance with this resolution and also the updated Energy Strategy to 2030, 4.5 per cent of all electricity produced and consumed in 2020 should be generated from renewable energy sources. Resolution No. 1-r also includes provisional targets of 1.5 per cent for 2010 and 2.5 per cent by 2015. According to government estimates in the Energy Strategy to 2030, reaching the 4.5 per cent target would require up to 25 gigawatts of new installed renewable energy capacity by 2020 (excluding large hydro). The Energy Strategy to 2030 stipulates that the share of renewables must remain at least 4.5 per cent in the period from 2020 to 2030, generating 80-100 billion kilowatt-hours per year. According to more recent analysis by the Russian Energy Forecasting Agency, reaching the target would require 14.7 gigawatts of new installed renewable energy capacity. IFC has estimated that reaching the 4.5 per cent target would displace more than 36 million tonnes of carbon dioxide per year.

On more than one occasion, Russian leaders have shown the political will to develop renewable energy. For example, President Medvedev stated in July 2009, during a State Council meeting in Arkhangelsk, “We should no longer burn our energy reserves.” Medvedev also called for the enhanced generation of alternative energy, saying that, “Alternative energy will sooner or later replace hydrocarbons.” Following these legal and regulatory developments and political statements, several foreign and Russian investors turned their attention to the country’s vast renewable energy potential. In addition to RusHydro, which has had renewable energy on its agenda for some time, other companies, including affiliates of Rosatom, Rosnano and Rostechnotlogii, started developing renewable energy projects.

Many other countries, including all of the EU members, have adopted specific targets for renewable energy to account for a certain proportion of total energy demand and/or electricity consumption (or generation). All the EU members have also adopted targets for renewables in the heating and transport sectors. Countries that adopt such targets usually develop a detailed renewable energy strategy, or action plan, outlining how the country will achieve the target (see Box 1). Although such action plans are not a key prerequisite for successful renewable energy deployment, they are generally very useful because they: i) provide a long-term vision for investors and enhance policy credibility; and ii) help the government to track progress in meeting the national target.

If renewable energy targets are not supported by effective measures, the risk of non-compliance is high. If targets are neither mandatory nor properly enforced, their raison d’être is undermined, damaging investors’ confidence in the government’s policy commitments. In Russia, Resolution No. 1-r does not explicitly state that the renewable energy targets are mandatory: it simply says that the Ministry of Energy should adopt additional “indicative” targets in order to monitor achievement of the general objectives.

---

8 Article 21, paragraph 1, Federal Electricity Law.
9 This percentage does not include large-scale hydropower plants (i.e. above 25 megawatts).
10 Energy Strategy to 2030, p. 54.
The target of 1.5 per cent by 2010 has not been met. The updated General Scheme for the Development of the Electricity Sector, currently at government approval stage, assumes that, with the current legal and regulatory framework, the 4.5 per cent target will not be met by 2020. According to the Energy Forecasting Agency, only about 0.3-0.4 gigawatts of new renewable energy capacity will be installed by 2020. The Agency assumes that the 4.5 per cent target might be met by 2030. But even in 2030, only 6.1 gigawatts of the new renewable energy capacity are projected to come online in the Agency’s “reference scenario” and 14.1 gigawatts in its “maximum growth” scenario. Postponing the target to 2030 would make it more expensive to meet. The delay in adopting the incentive schemes necessary to reach the target would affect investor confidence, thus increasing the cost of investment in renewable energy sources because of a “risk premium” (see 4.2.1. Regulatory Instability and Unpredictability). Moreover, postponing the target would also affect the total investment required: in 2030, more capacity/more electricity is expected to be produced and consumed.

**BOX 1. Promotion of Renewable Energy in the European Union**

**Integrated Climate and Energy Policy**

Members of the EU have a binding obligation to promote renewable energy within the framework of the EU-wide “climate and energy package”. In March 2007 the EU leaders endorsed an integrated approach to climate and energy policy. Pursuing the double objective of combating climate change and increasing the EU’s energy security, while strengthening its competitiveness, the EU Heads of State and Government set three targets, known as the “20-20-20” targets, to be met by 2020:

- A reduction in EU greenhouse gas emissions of at least 20 per cent below 1990 levels;
- 20 per cent of EU gross final energy consumption to come from renewable resources; and
- A 20 per cent reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

In January 2008, the European Commission proposed binding legislation to implement the 20-20-20 targets. This “climate and energy package” was agreed by the European Parliament and Council in December 2008 and became law in June 2009.

**National Targets**

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 (Renewable Energy Directive 2009/28/EC) is part of the energy and climate package. This Directive sets binding national targets to increase the share of renewable energy in gross final energy consumption by 2020. These targets vary from country to country depending on available resources and other conditions, and range from 10 per cent for Malta and 13 per cent for Belgium, Cyprus, the Czech Republic, and Hungary, to 38 per cent for Finland and 49 per cent for Sweden. The member countries are required to set specific renewable energy targets for the following sectors: i) heating and cooling; ii) electricity; and iii) transport. The three targets taken together must be sufficient for a country to reach its overall binding target, as set by the Directive. The Directive sets a specific target for the transport sector in every EU country: at least 10 per cent of the energy used in transport must come from renewable sources.

**National Renewable Energy Action Plans**

Under Article 4 of Renewable Energy Directive 2009/28/EC, the EU member countries were required to submit national renewable energy action plans (NREAP) by 30 June 2010. These plans were to be prepared in accordance with the template published by the Commission and they were to provide detailed roadmaps showing how each member state expected to reach its legally binding 2020 targets. The template, adopted by the European Commission in June 2009, required each EU country to include the following information in its Action Plan:

---

14 The General Scheme to 2020 was adopted by the Russian government in 2008. An updated scheme with an outlook to 2030 was approved in principle by the government in June 2010 and is expected to be officially adopted.

1. Summary of national renewable energy policy;
2. Expected final energy consumption to 2020;
3. Sectoral targets and trajectories for heating and cooling, electricity and transport;
4. Regulatory and financial measures to achieve the targets in each of these sectors, as well as specific measures and reforms to overcome the barriers to developing renewable energy (see below);
5. Assessment of the contribution of specific technologies to meeting the target.

When describing specific measures the countries must address the following issues:

- Administrative procedures and spatial planning;
- Technical specifications;
- Buildings;
- Information provisions;
- Certification of installers;
- Electricity infrastructure development;
- Electricity network operation;
- Biogas integration in natural gas networks;
- Biofuels and other bio-liquids: sustainability criteria and verification of compliance;
- District heating and cooling infrastructure development;
- Planned use of statistical transfers and joint projects.

Of particular note, the countries must provide information on specific measures to promote the use of energy from biomass:

- Biomass supply, including domestic and trade;
- Measures to increase biomass availability.

An assessment of the costs and benefits of the support measures is optional and only a few countries have provided one. The NREAPs suggest that the European Union is likely to meet and even surpass its overall renewable energy target. Sixteen member countries, including Finland, Germany, Spain and Sweden, forecast that they will exceed their binding targets. Only two countries (Italy and Luxembourg) admit that they will likely become the recipients of cross-border cooperation. The European Renewable Energy Council (EREC) notes: “The fact that nearly all Member States intend to achieve their national targets within their national territory and that more than half of them foresee to overshoot their targets sends a strong signal showing that Member States consider renewable energy as the energy source of the future.” (EREC, 2011)

However, as highlighted by Environmental Data Services (ENDS), while the NREAPs “display some sound planning and a significant amount of goodwill on the part of member states, the plans are just figures on paper. The challenge will be to deliver the investments needed to build capacity.” (ENDS Europe, 2010) The quality and completeness of the submitted NREAPs varies significantly among countries. Ragwitz et al (2011) note that, “…several countries have taken the obligation seriously to provide a complete and comprehensive renewables roadmap up to 2020, indicating what is in place and what needs to be done. Others drew a nice picture on the implemented measures to stimulate an enhanced renewables deployment, which does not in all cases match with reality. Very few countries provided a minimalistic and incomplete report.”

Many NREAPs could be further improved. According to EREC and ENDS Europe, areas for stronger policy focus in the electricity sector include: the simplification of authorization and permitting procedures; procedures for connecting to and managing the grid; and grid extensions and interconnections. Nevertheless, despite their shortcomings, NREAPs represent a very important step towards meeting the EU’s renewable energy target because they explain current and planned policies to investors and other stakeholders and allow progress to be tracked.

1.3. Economic, Social and Climate Change Policy

As highlighted by the Russian authorities, the development of renewable energy fits very well with several of the country’s strategic policy objectives, including modernizing the Russian economy and improving its energy efficiency. Russia faces an urgent need to upgrade its obsolete and very energy inefficient infrastructure in order to ensure a reliable and secure electricity supply. It must also encourage energy savings in the electricity sector as part of a general effort to make the Russian economy more energy efficient. Renewables can play a role in modernizing the electricity sector, as discussed in Section 2.3.

Another related policy objective is to transform Russia into an “economy of leadership and innovation”, as stated in the Concept for Long-Term Social and Economic Development to 2020 (“the Concept”). The Concept envisions that Russia will not only remain a key producer and exporter of raw materials, but that it will also develop high-tech sectors and make its economy “competitive worldwide”. It states that there will be several aspects to the transition to an innovative economy, including “winning leading positions in the development of renewable energy sources”. Russian Government Resolution No. 1-r also states that the use of renewable energy contributes to the “integration of innovative high technology and equipment in the energy sector”. Notably, the Russian policy document, “List of Priorities for the Development of Science and Technology”, approved in 2006, identifies energy and energy efficiency as priorities.16

As it pursues its objective of making the Russian economy globally competitive, the government should keep in mind the global trend towards “greening” of energy supply and use. Driven by the climate change challenge and energy security concerns, more and more countries are turning their attention to renewable energy sources. In its World Energy Outlook 2010 the International Energy Agency (IEA) projects that the share of fossil fuels in global primary energy demand will fall from 81 per cent in 2008 to 74 per cent in 2035, while the share of renewables increases from 7 per cent to 14 per cent over the same period in its New Policies Scenario.17 The share of renewables in global electricity supply is projected to increase from 19 per cent in 2008 to nearly a third in 2035 in the same scenario. Can Russia, as a key energy player, remain a mere observer of this global trend? Or, is it in Russia’s strategic interest to develop its own renewable energy industry and ultimately become a front runner in the global process of “greening” energy, which would be possible given its considerable renewable energy

---


17 This is the scenario that takes into account the policies and measures already implemented and also those that have been announced. IEA, World Energy Outlook (IEA, Paris, 2010).
potential? The examples of Denmark, Germany and Spain demonstrate that countries that actively support their renewable energy industry in the early stages go on to become leading renewable energy players.

Another important objective set out in the Concept is “balanced territorial development” and reducing inequalities among regions. Here again, renewable energy can play an important role by boosting economic development and creating jobs in regions with abundant renewable energy resources. This will help Russia to achieve two more of the objectives set out in the Concept, namely, human welfare and social well-being and harmony.

The wider use of renewables would help Russia address environmental challenges, as it would reduce the use of fossil fuels and decrease air pollution. The Concept highlights that environmental indicators in about 15 per cent of the Russian territory reveal dangerous or nearly dangerous environmental conditions and that 56 per cent of the urban population live in cities with high or very high air pollution levels.

Russia’s Climate Doctrine, signed by the president in 2008, states that the Russian Federation “will concentrate its efforts, as much as possible, on reducing anthropogenic emissions of greenhouse gases…” To this end, several measures are planned, including “developing the use of renewable and alternative energy sources”. The Climate Doctrine also says that effective climate change policy will be a “catalyst for the dynamic technological modernization of the whole Russian economy, thus strengthening its positions in the global economic community…” It also states that one of the climate change policy priorities is to develop a legal and regulatory framework to reduce human impact on the global climate system.

According to the Fifth National Communication of the Russian Federation to the United Nations Framework Convention on Climate Change (UNFCCC), the energy sector accounts for nearly 82 per cent of the country’s anthropogenic greenhouse gas emissions. Therefore, the Russian energy sector has a key role to play in reducing the country’s impact on climate change. It is encouraging that the Energy Strategy to 2030 includes energy efficiency and the environmental safety of the energy sector among its key policy directions. However, some of the Russian energy policy directions may contradict the overall climate change mitigation goals of the international community. For example, one of the policy directions is to reduce the use of gas in Russia’s energy mix and increase the use of coal (the most carbon dioxide-intensive fossil fuel). Chapter 3 discusses how the European Union might be able to help attract investments to reduce the climate impact of Russian energy use. Nevertheless, the key responsibility for mitigating energy-related greenhouse gas emissions lies with Russia itself. By actively developing renewable energy sources, Russia would move towards a better integration of its climate and energy policies. In doing so, the Russian government would show its commitment to combating climate change, while attracting investments that are beneficial for the national economy. Such a commitment by the world’s largest fossil fuel producer and exporter would send a very strong, positive message to the international community.

**BOX 2. The Energy Sector and Climate Change**

The possible impacts of climate change add to existing policy and regulatory concerns, such as the optimal energy mix, pricing, grid operation and demand management.

---

18 p. 6, paragraph 23.
19 The Fifth National Communication of the Russian Federation to the UNFCCC, Moscow, 2010.
BOX 2. (continued)

The Russian Climate Doctrine rightly highlights the need to carry out scientific studies on climate change and its implications, in order to design adequate policies and measures. The Doctrine points out that climate change can have not only negative, but also positive impacts on Russia’s economy and society. However, the exact impacts and their degree and severity are difficult to estimate. Among positive impacts, the Doctrine mentions: improving the structure of crop production, expanding agricultural zones, and increasing boreal forest productivity. These developments could increase the availability of biomass for energy needs. According to the Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet), increased precipitation in Russia (apart from the North Caucasus) will generally have a positive impact on hydropower generation, but some areas will suffer from reduced mean annual inflows to reservoirs.20

A study published by the World Bank Group21 focuses on the possible negative and positive impacts of climate change on the energy sector in Russia and other countries in the region. One of the most remarkable impacts is reduced demand for heat in winter and increased demand for cooling and air conditioning in summer. The study warns that, “Electricity systems that are overstretched will be particularly affected by warming trends and some are already experiencing impacts. Many regions of Russia are struggling with supply side capacity constraints either not meeting demand, or projected not to in the near future. In the absence of back up, supply shortages could lead to issues of affordability of energy for some segments of the population.” It also notes, “Rising temperatures may make load management more problematic especially for aging infrastructure and networks; networks located in areas with summer-time power constraints; or for energy systems dependent on hydropower where drought and heat wave are a risk.”

As climate change impacts represent both challenges and possibly opportunities for the Russian energy sector, including the renewables sector, they should be taken into consideration when developing renewable energy policy.

SPOTLIGHT

Renewables Contribute to Meeting Strategic National Policy Objectives

“Winning leading positions in the development of renewable energy sources”

— Russia’s Concept for Long-Term Social and Economic Development to 2020

2. The Russian Energy Sector: Opportunities and Challenges for Renewables

This chapter analyses aspects of the Russian energy sector that influence (positively or negatively) the prospects for renewable energy deployment. It starts with a brief summary of Russia’s ongoing electricity sector reform, in order to provide a better understanding of the opportunities and challenges. This summary also provides the context for the discussion in Chapter 3 of the proposed support schemes. It then looks at current developments in the energy sector that are creating momentum for the wider use of renewables. It concludes with an analysis of several key system barriers to the development of renewables.

2.1. Electricity Sector Reform

Russia has reformed its electricity market by organizing it on a free market basis, at least in theory. The Federal Electricity Law provides the legal basis for the operation of the liberalized electricity sector. One of the central aspects of the Russian electricity reform is the creation of a competitive wholesale electricity and capacity market. The Wholesale Market Rules, adopted by Resolution of the Russian Government No. 1172 dated 27 December 2010, constitute the regulatory basis for the functioning of the Russian wholesale electricity and capacity market. The regulator of the wholesale market is the Market Council (Soviet Rynka). The Market Council is a “self-regulating” entity and is therefore not formally part of the executive branch of the Russian government.

The wholesale electricity market consists of a day-ahead (spot) market (rynok na sutki vpered) and an intraday (balancing) market (balansiruiushchii rynok). In addition to transactions on the day-ahead market, the electricity commodity can be traded on the basis of bilateral contracts.

The capacity market remunerates generators for the installed capacity of their electricity generating facilities. The System Operator organizes the capacity market for four years preceding the supply of capacity. To fulfil their capacity supply obligations, generators that sell (supply) capacity on the wholesale market must guarantee the availability (readiness) of their installations to produce

---

22 Article 31, Federal Electricity Law.
electricity. The System Operator selects capacity on a competitive basis. It therefore aims to achieve long-term security and short-term reliability of electricity supply. Capacity demand is created by requiring the buyers of electricity on the wholesale market to purchase an amount of capacity that corresponds to their peak electricity consumption.

Parallel to this liberalization process, Russia has pursued corporate restructuring (privatization) of the electricity sector by selling the thermal electricity production capacity of the former quasi-monopolist RAO UES to private Russian and foreign investors. The assets sold off are classified as either wholesale generating companies or territorial generating companies. The objective of the liberalization and privatization processes is largely the same: to attract capital and technology in order to improve the energy efficiency of the sector and guarantee security of electricity supply.23

The investors that purchased RAO UES’s production assets committed themselves to implementing the investment programmes already in place for these facilities. In accordance with the philosophy of the RAO UES corporate restructuring process, the installed capacity envisaged by these investment programmes is to be remunerated at regulated tariffs for a period of ten years. Investors conclude “Agreements for the Delivery of Capacity on the Wholesale Market” (Dogovory o Predostavlenii Moshchnosti). The purpose of these agreements is to ensure the implementation of the investment programmes of the former RAO UES, in particular, the construction of electricity generating facilities that are essential to guarantee secure and reliable electricity supply. The Agreements for the Delivery of Capacity on the Wholesale Market are therefore a result of the corporate restructuring (privatization) of RAO UES; they are not a direct result of the organization of the Russian electricity market on a free market basis (liberalization). The agreements are characterized by regulated prices for a long-term period and therefore are an exception to the competitive segment of the capacity market organized by the System Operator (described above).

RAO UES ceased to exist on 1 July 2008.24 Moreover, following the gradual transition from regulated to “free” market prices, since the first of January 2011 the wholesale market has functioned on the basis of the long-term model.

Participation in the wholesale market is limited to large generating facilities. Generators with an installed capacity equal to or exceeding 25 megawatts must participate in the wholesale market.25 Generators with capacity of at least 5 MW (but less than 25 MW) can sell electricity and capacity on the wholesale market or participate in the retail market. Smaller generating facilities must participate in the retail market. The retail market is open to competition, with the exception of regulated tariffs for the electricity supplied by the “guaranteeing suppliers” (garantiruuiushchii postavshchik), i.e. “suppliers of last resort”.

The wholesale market is divided into price26 and non-price zones. Non-price zones are not organized on the basis of the free market model. Moreover, isolated regions are not included in the wholesale market.

---

23 Article 20, paragraph 1, of the Federal Electricity Law considers the creation of the “necessary conditions to attract investments for the development and functioning of the Russian electric power system” as a “fundamental principle of government regulation and control in the electric power industry”. See also Vladimir Putin, “Predsedateľ pravitel'v'ja Rossijskoj Federatsii provel soveshchanie po investitsionnomu programme elektroenergetiki’ [The Chairman of the Government of the Russian Government, V. V. Putin, Held a Meeting on the Investment Programme for the Electric Power Sector], 24 February 2010, available at http://www.premier.gov.ru. Putin stated, “We anticipated that the reform of the electricity market would lead to new sources of finance for innovation and modernization in this important sector.”


25 Article 36, paragraph 5, Federal Electricity Law.

26 The price zones are further divided into first price zones and second price zones.
2.2. Opportunities for Renewable Energy Sources

This section discusses how renewable energy can contribute to the security and cost-efficiency of electricity and heat supply. It starts by looking at how renewables can contribute to the building of modern, efficient, environmentally friendly generation capacity when old and inefficient power plants retire in the short and medium term. It will be argued that, thanks to distributed generation, renewables can foster the use of local energy sources, thus reducing the need for fuel transportation and/or electricity transmission over large distances. This section then discusses the current place and the potential future role of renewables in the heat sector. It concludes by examining the idea that increased renewables deployment in Russia could make more natural gas available for export.

2.2.1. Power Sector Investment Requirements

The Russian electricity sector is characterized by aging generation capacity. Huge investments are needed to modernize and replace old and unreliable infrastructure. According to Russia’s Energy Strategy to 2030, the total capital investment required in generation capacity is between $355 billion and $554 billion.27

Figure 1 below shows the new generation capacity required according to the “Reference Scenario” (base scenario) and the “Maximum Consumption Scenario” developed by the Russian Energy Forecasting Agency for the updated version of the General Scheme for the Location of Electricity Generating Facilities to 2030 (“the General Scheme”). According to the General Scheme, between 2009 and 2030, 67.7 gigawatts of existing capacity is expected to be decommissioned, while 173 to 228.5 gigawatts of new capacity must be constructed.

---

See, for example, the energy Strategy to 2030, and the Scenario Conditions for the Development of the electricity Sector to 2030 (APBE Energy Forecasting Agency).

The Russian authorities recognize that this need for new capacity and the related investment challenges represent a unique opportunity to modernize and “decarbonize” the power sector, so as to guarantee the long-term security of electricity supply in a climate-friendly way.28 Investments made today will result in a generation capacity mix that will continue for decades to come. Given Russia’s huge renewable energy resources and the apparent political will to support renewables, a significant share of the required new generation capacity could, theoretically, come from renewable sources. However, according to the General Scheme, this will not be the case (because the regulatory framework to support investment in renewables is not yet in place). Figure 2 shows the structure of installed capacity and electricity generation in the updated General Scheme. The Reference Scenario anticipates that 6.1 gigawatts of renewable energy capacity (excluding large hydro) will be built by 2030, mainly in the period after 2025. If this happens, renewables would account for only 2 per cent of electricity generation in 2030. As for the 2020 deadline, the share of renewables is expected to be insignificant, with only 0.3-0.4 gigawatts of new renewable energy capacity coming online by that time. However, several renewable energy projects are planned for the period 2010-2020, and it is encouraging that they are included in the General Scheme.

![Figure 1. Requirements for new electricity generation capacity to 2030](image)

**Figure 1. Requirements for new electricity generation capacity to 2030**

Source: Kozhuhovsky, I. (APBE Energy Forecasting Agency), Presentation on the General Scheme, Adam Smith Conference on Russian Power, 23 November 2010

### Figure 2. Structure of installed capacity and electricity generation, 2008 and 2030

#### Installed capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>Gigawatts</th>
<th>2008</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>23.5</td>
<td>50.5</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>45.9</td>
<td>58.6</td>
<td></td>
</tr>
<tr>
<td>Fossil</td>
<td>145.3</td>
<td>208.3</td>
<td></td>
</tr>
<tr>
<td>Renewables</td>
<td>0.4</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>215.1</strong></td>
<td><strong>323.8</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kozhuhovsky, I. (APBE Energy Forecasting Agency), Presentation on the General Scheme, Adam Smith Conference on Russian Power, 23 November 2010

#### Electricity generation

<table>
<thead>
<tr>
<th>Year</th>
<th>Billion kWh</th>
<th>2008</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>162.3</td>
<td>370.5</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>166.2</td>
<td>212.7</td>
<td></td>
</tr>
<tr>
<td>Fossil</td>
<td>698.9</td>
<td>1018.2</td>
<td></td>
</tr>
<tr>
<td>Renewables</td>
<td>0.4</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1027.8</strong></td>
<td><strong>1626.6</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kozhuhovsky, I. (APBE Energy Forecasting Agency), Presentation on the General Scheme, Adam Smith Conference on Russian Power, 23 November 2010

---

28 See, for example, the Energy Strategy to 2030, and the Scenario Conditions for the Development of the Electricity Sector to 2030 (APBE Energy Forecasting Agency).
Apart from investment in new generation capacity, major investments will also be required in the Russian electricity networks. The Energy Strategy to 2030 estimates the capital investment needed to develop the network infrastructure at between $217 billion and $334 billion for the period 2009 to 2030 (at 2007 prices). As stated in the Energy Strategy, the development of decentralized renewable energy sources can reduce the need to transport energy over large distances, thus reducing power losses.

2.2.2. Isolated Zones

The security and affordability of electricity supply are particularly important issues for the Far East and other isolated zones. These zones, with 9.4 gigawatts of capacity, represent a relatively small part of the Russian electricity market, but cover wide geographic areas. The large distances involved and a lack of power transmission interconnections result in a lack of competition. Therefore, these areas will not benefit from liberalization and their electricity prices will remain regulated for the foreseeable future. Due to the large distances and the inadequate infrastructure, the supply of traditional fuels to many isolated areas is extremely costly and must be heavily subsidized. Experts estimate that 10 to 15 million people live in such isolated areas. These areas therefore represent a large potential market for renewable energy technologies. The use of local, renewable sources would not only reduce energy costs, but would also boost local economic development and job creation. In 1997, responding to these considerations, the government adopted a programme for the supply of isolated areas and the areas inhabited by the indigenous peoples of the North, Siberia and the Far East, with power based on non-traditional renewable and local energy sources. This programme was for the years 1997-2000. It was followed by the federal programme “The Energy Efficient Economy in 2002-2005 and up to 2010”, adopted in November 2001, which contained a section on “The Effective Energy Supply of Regions, including the Northern Territories, on the basis of Non-Traditional Renewable Energy Sources and Local Fuels”.

**SPOTLIGHT**

<table>
<thead>
<tr>
<th>Electricity sector investment challenges</th>
<th>How can renewables contribute?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required capital investment in generation capacity to 2030: $355 billion – $554 billion</td>
<td>Decarbonizing the generation mix</td>
</tr>
<tr>
<td>Required capital investment in infrastructure to 2030: $217 billion – $334 billion</td>
<td>Distributed generation – reduction of transportation needs</td>
</tr>
<tr>
<td></td>
<td>Reliable supply to isolated areas</td>
</tr>
</tbody>
</table>

2.2.3. Momentum for “Greening” the Heat Supply

Heat accounts for more than half of Russia’s total final energy consumption, above the world average. The whole heat supply chain is inefficient and there is significant potential to make heat savings in residential and commercial buildings, as well as in industrial processes that use heat. With the reform of the electricity market under way, the Russian authorities are now aiming to develop a new regulatory structure for the heat sector. Federal Law No. 190-FZ “On Heat Supply” was adopted on 27 July 2010 (hereafter “the Federal Heat Supply Law”). This law aims to modernize the sector and improve its energy efficiency.

---


RENEWABLE ENERGY POLICY IN RUSSIA: WAKING THE GREEN GIANT 17
Russian experts estimate that renewable energy accounts for about 4 per cent of heat supply in Russia. According to the Fifth National Communication of the Russian Federation to the UNFCCC, there were about 66,000 heat supply sources in Russia in 2007, of which 33,400 were fired by gas, 27,000 by solid fuels, 4,100 by liquid fuels and only 1,600 by renewable energy sources. The renewable sources have mainly comprised the traditional use of biomass (wood), used for space heating. The traditional use of biomass is not considered sustainable because it is often burned at low efficiencies and releases many unhealthy pollutants. However, modern biomass technologies have also made inroads in the Russian heat markets, for example, some coal-fired and heavy fuel oil-fired boilers have switched to using wood pellets. Moreover, there are many more old and inefficient boilers and combined heat and power (CHP, cogeneration) plants that could be converted to biomass use. There is also the potential to use geothermal energy for heat in regions with geothermal resources (Kamchatka, the Kuril Islands and the North Caucasus).

More and more countries are recognizing the potential role of renewable energy in modernizing and decarbonizing the heat sector. However, worldwide, the policies to support renewable heat are less developed than the policies to support renewables in the electricity sector. Examples of policies to support renewable heat are provided in Box 3. Experience gained in electricity policy cannot simply be transposed to heat because there are significant differences between the two sectors. Heat supply is much more heterogeneous. One single heat market does not exist as such; there are many local heat markets with a great number of players operating in different conditions. At the same time, in Russia, as in several Nordic countries, heat supply is closely intertwined with the electricity sector because of the large share of cogeneration. Therefore, designing adequate policies to stimulate the use of renewables for heating would also help encourage “green” CHP, and thus help Russia to meet its 4.5 per cent target for the electricity sector.

**Box 3. Policies to Support Renewables for Heating and Cooling**

**Types of policies and measures**

Worldwide, the policies to support the use of renewables for heating and cooling are less developed than the policies to support renewables in the electricity sector. The growth of renewables in these sectors has often been limited because of the stop-and-go nature of support in some countries (IEA, 2010). According to analysis by the IEA, existing policies can be classified into three categories: sticks, carrots, and guidance, similarly to policies in the electricity sector (IEA, 2007).

**Carrots (incentive schemes)** include:

- **Investment incentives** such as capital grants and rebates, operation grants, soft loans and loan guarantees. For example, the German Market Incentive programme (MAP) has driven significant growth in solar thermal installations through investment grants and soft loans.
- **Fiscal incentives** such as tax credits, tax reductions and exemptions. For example, Sweden has successfully used tax exemptions to increase the share of heat produced from biomass.

**Sticks (regulatory schemes)** include:

- Building regulations. For example, in Barcelona, Spain, new and renovated buildings must use solar thermal technologies to meet at least 60 per cent of their hot water requirements.
- Standards.
- Purchase obligations. Slovak district heating companies are obliged to buy heat produced from renewable sources. Denmark requires utilities to purchase and incinerate specified amounts of wood and straw.

---

BOX 3. (continued)

Guidance (education-based schemes) includes enhancing public awareness through different forms of information dissemination, training, and technical assistance. The IEA (2007) gives the example of a successful Canadian programme, the Renewable Energy Deployment Initiative (REDI), which ran from 1998 to 2007. This programme stimulated demand for water heating, space heating and industrial process heating from renewable energy by providing information, analysis and advice, among other actions.

The IEA (2007) emphasizes that a combination of different instruments (sticks, carrots and guidance) is vital for the success of renewable energy deployment in heating and cooling. The IEA also concludes that, “Each nation must design its own system and combination of policies based on its individual situation, resources and set of goals.”

The IEA (2007 and 2010) also warns that experience gained in electricity policy cannot simply be transposed to heat because there are significant differences between the two sectors. Heat supply is much more heterogeneous. One single heat market does not exist as such; there are many local heat markets with a great number of players operating in different conditions. Therefore, renewable energy policy should take into account local circumstances to a greater extent. Nevertheless, experience gained in the electricity sector could be useful if it is adapted to the particularities of heating/cooling. The U.K. government has taken a first initiative in introducing a feed-in tariff (FIT) for the heat sector (see below). Feed-in tariffs for heat were also considered in Germany, but they were not implemented (IEA, 2010).

EU experience

At both EU and national levels, in the past, the potential role of renewable energy in the heating and cooling sectors received relatively little policy attention, compared to electricity and transport. However, the situation has changed in recent years. Following the adoption of Renewable Energy Directive 2009/28/EC, all EU members must include policies and measures for the heating and cooling sectors in their National Renewable Energy Action Plans (NREAPs) (see Box 1). The share of renewables in heating and cooling reached about 11.9 per cent in 2008, with biomass representing 11.4 per cent of heat consumption, geothermal energy 0.3 per cent and solar thermal energy 0.2 per cent. According to the 27 NREAPs, renewable energy is expected to account for 21.3 per cent of EU heating and cooling consumption in 2020, while some energy industry experts estimate that this share could reach 23.5 per cent (EREc, 2010).

Table A below, based on analysis by Ecofys, provides an overview of “carrot” measures in the European Union. According to Ecofys (2011), most EU countries promote the use of renewables in heating and cooling by offering investment grants and tax exemptions, while financial incentives, such as soft loans, are less commonly available. The use of renewables in district heating receives relatively little attention in the NREAPs, with the exception of the plans submitted by Austria, Finland, Hungary, and Lithuania (Ecofys, 2011). EREC (2011) notes that only a few countries, such as Germany, Greece, and Spain, propose a renewable heat obligation for buildings. Also, not all of the NREAPs propose the streamlining of authorization procedures.

Table A: Overview of the main mechanisms to support renewable heat and cooling in the EU-27

<table>
<thead>
<tr>
<th></th>
<th>AT</th>
<th>BE</th>
<th>BG</th>
<th>CY</th>
<th>CZ</th>
<th>DE</th>
<th>DK</th>
<th>EE</th>
<th>ES</th>
<th>FI</th>
<th>FR</th>
<th>GR</th>
<th>HU</th>
<th>IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment grants</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Tax exemptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial incentives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>IT</th>
<th>LT</th>
<th>LU</th>
<th>MT</th>
<th>NL</th>
<th>PL</th>
<th>PT</th>
<th>RO</th>
<th>SE</th>
<th>SI</th>
<th>SK</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment grants</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Tax exemptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial incentives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

Source: Ecofys, 2011
The United Kingdom’s innovative scheme: heat feed-in tariff

The U.K. government confirmed the introduction of a new Renewable Heat Incentive (RHI) at the end of 2010. In March 2011, the U.K. Department of Energy and Climate Change published details of the policy in the official document “Renewable Heat Incentive”. The government plans to take a phased approach to implementing the RHI.

In the first phase, long-term tariff support will be introduced for large users of heat and big emitters of carbon dioxide in the non-domestic sector. The key aspects of the RHI tariffs in this phase will be:

- Support for a range of renewable technologies and fuels;
- Support for all non-domestic sectors, including: the industrial, commercial, and public sectors; and not-for-profit organizations and communities in England, Scotland and Wales;
- RHI payments to be claimed by, and paid to, the owner of the heat installation or the producer of bio-methane;
- Payments will be made quarterly over a 20-year period;
- For small and medium-sized plants (up to and including 45kWth), both installers and equipment are to be certified under the Microgeneration Certification Scheme (MCS) or equivalent standard, helping to ensure quality assurance and consumer protection;
- Tariff levels have been calculated to bridge the financial gap between the cost of conventional and renewable heat systems, with additional compensation for certain technologies for an element of the non-financial cost;
- Heat output to be metered and the support calculated from the amount of eligible heat, multiplied by the tariff level;
- Biomass installations of 1 MW capacity and above will be required to report quarterly on the sustainability of their biomass feedstock for combustion and to produce biogas;
- Eligible non-domestic installations completed on or after 15 July 2009, but before the start of the RHI, will be eligible for support as if they had been installed on the date of its introduction;
- The Gas and Electricity Market Authority (Ofgem) will administer the RHI including: dealing with applications; accrediting installations; making incentive payments to recipients; and monitoring compliance with the rules and conditions of the scheme; and
- The RHI will be funded from general government spending (i.e. the budget), not through the previously proposed RHI levy.

As part of the first phase, the government also plans to introduce Renewable Heat Premium Payments for the domestic sector (from July 2011). In return for the payments, participants will be asked to provide some feedback on how the renewable heat equipment works in practice. The Premium Payments will help the government to learn more about the technologies and manage their roll-out, while controlling budgets.

From 2012, the government plans to introduce a second phase of support, which will include RHI tariffs for domestic installations and a number of additional technologies and fuel uses.


SPOTLIGHT

Renewables for Heating

<table>
<thead>
<tr>
<th>Russia</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current share – 4% (estimated)</td>
<td>Current share – 12%</td>
</tr>
<tr>
<td>Large growth potential</td>
<td>Expected share by 2020 – 21.3%</td>
</tr>
<tr>
<td>Heat sector reform: opportunity to “green” heat supply</td>
<td>Increased policy focus, renewable heat is included in the National Renewable Energy Action Plans</td>
</tr>
</tbody>
</table>
2.2.4. Export Potential

Over the last decade, one strong argument in favour of renewables in Russia has been that replacing gas with renewable sources in Russia’s energy mix would free up more natural gas for export. In the mid to late-2000s there were concerns that, without additional investments, the Russian gas industry might fail to meet the demands of the internal Russian market and the export markets. The idea of freeing up more gas for export by improving energy efficiency and developing renewable energy sources was incontestably very appealing. However, when global gas demand dropped sharply following the 2008 financial crisis, and the fall in demand was accompanied by unexpectedly high unconventional gas production in the United States, a significant glut of gas-supply capacity developed worldwide, particularly in Europe. The reduced export revenues gave rise to arguments in Russia about the need to maintain the gas industry by stimulating demand on the internal market (hence, there would be no need to develop other sources).

Such arguments, reflecting short-term reality, can serve as a strong barrier against the development of renewables. These arguments could also be short-sighted. Gas demand started to recover in 2010 and is expected to grow steadily over the coming decades. In Europe, where an increasing amount of intermittent renewables-based generation is coming online, gas is expected to play a growing role in fuelling back-up capacity. Moreover, EU generators constrained by the EU Emissions Trading Scheme (EU ETS) have incentives to replace old coal-fired capacity by gas-fired plants, as gas plants emit less carbon dioxide, while also being less capital intensive and quicker to build. The “New Policies Scenario” in the IEA’s World Energy Outlook projects that global gas demand will increase by 44 per cent between 2008 and 2035. Demand growth will be highest in China, at nearly 6 per cent per year on average. Therefore, despite a temporary decline in global gas demand, opportunities to export Russian gas are still significant in the medium to long term. This means that developing renewable energy sources can still help to provide energy to meet internal needs, while also freeing up more fossil fuels for export.

2.3. Challenges

This section starts by looking at some key barriers to renewable energy deployment, including the uneven playing field vis-a-vis traditional fuels and the fact that externalities are not “internalized” in the cost structures of different energy sources. It then analyses the current level of government control over power prices, which serves as a barrier not only to renewable energy development, but to investment in the electricity sector as a whole. The section concludes by examining the issue of the variability of some renewable energy sources, which is often perceived as a potential problem for electricity grids, thus hindering the development of renewables.

---

33 More detailed analysis on gas export potential is available. See, for example: IFC/the World Bank, Energy Efficiency in Russia: Untapped Reserves (IFC/the World Bank, Moscow, 2008).


35 See, for example, the Energy Strategy to 2030, approved by Order of the Government of the Russian Federation No. 1234-r dated August 28, 2003.

36 For example, this argument was raised by Mr. Leshukov of the Ministry of Energy at the workshop ‘EU and Russia Modernization Partnership: scaling up low-carbon energy investments and technology cooperation’, held during the EU Sustainable Energy Week, 12 April 2011, Brussels.

As this paper focuses mainly on financial issues, it does not analyse in detail the many other barriers to renewables deployment that are mentioned in Chapter 1. Nevertheless, it should be noted that barriers such as administrative hurdles (for example, obtaining authorizations and permits), low public awareness, and the lack of technical and economic expertise, can significantly deter investment in renewable energy projects.

### 2.3.1 Uneven Playing Field

To better understand the potential role of renewables in the energy mix, it is important to have in mind the structure of the Russian energy sector as a whole. Russian total primary energy supply consists mainly of fossil fuels: natural gas, oil, and coal. The share of gas in Russia’s total primary energy supply is among the highest in the world. Hydropower accounts for around 2 per cent, and other renewable sources together account for about 1 per cent (see Figure 3). The country’s electricity generation mix is also dominated by fossil fuels, which accounted for more than two-thirds of total generation in 2008, compared with hydropower and nuclear power, which each accounted for approximately 16 per cent (see Figure 2). The share of non-hydro renewable energy sources in the electricity generation mix is less than 1 per cent.

**Figure 3. Russia’s total primary energy supply, 2008**

The availability of vast fossil fuel resources, as well as the importance of the Russian gas, oil, coal, and nuclear industries for Russia’s economy, present barriers to the development of renewable energy sources. With the current energy market structure and pricing policies, renewable energy technologies are more expensive than traditional ones. A recent report by the Intergovernmental Panel on Climate Change concludes that, worldwide, the “levelized (sic) cost of energy for many renewable energy technologies is currently higher than existing energy prices, though in various settings renewable energy is already economically competitive… The cost of most renewable energy technologies has declined and additional expected technical advances would result in further cost reductions.”

At present, renewables are not competitive because the playing field for different energy technologies is distorted by a number of factors. Subsidies for fossil fuels have made it very difficult for renewable energy to compete on the Russian energy market. Natural gas prices in Russia have historically been kept below market price levels. Sales within Russia (the internal market) have been cross-subsidized by gas exports; moreover, gas sales to households have been subsidized by higher prices for industry.

---

38 Supply of primary energy sources, before their transformation.
39 Intergovernmental Panel on Climate Change (IPCC) UNFCCC. Special Report Renewable Energy Sources (SRREN). Summary for Policy Makers, approved at the 11th Session of Working Group III of the IPCC, Abu Dhabi, United Arab Emirates. 5-8 May 2011.
Subsidies and cross-subsidies also exist in the electricity sector, although they are gradually being reduced as a result of the ongoing reform, aimed at market liberalization. Reform of the gas market is in a less advanced stage; nevertheless, gas tariffs for industry have been steadily growing over the last decade. In 2007, the government announced its commitment to bringing gas prices on the internal market into parity with export market prices by 2011. This deadline has since been extended to 2014. In 2009, Gazprom recorded its first-ever profits from gas sales to Russian consumers.\(^{41}\)

Despite significant progress in phasing out subsidies, they remain high. The IEA estimated that in 2009 Russian subsidies for gas and electricity generated from fossil fuels cost almost $34 billion, or $238 per person, equivalent to 2.7 per cent of gross domestic product.\(^{42}\) This means that, on average, consumers paid only 77 per cent of the full economic cost of their energy products.\(^{43}\) The highest subsidies were those for natural gas. Therefore, the prospects for renewable energy in Russia will depend to a very large extent on the pace at which subsidies for traditional fuels are phased out.

### 2.3.2 Externalities

Another reason why renewable energy is not currently competitive is that environmental and social “externalities” are not taken into account when comparing the costs of different technologies.\(^{44}\) Externalities are difficult to monetize, not only in Russia, but in any country.

The existing analytical tools for comparing costs often discriminate against renewable energy and fail to account for future uncertainties, such as the risks associated with fluctuations in future fossil fuel prices.\(^{45}\) While the capital cost of most renewable energy technologies is generally high, the operational costs are lower (except for biomass), compared to fossil fuel plants. In the context of the current geopolitical and economic uncertainties, nobody can reliably forecast future fossil fuel prices. Renewable energy technologies that avoid fuel costs thus avoid fuel price risk. However, this “risk-reduction premium” is often missing from economic comparisons because it is difficult to quantify.\(^{46}\) Box 4 describes two online tools that help decision makers “internalize” such externalities when comparing different electricity generation technologies.

---

**Box 4. Internalizing Externalities**

Many studies aim to “monetize” the costs and benefits associated with the use of different energy technologies. For example, the European Commission financed a project called “Externe” (External Costs of Energy) European Research Network, which involved more than 50 research teams in over 20 countries between 1991 and 2005. The project’s objective was to estimate the externalities of energy conversion. The project results included software packages with environmental impact assessment models, and a database containing data for the whole of Europe. Externe demonstrated that the external costs of electricity generation were significantly higher for conventional technologies based on fossil fuels than for most renewable energy technologies.

---

\(^{41}\) IEA, World Energy Outlook, p. 600 (IEA, Paris, 2010).


\(^{43}\) This situation is not unique to Russia. The IEA estimates that worldwide, fossil fuel consumption subsidies (including subsidies for electricity generated from fossil fuels) amount to $312 billion.

\(^{44}\) “Externalities” in this context are the effects of electricity generation, which can have both negative and positive impacts on society, the environment, human health and climate change, but which have no financial bearing on the owner of the power plant.


\(^{46}\) Ibid.
More recently, a project has been developed under the IEA’s Implementing Agreement on Renewable Energy Technology Deployment, entitled Renewable Energy Costs and Benefits for Society. The objective of this project is to estimate the costs and benefits of electricity from renewable energy sources compared to conventional technologies. The project has created an interactive web-based calculation tool, REcalculator, to allow users to carry out their own comparative analyses of renewable energy technologies and conventional electricity generating technologies (http://www.recabs.org). The REcalculator allows the user to include the economic values of various externalities (air emissions, system integration, security of supply, employment) in the calculations. All of the project’s economic and technology assumptions are available on its website. The project data and documentation rely on internationally respected sources and are fully referenced. The REcalculator demonstrates that the total costs of many renewable energy technologies are, in the longer term, close to or even below the costs of conventional fuels if external environmental and social costs are taken into account. By 2025, many renewable energy technologies (such as wind) should become even more competitive: their costs are expected to decline thanks to the learning curve. Users of the REcalculator can insert their own key parameters to replace the default values and produce tailor-made analyses.

Sources:  http://www.recabs.org and http://www.externe.info

**SPOTLIGHT**

**Subsidies for Fossil Fuels Compared to Subsidies for Renewables**

**Total worldwide subsidies for fossil fuels and renewable energy in 2009**

- Subsidies spent on holding down the price of fossil fuels – $312 billion
- Subsidies for renewable energy – $57 billion

**Subsidies for fossil fuels in Russia**

- $34 billion = $238 per person = 2.7% GDP

Source: IEA

### 2.3.3 Price Control

According to the Federal Electricity Law, one of the fundamental principles governing the organization of the Russian electricity market is that there should be free interaction between the market players. Following a gradual transition, prices shall be formed on a free market basis. According to the philosophy of the Russian electricity reform, free market price formation is necessary to attract investors to help modernize and develop the electricity sector. In practice, however, market prices are far from being left to the “invisible hand” of the market. The Wholesale Market Rules provide for strict monitoring of price increases and allow intervention if certain thresholds are exceeded.

---

47 Article 30, paragraph 2, and Article 32, paragraph 1, Federal Electricity Law.
In 2010 and early 2011, end-users experienced particularly high electricity price increases. This was partly due to rising gas prices and the switch of electricity transmission and distribution companies to “regulatory asset base” regulation.\textsuperscript{49} In order to maintain the competitiveness of domestic industry and limit the financial burden on households, the government capped increases in end-user prices at 15 per cent for 2011.\textsuperscript{50} However, in many Russian regions, the price increases in the first months of 2011 were higher than this “norm”. To limit further price increases, the government proposed implementing a number of “stabilization” measures affecting both power generation and transmission/distribution.\textsuperscript{51}

Administrative price control slows renewable energy development and it could also endanger the overall investment climate in the electricity sector, raising investment risks. Limiting end-user price increases could also put the brakes on energy efficiency improvements.

\textbf{Figure 4: Forecast for regulated and non-regulated capacity and electricity prices to 2030, rubles/MWh and rubles/MW per month}

\textsuperscript{49} Regulatory asset base regulation includes the return of invested resources and a certain interest rate for the investor.

\textsuperscript{50} Article 9, Order of the Government of the Russian Federation No. 1172 dated 27 December 2010.

\textsuperscript{51} See, for example, the measures outlined by Deputy Prime Minister Igor Sechin at http://www.ng.ru/economics/2011-02-18/4_energy.html
2.3.4. Variability

Experience in the countries with a high penetration of renewable energy sources demonstrates that variable\textsuperscript{52} (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. System balancing could also be an issue if the share of variable renewable energy sources grows significantly.

Box 5 outlines several measures that countries can take to ensure the safe and reliable operation of their system when a growing share of electricity is generated from variable sources. Experience in Western Europe and the United States suggests that many electricity systems can cope with the addition of new intermittent capacity, provided that the total share of variable renewables is below 5 per cent.\textsuperscript{53} Some power systems, such as those of Denmark, the Iberian Peninsula, and the Nordic region, already cope with much higher levels of wind power. However, the actual ability of a power system to cope with increasing variable renewables penetration depends on the “flexibility” available (see Box 5). Therefore, the Russian target of 4.5 per cent should not create significant problems for system balancing provided that the system has enough flexibility resources and they are used in an optimal way. The Russian government has to adopt a breakdown of the 4.5 per cent by technology. Presumably, only a portion of new renewables capacity will come from variable sources such as wind. Other technologies, such as biomass, for which Russia has vast potential, can also contribute to system flexibility.

Despite the low penetration of renewables in Russia, system balancing already seems to be an issue in winter when a large share of electricity is generated by CHP plants. CHP plants, which account for nearly 45 per cent of Russia’s heat supply and around 40 per cent of its electricity generation, benefit from priority dispatch to electricity networks.\textsuperscript{54} There are situations in winter when CHP plants must be run in order to provide heat, while there is not enough demand for the electricity that they produce. It could be argued that adding intermittent renewables to a system that already has high CHP penetration would exacerbate existing problems in terms of grid operation and stability. However, this is not necessarily the case: countries like Denmark and Finland successfully combine very high levels of CHP and renewables. For example, if CHP capacity includes thermal storage, as Denmark has incentivized, then CHP can successfully balance variable wind production.

---

\textsuperscript{52} Variable sources produce electricity when resources are available, which may not coincide with demand.


\textsuperscript{54} In accordance with Article 32 of the Federal Electricity Law.
One of the objectives of Russian energy policy is to move towards the adoption of smart grids. In the long term, smart grids would certainly facilitate the deployment of renewable energy technologies. In the short term, more focus could be placed on demand-side response to enhance system flexibility and more effectively manage peak and base loads, as highlighted in Box 5.

**BOX 5. System Integration of Variable Renewable Energy Sources**

The experiences of the European Union and other countries demonstrate that growing shares of variable (intermittent) generation can create additional challenges for system balancing and that these challenges can be overcome by improving the flexibility of the electricity system. The more flexible a system is, the less effort will be needed to reach a certain level of penetration of variable energy (EWEA, 2010).

Some variability exists in all power systems because of demand fluctuations, but adding intermittent renewable sources increases this variability. System operators can rely on the following flexible resources to balance fluctuating demand and supply: 1) dispatchable plants, including gas, hydropower and some coal plants, i.e. plants that can, at any given time, generate electricity when it is required, and reduce or stop generation when it is not required; 2) demand-side measures; 3) storage (for example, pumped hydro) and 4) transmission to/from adjacent areas through interconnections.

The IEA argues in its recent study, *Harnessing Variable Renewables*, that existing flexible resources can be used to integrate a certain share of variable renewable generation into power systems. However, this share varies significantly from one system to another, depending on many factors, including “system design, operation and consumption patterns, the natural resources that underpin them, the markets they contain, and the transmission grids that bind them together.” (IEA, 2011) Insufficient understanding of the balancing capability of existing resources is a key barrier to increasing the share of variable renewables in the electricity mix. Therefore, the IEA has developed a method to assess the resources and the requirements for balancing in a given system: the Flexibility Assessment (FAST) Method (Figure A). It consists of four steps:

- **Step 1** is to assess the Technical Flexible Resource, i.e. the maximum technical ability of the flexible resources to ramp up and down over the balancing time frame.
- **Step 2** is to identify the Available Flexible Resource, i.e. to capture the extent to which the availability of the technical resource can be constrained by attributes of the power area in question.
- **Step 3** is to calculate the maximum Flexibility Requirement of the system, which is a combination of fluctuations in demand and output of variable renewable energy (the net load), and contingencies.
- **Step 4** is to establish the system’s present potential for penetration of variable renewable energy by bringing together the requirement for flexibility and the available flexible resource.

*Figure A: The IEA’s Flexibility Assessment Method (FAST)*

---

55 The Energy Strategy of Russia to 2030.
**BOX 5. (continued)**

The following measures contribute to the more efficient use of flexible resources:

- Improved forecasting of variable power production. The European Union of the Electricity Industry, Eurelectric, argues that, “It is necessary to ensure a level playing field for balancing responsibility, which applies to all producers, including wind generators, in order to stimulate all market participants to carry out thorough and proper scheduling and forecasting and thus limit system costs.” (Eurelectric, 2010)
- Developing larger-scale, faster and deeper trading of electricity; trading closer to real time (changing from day-ahead to intra-day forecasting and rescheduling producers);
- Aggregating market areas, ensuring sufficient cross-border interconnection capacity and trade;
- Improved cooperation between adjacent system operators;
- Using improved communication and control tools;
- Active demand-side participation in markets (through two-way communication systems, smart metering);
- Distributed generation and domestic storage (for example, electric cars);
- Active management of distribution networks (smart grid).

The role of demand-side response for system flexibility can be quite significant, as demonstrated by EDF in France. EDF’s Tempo tariff informed customers in advance of the electricity price for the next day using colour-coded lights. Consumption shifted an average of 45 per cent between the most expensive days (red days) and the cheapest (blue days) (U.K. Department of Energy and Climate Change, 2010).

To optimize the use of existing flexible resources, specific incentives may be needed to encourage operators to adapt to the flexibility requirements of the system. In particular, the existing mid-merit and peak power plants must have sufficient revenues to continue providing flexibility services (IEA, 2011; Eurelectric, 2010). There are concerns that higher penetration of renewable energy will result in reduced load factors for conventional flexible generators. Their ability to recover fixed costs will therefore be reduced, which can lead to earlier decommissioning of existing plants or discourage investments in new ones (Eurelectric, 2010). The IEA highlights the key role of “market mechanisms that adequately reflect the value of the flexibility service, and clearly signal the need for it well in advance.” (IEA, 2011)

The IEA and the European Wind Energy Association (EWEA) argue that new flexible resources should be developed only when the existing ones are not sufficient to safely integrate the targeted level of variable renewable generation. “The relative (and system-specific) costs of increasing the four flexible resources should be assessed carefully: it may be more cost-effective to increase demand response, for example, than to build new power plants.” (IEA, 2011)

3. Financing Renewables in Russia

This section examines mechanisms that could improve the financial viability of renewable energy investments in Russia. It starts by analysing the national and regional support in Russia for renewable energy, before looking at the flexible mechanisms of the Kyoto Protocol, in particular, Joint Implementation.

3.1. The National Support Scheme for Renewable Energy

Russia has adopted a regulatory framework to support the development of renewable energy in accordance with national strategic targets. Initially, the main element of the Russian approach to supporting renewable energy consisted of a premium added to the wholesale market price of electricity. In December 2010, the Russian authorities decided to move towards a capacity-based scheme to support renewables. At the time of writing, the authorities were still to adopt the necessary executive documents for the implementation of these support schemes in practice.

The creation of the electricity premium scheme and the capacity-based scheme is the result of a lengthy legislative process that started in the 1990s. The long timescale involved illustrates the sensitivity of the subject of renewable energy in Russia. This section starts with an historical overview of the regulatory framework governing renewable energy in Russia. It then describes the electricity premium scheme and the new capacity-based scheme and analyses how the two schemes relate to one another. The section concludes with a brief description of the mechanism to compensate the costs of connecting renewable energy generating facilities to the grid.

3.1.1. Historical Background

The creation of a regulatory framework to support the development of renewable energy in Russia has been discussed in the State Duma and the Federation Council since 1999 (the lower house and the upper house of the Russian Federal Assembly, respectively). In May 1999 the State Duma adopted a proposal for a federal law “On Government Policy for the Use of Unconventional Renewable Energy Sources”.56 The proposed law drew largely on the former Federal Law “On Energy Efficiency”, which contained a definition of “renewable energy sources”.

---

56 State Duma Decree No. 3968-II GD dated 19 May 1999.
The 1999 State Duma proposal contained far-reaching initiatives. Indeed, it proposed that, each year, not less than 3 per cent of total public investment in Russia’s fuel and energy complex should be in the development of renewable energy sources. Moreover, it proposed that the Russian government provide state guarantees to attract financing for renewable energy projects. However, the Russian President rejected these proposals.  

Following a renewed attempt, in November 2007, Russia succeeded in creating a legal basis for the development of renewable energy sources. Federal Law No. 250-FZ dated 4 November 2007, which amended the Federal Electricity Law (hereafter, “the Federal Law Introducing the Electricity Premium Scheme”), created a system whereby premiums were to be added to the wholesale market price for the electricity produced by renewable energy generating facilities. The support for renewable energy is thus intertwined with the electricity market. This law also provides a legal basis for the compensation of the grid connection costs of renewable energy generating facilities with a capacity not exceeding 25 MW. In addition, it requires the grid companies to prioritise electricity produced from renewable energy when covering losses on the transmission grid.

Recently, Russia decided to promote renewables by remunerating the installed capacity of renewable energy generating facilities. On 28 December 2010 the Russian legislature approved Federal Law No. 401-FZ, which introduced further amendments to the Federal Electricity Law (hereafter, “the Federal Law Introducing the Capacity-Based Scheme”).

---

**SPOTLIGHT**

**From Electricity Premium to Capacity-Based Support for Renewable Energy**

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation</th>
<th>Support Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999 – Duma and Federation Council</td>
<td>First attempts to introduce renewables legislation</td>
<td>3% of total public investment in the fuel and energy sector to be in developing renewables</td>
</tr>
<tr>
<td>2003 – Federal Electricity Law</td>
<td>No provisions on renewables</td>
<td></td>
</tr>
<tr>
<td>2007 – Amendment to Federal Electricity Law</td>
<td>Definition of renewables</td>
<td>Premium</td>
</tr>
<tr>
<td></td>
<td>Compensation of connection costs</td>
<td>Priority purchase by grid companies to cover losses</td>
</tr>
<tr>
<td>2010 – Amendment to Federal Electricity Law</td>
<td>Capacity</td>
<td></td>
</tr>
</tbody>
</table>

---

3.1.2. The Electricity Premium Scheme

In accordance with Article 32, paragraph 2, of the Federal Electricity Law, as amended by the Federal Law Introducing the Electricity Premium Scheme:

The price of electricity produced by qualified renewable energy installations shall be determined by adding to the equilibrium price of the wholesale market a premium, which shall be fixed in accordance with the procedure established by the Government of the Russian Federation.

The premium shall be calculated so as to attain the strategic, national renewable energy targets set by the Russian government. The amount and the duration of this support thus depend on the implementation by the government of the national targets. The current discussion about postponing the 4.5 per cent renewable energy target from 2020 to 2030 therefore has an important impact on the support available for renewable energy in Russia.

To prove that a certain amount of electricity has been produced from renewable energy sources, the Federal Electricity Law, as amended by the Federal Law Introducing the Electricity Premium Scheme, provides for a system of “certificates”. To regulate the processes of issuing, transferring and accounting for these certificates, the Ministry of Energy issued Order No. 187 dated 17 November 2008 “On the Procedure for Keeping a Register of the Issuing and the Accounting for Certificates Confirming the Amount of Electricity Produced by Qualified Renewable Energy Generating Facilities”.

---

**BOX 6. Comparison of the Russian “Premium” and “Certificates” with Guarantees of Origin, Green Certificates, Feed-in Tariffs and Premium Schemes in the European Union**

The EU member states have developed support mechanisms and instruments to stimulate trade in renewable energy. How do the Russian “premium” and “certificates” schemes relate to the European approach to promoting renewable energy?

In accordance with Article 2 (j) of Renewable Energy Directive 2009/28/EC, a “guarantee of origin” means “an electronic document which has the sole function of providing proof to a final customer that a given share or quantity of energy was produced from renewable energy sources”. “Guarantees of origin” have no support function but are meant for information and calculation purposes only.

On the other hand, “green certificates”, “feed-in tariffs” and “premium” schemes are considered “support schemes”. In contrast to guarantees of origin, they do not have the “sole” function of proving the renewable origin of electricity, but aim to actively promote the use of renewable energy, either by increasing the volumes of renewable energy purchased or by increasing the price at which this energy can be sold. In accordance with Recital 52 of Directive 2009/28/EC, it is important to distinguish these different functions of proof, on the one hand, and support, on the other.

Usually, certificate schemes require regulatory authorities to deliver tradable certificates for a certain amount of electricity generated from renewable energy sources. The value of such certificates is created by obliging electricity suppliers to submit a certain amount of certificates to the regulatory authorities. This amount is generally determined in proportion to their supplies of electricity to end consumers. Suppliers that fail to meet this quota obligation are fined. A secondary market for certificates is created where eligible producers and suppliers with too many certificates can sell their certificates to other market players.

In feed-in tariff schemes, the electricity generated from renewable or high-efficiency cogeneration facilities is purchased at a fixed minimum price. This minimum purchase price is generally set higher than the market price and guaranteed over a specified duration.
The difference between feed-in tariffs and premium schemes is that in the latter case a premium is applied to the market price, whereas feed-in tariffs entitle producers to a specific price. In premium schemes the final price paid to the producers usually fluctuates with the price of electricity on the wholesale market. Box 7 looks at different approaches to premiums in more detail.

The Russian premium system is largely comparable to the premium scheme developed in the EU member states. The Russian scheme cannot be considered an EU green certificate scheme because the Russian certificates are unlikely to be traded separately from the electricity commodity on a secondary market for certificates.


To be eligible for support, installations must be qualified in accordance with the procedure set out by the Russian government in Resolution No. 426 dated 3 June 2008 “On the Qualification of a Renewable Energy Generating Facility”. In accordance with this Resolution, only those installations included in the Scheme for the Location of Renewable Energy Generating Facilities are eligible for support. This Scheme, adopted by the Ministry of Energy, specifies the location and type of renewable energy generating facilities.

Resolution No. 426 also establishes a Register of Qualified Renewable Energy Generating Facilities. The regulator of the Russian wholesale electricity and capacity market, the Market Council, is charged with the administration of this register. On 3 October 2008, the Supervisory Board of the Market Council therefore adopted the Regulation “On the Qualification of a Renewable Energy Generating Facility and Keeping a Register of Qualified Generating Facilities”.

Buyers of electricity on the wholesale market are expected to contribute to the financing of the support scheme. Indeed, Article 33, paragraph 3, of the Federal electricity Law refers to the obligation of consumers to “purchase a given amount of electricity produced by renewable energy installations”.

Although the Federal Electricity Law provides a solid legal basis for the support of renewable energy, the “premium” scheme has not yet been put into practice. For the electricity premium scheme to function, the Russian government must adopt a Resolution on the Procedure to Determine the Premium Added to the Equilibrium Price of the Wholesale Market.

Order of the Russian Government No. 1166-r dated 18 August 2009 “On the Approval of a Set of Measures to Protect the Environment” did announce that a regulation on the calculation of the premium would be adopted and that this would determine the duration of the support scheme. However, the regulatory framework governing the electricity premium scheme has not (yet) been finalized.

Instead, on 28 December 2010, the Russian government brought in the Federal Law Introducing the Capacity-Based Scheme, which amended the Federal Electricity Law by adding a new approach to the support of renewable energy.
BOX 7. Designing a “Premium” Support Scheme

Premiums vs. feed-in tariffs

Premiums are often considered a type of feed-in tariff (NREL, 2010; Klein et al., 2008). In this paper, however, premiums and feed-in tariffs are viewed as two different approaches to supporting electricity generation from renewable energy sources. The key difference between a feed-in tariff and a premium is that the former is independent of market prices, while with the latter, either the whole payment or just the premium itself depends on market prices. Another difference is that a feed-in tariff support scheme usually includes a purchase guarantee, thus separating renewables-based electricity from market dynamics. Under a premium scheme, electricity generated from renewables is usually traded on the wholesale market like traditional power.

In the European Union, premiums are used in Denmark and the Netherlands. The Czech Republic, Estonia, Slovenia and Spain offer a choice between feed-in tariffs and premiums. For example, in Spain, in 2008, when the spot market prices were high, 95 per cent of wind generators chose the premium scheme (IEA, 2009). Canton and Lindé (2010) argue that “combining feed-in tariffs and premiums can be regarded as a transition phase, as the introduction of a premium makes the system more market-oriented and exposes producers to more risk. However, to make the system compatible with a well-functioning electricity market, the premium should be the preferred instrument.”

Any kind of support scheme has its own advantages and disadvantages, depending on the policy objective(s) pursued and the evaluation criteria. Several analyses have demonstrated that premiums are usually less cost-efficient in deploying renewable energy technologies than feed-in tariffs because they provide a lesser degree of certainty for investors, thus increasing investment risks and the total cost of capital (NREL, 2010; Ecofys, 2011). However, they are more compatible with a competitive market. For this reason, Canton and Lindé (2010) argue that, “In order to limit internal market distortions, (...) premiums should be preferred over feed-in tariffs.” At the same time, the US National Renewable Energy Laboratory (NREL) highlights that the system of premiums eliminates the possible hedge value of renewable energy projects because they receive the spot price when the price goes up (NREL, 2010).

In any case, the evaluation of the support instruments depends not only on the type of instrument but also on the individual design. Ecofys argues that, “Potential disadvantages of a certain instrument type regarding a certain criterion may be compensated by several elements. However, this compensation may affect the instrument’s performance with regard to another criterion” (Ecofys, 2011). The section below describes different options for premiums and presents analyses of their relative advantages and disadvantages.

Different premium design options

A fixed (constant) premium is a fixed sum that is paid to the generator on top of the spot market price (Figure A). It does not change when electricity prices go up or down. The advantage of this option is that it is relatively easy to implement. It gives public authorities a high degree of control over the total amount of support, thus reducing uncertainties regarding the financial burden for final consumers or the government’s budget. The key disadvantage is that this scheme creates a high level of uncertainty for investors. The scheme is attractive when market prices are high, but if they suddenly drop, renewable energy generators may have difficulty covering high capital costs. This uncertainty over future revenues represents an additional risk for investors and could increase the marginal costs of renewable energy deployment (NREL, 2010).

Figure A. Fixed Premium
BOX 7. (continued)

A “percentage-based premium” is an additional payment on top of the market price, determined as a percentage of the spot market price. Spain used this model between 2004 and 2006, but then abandoned it because it arguably led to much higher overall policy costs (NREL, 2010). In addition to all the disadvantages of a classical fixed premium, with this design the premium payments are more volatile, as they are linked to volatile market prices.

A “sliding premium” varies depending on the market price: when the market price increases, the premium decreases, and vice versa. This model pursues the double objective of guaranteeing reasonable revenues for generators (particularly when the prices are low) and also limiting possible overcompensation (when the prices are high). Figure B shows one example of this approach, a “spot market gap” premium, implemented in the Netherlands and Switzerland (with some variations). This scheme sets a total guaranteed payment level for different renewable energy technologies, similar to the system of feed-in tariffs. Renewable energy generators sell power on the market and the premium covers the difference between the market price and the guaranteed level. When the market price exceeds the guaranteed level, the premium reduces to zero.

Figure B. Spot Market Gap Premium

This model provides the same benefits to investors as the feed-in tariffs (certainly, guaranteed revenue) and is even more attractive because it gives them an opportunity to earn additional revenue when the market price goes very high. At the same time, this model can help limit the costs of public support when prices are high (NREL, 2010). However, the total level of support is difficult to forecast; it can be quite high if the market prices stay low for a long period of time. As with the feed-in tariff, generators can be overcompensated under the sliding premium model if the guaranteed level is set too high and if policy does not react quickly enough to technology learning curves. (This has been the case with feed-in tariffs for solar photovoltaic in many EU countries.)

Another example of a sliding premium, a “cap and floor” premium system, has been in place in Spain since 2007. Under this scheme, the premium slides within a range between the upper and the lower limits (cap and floor). Figures C1 and C2 illustrate how the Spanish support system worked in 2008, using wind power as an example. When the market price is low, the premium increases to guarantee the generator a revenue equal to the floor price of €74 Megawatt hour (MWh). If the market price is between €43/MWh and €58/MWh, the revenue equals the market price plus a fixed premium of €30/MWh. When the pool price exceeds €58/MWh, the premium decreases so that the total revenue (pool price + premium) does not exceed the cap, €88/MWh. If the pool price is higher than €88/MWh, there is no premium, and the operator receives only the market price. The government is considering introducing a mechanism that would gradually reduce the cap and floor levels (IEA, 2009).

This design has similar benefits to the previous one. Additionally, NREL argues that the system of caps and floors can reduce the risk of the under- and overcompensation of generators that can result from the linkage to market prices. However, this risk will not be completely eliminated if the limits are not set correctly.
Overall, sliding premiums, either market price gap or cap and floor, seem to be the optimum designs for premiums. They combine most of the advantages of feed-in tariffs while limiting the negative aspects of a classical fixed premium. The U.K. government, which initiated a major reform of its electricity sector in 2010, is considering sliding premiums as a preferred option. (It calls them “feed-in tariffs with a contract for difference”) (UK, 2010). The key challenge with sliding premiums, like with feed-in tariffs, is setting the guaranteed payment (or the upper and lower limits) at an adequate level. Ecowys (2011) underlines the importance of “time limits and a regular review of cost projections and adjustment of premiums based on these projections” when designing a premium scheme.


### 3.1.3. The New Capacity-Based Scheme

In contrast to the “premium” scheme, which seeks to support renewable energy through the electricity market, the Federal Law Introducing the Capacity-Based Scheme is anchored in the capacity market. In accordance with Article 32, paragraph 1, of the amended Federal Electricity Law, electricity buyers must conclude “Agreements for the Delivery” of Capacity (Dogovory Postavki Moshchnosti) to remunerate the installed capacity of specific installations determined by the Russian government. It appears from

---

59 The Federal Law Introducing the Capacity-Based Scheme refers to Agreements for the Supply (Postavka) of Capacity. However, hereafter Supply will be replaced by Delivery. Indeed, as will be seen below, the Federal Law Introducing the Capacity-Based Scheme appears to refer to the existing instrument of “Agreements for the Delivery (Predostavlenie) of Capacity “, as regulated by the Wholesale Market Rules. The use of a different formulation (and resulting confusion) might be explained by the fact that Agreements for the Delivery of Capacity are commonly referred to as DPM, P being the first letter of both Predostavlenie and Postavka.
the preparatory documents (travaux préparatoires) that these installations will include renewable energy projects. Under the new capacity-based support scheme, electricity generation from renewable energy sources will thus be promoted through Agreements for the Delivery of Renewable Energy Capacity. The Federal Law Introducing the Capacity-Based Scheme does not provide a precise definition of “Agreements for the Delivery of Capacity”. The Federal Electricity Law does not contain a clear definition of this concept either, nor does it contain any provisions from which the exact meaning of this notion could be inferred. The content of the Agreements for the Delivery of Renewable Energy Capacity is not specified anywhere in Russian law.

However, a comparable notion, “Agreements for the Delivery of Capacity” (Dogovory o Predostavlenii Moshchnosti), is defined in Item 4, 10 of the Wholesale Market Rules. This definition is essential to understand the new capacity-based support scheme for renewable energy, given the absence of information in the Federal Electricity Law about the concept of capacity agreements.

As mentioned in Chapter 2, the Agreements for the Delivery of Capacity (Dogovory o Predostavlenii Moshchnosti) refer to the regulated capacity contracts concluded in the context of the corporate restructuring of the former quasi-monopolist RAO UES. These agreements aim to ensure that the new investors implement the investment programmes of the wholesale and territorial electricity generating companies (OGKs and TGKs). Agreements for the Delivery of Capacity remunerate, at regulated tariffs, the installed capacity of the power plants constructed in accordance with the investment programmes of these companies. The Russian government has determined a list of power plants that are covered by Agreements for the Delivery of Capacity. For every power plant included in this list, the Market Council determines the regulated capacity tariffs. It fixes these tariffs on the basis of the methodology established by the Russian government. These Agreements apply for a period of ten years. The System Operator, together with the Ministry of Energy, oversees the implementation of the investment obligations.

**SPOTLIGHT**

Main Characteristics of Agreements for the Delivery of Capacity

- **List of power plants** determined by the government: limited to the investment programmes agreed by the investors in OGKs and TGKs when purchasing these assets from RAO UES
- **Regulated tariffs** on the basis of pricing parameters determined by the government
- **Long-term:** 10 years
- **Mandatory purchase** by the buyers of electricity on the wholesale market in proportion to their peak capacity
- **Control** of fulfillment of investors’ obligations: System Operator and Ministry of Energy

---

63 New nuclear and hydropower plants are remunerated at the regulated price for a period of twenty years.
On this basis, it can be assumed that the Agreements for the Delivery of Renewable Energy Capacity will have the same constituent elements as the “classic” Agreements for the Delivery of Capacity (i.e. the agreements concluded in the context of the corporate restructuring process of RAO UES, following the sale of the TGKs and OGKs to private investors):

(i) list of generating facilities approved by the government;
(ii) regulated tariffs;
(iii) long-term contracts;
(iv) mandatory purchase;
(v) external control over fulfilment of investment obligations and readiness to produce electricity.

Moreover, additional requirements will most probably be introduced to ensure that only “qualified” renewable energy generating facilities benefit from support (vi) (qualified within the meaning of Russian Government Resolution No. 426 dated 3 June 2008 “On the Qualification of a Renewable Energy Generating Facility”).

To implement the new capacity-based support scheme, further regulatory intervention by the Russian government, the Russian Ministry of Energy, and the Market Council is necessary. Specifically, the list of renewable energy generating facilities that will be entitled to support must be determined. In accordance with Article 32, paragraph 1, of the Federal Electricity Law, this task lies with the Russian government. The government must also establish price parameters and specify the duration of the support. On the basis of this information, the Market Council will have to adopt the text of the Standard Agreements for the Delivery of Renewable Energy Capacity.

The following section analyses the presumed constituent elements of the Agreements for the Delivery of Renewable Energy Capacity. The analysis draws on the existing “classic” Agreements for the Delivery of Capacity, as well as on proposals made by stakeholders involved in the creation of a support scheme for renewable energy in Russia (for example, RusHydro).

(i) list of renewable energy generating facilities approved by the government

The new capacity-based scheme is not open to all renewable energy generating facilities. Firstly, the scheme is anchored in the wholesale market. It is therefore limited to installations with an installed capacity of no less than 5 MW. Secondly, Agreements for the Delivery of renewable energy Capacity will only be concluded with the operators of new renewable energy generating facilities that are included in a list adopted by the Russian government.

The idea of charging the government with the task of selecting the installations that are entitled to conclude regulated capacity agreements stems from the existing approach to the conclusion of the “classic” Agreements for the Delivery of Capacity. Indeed, Resolution of the Government of the Russian Federation No. 1334-r dated 11 August 2010 (with subsequent amendments) adopted a list of electricity generating facilities that can conclude Agreements for the Delivery of Capacity.

The Federal Law Introducing the Capacity-Based Scheme does not provide any indication as to how the government will adopt the list of installations that are entitled to support. The government could announce a tender for specific projects at specific locations. The list could then be approved on the basis of bids submitted by investors. Alternatively, investors could independently take the initiative to bid for projects that they identify themselves. Looking at the “classic” Agreements for the Delivery of Capacity, it can be expected that the government will unilaterally determine the location, the amount of capacity, and the type of projects in advance. Indeed, the private investors that purchased the TGKs and OGKs from RAO UES must implement the investment programmes that are determined centrally by the state. The Agreements for the Delivery of Capacity formalize this obligation.
At the time of writing, the government had not adopted a list of renewable energy generating facilities that would be eligible to conclude Agreements for the Delivery of Renewable Energy Capacity. However, as illustrated in Annex 1, the General Scheme for the Location of Electricity Generating Facilities to 2020-2030, as approved in principle by the government, as well as the Scenario Conditions for the Development of the Electricity Sector to 2030, produced by the Energy Forecasting Agency, already provide indications as to the type and location of renewable energy generating facilities envisaged by the government. These documents contain a “reference” (minimum) scenario and a “high growth” scenario.

It appears from these forecasts that only a few renewable energy projects are envisaged before 2020 (for example, a 150 MW wind project in Kalmykian Energy System, a 40 MW wind project in Kamchatka, and other small hydropower projects). Interestingly, a major difference between the reference and the high growth scenario is that, in the former, wind is unlikely to be developed significantly. Biomass, in contrast, is present in both the reference and the high growth scenario.

(ii) Regulated tariffs

In accordance with the philosophy of Russian electricity reform, the remuneration of capacity primarily aims to cover investment costs. Electricity prices, on the other hand, primarily aim to cover operating costs.

Regulated prices for the remuneration of the installed capacity of renewable energy generating facilities will require analysis of the investment and operating costs associated with the generation of electricity from renewable energy sources. RusHydro proposes to establish different cost “benchmarks” (standard costs) for the different renewable energy technologies. These costs relate to: the initial capital invested (investment costs), the facilities’ operating expenses, property taxes, and also the costs of connecting the facilities to the network. The regulated capacity tariffs will likely compensate for only part of the costs associated with electricity generation from renewable energy sources.

Similarly to the approach adopted for the “classic” Agreements for the Delivery of Capacity, the government will most likely determine the overall methodology for the calculation of renewable energy capacity tariffs. The Market Council will then determine specific tariffs for each renewable energy generating facility.

(iii) Long-term contracts

RusHydro, the leading stakeholder involved in developing the support scheme, has proposed that Agreements for the Delivery of Renewable Energy Capacity be concluded for a period of 15 years.

(iv) Mandatory purchase

According to Article 32, paragraph 1, of the Federal Electricity Law, as amended by the Federal Law Introducing the Capacity-Based Scheme, electricity buyers on the wholesale market are obliged to purchase a certain amount of capacity on the basis of “Agreements for the Delivery of Capacity”. This provision appears to require each electricity buyer on the wholesale market to purchase an amount of energy capacity that is proportional to its total electricity purchase. It is assumed that this requirement will extend to renewable energy capacity.

This requirement is largely similar to the existing obligation for electricity buyers to purchase a proportional amount of capacity covered by the “classic” Agreements for the Delivery of Capacity. Indeed, to finance the regulated capacity prices under these Agreements, electricity buyers must purchase a certain amount of the installed capacity of the power plants built in accordance with the investment programmes of the TGKs and OGKs purchased from RAO UES. Electricity buyers purchase
an amount of this capacity that is proportional to their peak consumption. All electricity buyers thus contribute to the financing of the investment programmes of the former RAO UES in proportion to their peak consumption.

(v) Control over fulfilment of investment obligations and readiness to produce electricity

By concluding Agreements for the Delivery of Capacity, investors commit to constructing a certain type of electricity generating facility, with a certain capacity, and at a certain location. Moreover, investors commit to maintaining their installations in a state of readiness to produce electricity. The Wholesale Market Rules specify the procedure for assessing this readiness. A comparable procedure is likely to apply to renewable energy generating facilities.

In accordance with the existing procedure, the System Operator must first “certify” that an installation meets certain parameters and is ready to produce electricity. This “certification” process consists of determining the amount of capacity that an installation is able to supply.64 Based on tests of the electricity generating equipment,65 the System Operator assesses whether an installation complies with the installed capacity and parameters specified in the Agreement for the Delivery of Capacity. In addition, the Ministry of Energy oversees the fulfilment of the investment obligations assumed by an investor when they sign an Agreement for the Delivery of Capacity.66

The System Operator confirms that an installation is ready to produce electricity if the installation is able to participate in maintaining the electricity system in balance67 and to respect the System Operator's generation graphs.68 The System Operator assesses whether an installation meets this requirement by, among other things, examining the bids submitted by the installation's operator for the sale of electricity in the day-ahead market.69 It also looks at deviations between the amount of electricity the operator planned to produce and the amount of electricity they ultimately produced. The System Operator examines whether the operator of the installation in question executed the dispatch commands properly. Capacity, as regulated by the Wholesale Market Rules, thus very much depends on the dispatchability of electricity generating facilities and their potential contribution to the reliability of electricity supply.

If electricity producers fail to guarantee the availability (and the dispatchability) of their installations, the capacity remuneration to which they are entitled decreases by specific coefficients.70 The values of these coefficients vary in relation to the requirements that the producers were unable to meet, as well as the type of generating facility concerned. Therefore, in accordance with the Wholesale Market Rules, financial sanctions apply when electricity producers are unable to contribute to the reliability of electricity supply.

Many renewable energy generating facilities (for example, wind and solar energy) are characterized by relatively unpredictable supply patterns and difficult dispatchability. On the basis of the general regulation of capacity supply under the Wholesale Market Rules, wind and solar energy would thus be penalized.

(vi) Qualified renewable energy generating facilities

To be entitled to support under the new capacity-based scheme, installations will need to demonstrate that they produce electricity from renewable energy sources. As mentioned above, the Wholesale

---

64 Item 43, Wholesale Market Rules.
65 Item 44, Wholesale Market Rules.
67 i.e. it is able to supply active and reactive energy following its commands.
68 Item 48, Wholesale Market Rules.
69 Items 50, 5), and 51, Wholesale Market Rules.
70 Items 52-55, Wholesale Market Rules.
Market Rules require the “certification” of new installations. To guarantee that only installations that use renewable energy sources can benefit from the support scheme, the Wholesale Market Rules could provide specific criteria for the certification of renewable energy generating facilities.

Alternatively, the requirements of Russian Government Resolution No. 426 dated 3 June 2008 “On the Qualification of a Renewable Energy Generating Facility” could continue to apply. In accordance with this Resolution, for a renewable energy generating facility to be “qualified”, its operator must first demonstrate that the facility uses renewable energy sources and thus contributes to the attainment of the national renewable energy targets. Moreover, these installations must be connected to the grid and equipped with the required measurement instruments. They must also be fully commissioned.

Furthermore, all operators of renewable energy generating facilities must obtain the status of a wholesale market participant. To access the wholesale market trading system, electricity producers must meet certain technical requirements, including requirements on metering the electricity produced and consumed. Moreover, the Federal Electricity Law and the Wholesale Market Rules specify additional requirements that must be met by facilities applying for the status of wholesale market participant. For example, sellers and buyers must, prior to their accession to the wholesale market, accept the terms of the Standard Agreement for Accession to the Wholesale Market Trading System. The Standard Agreement for Accession to the Wholesale Market Trading System is of fundamental legal importance for the functioning of the wholesale market. It details the rights and obligations of the wholesale market participants, on the basis of which every exchange of capacity and electricity will have to take place. Conclusion of the Agreement is the final mandatory step before an applicant can be included in the Market Council’s register.

**SPOTLIGHT**

**Probable Main Characteristics of Agreements for the Delivery of Renewable Energy Capacity**

- **List of renewable energy generating facilities determined by the government**: indications provided in the General Scheme for the Location of Electricity Generating Facilities and Scenario Conditions 2030
- **Regulated tariffs** on the basis of pricing parameters determined by the government: analysis of investment and operating costs, forecasts of future revenues on the electricity market
- **Long-term**: 15 year period?
- **Mandatory purchase** by the buyers of electricity on the wholesale market in proportion to their peak capacity
- **Control** over fulfillment of investment obligations and of readiness to produce electricity: dispatchability of intermittent sources of electricity supply?

72 See Article 35, paragraph 1, Federal Electricity Law; and Item 23, Wholesale Market Rules.
3.1.4 The Premium and Capacity Schemes: Exclusive or Combined Support?

How does the new capacity-based support scheme relate to the existing electricity premium support scheme? Does it replace the existing scheme or does it come in addition to the existing scheme? If the two schemes are supposed to co-exist, to what extent could the same renewable energy generating facilities benefit from the capacity scheme in addition to the electricity premium? Are the operators of renewable energy generating facilities that have concluded Agreements for the Delivery of Capacity entitled to sell the electricity they produce at the market price increased by the premium? Alternatively, does support under the capacity scheme exclude support under the electricity premium scheme?

The Federal Law Introducing the Capacity-Based Scheme does not explicitly repeal the electricity premium scheme. However, according to the preparatory documents for the Federal Law Introducing the Capacity-Based Scheme, the new scheme “removes the establishment of a mandatory amount of electricity that electricity buyers on the wholesale market have to purchase from qualified renewable energy installations.” It also says that the amendments to the Federal Electricity Law create a “new mechanism for the support of the development of electricity generation from renewable energy sources by requiring the mandatory purchase of capacity instead of the provision of a premium added to the electricity price.” This interpretation is also supported by the endorsement at the highest political level of a capacity-based support scheme for renewable energy. Indeed, before the Federal Electricity Law was amended, President Medvedev, Prime Minister Putin, and Vice Prime Minister Sechin all issued orders requiring that consideration be given to the possibility of supporting renewable energy by using the capacity market.

Nevertheless, to reiterate, the Federal Law Introducing the Capacity-Based Scheme does not explicitly withdraw the electricity premium scheme. The Federal Electricity Law still entitles the operators of renewable energy generating facilities to a premium in addition to the wholesale market price of electricity. It still obliges the Russian government to adopt such a premium as will help achieve the national strategic renewable energy targets. Moreover, it still refers to the obligation of buyers of electricity on the wholesale market to purchase a certain amount of electricity from renewable energy sources, and it still requires the Market Council to organize a register of certificates proving that a certain amount of electricity has been produced from renewable energy sources.

As these obligations have not been formally withdrawn from the Federal Electricity Law, it is arguable that the clear formulation of the law supersedes contrary indications in the preparatory documents. Nevertheless, there appears to be a political desire to move from the electricity premium scheme to the capacity-based scheme.

3.1.5 Compensation of Connection Costs

The Federal Electricity Law requires the Russian government to adopt criteria for the compensation of the grid connection costs of renewable energy generating facilities with an installed capacity not exceeding 25 MW. On 20 October 2010, the Russian government adopted Resolution No. 850 “On the Approval of Criteria for the Provision of Subsidies from the Federal Budget to Compensate for the Costs of the Technical Connection of Generating Facilities with an Installed Capacity Not Exceeding 25 MW and that have been Qualified as Renewable Energy Facilities”. This Resolution stipulates that to qualify for compensation, renewable energy generating facilities must meet the following requirements:

---

(i) They must be qualified as a renewable energy generating facility in accordance with the procedure specified in Resolution No. 426;
(ii) They must not exceed an installed capacity of 25 MW;
(iii) They must have been commissioned after the entry into force of the Federal Law Introducing the Electricity Premium dated 4 November 2007;
(iv) The operator of the facility concerned must not be subject to insolvency proceedings;
(v) The operator must not be in liquidation.

A decisive issue for the operators of renewable energy generating facilities is how the installed capacity is calculated. Neither the Federal Electricity Law nor Resolution No. 850 provides a clear answer. Renewable energy investors could have an incentive to structure their projects by taking into account the amount of installed capacity per “point” or “groups of delivery” of electricity so as to remain under the 25 MW threshold.

It is not clear from these criteria whether investors need to pay for the connection costs themselves, with reimbursement at a later stage, or whether the state pays the costs upfront.

---

**SPOTLIGHT**

**“Rules of the Game” for the Electricity and Capacity Support of Renewables in Russia**

<table>
<thead>
<tr>
<th>Legal basis (Federal'nyi Zakon)</th>
<th>Electricity premium and certificates scheme</th>
<th>Capacity trade</th>
<th>Compensation of connection costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution on the Procedure to Determine the Premium (government)</td>
<td>– List of renewable energy generating facilities and price parameters (government) – Standard Agreement for the Delivery of Renewables Capacity (Market Council) – Amendments to Wholesale Market Rules (government) – Amendment to the Standard Agreement for Accession to the Wholesale Market (Market Council)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

77 Article 3 of the Federal Electricity Law defines “installed capacity” as the capacity of generating facilities at the time of their commissioning.
3.2. Regional support

As discussed above, the electricity premium scheme is anchored in the wholesale electricity market. It is based on the “equilibrium” electricity market price and therefore only applies in the “price zones” of the wholesale market, i.e. those parts of the wholesale market where electricity is traded at free market prices. Similarly, the capacity-based scheme is limited to the wholesale market. Therefore, at the regional level, additional mechanisms are needed to stimulate the development of renewable energy installations that supply electricity in the price zones of the retail market. Specific measures are also necessary for renewable energy installations that operate in the “non-price” zones of the wholesale market and in isolated regions.

Some regional initiatives have already been developed. Belgorod Region, for instance, has adopted measures to support renewable energy: Order of the Government of Belgorod Region No. 300-rp dated 19 July 2010\textsuperscript{79} establishes “eco-tariffs” for the electricity produced from renewable energy sources. Other regions, such as Kaluga, have announced comparable regulatory interventions.

Alternative support mechanisms include subsidies from the regional budget to compensate the grid connection costs of small-scale renewable energy generating facilities or to partially compensate the costs of loan capital.\textsuperscript{80}

**SPOTLIGHT**

**Regulated Eco-Tariffs in Belgorod Region**

The Government of Belgorod region has taken the initiative to support electricity generation from renewable energy sources by adopting specific eco-tariffs. These tariffs are based on an analysis by the regional authorities of the investment and operating costs of renewable energy generating facilities. Moreover, they are linked to the supply obligations of the local “guaranteeing supplier” (or supplier of last resort).

3.3. Kyoto Protocol Mechanisms: Joint Implementation

The Kyoto protocol mechanisms represent an important source of financing for greenhouse gas emission reduction projects, such as renewable energy projects, at least for the period 2008-2012. One such mechanism is Joint Implementation.

On 28 October 2009, the Russian government adopted a national regulation for the implementation of Joint Implementation projects: Resolution No. 843 “On Measures for the Implementation of Article 6 of the Kyoto Protocol to the UNFCCC”. In accordance with Resolution No. 843, greenhouse gas emission reduction projects in Russia are approved on the basis of a competitive selection process organized by Sberbank. The selection is carried out using the Rules for the Competitive Selection of JI Projects, adopted by Order of the Ministry for Economic Development of the Russian Federation No. 485 dated 23 November 2009.

---

\textsuperscript{79} “On the Adoption of Temporary Rules for the Calculation of Economically Justifiable Regulated Eco-Tariffs for the Electricity (Capacity) Produced by Electricity Installations Using Renewable Energy Sources”.

Resolution No. 843 refers to energy efficiency as one of the criteria for the selection of JI projects. Project investors must demonstrate in their applications (Project Design Documents – PDDs) that their projects will generate energy savings and reduce the environmental impact of the activities in question. The energy savings of the proposed projects are compared to those achieved by the best technologies and practices used in comparable projects.

As shown in Box 8, a number of renewable energy projects in Russia have been selected and approved as JI projects.

However, the role of the JI mechanism in supporting the large-scale deployment of renewable energy in Russia is likely to remain limited. The JI mechanism is not legally constrained to the 2012 commitment period, but investors face uncertainty regarding the mechanism in a post-2012 international climate regime and also regarding post-2012 emission reduction commitments.

Moreover, the relevance of the JI mechanism for renewable energy in Russia appears to be limited by the domestic regulatory framework. Legal experts have warned that, “The selection criteria appear to be in practice rather subjective and undeveloped, and may lead to a lack of transparency and ‘political’ selection of projects.”

**BOX 8. Financing Russian Renewable Energy with JI: Current Experience**

The Ministry of Economic Development, on the basis of Sberbank’s selection, has approved the following renewable energy projects (Order No. 709 dated 30 December 2010):

**Coal to wood waste energy switch in Onega (Arkhangelsk)**

According to its PDD, the purpose of the coal to waste wood project in Onega is to replace an obsolete, coal-fired CHP installation with an efficient wood-fired installation. The project is expected to reduce total emissions by approximately 788,000 tonnes of carbon dioxide equivalent in 2008-2012.

**Biomass waste to energy project in the town of Bratsk (Irkutsk Region)**

The Bratsk biomass project consists of improving the efficiency of heat and electricity generation based on the use of wood waste. Modernizing the production of electricity and heat on site and improving the use of waste wood is expected to reduce greenhouse gas emissions by around 1,390,000 tonnes of carbon dioxide equivalent over five years. Indeed, in the absence of this project, heat would be produced by less efficient boilers and electricity would be supplied by lignite-fired power plants. Moreover, a large part of the wood waste, now used as fuel, would be dumped and left to emit methane without energy recovery.

**Wood waste to energy project in Arkhangelsk**

This project consists of the modernization of existing heat boilers and the implementation of CHP based on the use of wood waste. The CHP plant will replace heat and power generation by inefficient coal-fired installations. The project is expected to reduce greenhouse gas emissions by approximately 215,000 tonnes of carbon dioxide equivalent.

---

4. Assessment of the Russian Support Scheme from the Perspective of the Russian Government and Private Investors

Having created a legal basis for the support of renewable energy through the electricity market, the Russian authorities are now following a capacity-based approach. What are the public policy considerations underlying this new approach? What is the impact of this change for private investors?

This section starts by analysing the new capacity-based support scheme from the perspective of the Russian government. It looks primarily at the official reasons given by the Russian authorities to justify the introduction of a new scheme.

It then looks at the new capacity-based scheme from the perspective of private investors and assesses whether the scheme can allay the fundamental concerns of investors, as identified from European experience in the field of renewable energy law and policy.

4.1. Government Perspective

4.1.1. Effectiveness of Support / Cost-Efficiency

The Russian authorities have justified the creation of a capacity-based support scheme for renewable energy sources by referring to the difficulty of implementing the electricity premium scheme in practice. According to the preparatory documents for the Federal Law Introducing the Capacity-Based Scheme:

> The mechanism of the payment of special premiums in addition to the equilibrium wholesale market price, as provided for by the existing version of the law, cannot be introduced due to technological and model limits.82

However, the preparatory documents do not explain what these “technological and model limits” are.

Other reasons underlying government support for the new capacity-based scheme appear to relate to the increased investment certainty offered by this approach. A capacity-based scheme would reduce investment risks. Moreover, with the new capacity-based scheme, the authorities appear to be aiming to improve the cost efficiency of the national renewable energy policy (the idea being that greater efficiency would result from central government control over the approval of projects (for example, type of technology and location) and tariffs).

Analysts agree that long-term contracts minimize investment uncertainty and that they can create appropriate incentives for the location and operation of renewable energy generating facilities. However, it can be questioned (see section 4.2.), whether the reduction in investment risks pursued by the new capacity scheme will outweigh the negative investment signals sent by the change of approach to the support of renewable energy in Russia.

4.1.2. Reinforced Government Control

a) The list of renewable energy generating facilities approved by the government

Limiting the support scheme to a list of government-approved installations would enable the government to control the amount of renewable energy capacity and the costs of government support for renewables. A desire to tighten central government control over the support scheme appears to be one of the main reasons for the new capacity-based approach to the support of renewable energy. According to the ‘Final Report on the Determination of the Appropriate Level of Tariffs/Market Premium for Renewable Energy’ published by Mercados:

the main reason for such change was the Ministry’s desire to tightly control and coordinate the volumes of renewable electricity capacity installed for fulfilling the long-term renewable targets fixed in the RF Government Resolution of 08.01.2009 1-r.

However, it must be noted that a central command and control approach has already been embedded to a large extent in the existing electricity premium mechanism. Indeed, support under the premium mechanism is conditional on the inclusion of a renewable energy installation in the Scheme for the Location of Renewable Energy Generating Facilities determined by the Ministry of Energy. Therefore, the executive branch has already reserved the right to determine centrally the installations that it wishes to support (type and location). The Mercados report argues in this respect that requiring the inclusion of installations in a Scheme for the Location of Renewable Energy Generating Facilities is problematic because:

nobody explained from that time on who will be developing this scheme [for the Location of Renewable Energy Installations], based on what methodology, and what would be a completion date for the scheme and introduction of renewable electricity generators to it. Unless it is ready, all the renewable development in the country will be put on hold.

The same comment applies to the list of renewable energy generating facilities that the government will develop in the context of the new capacity-based mechanism: with the exception of the non-price

---

85 RusHydro’s proposal, p. 7.
zones, the development of large renewable energy generating facilities in Russia will depend entirely on the adoption by the government of this list.

b) The Agreement for Accession to the Wholesale Market Trading System

The new capacity-based scheme reinforces the government’s role in the regulation of the wholesale market trading system in general. Indeed, prior to the amendments made by the Federal Law Introducing the Capacity-Based Scheme, the government’s regulatory power was limited primarily to the adoption of the Wholesale Market Rules. The Market Council was charged with elaborating and adopting the Agreement for Accession to the Trading System of the Wholesale Electricity and Capacity Market (“the Agreement for Accession to the Wholesale Market Trading System”). As mentioned above, this document (together with its annexes) is of fundamental importance for the functioning of the wholesale market because it regulates in detail all aspects of the organization of electricity and capacity exchanges.

The Federal Law Introducing the Capacity-Based Scheme now tasks the government directly with determining the main conditions of the Accession Agreement. It transfers competences from the Market Council to the government and therefore reinforces the government’s role in the regulation and control of the market.

SPOTLIGHT

Analysis of the New Capacity-Based Support Scheme from the Perspective of the Government

Reinforced government control

- Support under the capacity-based scheme is limited to those installations included in the list determined by the Russian government. The government thus decides the type, location and timing of investments.
- Central control over the selection of installations eligible for support was already a key component of the premium scheme.

Effectiveness of support/cost efficiency

- By centrally controlling the selection of installations eligible for support, the government aims to control the costs of the support scheme.

4.2. Investors’ Perspective

4.2.1. Regulatory Instability and Unpredictability

Regulatory instability and unpredictability is the key concern for investors in renewable energy because they are dependent on state support for the financial viability of their investments. When analysing regulatory instability and the unpredictability of support schemes, a distinction must be made between regulatory changes that affect existing investments and regulatory uncertainty that influences the development of new projects.88

---

88 Prospective investors that have already committed funds to studies and other pre-investment activities could be considered a third category of investors.
As highlighted by the recent reductions in the level of support in Spain and Germany, there is a risk that governments will renge on commitments of support made to existing electricity generating facilities. Governments may be tempted to withdraw their commitments in order to reduce the burden of government aid on the budget or on consumers. Once investments have been made and costs are “sunk”, such regulatory changes to support schemes can have devastating effects on the business case of renewable energy investments. From interviews with stakeholders in the renewable energy business, analysts have concluded that:

developers of renewable energy projects consider the stability of the support instrument to be the most important factor for the scheme’s success, regardless of the type of support scheme involved. Whether a feed-in tariff based support system, a quota obligation scheme or a tax incentive is concerned, creating a framework which ensures long-term stability is needed to attract investors and project developers.


Investments in renewable energy in the European Union have been affected by retroactive changes to the amount of support initially promised. Germany has cut its support for solar power by 15 to 25 per cent. Moreover, the Spanish Government has reduced the feed-in tariffs it pays to renewable energy installations. The Czech Republic and Italy have also announced cuts to the support of solar energy. France has also adopted comparable changes, but, in contrast to the German and Spanish plans, its cuts do not extend to existing installations. Many commentators highlight the fact that the austerity measures expected to be introduced to cut budget deficits in Europe will affect the support for renewable energy. Indeed, subsidies for renewable energy are often considered “an easy target in times of crisis.” The problem is not just that governments “will reduce subsidies for new projects. The industry regards cuts as inevitable (…). More serious is the fear that the government will cut agreed subsidies for projects built or under construction.” Past experience shows that the risk of such cuts has a very negative effect on the development of renewable energy. According to the OPTreS interim report on the assessment of support for renewable energy in the European electricity market, “[a] financial change of the system has been performed in a number of markets in the past and has led to drastic consequences on the renewables development, for example, in Denmark.” For instance, Latvia’s policy in the field of renewable electricity has been characterized by “frequent policy changes and short duration of guaranteed feed-in tariffs [which resulted] in high investment uncertainty”. In the case of the Slovak Republic, a recent analysis has found that the “lack of longer-term certainty in the past has made investors very reluctant” to invest. In contrast, Slovenia’s “relatively stable tariffs combined with long-term guaranteed contracts make the system quite attractive to investors”.

Based on the European experience, the European Commission has consistently acknowledged that:

one of the main concerns with national support schemes is any stop-and-go nature of a system. Any instability in the system creates high investment risks (...). Thus, the system needs to be regarded as stable and reliable by the market participants in the long run in order to reduce the perceived risks.98

A recent study by Ecofys on financing renewable energy in the European energy market confirms that the attractiveness of a support scheme depends on the risk of “potential changes to the regulatory framework (policy risks)”.99 According to Ecofys, “Uncertainty about policy has been identified by most financiers as a key barrier to the development of renewable energy technologies (...).”100 According to Deutsche Bank Climate Change Advisors, “Investors face legislative and regulatory risks that raise the cost of capital required to finance renewable energy deployment”.101

Replacing the existing electricity premium scheme with a capacity-based scheme constitutes a radical change to the regulatory framework governing the support of renewable energy in Russia. This regulatory (policy) change could send a negative signal to potential investors, as it highlights the readiness of the Russian authorities to radically change the “rules of the game” for renewable energy investments and illustrates the regulatory instability and unpredictability that investors face in this sector. This could seriously affect the credibility of any future attempt to attract private investors in the Russian renewable energy sector.

Such radical policy change could potentially have a very negative influence on the credibility of future support commitments because it affects an approach that the Russian authorities have repeatedly endorsed. Since 2007, the Russian authorities have confirmed on more than one occasion that their approach to supporting renewable energy would consist of adding a premium to the wholesale market electricity price. This approach has been crystallized in several provisions of the Federal Electricity Law and implemented in various resolutions of the Russian Government, as well as orders issued by the Ministry of Energy and the Market Council.

The reduced credibility of future commitments of support also negatively affects the cost of renewable energy investments in Russia. Investors’ perceptions of such regulatory risk and uncertainty requires them to integrate a risk premium, which increases the cost of capital.102 This effect can be significant. According to Ecofys, it can amount to 10 to 30 per cent of the cost of electricity.103 Martinot defends the view that for renewable energy investments in Russia:

even given information, proper price signals, and a conducive regulatory and contractual framework, one of the most serious barriers is (...) a perceived climate of high investment risk.104

---


100 Ecofys, Financing Renewable Energy, p. 120.


It is important to note that the Russian authorities have not yet officially repealed the electricity premium scheme. The current formulation of Article 32 of the Federal Electricity Law, as modified by the Federal Law Introducing the Capacity-Based Scheme, allows for the electricity premium and capacity-based support schemes to be combined. It is true that the preparatory documents indicate that the capacity-based scheme will replace the electricity premium in the price zones of the wholesale market. However, as will be seen in Chapter 5, alternatives could be proposed.

Moreover, the policy change from an electricity premium scheme to a capacity-based approach does not affect existing investments. The authorities decided to introduce a new approach before finalizing the electricity premium scheme. In the absence of a Resolution on the Procedure to Determine the Premium Added to the Equilibrium Price of the Wholesale Market, there are no renewable energy investments that could have been affected by a change of policy. The Federal Law Introducing the Capacity-Based Scheme applies retroactively to electricity exchanges concluded on the wholesale market from the first of January 2010. However, this retroactive application does not seem to negatively affect potential investors in electricity generation from renewables.

It is interesting to note that, in the context of Russia’s climate change mitigation policy, regulatory instability and unpredictability has also affected the legal framework for the realization of Joint Implementation projects. Indeed, comparable to the way in which radical changes were made to the support scheme for renewable energy, the Russian authorities developed a regulation for the approval of JI projects and then radically changed it.

To elaborate, after considerable delay, the Russian government adopted a national regulation on the implementation of JI projects: Regulation No. 332 “On the Procedure for the Approval and Verification of the Realization of Projects Implemented in Accordance with Article 6 of the Kyoto Protocol”. The government and the competent ministries then enacted the necessary implementing legislation. All the conditions were fulfilled to start approving JI projects. However, on 28 October 2009, the Russian government completely replaced Regulation No. 332 with Regulation No. 843 “On Measures for the Implementation of Article 6 of the Kyoto Protocol to the UNFCCC”. Regulation No. 843 now constitutes the legal basis for the implementation of JI projects in Russia.

It is therefore not surprising that analysts consider that, “the Russian climate policy is among the most unpredictable in the world.”

4.2.2. Investment / Project Risks

One of the reasons advanced by the Russian authorities to justify the creation of a capacity-based scheme is that it will reduce investment risks. Concluding long-term capacity contracts would improve investment certainty. Do capacity contracts offer more certainty to investors than electricity premiums?

The European Commission has analysed and financed analyses of the effectiveness of support schemes implemented by the EU member states to develop renewable energy in the fuel mix of the electricity sector. Feed-in tariffs consistently appear as the scheme that provides the most certainty to investors. Analysts often explain the success of the German feed-in scheme by referring to its stability and the certainty it provides to investors (until the recent changes to the support of photovoltaic energy).
Similarly, long-term contracts also provide considerable investment certainty, including certainty of cash flow over a period of time. According to Ecofys:

> Linking the security for investors to financing issues, project finance lenders clearly prefer a long-term contract that ensures a relatively consistent and guaranteed revenue stream.\(^{110}\)

In contrast, premium schemes, depending on their design, are characterized by a lesser degree of investment certainty.\(^{111}\) However, they are more compatible with a free market and are therefore preferred by some analysts.\(^{112}\) Innovative approaches, for example, “sliding premiums”, can combine investment certainty with other benefits, if implemented properly (See Box 7).

According to Ecofys, “Long-term predictability of tariffs seems to be the key demand for investors.”\(^{113}\) Regulated prices under long-term Agreements for the Delivery of Renewable Energy Capacity in price zones and long-term electricity and capacity contracts in non-price zones appear to address investors’ concerns.\(^{114}\) However, it is unclear to what extent this increased certainty will compensate for the instability and unpredictability created by the introduction of a new scheme.

### 4.2.3. Contractual Guarantees and Investment Protection

In addition to long-term pricing predictability, capacity contracts provide for increased investment certainty because contracts between investors and the state benefit from special protection under international investment law. Russia has concluded bilateral investment treaties (BITs) containing so-called “umbrella” or “sanctity of contract” clauses. For example, Article 2, paragraph 2, of the UK–Soviet BIT and Article 3, paragraph 4, of the Netherlands–Soviet BIT, stipulate that:

> [e]ach Contracting Party shall observe any obligation it may have entered into (...) consistently with this Agreement with regard to investments of investors of the other Contracting Party.\(^{115}\)

Umbrella clauses in investment treaties aim to guarantee by treaty that the host state will respect the specific obligations it enters into with investors. Arbitral tribunals have consistently recognized that investment contracts (i.e. agreements concluded between foreign investors and the state) are protected under this clause.\(^{116}\)

Violations of contractual obligations by the state (for example, a refusal to pay the regulated tariff promised in Agreements for the Delivery of Renewable Energy Capacity or changes to the duration of these Agreements) could thus amount to a violation of the bilateral investment treaty. Investors could seek compensation on the basis of the applicable BIT’s procedure for the resolution of disputes between investors and the state.\(^{117}\) However, this protection is limited to investors of foreign origin that are covered by BITs containing sufficiently broad dispute resolution clauses.\(^{118}\)

---


\(^{115}\) See also Article 3, paragraph 3, of the Japan–Russia BIT and Article 8 of the France–Soviet BIT. Only a few Russian BITs contain umbrella clauses. Umbrella clauses could, however, be based on the Most Favoured Nation clause that is contained in most Russian BITs.


\(^{117}\) For a precedent, see ‘International PV Investors Demand Compensation or Repeal for Retroactive Spanish PV Tariff Changes under International Investment Treaty’ (8 March 2011), available online at www.presseportal.de/pm/78742/2004299/white_owl_capital_ag.

\(^{118}\) The Russian BITs with Austria, Belgium, Finland, Germany, Luxembourg, the Netherlands, and the United Kingdom do not contain generous dispute resolution provisions. For an analysis, see Anatole Boute, 'The Access to International Arbitration by Foreign Energy Investors in Russia – The Impact of the Yukos Decision on Jurisdiction’, in Martha Roggenkamp and Ulf Hammer (eds.) European Energy Law Report (Antwerp: Intersentia, 2011).
**SPOTLIGHT**

**Investment Stability**

Stability of support is the most important factor for the scheme’s success, regardless of the type of support scheme involved (premium, certificates, capacity). By announcing a fundamental change of approach, from a premium to a capacity-based scheme, the authorities are showing their readiness to radically modify the “rules of the game” for renewable energy investments. This sends a negative signal to investors.

It is true that this policy change does not affect existing investments. Moreover, regulated prices under long-term Agreements for the Delivery of Renewable Energy Capacity will provide pricing certainty to investors. In addition, by concluding agreements with the state, investors benefit from increased protection under the “sanctity of contract” clauses of investment treaties.

However, it is unclear to what extent this increased certainty and protection will compensate for the instability and unpredictability created by the introduction of a new scheme.

---

**4.2.4. Connection and Access to the Network Infrastructure**

Under a capacity-based scheme, grid connection costs could be incorporated in the regulated capacity tariffs. As well as making it possible to compensate connection costs at regulated prices, a capacity-based scheme is beneficial because of the pressure on network companies to provide for the necessary network capacity to ensure the delivery to the network of the electricity produced by installations that have been approved and are supported by the government.

The new capacity-based scheme does not explicitly provide clear guarantees as regards access to (i.e. use of) the network. It does not require the Administrator of the Trading Scheme to prioritise the electricity produced from renewable energy sources when it makes its selection. Nevertheless, the operators of renewable energy generating facilities can submit price-taking bids on the day-ahead market. Indeed, the variable costs of most renewable energy generating facilities are generally low. Moreover, the new capacity-based scheme is supposed to cover a large part of the investment costs of renewable energy generating facilities.

**4.2.5. Reliability Issues**

The “commodity” traded on the capacity market is the availability or the readiness of power plants to produce a certain amount of electricity, of a certain quality, within a certain period of time. As analysed above, remuneration of installed capacity depends, among other things, on the ability to fulfil the dispatch commands issued by the System Operator. Many renewable energy generating facilities are characterized by relatively unpredictable supply patterns and are often not as easily dispatchable as traditional thermal plants. The capacity trade does therefore not seem to be adapted to the fundamental supply characteristics of renewable energy facilities. According to the Mercados report:

---

119 There has been an intense debate in the Russian literature about the legal qualification of “capacity” as a commodity or a service. This discussion seems to be closed now, with the explicit recognition in Article 3 of the Federal Electricity Law and Item 36 of the Wholesale Market Rules that capacity is a “commodity”.

A capacity payment scheme (administrative or through a capacity market) is designed for plants that can actually provide reliable and predictable capacity service to the system, something that the most widely spread renewable energy technology (wind) can hardly provide. A usual capacity scheme would therefore be applicable only to technologies that can provide reliable capacity like biomass, geothermal and a fraction of small hydro; for the rest of the technologies, the mechanism would have to be adapted, creating a distortion with respect to the efficient market outcome.121

4.2.6. Lack of International Experience with Capacity-Based Support Schemes

The Mercados report highlights that one of the concerns about the development of a capacity-based scheme is “the absence of any international experience regarding capacity payments/premiums as a way to promote efficient and/or effective deployment of renewable sources.”122 In contrast, international experience has been accumulated in developing and implementing premium schemes, including in the European Union.

From an investor’s perspective, the use of a new approach could increase transaction costs, whereas regulatory convergence, in theory, aims to reduce these costs for transnational companies.123 If companies are familiar with the “rules of the game” it will be easier for them to understand the regulatory framework, which, in turn, could have a favourable impact on investment decisions.

In addition, developing an original Russian approach reduces the benefit of learning from previous experiences (in particular, from previous failures in the design of support schemes). Regarding relations with the European Union, departing from established regulatory practice to develop an independent approach also reduces the political benefits of cooperating with EU partners on issues that are less strategically sensitive than upstream energy projects. An independent approach is at odds with the EU-Russian policy of cooperation in the field of renewable energy and energy efficiency policymaking. In 2006, the European Union and Russia agreed on a joint EU-Russia Energy Efficiency Initiative (part of the EU-Russian Energy Dialogue), including projects on “the approximation of legislation and regulations in the field of (…) renewable energies”.124

Nevertheless, from an institutional economic perspective, developing an original regulatory approach could increase the chances of compliance with this approach. Indeed, how regulations “fit with the underlying domestic institutions”125 considerably influences their application by domestic institutions.

4.2.7. Lack of Independence from Short-Term Political Interests

The Federal Law Introducing the Capacity-Based Scheme reinforces government control over the support scheme. It also reinforces the government’s role in the regulation of the wholesale market by directly transferring the competence to develop the Agreement for Accession to the Wholesale Market Trading System from the Market Council to the government.


122 Mercados, Final Report, p. 47.


124 See Joint report EU-Russia Energy Dialogue 2000-2010: Opportunities for our Future Energy Partnership, available online at http://ec.europa.eu/energy/international/russia/doc/reports/2010-11-report-10thanniversaryfinal.pdf. Article 55 of the current Partnership and Cooperation Agreement between Russia and the European Union states that, “Russia shall endeavor to ensure that its legislation will be gradually made compatible with that of the Community.”

This transfer of competence is important from an investor’s perspective because one of the objectives underlying the creation of the Market Council as the regulator of the wholesale market was to facilitate independent decisions in favour of the market’s long-term development. As mentioned above, the Market Council is a “self-regulating” entity. It is a membership-based organization, bringing together the wholesale market participants, including electricity buyers and suppliers. Electricity buyers and suppliers thus participate in organizing the wholesale market and in decision making in the market. The idea underlying the creation of “self-regulating” regulatory authorities in energy markets is to depoliticize decisions relating to the functioning of these markets. “Self-regulating” entities are expected to act in the long-term interests of the market, while executive authorities are expected to be sensitive to short-term political (populist) interests.

By transferring the competence to “adopt the fundamental conditions of the Agreement for Accession to the Trading System of the Wholesale Electricity and Capacity Market” from the Market Council to the government, the Federal Law Introducing the Capacity-Based Scheme considerably reduces the role of the Market Council in regulating the wholesale market. In practice, the Wholesale Market Rules already regulated the fundamental conditions of the Agreement for Accession to the Wholesale Market Trading System. This, however, contradicted Article 21 of the Federal Electricity Law, which empowered the Market Council to adopt the wording of the agreement. By providing an explicit legal basis, the new legislative amendment increases the control of the government, as executive authority, over the regulator of the wholesale market, which was initially designed to be an independent ("self-regulating") authority. This exposes investors to government interference with the functioning of the wholesale market, based on short-term political concerns and not necessarily to the benefit of the market’s long-term development. In 2004, a report by the World Bank (Infrastructure and Energy Services Department Europe and Central Asia Region), ‘Policy Perspective and Analysis of the Regulatory Regime in the Restructured Russian Power Sector’, had already highlighted that:

“The overall independence of the regulatory regime for both government and vested private interests seems, in principle, seriously compromised. The best international practice suggests that final authority over regulatory matters be vested in agencies that possess adequate independence from government and from private interests with significant stakes in regulatory outcomes. It does not appear that the Russian regulatory agencies possess the requisite level of independence.”

The World Bank moreover argued that:

“The current framework in Russia provides quite broad discretion, which may or may not be problematic. It must be noted, however, that this discretion is accompanied by a tradition of political intervention, much of it appearing in non-transparent ways. This combination of broad discretion and continued non-transparent political interference creates excessive risks and may result in worse outcomes for both investors and consumers.”

---

127 Ibid, p. 5-6.
### Analysis of the New Capacity-Based Support Scheme from an Investor’s Perspective

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability, predictability</td>
<td>Not affecting existing investors</td>
<td>Radical change of approach</td>
</tr>
<tr>
<td>Adapted to specific supply characteristics of renewables</td>
<td></td>
<td>– Inherent contradiction between renewables and capacity trade;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Compliance with production forecasts is a major challenge</td>
</tr>
<tr>
<td>Connection to the network</td>
<td>– Costs can be taken into account;</td>
<td>Under the existing scheme, compensation is for installations under 25 MW only. Compensation and not upfront subsidy.</td>
</tr>
<tr>
<td></td>
<td>– Network development obligation due to link with capacity market</td>
<td></td>
</tr>
<tr>
<td>Access to the network</td>
<td></td>
<td>No guarantees provided for the electricity produced in the price zones</td>
</tr>
<tr>
<td>Best practice</td>
<td>Fits within institutional and regulatory structure of Russian electricity market: increases chances of compliance</td>
<td>– Limited international experience with tendering and capacity-based schemes;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Lack of convergence.</td>
</tr>
<tr>
<td>Investment/project risks</td>
<td>– Long-term regulated prices;</td>
<td>Insecurity due to radical change of approach</td>
</tr>
<tr>
<td></td>
<td>– Increased protection under investment law</td>
<td></td>
</tr>
</tbody>
</table>
5. Waking the Green Giant: Possible Way Forward

5.1. Fine-Tuning the National Support Scheme: Issues for Consideration

5.1.1. Stability and Predictability of Support

The Russian authorities have not yet officially repealed the electricity premium scheme and replaced it with a capacity-based mechanism. It is true that the preparatory documents for the Federal Law Introducing the Capacity-Based Scheme indicate that the capacity-based scheme will replace the electricity premium in the price zones of the wholesale market. However, given that the clear formulation of the law prevails over the preparatory documents, it is not too late to maintain both approaches. To alleviate possible concerns about overcompensation, a creative alternative could be developed in order to avoid supporting the same renewable energy generating facilities under both the electricity premium and the capacity-based scheme.

In the European Union, many member states opt to use a combination of support schemes (for example, feed-in tariffs and green certificates, or feed-in and premium). Along the same lines, the Russian authorities could decide to support certain strategic renewable energy investments on the basis of Agreements for the Delivery of Renewable Energy Capacity. These strategic investments could, for instance, consist of particularly large projects or technologies that are relatively new (infant). Other renewable energy investments would remain under the scope of the electricity premium scheme. The government could determine in advance the type of project that it wishes to support under the capacity scheme, and also the project locations. Agreements for the Delivery of Renewable Energy Capacity could be concluded for these projects, with the investors selected on the basis of a competitive tender. In contrast, under the electricity premium scheme, investors could independently propose projects, possibly following some guidance as to the government’s preferred locations and project types. The Ministry of Energy would then still have to approve the projects that are to receive support.

The Russian authorities could consider allowing investors to choose between the capacity scheme and the electricity premium scheme. In this respect, strategic projects that are entitled to conclude Agreements for the Delivery of Renewable Energy Capacity could opt for the premium scheme. EU countries that offer investors a choice of support approach include: the Czech Republic, Estonia, Slovenia, and Spain. In Russia, such an approach would fit well with the existing regulation of the “classic” Agreements for the Delivery of Capacity, whereby investors in OGKs and TGKs can decline regulated tariffs and choose to participate in the competitive capacity market.

It is true that a combined electricity premium – capacity approach could increase the administrative burden of promoting renewable energy sources in Russia. Indeed, it would require two parallel support schemes.

However, the coexistence of two combined or parallel regimes is not new to the Russian wholesale market. It is already central to the Russian approach to promoting private investment in the modernization of the electricity sector in general. Indeed, with the “classic” Agreements for the Delivery of Capacity, the government aims to attract private capital for some specific investments on a regulated basis. Investors are encouraged to make the remaining investments that are necessary to guarantee the reliability and security of electricity supply on a competitive (free market) basis.

Moreover, it is arguable that the benefits of the improved regulatory stability and predictability could outweigh the potential costs associated with this combined approach. These benefits could, as mentioned above, amount to 10 per cent to 30 per cent of the price of electricity.

**SPOTLIGHT**

**Possible Ways to Improve Investors’ Confidence in the Credibility of Russia’s Renewable Energy Policy**

Enact the executive documents (podzakonnye akty) that are necessary for a functioning support scheme.

Maintain the premium scheme, in addition to the capacity-based scheme. To avoid risks of overcompensation, implement a system of dual support schemes, with capacity contracts for specific strategic investments selected by the government and premiums for the remaining renewable energy investments.

A dual or combined approach to the support of renewables, consisting of both a regulated and a free market segment, is compatible with the philosophy underlying the privatization and the liberalization reform of the Russian electricity market.

**5.1.2. Reliability**

To a certain extent, the existing procedures to assess the readiness of installations to generate electricity already link the remuneration of capacity to the amount of electricity produced. Supporting renewable energy generating facilities through the capacity market will therefore not dissuade investors from actually producing electricity.

---

129 Joan Canton and Asa Johannesson Lindén, p. 33.
However, the lack of predictability of electricity generation from some renewable energy sources (wind, solar PV) is hardly compatible with the reliability requirements of the capacity trade. Specific arrangements must be included in the Wholesale Market Rules, the Annexes to the Standard Agreement for Accession to the Wholesale Market Trading System, and the Agreement for the Delivery of Renewable Energy Capacity, in order to adapt the capacity trade rules to the relative unpredictability of supply of some renewable energy generating facilities. For instance, modified coefficients could be provided. Such an approach is already followed for hydropower installations, to a certain extent.

5.1.3 Mandatory Targets

The Federal Electricity Law requires the Russian government to adopt strategic renewable energy targets and to develop a support system to attain these targets. By modifying the targets, the government can modify the entire support scheme. This considerably reduces the credibility of Russian renewable energy policy and creates significant uncertainty for investors.

To increase the credibility of Russian renewable energy policy, the Federal Electricity Law could be amended to include mandatory targets for the share of renewable energy in the fuel mix of the electricity sector. As will be seen below, a similar approach could be adopted in the heating sector: mandatory targets for the share of renewable energy in the heating sector could be included in the Federal Heat Law.

While mandatory targets in Federal Laws do not completely eliminate the risk of non-enforcement by the government, they would expose failings of the executive branch to comply with its legal obligations.

In addition, mandatory targets could be imposed on the regional authorities, taking into account their renewable energy potential. Regional targets would also provide a strong legal basis for regional authorities to promote renewable energy in the absence of, or in parallel to, federal initiatives.

The achievement of mandatory targets should be adequately monitored. Establishing a procedure to monitor federal efforts will be challenging, but it will help raise the credibility of Russian renewable energy policy. In comparison, monitoring of compliance by regional authorities could more easily be integrated into the regulatory framework of the Russian electricity sector.

**SPOTLIGHT**

*A Specific ‘Capacity Availability Assessment’ for Renewable Energy*

Given that certain renewable energy sources are characterized by variable supply patterns, the Wholesale Market Rules should provide a specific regulation on the availability of these renewable energy generating facilities to produce electricity. The authorities could consider establishing specific coefficients for variable renewable energy generating facilities that fail to comply with the System Operator’s dispatch orders.
5.2. Making the Wholesale Market Framework Renewable Energy Friendly

The delay in designing and implementing a support scheme for renewable energy in Russia has highlighted the risks for investors in renewable energy of dependency on government support. Not only do investors face uncertainty regarding the implementation of the support scheme prior to making their investment decision (ex ante risks), but, as illustrated by the recent cuts in support in EU member states, dependency on government support also exposes renewable energy investors to the risk of changes in the amount and duration of support once investments have been made (ex post risks).

Given the current “unlevel” playing field for renewable energy (competitive disadvantage in relation to subsidized fossil fuel-fired power plants), government support mechanisms are indispensable to ensure the financial viability of renewable energy investments. Nevertheless, investors would benefit from structural measures designed to minimize their dependency on government support by maximizing their revenues from the sale of electricity and capacity on the wholesale market. To encourage renewable energy investments, the authorities could consider adapting the regulatory framework of the wholesale electricity and capacity market to the specific characteristics of renewable energy generating facilities.

Such regulatory fine-tuning would promote renewable energy without having a direct impact on the government budget and without requiring extensive changes to the existing rules. To make the wholesale market renewable energy friendly, changes could be introduced to the priority selection of bids in the day-ahead market (5.2.1), the regulation of the long-term capacity market (5.2.2), and the regulation of the balancing market (5.2.2).

5.2.1. Guaranteed Access to the Network: Prioritisation of Electricity Produced from Renewables

In accordance with the current electricity market regulation, the Administrator of the Trading System (“the ATS”) could refuse to select the price bids submitted by the operators of renewable energy generating facilities for participation in the day-ahead market. The operators of these facilities thus have no guarantee that they will be able to sell their electricity on the wholesale market. As the premium scheme is linked to transactions on the wholesale market, the renewable electricity that is not chosen by the ATS during the competitive selection of price bids will not benefit from the premium.

More generally, given the variable production patterns of renewable energy generating facilities, the ATS and the System Operator might be tempted to exclude the electricity produced from renewable energy in their trade and dispatching graphs. The System Operator might also exclude renewable energy from the structure of active and reserve electricity generating facilities, i.e. the installations that the System Operator considers necessary to cover the minimum and maximum consumption loads, which are likely to be committed to electricity generation during a given period.

Indeed, when determining this structure, the System Operator takes into account reliability of supply issues, as well as the need to “minimize the costs of electricity [generation]”.131

Russia’s Energy Strategy to 2030 announced that renewable energy generating facilities will benefit from a system of “guaranteed connection and access” to the network.\textsuperscript{132} However, the Strategy does not explain what this actually means. It does not appear that the authorities intend to introduce a system of priority access to the network or a system of priority dispatch.

Nevertheless, the “prioritisation” of environmentally friendly modes of electricity production when selecting price bids is not unknown to Russian electricity law (“priority selection’’). Indeed, to promote electricity production from associated petroleum gas, in order to reduce gas flaring, the Russian legislature recently introduced changes to the Federal Electricity Law. These amendments aim to prioritise this type of generating facility during the selection of bids by the ATS on the day-ahead market.\textsuperscript{133}

Comparable legislative amendments to prioritise the dispatch of renewable energy generating facilities could be imagined in the future. This would entail amending Article 32 of the Federal Electricity Law, as well as the Wholesale Market Rules and the Standard Agreement for Accession to the Wholesale Market Trading System.

\textbf{S P O T L I G H T}

\begin{itemize}
\item \textbf{Priority Selection of Day-Ahead Bids Submitted by Renewable Energy Generating Facilities}
\item Russian electricity law already makes some provision for the prioritisation of environmentally friendly modes of electricity production when selecting price bids: priority selection has been introduced for electricity produced from associated gases.
\item Priority selection would provide strong guarantees to investors in renewable energy that they will be able to sell their electricity on the wholesale market.
\item It is a necessary corollary to the premium support scheme.
\end{itemize}

\textbf{5.2.2. A Renewable Energy Friendly Long-Term Competitive Capacity Market}

The new capacity-based scheme is limited to those renewable energy generating facilities that the government puts on its list. The facilities that are not included in the list could nevertheless opt to participate in the competitive segment of the wholesale market. Indeed, as examined above, Agreements for the Delivery of Capacity are exceptions to the long-term competitive capacity market. The operators of renewable energy generating facilities could bid to participate in the long-term capacity market.

\textsuperscript{132} Russia’s Energy Strategy to 2030, Annex V, Item 8 “On Reducing the Amount of Gas and Increasing the Amount of Non-Fossil Fuels in the Structure of Domestic Consumption of Energy Sources”.

\textsuperscript{133} Article 32, paragraph 2, Federal Electricity Law.
However, the existing regulation of the long-term competitive capacity market presents considerable obstacles to the participation of renewable energy generating facilities. These obstacles first relate to the requirements for reliability of supply. The capacity trade aims to ensure long-term security of supply and short-term reliability of supply. The System Operator, which organizes the competitive selection process, is therefore unlikely to select the bids submitted by the operators of renewable energy generating facilities that are characterized by unreliable (intermittent) supply patterns.

Moreover, as analysed above, capacity supply entails ensuring the readiness of installations to produce electricity. This readiness is assessed by evaluating the compliance of electricity generating facilities with the operational dispatch orders issued by the System Operator. Renewable energy generating facilities such as wind and PV solar plants that are characterized by variable production patterns are clearly put at a considerable disadvantage by this dispatchability requirement. The inability of renewable energy generating facilities to comply with the System Operator’s dispatch orders exposes these installations to financial sanctions (in the form of reduced compensation). This affects the revenues that renewable energy installations could obtain on the long-term competitive capacity market.

First, to alleviate the competitive disadvantage of renewable energy generating facilities as regards their participation in the competitive capacity market, the government should clearly reaffirm the importance of renewable energy in the General Scheme for the Location of Electricity Generating Facilities. Moreover, the government should make specific recommendations regarding the location of renewable energy generating facilities that go beyond the installations entitled to conclude regulated capacity contracts. This would facilitate their selection by the System Operator during the competitive selection of capacity.

Indeed, Article 32 of the Federal Electricity Law states that the System Operator shall take the General Scheme’s recommendations into account when organizing the long-term capacity market. The importance of the General Scheme’s recommendations for the selection of capacity was confirmed by Resolution of the Government of the Russian Federation No. 476 dated 28 June 2008 “On Introducing the Wholesale Capacity Market”. By including recommendations as regards the location and type of renewable energy generating facilities in the Annexes to the General Scheme, the government thus increases the likelihood of their selection by the System Operator.

In addition, as recommended above for the Agreements for the Delivery of Capacity, specific criteria for the assessment of the readiness of renewable energy generating facilities to produce electricity should reflect their intermittent generation patterns and lack of dispatchability. Renewable energy generating facilities could, for instance, benefit from a relative reduction in the financial sanctions for failing to implement the System Operator’s dispatch orders in full.

Creating a renewable energy friendly capacity market presents advantages in terms of the infrastructure investments that network companies must make. Indeed, in accordance with Article 32, paragraph 1, of the Federal Electricity Law, the network companies must include in their investment programmes sufficient network infrastructure to ensure the delivery and transmission of the electricity produced by new installations that have been selected to participate in the capacity market.

5.2.3. A Renewable Energy Friendly Balancing Market

Forecasting the output of renewable energy generating facilities that are characterized by intermittent supply patterns is less accurate than for other modes of electricity production. These types of renewable energy are therefore relatively more exposed to imbalance charges. The risk of incurring such charges constitutes an obstacle to renewable energy investments.

The regulation of the balancing market in the Wholesale Market Rules could provide for renewable energy-friendly balancing arrangements. This would not necessarily require radical changes, such as shortening the period between gate closure (i.e. the moment when no more bids and offers to the market are accepted) and the moment when electricity is produced and consumed, but could simply take account of natural factors, such as wind conditions, when determining the balancing costs of renewable energy generating facilities. Natural factors could, for instance, be considered external causes of imbalances. Special criteria could also apply on a seasonal basis in order to reflect changing natural conditions.

**SPOTLIGHT**

**Towards a Renewable Energy Wholesale Electricity and Capacity Market**

Renewable energy generating facilities are currently at a disadvantage on the wholesale market. The regulation of the electricity and capacity trade does not reflect the specific operational characteristics of most of these facilities.

If the regulatory framework for the wholesale market allowed for the specific characteristics of renewable energy generating facilities it would contribute to their financial viability, even in the absence of a fully-fledged support scheme. In addition to the priority selection of bids from renewable energy generating facilities, changes could be introduced to the balancing regime and the capacity market to reflect the lack of dispatchability of electricity produced from intermittent renewable energy sources.

5.3. Regional Approach

The Federal Electricity Law does not explicitly regulate the support of renewable energy in the non-price zones of the wholesale market or at the retail market level. By stipulating that the Russian government is to determine the list of renewable energy generating facilities that are entitled to support, the Federal Electricity Law considerably limits the relevance of the capacity-based scheme for regional authorities.

Regional authorities could, however, pursue a renewable energy policy at the retail market level. The “eco-tariff” implemented by Belgorod Region is an example of a regional approach to promoting renewable energy sources. Similarly, the willingness of the administration of the Kaluga Region to pursue such an approach illustrates the role that regional authorities could play in developing renewable energy in Russia.

---

A regional approach provides benefits for renewable energy investors due to the regulation at the regional level of retail tariffs. Moreover, guaranteeing suppliers could play an important role in ensuring the off-take of the electricity produced from renewable energy.

Nevertheless, regulatory intervention appears necessary. Such intervention could, for instance, provide for minimum tariffs reflecting the investment costs of renewable energy projects. Moreover, it could establish guarantees as regards the duration of these tariffs.

5.4. Greening the Russian Combined Heat and Power Sector

The reform of the Russian heating sector (see the Federal Heat Supply Law) presents opportunities to increase the share of renewable energy in the fuel mix of the Russian CHP sector. The reform of the heating sector aims to attract investments in the modernization of the heating infrastructure. Article 3 of the Federal Heat Supply Law considers the energy efficiency of heat supply to be a fundamental principle underlying the organization of the Russian heat market. This reform thus provides a certain “momentum” from an investment perspective. This momentum could be used to combine modernization with the “greening” of the fuel mix of the heating and CHP sector.

Indeed, in accordance with Resolution No. 1-r dated 8 January 2009 “On The Main Areas of Government Policy to Raise the Energy Efficiency of Electric Power from Renewable Energy Sources for the Period to 2020”, the development of renewable energy is part of Russia’s energy efficiency strategy. Efforts to “green” the Russian heating and CHP sector would also contribute to implementation of the national strategic targets for renewable energy. By the same token, using more predictable renewable energy sources (for example, biomass or geothermal energy) for heat and CHP generation would respond to the Russian authorities’ concerns as regards the impact of intermittent renewable energy sources, such as wind and solar, on the operation of the grid. It would also be in line with the general trend (for instance, in the European Union) of paying increasing attention to the heating sector in order to meet national renewable energy targets (see Box 3).

The Federal Heat Supply Law does not directly regulate the use of renewable energy for heat production. However, it contains provisions that could help ensure the financial viability of renewable energy investments in the heating sector. One important provision that could potentially influence the use of renewable energy is the requirement for municipalities to adopt heat supply schemes. The authorities that are eager to promote local renewable energy and stimulate innovative investments in their regions/municipalities might want to design their heat supply schemes accordingly.

Moreover, in accordance with Article 7 and Article 10 of the Federal Heat Supply Law, the regulation of heat tariffs shall create conditions to attract investment and stimulate energy efficiency improvements. Article 9 of the Federal Heat Supply Law establishes tariff regulation methods, including the economic justification of costs and a guaranteed return on invested capital. The use of renewable energy contributes to the national energy efficiency strategy. It is therefore arguable that the costs of these investments could be covered by heat tariffs, including a reasonable return on investment. When calculating the heat tariffs of CHP plants, revenues generated by participation in the wholesale electricity market must be taken into account. In the electricity market, the electricity produced by CHP installations benefits from priority dispatch of an amount corresponding to the heat output. This contributes to the attractiveness of using CHP to develop renewable energy in Russia.

To enable these developments, the Russian government could consider explicitly recognizing the costs associated with the use of renewable energy for heat production in the general methodology to calculate heat tariffs.
Moreover, similar to the way in which the Federal Electricity Law was amended in 2007 so as to promote renewable energy in the electricity sector, the Russian authorities could include specific provisions in the Federal Heat Supply Law to stimulate the use of renewable energy for heat and CHP production. Such regulatory intervention could first consist of defining the renewable energy sources that can be used in the heating sector. The conceptual delimitation of “biomass” and other types of waste appears, for instance, to be particularly relevant. This definition could be used when determining eligible costs and calculating tariffs. It could be included in Article 2 of the Federal Heat Supply Law.

The Federal Heat Supply Law could also provide for strategic renewable energy targets. These targets will have to take account of the contribution of CHP plants to the attainment of the renewable energy objectives in the electricity sector.

Moreover, similar to the requirement in the Federal Electricity Law, the Federal Heat Supply Law could require network companies to prioritise heat produced from renewable energy when covering their network losses. This obligation could be introduced in Article 13, paragraph 5, and Article 15, paragraph 11, of the law.

Furthermore, the Federal Heat Supply Law could provide for the compensation of the network connection costs of renewable energy generating facilities. This provision could be included in Article 14 of the law.

5.5. Improving the Investment Climate for Renewable Energy Investments

As analysed above, one of the most important barriers to the development of renewable energy in Russia is the perceived instability and unpredictability of the overall investment climate in Russia. In this context, support of renewable energy could consist of developing specific investment guarantees to improve the regulatory stability for renewable energy projects. Following the existing regulation in Federal Law No. 160 dated 9 July 1999 “On Foreign Investments in the Russian Federation” and Federal Law No. 39 dated 25 February 1999 “On Investment Activity in the Russian Federation in the Form of Capital Investments”, guarantees of stability could apply to the taxation of renewable energy projects. In addition to taxation issues, renewable energy investment could be entitled to broad stability clauses applying to the regulatory framework governing renewable energy investments in general. Broad stability clauses apply, for instance, to investments covered by Federal Law No. 115 dated 21 July 2005 “On Concession Agreements”.

Improving the stability of investment conditions for renewable energy would enable a reduction in the “risk premium” of such projects. This approach would reduce the costs of renewable energy investments without affecting the public budget.

5.6. Environmental Legislation

Stricter environmental legislation on waste emissions provides a strong incentive to develop alternatives to waste dumping. This “constraining” approach offers considerable opportunities to encourage CHP plants to switch from coal to biomass.

An important aspect of this constraining approach is the credibility of the enforcement of environmental legislation, and, in particular, of the financial sanctions for violating emission standards or dumping rules.
5.7. EU Joint Renewable Energy Projects: a Russian WINDTEC to Green Europe’s Electricity Consumption

As stated above, a growing share of coal in Russia’s fuel mix will diversify Russia’s current energy mix. It will also make more natural gas available for export to the European Union. However, freeing up gas for export by replacing it with coal in Russia’s fuel mix will affect the country’s potential contribution to climate change mitigation efforts. There is a view that the carbon dioxide emissions associated with the increased use of coal represent the “climate change cost” of ensuring the security of Europe’s external energy supply. It could therefore be argued that the European Union has, to a certain extent, a responsibility to limit the carbon impact of electricity production in Russia.

The European Union could consider integrating the climate cost of its external energy supply by participating in efforts to improve energy efficiency and increase renewables deployment in Russia. European companies should help mitigate greenhouse gas emissions in Russia by participating in the transfer of capital and energy-efficient technologies to modernize Russian electricity and heat production. The Joint Implementation mechanism provides a way to assist Russia in this modernization effort, at least until the end of the 2012 commitment period.

In addition, renewable energy in Russia could benefit from support by EU member states under the so-called “joint project” mechanisms introduced by Renewable Energy Directive 2009/28/EC. Indeed, the Renewable Energy Directive allows member states to reach their mandatory national targets for the use of renewable sources through cooperative measures with third countries.

Member states can support the construction of renewable energy installations in non-EU countries and take the electricity produced by these installations into account when determining compliance with their national targets. In such cases, the following conditions must be fulfilled. Firstly, the electricity produced from renewable energy sources in a third country must be “consumed in the Community”, i.e. exported to the EU grid. The Renewable Energy Directive does not require that this electricity be consumed in the member state that implements the joint project. Secondly, the electricity must be produced by new installations. Thirdly, “the amount of electricity produced and exported has not received support from a support scheme of a third country other than investment aid granted to the installation.”

Member states with relatively limited physical potential for renewables and significant “not in my back yard” (NIMBY) issues (for example, Belgium or Luxembourg) might consider making use of these projects to attain their 2020 targets. The North-West of Russia has enormous potential for the development of renewables (for example, wind and biomass for CHP). Moreover, given its low population density, this region avoids the NIMBY problem that affects the development of renewables in many EU states. The North-West of Russia also borders the European Union and the Russian electricity network is already interconnected with the European network, which would allow renewables to be exported to the European Union, in compliance with the Renewable Energy Directive’s criteria.

The electricity produced from relatively small projects in specific locations (for example, biomass for CHP) could, in theory, be exported to the EU network without requiring huge investments in reinforcing interconnection capacity. Bigger wind projects would require large investments in network development (see Figure 5).

---

137 See Article 3 of the Renewable Energy Directive.
138 See Article 9 of the Renewable Energy Directive.
Article 16 of the Renewable Energy Directive requires member states to “take the appropriate steps to develop transmission grid infrastructure in order to allow the secure operation of the electricity system as it accommodates the further development of electricity produced from renewable energy sources, including interconnection capacity between member states and third countries.” Investors could invoke this provision to stimulate member states to reinforce their interconnection capacity with Russia in order to facilitate the import of electricity produced from renewables in Russia.

Moreover, interconnection projects could benefit from support as projects of EU interest under the Trans European Energy Network (TEN-E) framework. Russia’s renewables potential and the need to reinforce network capacity to export this electricity to the European Union could, for instance, be addressed as part of the Baltic Ring project, which is concerned with reinforcing the interconnection capacity between the Baltic states, Russia, and the rest of the European Union. The role of renewable energy in the context of the Baltic Ring project is already mentioned in the 2006 TEN-Energy Guidelines. However, in practice, instead of recognizing the potential of renewables, all attention is now on the network investments required to enable the export of the electricity produced from nuclear power plants built in the region.

Russia’s potential for renewables could be used to “green” Europe’s electricity supply by importing electricity produced from renewables in the North-West of Russia to the European Union. However, the EU institutions have largely ignored this possibility, focusing instead on the DESERTEC project. An EU-Russian WINDETEC (EU-Russia Joint Renewable Energy Project) could help the European Union move towards a more sustainable energy supply sooner and at a lesser cost.
SPOTLIGHT

WINDTEC to “Green” Europe’s Electricity Supply and Exploit Russia’s Renewables Potential

Many EU member states have NIMBY constraints and very limited renewables potential.

WINDTEC or BIOTEC is a win-win alternative to exploit Russia’s potential and “green” the EU’s electricity supply.

It will contribute to the EU-Russian energy policies by:

(i) Improving EU-Russian relations through cooperation on issues that are less strategically sensitive than upstream oil and gas;
(ii) Diversifying/reducing the EU’s dependency on Russian gas and Russia’s dependency on gas sales to EU; and
(iii) Avoiding transit countries.
Annex 1. Renewable energy projects identified in the Scenario Conditions for the Development of the Electricity Sector to 2030
Reference scenario
About IFC

IFC, a member of the World Bank Group, is the largest global development institution focused exclusively on the private sector. We help developing countries achieve sustainable growth by financing investment, providing advisory services to businesses and governments, and mobilizing capital in the international financial markets. In fiscal 2012, amid economic uncertainty across the globe, we helped our clients create jobs, strengthen environmental performance, and contribute to their local communities – all while driving our investments to an all-time high of nearly $19 billion. For more information, visit www.ifc.org.
For more information about the Project please visit:

http://www.ifc.org/ifcext/eca.nsf/Content/RussiaProjectRE