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RENEWABLE ENERGY: GLOBAL TRENDS & RUSSIA

The paper focuses on major drivers, constraints and risk factors related to the forming the long-run Energy Strategy in the RF comprising development of various renewables, in particular hydro and solar energy along with enhancing energy efficiency and decrease in energy consumption. Since Russia stands behind most European and Asian countries in the renewable energy sector and concentrated so far on nuclear option rather than renewables this concerns the elaboration of the Russian model of the greenhouse gas emissions regulation which should include an adequate state support. The author comes to the conclusion that these issues are to be properly sorted out taking into account both advantages, key interests and perceived risks for particular sectors, such as coal mining and metallurgy, as well as for the Russian economy in general. Summary of the paper incorporates proposals directed at building the low-carbon economy and boosting RES development in the country.

Key words: renewable energy and renewables; energy efficiency; energy consumption decrease; greenhouse gas emissions regulation; low-carbon economy.

Russia power generation sector highlights

The power generation sector is referred to a priority area of the Russian economy modernization, with the stable and at certain stages surpassing development of the electric power industry being necessary for a steady economic advancement of the country. In addition, the overwhelming majority of the energy complex companies face the task of re-equipping their power facilities and developing the renewable energy. Decommissioning of life-expired power facilities without their adequate replacement could not but result in a growing deficit of power generation, simultaneously affecting the reliability of power supply to consumers. Given that deficit, the energy producers tend to get higher revenues through exploiting their monopolistic status and raising

prices for electric power. But the government, in order to protect the economy and avoid social tension, regulates (actually, restrains) the escalation of price by way of introducing relevant tariffs which, in its turn, gives a negative impact on the investment potential of the power sector. As a result, there takes place, on the one hand, the enhancement of government regulation in the power sector which forces generating and distributing companies to cut their technical re-equipment programs or waive any capital investment whatsoever, and, on the other hand, due to lower investment attractiveness of the power complex there gets increased the state-owned share in this sector of economy.

The reform held in the Russian power industry has resulted in a noticeable diversification of both the structure

of potential investment sources and the sector funding ways themselves. The existing sources and ways of bringing finance to energy sector from the Russian and international financial markets include own investment funds of project originators, strategic and portfolio investments by financial partners, rising capital via equity issue, project bond issues, budget financing or state guarantees, various debt instruments, including project loans, leasing schemes, etc. The deficit of long-term financial resources in the Russian capital market is a serious factor holding back domestic investments in energy, as well as in other economy sectors.

According to existing evaluations, the estimated payback periods for large-scale energy projects may vary between five and thirty years depending on the equipment capacity, financial capacity of power and heat market and a number of other specific parameters and conditions for investment program implementation. Since the maximum tenors offered by most of the Russian commercial banks are much shorter, aggravated by, as a rule, high interest rates, strict requirements of transferring significant amounts of settlements to the lending institution and some other conditions, it is the current liabilities only that the Russian financial market may realistically provide lending for.

However, even with credit resources sufficient to financially support projects, in most cases the Russian commercial banks can not lend for capital intensive projects in the power sector due to the existing ratios from Bank of Russia (maximum exposure on a borrower or a group of related borrowers). And in any case, raising investment capital via any financial instruments, as

well as funding energy projects from shareholders' equity, eventually bumps into the tariffs being the only source of income for generating and distributing companies.

Drivers

The fall of oil, gas and coal prices made the fossil fuels more competitive, but did not make the alternative energy investors reduce their activity. In 2015 the total investments in the sector worldwide reached US\$330bln, with over one third of the sum being the Chinese investments, 121 GV generation facilities were built. However renewables have to some extent been a victim of their own success, as subsidy payouts have unexpectedly surged. As a result, nearly half of the 28 EU member states have capped renewable energy funding, while at least five have frozen support or said that the coffers were bare – Bloomberg New Energy Finance.

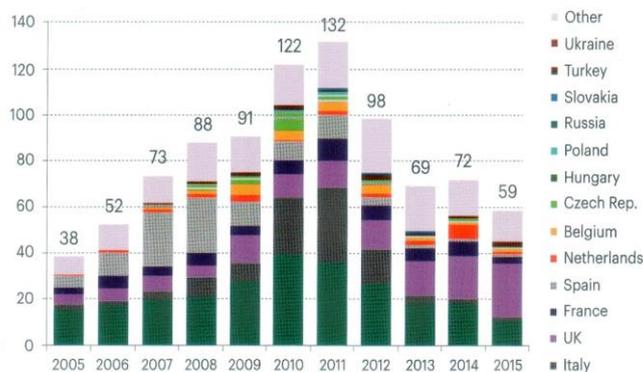


Fig. 1. New clean energy investment in Europe, in billion US\$

Russia is the fourth country in the world by volume of emissions (after China, the U.S. and India). During the next 15 years, the government plans to control emissions at the current level, which is a reduction of emissions by 2030 by approximately 25-30 percent if compared with 1990 levels. The new Russian Energy Policy for 2014-2035 provides for

an increase in capital investment in renewables, especially in hydro and solar energy, a greater focus on energy efficiency, a decrease in energy consumption and development of «balancing energy programs». In 2015 Russia joined the international Renewable Energy Agency (IRENA). Statements by energy sector officials suggest that Russia plans to invest approximately USD53 billion in renewables up to the Y203.

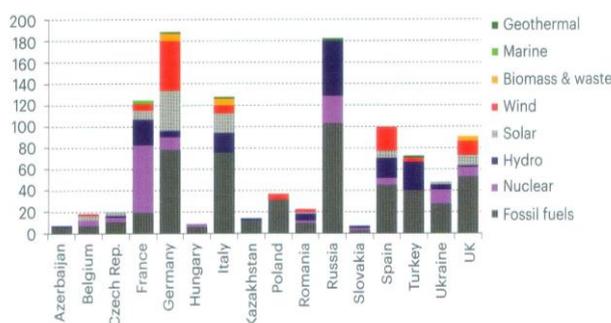


Fig. 2. Power generating capacity mix by country, GW

Hydro energy generation is the core renewable and is well regulated in Russia. 15 percent of the country's energy production comes from hydropower sources. Solar potential in Russia is reasonable despite its northern latitudes. Although Russia does not utilize many solar plants, it is quite advanced in photovoltaic technologies, especially in the production of silicon. One of the most important projects is a solar power plant initiated by a joint venture of Rusnano and Renova. Russia has now held three renewable capacity auctions, together approving awards to more than 1250 MW of capacity, and has refined the regime in a number of ways for the most recent (2015) one, which saw awards to 365 MW of the 460 MW of pre-approved bidding projects. This includes 280 MW of solar capacity, 35 MW of wind and just less than 50 MW of hydro capacity. However, the devel-

opment of its capacity-based auction system for renewable subsidies since 2013 has shown a willingness to make Renewable Energy Sources (RES) projects work in quite challenging market conditions. At present the overall share of renewables in the Russian energy mix does not exceed 6.2 percent, and solar generating facilities make up only 0.001 percent (!) of the whole energy system in the country. To this end between 2013 and 2020 Russia plans to introduce new RES generators to produce the equivalent of 6 GW of energy including 1.5 GW based on solar generation. What is not in doubt is the extent of renewable energy resources in Russia (especially wind, solar, hydro and geothermal), even if some of these are located far from centers of electricity demand/ consumption, meaning that a lot of new transmission infrastructure would need to be erected to integrate them into the grid. The Russian renewable energy market has the advantage of its huge resource potential: high wind potential in the coastal territories, the sun belt extending along Russia's southern borders all the way from the west to the east, various resources for bioenergy. Moreover, in the energy-isolated remote areas the RES cost efficiency equals or even exceeds that of the traditional energy production.

On the other hand Russia currently is out of many 'green finance' tools existing in the developed countries – so far the 'green' bonds and carbon units only can be used in Russia nowadays. A 'green' (or climatic) bond is treated as a debt security issued to invest in the environmental protection-related projects - the first issue of 'green' bonds (European Investment Bank) - USD0.5bln (in 2007). The stable upward trend in the

global 'green' bonds market is exhibited in the diagram to follow (fig. 3).

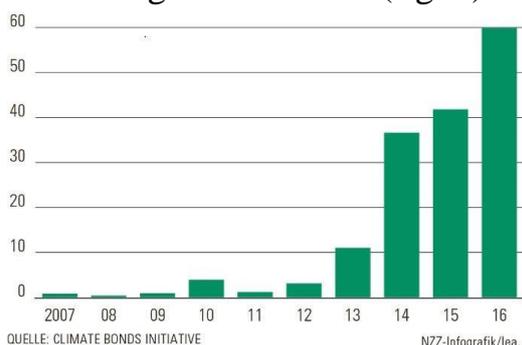


Fig. 3. 'Green' bonds market, in billion \$

'Green' bonds may be partially based on the existing products referring to infrastructural bonds and on the IC-MA documents – to this end the tool may turn out attractive for a certain number of foreign investors. Green projects implemented in the RF within the joint effort (Joint Fulfillment Mechanism) to reduce the CO2 emission comprise (fig. 4).

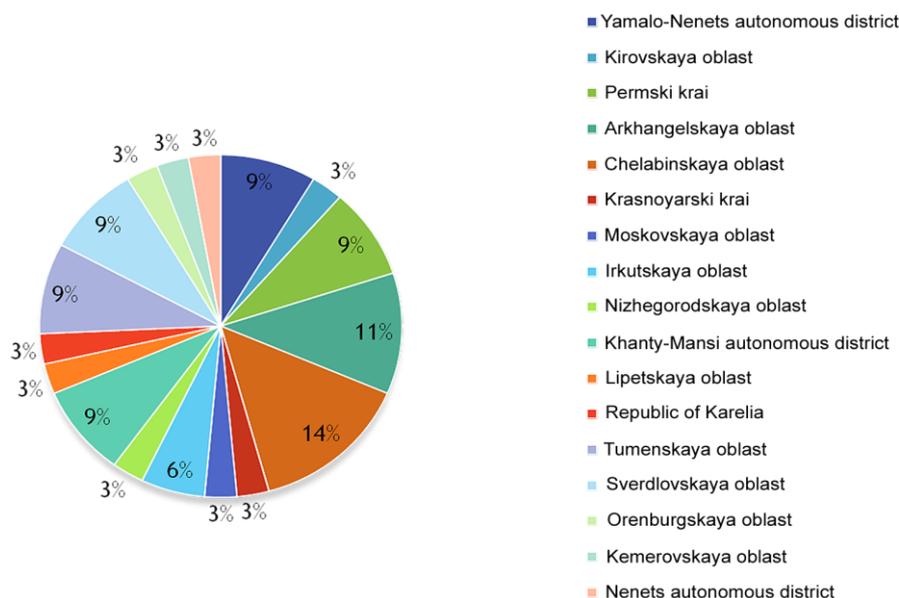


Fig. 4. Green projects implemented in the RF

Government role

Debate is going on in the country over the climatic policy future – despite the understanding of necessity of the government support to reduce greenhouse emissions, save power and raise energy efficiency and despite the relevant assurances, the federal budget actually provides no funds on these purposes, while the regional budget subsidies go down for the third consecutive year.

According to expert estimates, investments in renewable energy in Russia are by factor of hundreds less than in Brazil and by factor of thousands less

than in China, given the comparable potentials of these countries for the RES usage.

Starting from the late 1990-s the government has aspired that investment to large-scale energy projects be made mostly at the account of private Russian or foreign investors, rather than within public allocations. However, this strategy is inevitably associated with increasing project risks which could not but hold back investment activity in the sector. Because of the risks being high, from the point of view of international capital, in performing investments in Russia, particularly the long-term in-

vestments, international energy companies showing potential interest to the Russian power industry give up, as a rule, any large-scale investing. Nevertheless, both international and Russian investors may be interested in possible capital investment to develop regional and municipal power generation, since the volume of investment programs in this subsector is relatively small as compared to the “big energy”. The investment prospects of those projects are raised by such investor-important factors as regularly indexed electricity and heat tariffs and the possibility to participate in managing regional and municipal networks.

Underfinancing of emission reduction and energy efficiency from regional budgets has been aggravated in recent years with constrained borrowing from the global capital markets in the wake of anti-Russian economic sanctions by the US and EU – such key providers of capital as the World Bank, the IFC, the European Investment Bank have suspended financing new projects in the RF, while the Global Environment Fund has even cancelled financing the previously approved projects. In this context, unfortunately, we have to acknowledge the matter-of-fact absence of cooperation on the green agenda between the RF and the EU or the US.

Opponents' arguments

Until recently it was the coalmining and steel companies who came out against any carbon regulation, foremost against the carbon tax, referring to a high risk of negative social and economic consequences for mining regions. In some of them a municipalities-backed public campaign was launched under the hashtag ‘pravonaugol’ (the right for coal) - aimed at supporting the

coal industry and the employment therein and opposed to the plans of setting a price on carbon.

By estimate of a number of Russian energy companies, such as Inter RAO, Gazpromenergoholding, Siberian Generating Company, “the idea of carbon tax may deliver a catastrophic blow on the Russian industry and its position in the international markets” – according to the available calculations, a US\$15 carbon tax will result in the electric power price growth by 27% in the European part of Russia and by 55% in Siberia

In the opinion of the Russian Union of Industrialists and Entrepreneurs (RUIE) the PA “sets significant risks for Russia’s fuel and energy complex which bears strategic importance for the economy”, and the emission-regulating measures in Russia “should not be stricter than elsewhere in the world, restricting the development and competitive ability of the Russian economy (key) sectors”. It looks like a ‘vicious circle’ and exhibits the task how to convert a so to say ‘lose-lose situation’ into a ‘win-win’ one?

Paris agreement

The importance of the Paris Agreement (PA) adoption became a marquee topic at the latest St. Petersburg International Economic Forum. Mr Sergei Donskoi, head of the Russian Federation Ministry of Natural Resources and Environment qualified implementation of the PA-provided obligations as “a driver for building up the green economy in the country” and announced the “start of developing the Russian model for government control of greenhouse gases”.

The PA is known to come into effect after 55% of countries accountable

for 55% of global emissions ratify it – the process has been launched and by now over twenty countries have performed the required procedure. So far, Russia takes time with implementing the PA, not groundlessly believing that prior to taking the decision it is necessary to clarify its implementation rules, while the talks on their elaboration have just begun. Besides, those who work out measures to prepare for the PA ratification assume that, first of all, the financial, economic and social impact of the PA ratification on the Russian economy should be analyzed and the conception of the country's low carbon development till 2050 should be formulated. Meanwhile according to some assessments and market testing the attitude of the bulk (50-55%) of Russian companies to the PA is «rather negative» while one third of them are «indifferent» and only 10-15% of the entrepreneurs treating the above agreement «rather positively».

Global considerations, constraints & risk factors

Although the regulatory and commercial structures of national markets often differ substantially, governments and regulators in all the jurisdictions have to grapple with many of the same issues. These include – how to:

- drive down the costs of RES support while still meeting relevant RES targets (particularly in a world of relatively low fossil fuel prices)?

- keep up with falling costs and rising efficiency of some RES technologies?

- reconcile the demands of RES policy, given PA requirements, with the demands of their own fossil fuel industries and the limitations of existing RES technologies?

- ensure that there is a liquid market for power purchase agreements from RES power projects?

- manage the transition from historic green certificate and “feed-in-tariff” (FIT) schemes to the new world of competitive awards?

- cope with the costs that RES support schemes impose on consumers, in particular on the most energy intensive industrial users of power?

- prioritize the development of RES over energy efficiency measures and the expansion of nuclear power (as the main current alternative low carbon power generation technology) as ways of reducing greenhouse gas emissions?

In regard of Russia the key constraints that restrain the RES development can be formulated as follows:

- relatively low federal government interest in the RES projects - greater interest of regional administrations, however lacking financial resources.

- significant hydrocarbon lobby due to material investment made in oil and natural gas development in the past.

- reduction of electricity consumption by population and production enterprises as a result of economic stagnation.

- difficulties associated with «local content» equipment requirements in the subsidy regime.

- perceived potential risk to foreign investments in Russia in the current political context (sanctions etc.) and shortage of overseas capital.

- financial problems arising for projects as a result of fluctuations in the value of the RUR

- need in further sophistication of the law base regulating the low-carbon performance of the economy.

Summary

Despite the lack of consensus, the Russian business community gradually becomes aware that, given the considerable lagging of the RF behind other countries in setting up an integral system for the greenhouse gas control, the carbon regulation emerges as a key mechanism for shifting the economy towards innovation-based development.

Thus, according to the Ministry of Economic Development and Trade, “neglecting the world economic development trends may be extremely dangerous for the Russian economy in terms of future (global) competitiveness of Russian companies” – moreover, such lagging represents an economic threat and the risk of economic backwardness entrenchment. Russia is well behind most European and Asian countries (such as China) in the renewable energy sector. When it comes to generating low carbon power, it has traditionally focused more on nuclear than on renewable energy although it also has the fifth largest hydro sector in the world. Positive changes have been noted in Russia. So, enactment of the Government Resolution on stimulating the use of RES in the wholesale market of electrical power may be qualified as a pivotal moment in the Russian alternative energy history.

It may be assumed that the emerging Russian model of carbon regulation will be based not on hard pressure on the business, but on “soft incentives”, firstly – tax reliefs. Evidently, of great importance should be the elaboration of regional development plans and support measures considering local peculiarities of power generation and consumption, as well as the reduction of administrative barriers for new companies to enter the market.

The world witnesses the expanding and accelerating transition to a new technological platform of global power production where the RES will take a significant place with a 30-35% share and the entire carbon-free technologies will comprise over 60%. Russia needs an optimization of the regions’ fuel and energy balance with a parallel improvement of the quality of living – this task is being solved via extensive use of RES and local fuels. Green finance in the RF development directions – along with the carbon market finance support - are to include the following steps/measures:

- introduce the accounting and evaluating of new types of risk, power efficiency and environmental damage (emissions) in the pricing of shares in companies of certain sectors (steel, power, fuel, cement, pulp-and-paper industries)

- seek internationally a higher legal status for absorption units to obtain better conditions for Russia to trade therein in order to have the opportunity of depositing quotas provided under that mechanism while transferring from one Kyoto protocol phase to another

- * set up an efficient financial mechanism of the Russian Federation domestic carbon market the below measures are required, based on the international experience (the US, China):

- introduce carbon unit trading in particular regions of the country (the Urals, West Siberia) having appropriate background and conditions;

- deposit the unused quotas in a specialized carbon fund in Russia to build up the carbon potential;

- set up (in future) a carbon exchange centre in a major city - in a forested region - with a sufficiently devel-

oped infrastructure.

In spite of Russia's lagging behind developed countries in the applied technologies, it is plausible to assimilate existing western technologies, support domestic developments in the newest technologies, finance research in prospective areas of future power generation with reasonable combining government and business resources. National policies and legislation are regu-

larly changed as governments and regulators seek to address these challenges. For RES developers and investors, understanding current and possible future changes, spotting the opportunities that may arise from them, avoiding potential risks and finding a business model that is capable of surviving the resulting uncertainties is a key constituent of commercial success.

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ВОЗОБНОВЛЯЕМАЯ ЭНЕРГЕТИКА В МИРЕ И РОССИИ

Статья сфокусирована на исследовании основных движущих сил, сдерживающих факторов и рисков, с которыми сопряжены формирование и реализация долгосрочной энергетической стратегии в РФ, включающей в себя развитие различного рода возобновляемых источников энергии, включая гидро и солнечную энергию наряду с решением задач повышения энергоэффективности и энергосбережения. Поскольку Россия отстает от стран Европы и Азии в развитии сектора возобновляемой энергетики и сосредотачивала свои усилия на развитии атомной энергетики – нежели «чистой энергии» - это касается задачи разработки российской модели государственного регулирования выбросов парниковых газов. Автор приходит к выводу, что подходы к решению указанных задач должны быть тщательно взвешены принимая во внимание как преимущества и ключевые интересы субъектов отдельных секторов экономики, таких как угольная промышленность и металлургия – равно как и всей экономики, так и сопряженные с такими решения-

ми потенциальными рисками. Сформулирован ряд предложений, направленных на формирование в РФ модели низкоуглеродной экономики и развитии возобновляемой энергетики.

Ключевые слова: возобновляемая энергетика, возобновляемые источники энергии, энергоэффективность и энергосбережение, регулирование выбросов парниковых газов, низкоуглеродная экономика.

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