12. Russia: A Gas Superpower Striving for Nuclear Expansion and Starting to Support Renewables

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Russia has the fourth highest electricity demand globally. In the mid- and long-term, fossil fuels (gas, oil and coal) and nuclear energy will remain the backbone of Russian domestic and international energy policies. Russia is spearheading international support for nuclear power. Recent governmental decisions clearly show growing support for renewables. Despite overall budget cuts, renewable energy has for the first time received direct financial support from the federal budget. While energy efficiency policies have experienced substantial setbacks in recent years, gasification of public transport could further contribute to decarbonisation.

Increasing support for green energy with major reliance on fossil fuels

The Russian Federation remains one of the world's leading producers and exporters of fossil fuels. In 2015, it produced 12.4 percent of the world's oil, 16.1 percent of natural gas and 4.8 percent of coal (BP, 2016). It is also a key player in the nuclear sector in terms of uranium supply and enrichment services. The energy sector is of systemic relevance to the Russian economy, as export revenues are a major income source for the Russian budget. Despite the decrease in global oil prices, annual net profits of major Russian energy companies have continued to grow due to the combination of several factors such as low production costs, domestic currency devaluation and tax reforms. Moreover, oil production reached a record high in 2015 and continues to grow further. This is due to the so-called "tax manoeuvre", which implied a decrease in export duties for oil, therefore making exports more attractive for companies and stimulating them to maintain their production rates and export shares. In the gas sector, production volumes have declined, mostly due to decreasing domestic demand. Nevertheless, profits continued to grow, mainly due to currency devaluation, as oil and gas are traded in USD whereas Russia's investment programmes and budgets are calculated in rubles.

Russia has the fourth highest electricity consumption globally, after the US, China and India (IEA, 2015). Fossil fuels and nuclear energy still predominate in the electricity, heating and transport sectors. The break-down of electricity generation by source in 2015 shows that the largest share of electricity (65%) was produced by thermal power stations (Ministry for Energy, 2016a). Thermal power stations are mostly fuelled by gas in western and European parts of Russia and by coal in the Asian continental side. Electricity generation from nuclear energy has been growing steadily in recent years and accounted for 18 percent of total electricity generation in 2015. At the St. Petersburg Economic Forum in 2014, Vladimir Putin declared that Russia would increase the share of nuclear energy to at least 25 percent of total electricity generation. Electricity generation from renewable energy sources is mainly represented by hydroelectric power stations, which accounted for

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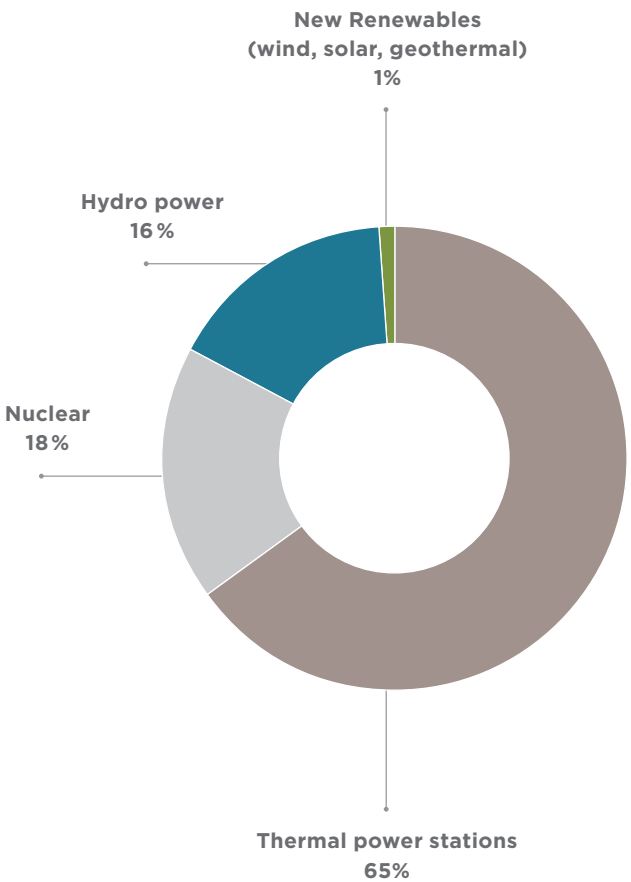
16 percent of electricity generation. Solar, wind, biomass and small-scale hydro power accounted for less than one percent of electricity generation. The government aims to increase the share of renewable energy, excluding large hydro power plants, to 2.5 percent by 2024. The key drivers are electrification of remote areas, and falling costs for green technologies versus increasing costs for the development of oil and gas greenfields. Furthermore, RusHydro, one of the key federal authorities dealing with renewable energy, actively engages in international cooperation on hydro power (Ministry for Energy, 2016a).

Therefore, electricity generation in Russia is characterised by steady growth of nuclear energy, stable position of thermal power stations and varying electricity production from hydro power stations, subject to seasonal fluctuations. In the mid-term, the electricity mix will not change substantially.

Figure 1: Electricity generation in Russia in 2015



Source: Federal Ministry for Energy, 2016

In the heating sector, heat-only boiler stations – working on gas, diesel or pellets – and central heating plants play the key role. The current situation in the heating sector is characterised by growing decentralisation. Since many large companies prefer to use their own independent sources such as boiler stations, the useful output of central heating stations has been steadily decreasing because of low levels of cogeneration. Thus, the share of central heating plants and heat-only boilers in heating production in 2014 accounted for 33 percent and 67 percent respectively (Ministry for Energy, 2016b).

Major trends with regard to renewable energy

The motivation behind renewable energy deployment is primarily economic: costs for new oil and gas fields are growing whereas costs for renewable technologies are decreasing. There is a growing perception that renewable energy does not compete with gas and oil but rather supplements them when used in remote areas. As a result, political elites are showing an increasing openness to promote wind and solar energy in Russia.

The first governmentally defined targets on the share of renewable energy in the national energy mix were specified in the Energy Strategy of Russia up to 2030, adopted in 2009. According to the national strategy, the share of renewables was expected to amount to 4.5 percent by 2020 (Ministry for Energy, 2009) or 8.1 GWt in absolute terms. This would require an annual increase of around 1.7 GWt between 2015 and 2020 (Semikashev, 2015). However, in April 2013 the target indicator was decreased to 2.5 percent or 5.8 GWt.

In May 2013 Governmental Decree No. 449, establishing several financial mechanisms to support deployment of renewables, was adopted, with initial tenders following in September. Among the key measures supporting renewables were capacity delivery agreements, which made renewable energy projects profitable and guaranteed paybacks on the wholesale market. The capacity delivery agreement was a unique approach: in most countries, renewables receive support for the volumes of electricity generated, whereas in Russia financial support was provided for capacities installed (the only specification being the minimum generation output). However, the law encompassed support only for solar, wind and small-scale geothermal projects, therefore excluding biogas (Gusev & Westphal, 2015). Furthermore, the legislation aimed to support electricity produced only for the wholesale market, thus excluding the deployment of renewables in remote areas, where large potential is concentrated. Finally, the installation of new capacities was subject to the provision of local content, which required any project to use a certain amount of equipment produced in Russia.

Despite initial success in developing support mechanisms, the first tender for renewable energy, organised in September 2013, revealed some problems and was only partly successful. Firstly, as a result of the local content provision, the bids received were mostly for solar, as Russia has only one largescale domestic producer of solar panels and almost no domestic production of wind equipment. Consequently, there were few bids for wind energy and none for geothermal. Secondly, the tender imposed tough guarantee requirements on project participants, who were mostly represented by small and medium enterprises (Boute, 2014).

In 2015 the government expanded its support for renewables, and two further steps were made. Firstly, renewable energy received support on the retail electricity market (previously limited to the wholesale market) including those in isolated and remote areas, where the use of renewable energy is more cost-effective than diesel generation. Secondly, deployment of renewables in isolated and remote areas was exempted from the requirement for local content provision. Finally, the decree provided support for all kinds of renewable energy, including biogas, biomass and landfill gas (Russian Federation, 2015). In 2016, despite the budget cuts in many other spheres, renewable energy received for the first time direct financial support from the federal budget (Dyatel, 2016). The government also extended the deadline for putting solar and wind stations into operation, from 2020 to 2024, and reduced the local content requirements for wind energy equipment due to the lack of domestic manufacturers (Fomicheva, 2016).

Therefore, despite evident progress in developing a legal basis for renewable energy in Russia, many problems still remain. Among them are the very limited

number of bids, and the delayed commissioning of planned capacities from 2020 to 2024. Finally, at present, the main electricity companies do not include renewable energy in their plans for capacity development. Nevertheless, an important message is that the government plans to further support renewable energy. All key Russian conferences organised by the Ministry for Energy, such as the Eastern Economic Forum and St. Petersburg International Economic Forum, include sessions on renewable energy.

Bumpy road for energy efficiency

Energy efficiency policies previously received considerable impetus under the presidency of Dmitry Medvedev, but have experienced substantial setbacks in recent years. Enactment of the Federal Law on Energy Efficiency in 2009 and the State Program on Energy Savings triggered the development of Russia's legislative framework on energy efficiency. This has greatly improved Russia's ranking among countries implementing energy efficiency measures recommended by the International Energy Agency. The State Program included 89 target indicators to be achieved across all sectors of the economy: buildings, industry, transport, lighting, appliances and equipment. Between 2008 and 2011, positive results were achieved in sectors such as state-funded organisations, lighting, appliances and equipment. Implemented measures led to reduced energy consumption in new and renovated buildings; the implementation of energy-efficient equipment; installation of metering devices; and mandatory labelling of buildings. In addition, a special programme on harmonisation and implementation of European technical standards in the construction sector is being implemented. However, the rush to adopt the new laws, combined with lack of monitoring, resulted in poorly drafted legislation that has required numerous amendments (Gusev, 2013).

In April 2014, a new state programme, "Energy Efficiency and Energy Development", abolished the previous programme and all of its established indicators. The new programme is less detailed and less specific in terms of objectives, tools and targets. Furthermore, federal funding of energy efficiency measures for the period 2015–2018 was reduced from USD one billion to almost zero (Shapovalov, 2014). This might be a reaction to the inefficient policy on energy savings over the previous four to five years, as well as the deteriorating economic situation that necessitated spending cuts. As a final step, the Department for Energy Efficiency and Energy Saving within the Russian Federal Ministry for Energy was recently dismissed in 2016 (Energosovet, 2016). Nevertheless, energy efficiency still remains on the political agenda and will get a second chance in the light of the Paris Agreement and CO_2 reduction measures. Thus, the government plans to restart energy efficiency policies in 2017 (Davydova, 2016b).

The potential for decarbonisation of the transport sector

The transport sector is the second largest emitter of CO_2 in Russia (UNFCCC, 2015a). The main factor driving efforts to reduce CO_2 emissions in the transport sector is the deterioration of urban air quality caused by the steady increase in vehicle numbers. Key policies on decarbonisation in this sector support gas and electric vehicles, and the use of Euro-5 standards for fuel and vehicles. A number of practical steps have been taken to expand the use of natural gas in the transport sector, since it has a smaller environmental impact than widely-used diesel. Therefore, in 2013–2015 the transport tax for gas vehicles was decreased, and regions received additional subsidies for shifting public transport to natural gas and constructing compressed natural gas stations. The government aims to increase the share of gas transport by 2020 to 50 percent in cities of more than one million inhabitants, and to 30 percent in cities with 300 000 inhabitants. Taking into account considerable governmental support, these goals are likely to be achieved.

Secondly, the important policy on decarbonisation of the transport sector is increasing support for electric vehicles. A recent report on electric vehicles worldwide, published by a leading Russian energy consultancy, clearly shows emerging political interest in this topic (Vygon & Belova, 2015). The first practical step to promote the adoption of electric vehicles was the elimination of import tax in 2014. This was followed by regulations (Decree No. 890) incentivising the installation of recharging points at fuel stations. Tesla Motors plans to open five supercharger stations in Moscow and Saint Petersburg by the end of 2016. Despite these measures, the number of electric vehi-

cles in Russia remains small: 647 light vehicles out of forty-eight million (Voronov, 2016). However, to boost the development of electric vehicles in Russia, the Government has drafted an ambitious strategy for the period to 2025. The programme enumerates a number of monetary and non-monetary incentives for the owners of electric vehicles, such as the use of bus-only traffic lanes, exemption from parking charges in cities and decreased highway tolls. Among practical steps is a pilot project on electrification of public transport, launched in Moscow in 2016.

Thus, decarbonisation of the transport sector in Russia is just beginning. Key challenges include the lack of specific target indicators on energy efficiency and energy saving, and the lack of detailed data on energy consumption and emissions by different transport modes.

Russian engagement in international energy cooperation

In the international arena, Russia actively engages, above all, in oil, gas and nuclear projects, followed by climate negotiations and the deployment of renewables.

Regarding oil and gas cooperation, Russian companies are involved in all sections of the added-value chain, from production and processing to distribution and storage. Cooperation includes European, Asian, Latin American and American companies. Current gas projects include the Nord Stream 2, Turkish Stream, Altai pipeline and LNG projects. Oil projects include expansion of refinery capacities in Europe, asset swaps with Asian companies and development of new fields abroad.

Russia is one of the leading supporters of nuclear energy. The main reasons are of an economic nature, as nuclear projects require large up-front investment and are accompanied by long-term ancillary services. Furthermore, the Russian Federation National Nuclear Corporation (ROSATOM) is diversifying its portfolio of services that use nuclear technologies in various sectors. Currently, Rosatom is involved in nuclear projects in 40 countries in Europe, Asia, Africa and the Middle East (Rosatom, 2016). Apart from construction of nuclear reactors and uranium enrichment, Rosatom develops medical and space nuclear technologies. A working group on nuclear energy was established within the framework of the EU–Russia energy dialogue. It addresses various aspects of nuclear energy deployment, but primarily safety requirements and the results of stress tests.

In April 2016, Russia among other countries signed the Paris Agreement. The Russian minister of natural resources and the environment emphasised that implementation of the Paris Agreement would give a positive impetus to modernisation of the economy. Indeed, climate policy in Russia started to develop primarily through its participation in international institutions to mitigate climate change, in particular – due to the adoption of international multilateral agreements – the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Russia submits annual national inventory reports to the UNFCCC, delineating its emissions situation.

Speaking at the 70th session of the UN General Assembly on September 28, 2015 (RT, 2015), Russian President Vladimir Putin paid special attention to the problem of global climate change, saying that Russia is planning to limit anthropogenic greenhouse gases to 70–75 percent of 1990 levels by the year 2030, thus making its Intended Nationally Determined Contribution (INDC) to slowing global climate change (UNFCCC, 2015b). The Russian INDC faced considerable criticism from foreign and Russian experts, as Russian greenhouse gas emissions in 2015 already amounted to only 71 percent of 1990 levels (Russian Federation, 2015), thereby actually leaving some space for growth in emissions, whereas any significant exceeding of this target appears unrealistic.

The Paris Agreement supplemented greenhouse gas emissions reporting and target-setting obligations by requirements for climate change adaptation policy. Although the National Adaptation Plan is underway, there is already a positive example of adaptation and mitigation policies at the regional level. In September 2015, Saint Petersburg presented its draft climate strategy to 2030 (Government of Saint Petersburg, 2015). Development of such a strategy is explained by statistically observed changes in Saint Petersburg's climate and negative impacts on the city's economy and public health.

To reduce CO_2 emissions, several key measures were identified, including: the establishment of a mandatory greenhouse gas monitoring system; assessment of reduction potential; the development of corresponding target indicators, and action plans by organisations and by sectors. Beyond that, the introduction of carbon pricing has been discussed. The issue of carbon tax has caused intense debate and revealed various opinions. Opponents argue that a carbon tax will burden the energy, metallurgic and cement industries, consequently reducing competitiveness. In turn, supporters underline that if carbon pricing is not established, then Russian export goods might become less competitive since they may be subject to additional environmental taxes in external markets (Davydova, 2016a).

Russia also cooperates in renewable energy development within the International Renewable Energy Agency (IRENA) and among the BRICS (Brazil, Russia, India, China and South Africa) countries. Russia became a member of IRENA in 2015, and joint projects currently involve a detailed analysis and Roadmap 2030 for renewable energy deployment in Russia. With the BRICS countries, Russia is chairing the group on green technologies and finance (Davydova, 2016c). Projects are funded through the New Development Bank, which financed the first projects in 2016. All the projects chosen were related to the development of renewable energy (Gurkov, 2016). Russia received USD one hundred million for small-scale hydro power plants in Karelia (RIA News, 2016). Apart from the cooperation with IRENA and BRICS, Russia actively engages in bilateral projects on the construction of new hydro power stations.

Impulses

Despite its dependence on fossil fuels, Russia shows some interesting developments in green technologies and decarbonisation. In terms of renewable energy, Russia actively supports cooperation on green technologies and green finance.

There is a growing understanding that renewable energy does not compete with gas and oil but rather supplements them in remote areas. As such, renewable energy projects in remote areas are often implemented by small and medium companies, and help to support local communities.

Russia engages more actively in international climate policy, and has a clear intention to establish a carbon market with mandatory monitoring of CO_2 emissions by sector and organisation. Along with the implementation of the Paris Agreement, energy efficiency policies will be restarted.

Finally, Russia is one of the foremost supporters and promoters of nuclear energy and new nuclear technologies in the context of low-carbon energy resources.

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