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The future of renewable energy and renewable energy systems in Russia

Russia remains a key player on the global energy markets. In 2015, after oil prices fell, the country increased oil production to a record 534.081 bn tons. However, relying exclusively on the fuel and energy sector will not lead to the achievement of sustainable and dynamic economic growth. The national forecasts show that the energy industry's contribution to GDP is likely to drop twofold: from 31% in 2015 to 13%-15% in 2040. Likewise, the industry's contribution to the country's consolidated budget will drop from 30% to 14%-18% during the same period. Therefore, the country has to search for new growth drivers for economy and energy industry. A shift to green growth requires stepping up innovation activity, diversifying the economy and energy sources.

Historically the Russian energy industry has been following a conventional development path. The availability of large hydrocarbon reserves (natural gas, oil, and coal) and water resources has turned into a significant barrier hindering the advancement of safe and efficient alternative energy sources. The innovative activity of Russian companies and those in the energy industry is only 9.9% and 10.9%, respectively. Moreover, until 2015, the country had no renewable energy support schemes. In addition, only a decade ago, the renewable energy technologies were not mature enough for profitable exploitation in most Russia's regions.

Scenario and market analysis shows that renewables could reach grid parity in Russia in 2035. Russian extractive industry companies will have to diversify and restructure. Grid companies should improve relay protection, automation, and accident prevention systems, given the growing share of distributed power plants. Russia's membership in IRENA and WEC, close cooperation with OECD and other international bodies in green energy and climate response opens direct access to the best relevant international R&D practices and their application. The establishment of the renewable sector before the pandemic and the first success stories laid the foundation for future development.

The COVID-19 pandemic had some adverse effects on the global and national energy industry, including renewables. The visionary future for the Russian renewable energy sector includes qualitative (structural) changes in the industry: full decommissioning of old power plants, radical reduction of coal-fired generation, and launching an ambitious modernization program. It will be possible to undertake these steps with a favorable external environment - technology cooperation with other countries, lower cost of credit, and economic recovery. Green digital transformation of the electric power industry implies close links with other energy segments and other sectors of economy (i.e. e-mobility, smart homes, etc.). New cross-sectoral solutions have to be put in place and benefit energy, construction, transport, water supply and sanitation, and other sectors.