

The Electric Power Industry: Challenges of the Fourth Industrial Revolution

KEY CONCLUSIONS

Digitalization is the driver of efficiency growth in energy

"There has always been a large amount of information in the energy sector, and now there is a unique opportunity to use digitalization to improve everything, the business processes and the interaction with consumers alike," Alexey Texler, First Deputy Minister of Energy of the Russian Federation.

"The role of renewable energy, active consumers, demand management, energy accumulation and storage systems will increase over time, the number of electric vehicles will increase. The basis for future transformation process in the power industry will be digitalization of networks. Digitalization is paramount for stable development of the economy, energy security, solving environmental problems <...> Development of digitalization is not the goal itself, but rather the way to significantly improve efficiency of energy companies and business processes in energy management," Pavel Livinsky, General Director, Rosseti.

"It is necessary to measure success in terms of environmental efficiency, in terms of safety and in terms of <...> downtime and breakdowns. <...> We invest actively in digital technologies, which allows us to reduce the costs of our end-consumers," Christoph Frei, Secretary General, Chief Executive Officer, World Energy Council.

"We made the networks more efficient. <...> We have reduced the number of downtime and breakdowns. In Italy, we made a transition from hundreds to <...> a million small substations; the transition was ensured by massive digitalization," Simone Mori, Head of Europe and North Africa, Head of European Affairs, Enel S.p.A.

Modernizing energy complex allows to reduce technological losses and negative environmental impact

"A number of large energy facilities in the energy sector have been modernized in recent years. As for the heat supply system, more than 40 inefficient sources have been put out of use, with transition to Moscow's larger thermal power plants. <...> As for the power supply system, large power plants were launched: Bersenevskaya, Skolkovo, Medvedevskaya. As for the gas supply system, all core

<...> stations have been reconstructed,” Petr Biryukov, Deputy Mayor of Moscow for Housing and Utilities and Improvement.

“The actions to develop Moscow’s energy complex allowed us to achieve significant results in reducing technological losses by nearly 6%, reducing the negative impact on the city’s environment,” Petr Biryukov, Deputy Mayor of Moscow for Housing and Utilities and Improvement.

PROBLEMS

Low competition

“The main problem of the Russian power industry <...> is lack of proper electricity retail market, there is no <...> competition. [That problem] is complicated by the large scale of cross-subsidization,” Pavel Zavalny, Chairman of the Committee on Energy, The State Duma of the Federal Assembly of the Russian Federation; President, Russian Gas Society.

Complications with implementation of projects in distributed generation and renewable energy in Russia

“Hydrocarbon economy, when cost of electricity production is relatively low, certainly makes it difficult to develop such areas as renewable sources and distributed generation sources, because it is hard to compete with big energy,” Pavel Livinsky, General Director, Rosseti.

“The situation is more complicated with decentralized energy, which is one of the key global trends. <...> In Russia, on the one hand, the volumes of distributed power generation are growing. <...> But there is no progress with recognition of distributed energy. It appears in plan only as a way to supply energy for remote and isolated technologies,” Pavel Zavalny, Chairman of the Committee on Energy, The State Duma of the Federal Assembly of the Russian Federation; President, Russian Gas Society.

Automation of energy processes is incomplete

“Many processes of revolution 3.0 have not been completed yet, for example <...> automation is not universal,” Pavel Zavalny, Chairman of the Committee on Energy, The State Duma of the Federal Assembly of the Russian Federation; President, Russian Gas Society.

SOLUTIONS

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Digitalizing management processes in the energy sector

"The Internet of Things <...> allows us to integrate renewable energy sources more efficiently, we can also manage growing demand and supply; it is also a way to operate in the context of <...> electricity theft. <...> Artificial intelligence and big data help us predict the operation and maintenance of networks, help us achieve <...> downtime reduction," Christoph Frei, Secretary General, Chief Executive Officer, World Energy Council.

"We need to create a new interface with our clients in order to make the process more efficient, make it smarter using smart networks," Marcus Eul, Partner, European Leader Digitization in Energy Industry, PwC.

"Digital network may become the industrial testing ground for research and production companies to develop their innovative solutions," Pavel Livinsky, General Director, Rosseti.

Developing technologies of energy transfer and storage

"It would be desirable to have the network not only to transport electricity from the top down, but also to provide the opportunity for connection at the lower level, so that all electricity producers have the opportunity to exchange it, along with the services on that basis," Alexander Starchenko, Chairman of the Supervisory Board, Energy Consumers Association (ECA).

"Gas will remain essential for energy balance. Microgrids do not rule out such possibility. And energy storage will be one of the fundamental elements of such balance," Matteo Marini, Vice President, Division Manager, Europe, Power Grids Division, ABB.

Government support in cybersecurity

"The place and the role of government is to provide flexible regulation <...> understanding the challenges. That is, first of all, cybersecurity," Alexey Texler, First Deputy Minister of Energy of the Russian Federation.

"We need comprehensive approach to cyber security. <...> Government and private sector must work hand in hand. This [issue] is where you can't make it on your own," Arto Rätty, Senior Vice President, Corporate Affairs and Communications, Fortum Corporation.

Changing qualification requirements for employees to meet the challenges of digitalization



"It cannot exist without a 'digital electrician'. Digitalization <...> defines new qualification requirements in the labour market," Pavel Livinsky, General Director, Rosseti.

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