

# Russian Wind Industry, the PAST and the FUTURE



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**R**ussia is the biggest country in the world covering more than an eighth of the Earth's land area. The vast Russian territory and offshore zones boast of wealthy fossil fuel reserves. The Russian Federation is known as an energy superpower, being the leading country in natural gas reserves, the 2nd in coal reserves, the 7th in oil reserves and the 3rd in uranium reserves. In fact oil, natural gas, metals, and timber account for more than 80 per cent of the country's exports.

Though Russia has a large land mass, it does not have a reasonable capacity of wind energy generation. Ironically, wind industry was for some time one of the country's major developing areas. The first grid-connected 100 kW wind turbine with a 30m rotor was switched on in the USSR in 1931. At that time this was the largest grid-connected WT in the world. In 1938, a 5-MW grid-connected wind farm was constructed and switched on in Crimea (The Balaklava wind farm). From 1950 till 1955 the USSR was producing up to 9,000 WTs per year with a unit capacity up to 30 kW. Unfortunately, beginning from the 1960s energy strategy in the country

changed and national wind industry gradually came to a standstill.

The well-developed hydroelectricity production system in the country makes Russia the 5th largest renewable energy producer<sup>5</sup>. Large cascades of hydropower plants are built in Europe and Eastern Russia along big rivers like Kama, Volga, Enisei, Angara and Amur.

The latest attempts to develop a wind energy generation system were made during 2002-2006 when three large wind farm projects were worked out. The first of the projects was a 75-MW

onshore wind farm in the Leningrad region (2002-2004). The second one, a 50-MW offshore wind farm, in Kaliningrad (2004-2006) and the third was a 150-MW onshore plant in Kalmykia (2005-2006). All three projects were finally put on hold by potential investors as it became crystal clear that none of them had any chance to survive without a State-sponsored support system being implemented in the country.

The first ever Russian renewable energy law was introduced in 1997 and later in 1999 it was adopted by the State Duma (Russian Parliament) and

	Total	Ranking Worldwide
Population	142 million	9
GDP per capita <sup>1</sup>	\$14,064/year	42
Electrical energy consumption <sup>2</sup>	1023.5 TWh/year	4
Wind Power		
Onshore economic wind potential <sup>3</sup>		32,6-71,7 (127) TWh/year
Wind installed capacity by the end of 2009, MW, incl.:		
- Kullkovskaya (Kaliningrad)		5.025 MW
- Chukotskaya (Chukotka pen.)		2.5 MW
- Tyupkeldy (Bashkortostan)		2.2 MW
- Kalmukia		1 MW
Total, installed capacity		13.275 MW
Total, operational		7.825 MW
2015 RES-E generation target		2.5%
2020 RES-E generation target <sup>4</sup>		4.5%

<sup>1</sup> World Bank. Data refer to the year 2008. PPP GDP 2008 [http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP\\_PPP.pdf](http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP_PPP.pdf) & Population 2008

<sup>2</sup> In 2009: <http://www.e-apbe.ru/balance/detail.php?ID=18998>

<sup>3</sup> The floor of the range is an assessment according to: Spravochnik po resursam vozobnoviyemykh istochnikov energii i mestnym vidam topliva (pokazateli po territoriyam). Pod red. P.P.Bazrukikh, (Data book on RES Resources and local fuels in Russia (territorial indicators)) Moscow, 2007, p. 85. The ceiling of the range is provided by: Nikolaev V., Ganaga S., Kudryashov Yu. Nacional'nyy kadastr vetroenergeticheskikh resursov Rossii i metodicheskie osnovy ikh opredeleniya (Russian National Wind Energy Cadastre and its Calculation Methodics), Moscow, 2008, 582 p. As one may see these evaluations are pretty conservative, also European specialists give larger volume – 127 TWh/year (Europe Wind Power Market Environment: Country Analysis (September 2009), Emerging Energy Research)

<sup>4</sup> RF Government Ordinance issued on 06.01.2009 # 1-p

<sup>5</sup> List of countries by electricity production from renewable sources, combination of sources, [www.wikipedia.com](http://www.wikipedia.com)



*The Kulikovskaya wind farm (5MW) is the largest in Russia. It is in the Kaliningrad region of the western Russian exclave in the Baltics*

approved by the Council of Federation (upper chamber) the same year. However, President of the Russian Federation Boris Eltsyn vetoed it. At that time the only support measure proposed in the draft legislation was the government's obligation to spend at least 3 per cent from total State investments towards RES (renewable energy sources) development. All the other "support measures" were in fact not more than a declaration.

We consider this as a negative result and a consequence of an obvious underestimation of renewable energy development by the Russian lawmakers and government at the end of 1990s.

We have to admit that paradoxically, but the refusal to approve this 1997 law finally played a positive role in further efforts to develop another support scheme for renewable energy development. If that law had been approved at that time, we would hardly start new legal RE developments later. In the years that followed, a new position on renewable energy generation and an attitude to its development emerged, including in Russia.

A new federal law was adopted on November 4, 2007, # 250-FZ "On Amendments to Legislative Acts of the Russian Federation Regarding Measures for the Reorganisation of the Unified Energy System of Russia". This law constitutes the main elements of the RE support system in Russia which include:

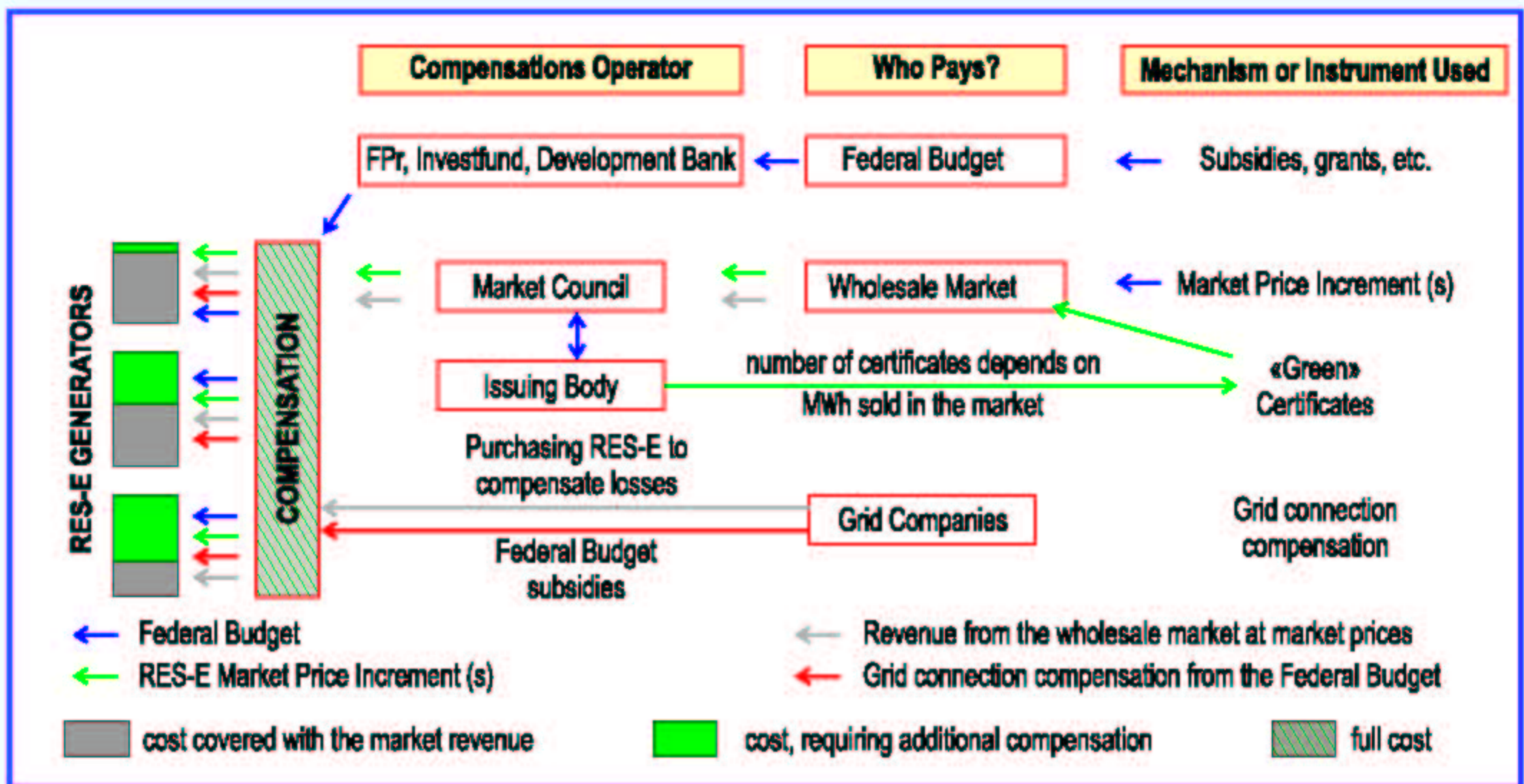
- Federal budget subsidies, covering grid connection cost for the RES-E generators < 25 MW;
- Obligation of the grid and distribution companies to purchase RES-E for their transmission losses compensation as a priority to other sources of energy;
- Introduction of the price premium(s) system paid over and above the RES-E market price achieved;

The price premium system has been proposed as an alternative to the FIT system, adopted in many countries, due to the existing energy market in the country and a legal prohibition for the new generators to use any centralised or direct tariffing system not based on market pricing. The money for price premiums is paid to the qualified generators participating in the wholesale electrical energy market for their RES energy volumes

sold in the market. The amount due is equal to RES-E energy volume multiplied by a price premium in Rubles fixed by the Government for a particular generation technology in the same way like FIT is used. The money needed for paying out these price premiums to the generators is collected from all the wholesale market participants in proportion to the volumes purchased by them in the market. It means that the amount collected monthly is equal to the money due to the qualified RES-E generators.

The law has introduced a system of renewable certificates for RES-E, based on which an RES-E generator confirms the right to receive any support proportionate to the volume of MWh sold and confirmed by the Trading System Administrator at the wholesale electricity market. These certificates have to be issued in favour of the qualified RES-E generator by the issuing body which, in the case of Russia is the Market Council. Certificates are issued based on the accrued MWh sold on the electrical energy market confirmed by the data from a commercial metering system approved by the Market Council.

**Figure 1. Support Scheme In the Law**



The general scheme of the RES-E support system adopted by the law is presented in the picture above.

On January 8, 2009, Russian Prime Minister Vladimir Putin signed a renewable energy governmental edict №1-p setting a goal of increasing renewable power generation from less than 1 per cent to 4.5 per cent of total energy generation by 2020 (excluding large hydro). Besides this there were few other by-laws adopted by the Russian Government or signed by the Ministry of Energy. Some are still missing. Pity that among the missing by-laws is the one on the price premium levels and payment procedures for the RES energy sold by the generators. There is another one about grid connection cost compensation out of the federal budget, but as this is only applicable for RES-E generators under 25 MW, we do not consider it very important for wind energy development in the country.

We also expect renewables growth after 2011, when Russia's energy

market is expected to be fully liberalised and when domestic power prices are expected to rise, as natural gas for the power sector is less subsidised and cross subsidies on the electrical energy will be eliminated as well.

Russia today faces serious problems in wind power development. Our country needs to address these energy challenges to ensure the accomplishment of the wind power targets for 2020. And though the current legislation fails to provide any financial incentives for renewable energy generation, we are optimistic and expect that Russia will meet targets specified by the Government, especially for wind.

Not wasting time, Russian wind farm developers are working on new projects in order to meet the future wind energy market explosion with a list of projects ready for practical implementation.

The Russian Association of Wind Industry ([www.rawi.ru](http://www.rawi.ru)) has combined

information on the wind farm projects that are under development in the country. Wind projects with more than 1,700 MW of capacity are under development or for which the development phase has already been completed. Another 3,000-3,500 MW capacity has already been announced to be set up. These project sites are mostly in the south of Russia in Krasnodar, Stavropol, Rostov oblasts, Karachaevo-Cirkassian Republic, Kalmykia and others.

Wind potential in Russia is huge. The country is situated in different climatic zones and large part of its territory constitutes vast planes. According to a country report by Emerging Energy Research, the leading provider of market intelligence on the global energy industry, Russia has a wind potential (economic onshore potential) of 127 TWh/year. The local assessments of the economically viable wind potential in the country are much more conservative – between 33 and 77 TWh/year – but we believe that the estimation methodology used needs an update and upgrade probably.