

## Hydropower: Avenues for Sustainable Development

### KEY CONCLUSIONS

#### **Hydroelectric power plants account for roughly 15% of the global increase in energy capacity**

“Hydroelectric power plants around the world had total installed capacity of 1.267 TW in 2017. At the same time, about 22 GW of capacity were commissioned throughout the world in 2017, including 3.2 GW at HPPs. The net power generation of HPPs around the globe amounted to about 4,200 TWh”, SibEnergy Technical Director Andrey Lymarev said.

#### **HPPs help conserve traditional resources**

“In the electric power industry, a key aspect of meeting the criteria for sustainable development is the maximum conservation of primary non-renewable energy sources while meeting the energy needs of the modern economy and society as well as minimizing the environmental impact throughout the entire chain of the cycle of electricity production. Given the growing global economic problems, air pollution, global warming, and climate change, the production of electricity using renewable sources is considered to be the [type of production] that best meets the listed requirements. Major HPPs are among the most significant factors in controlling climate change. In particular, according to the International Energy Agency, greenhouse gas emissions would be 11% higher without existing hydropower stations, which is comparable to emissions from road transport throughout the world”, RusHydro First Deputy General Director and Chief Engineer Boris Bogush said.

#### **Pumped-storage power plants are an essential component for regulating energy systems**

“According to global statistics, the power system can only be regulated today with the help of pumped-storage power plants. Having PSPPs makes it possible to operate nuclear and thermal power plants as well as electrical units that use solar and wind energy in the most efficient modes and optimize the operation of the power grid as a whole. PSPPs are the most effective tool for ensuring energy security and energy efficiency. More efficient and reliable storage devices that

would replace PSPPs are not expected to be established in today's foreign and Russian electric power industry over the next 10–15 years", Executive Director of the Hydropower of Russia Association of Hydropower Organizations and Workers Oleg Lushnikov said.

"If we talk about the backbone elements for the development of sustainable energy in any country, PSPPs are among the key components. All the modern trends in the development of renewable energy sources would be impossible without accumulators. PSPPs are essential for regulating the electrical power network throughout the entire world. At present, this type of generation is developing intensively around the world and is being actively used on an industrial scale. Considering the priorities of PSPPs that are capable of working at the peak of the daily load curve as well as consuming extra energy during the night-time dips in consumption, we believe it would be appropriate to develop PSPPs in Russia", Member of the Management Board and Director for Development Management at System Operator of the United Power System Aleksandr Ilienکو said.

### **The sustainable use of hydro-resources is a factor for regional economic development**

"The region's sustainable development is impossible without the sustainable use of the hydro-resources that exist in the Republic of Bashkortostan. Major hydroelectric power plants are being built in areas where there is a high level of electricity consumption and also where electricity consumption is lower. Rural areas need to continue the further development of small generation (micro-HPPs)", Bashkir Generation Company Chief Engineer Vladimir Kremer.

#### PROBLEMS

##### **High cost of operating small HPPs**

"Another complication is the lack of well-developed unified technical equipment for these micro-HPPs. If it appears, it will give a further impetus to developing the construction of small generation facilities, which are important for us", Kremer said.

## SOLUTIONS

### **Changes to regulatory legislation**

“We need to develop the legislative framework and settle a number of issues involving [in order to develop the construction of micro-HPPs”, Kremer said.

### **Meeting the interests of consumers and society is key to the sustainable development of hydropower**

“Our company views its contribution to the sustainable development of hydropower as meeting the needs of consumers, shareholders, society, investors, partners, and other concerned parties in an economically and socially sound manner. In 2017, RusHydro set out its key objectives for the period until 2020. They ensure the Group’s activities comply with the criteria for sustainable development in such categories as environmental protection and also improve the management and information disclosure system, reliability and safety as well as social responsibility. Key activities include the development and introduction of a biodiversity conservation programme, joining the UN Global Compact, and joining the National Global Compact Network Association. When compiling the list, the main provisions of the Environmental Safety Strategy of the Russian Federation until 2025 as well as the Concept for Russia’s Transition to Sustainable Development were taken into account”, Bogush said.