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TAJIKISTAN

BACKGROUND

To sustain long-term economic growth and development, Tajikistan needs an adequate and reliable electricity supply. From 2009-2016, approximately 70 percent of the Tajik population suffered from extensive electricity shortages during winter. The lower water flows in the winter season prevented full utilization of existing hydro generation capacity, and there were no alternative sources of supply. Amounting to approximately 2,500 GWh or 14 percent of annual electricity demand, these shortages imposed estimated economic losses of US\$200 million per annum or 3 percent of 2012 GDP.¹

Since then, the country has made significant progress in reducing severe electricity shortages by constructing new generation capacity, restoring and expanding existing generating capacity, and carrying out some energy efficiency measures at some of the largest industrial enterprises. By 2019, electricity shortages had been almost eliminated.

- 2016-2019: Increased average end-user electricity tariff by 22 percent with government approval for a further trajectory of increases until 2025.
- 2019: Prepared conceptual design for providing 100 percent renewable energy-based electricity service for 61 settlements, with total population of about 11,700, in the Gorno-Badakhshan Autonomous Oblast (GBAO) region of Tajikistan.
- 2020: Restructured an estimated US\$450 million or 35 percent of the long-term debt of the state-owned energy company, Barqi Tojik Open Joint Stock Holding Company

THE CHALLENGE

While Tajikistan has drastically decreased the shortage of electricity, three major challenges remain: (i) limited reliability; (ii) affordability; and (iii) accessibility of electricity supply.

Limited reliability: BT is in financial distress, jeopardizing the long-term adequacy and reliability of electricity supply. BT owns and operates about 4,800 MW or 77 percent of the electricity generation capacity

¹ Tajikistan's Winter Energy Crisis: Electricity Supply and Demand Alternatives, The World Bank, 2013.

in the country and is responsible for electricity transmission, dispatch, and distribution services to an estimated 8.2 million people. It serves all customers except for the GBAO region, which is served by a separate network operated by the Pamir Energy Company (PEC). BT has struggled with a chronic shortfall of revenue needed to finance power purchase costs from independent power producers (IPPs), the operating and maintenance (O&M) costs, the debt service costs, and taxes. As a result, BT: (a) reduced expenditures on O&M, and (b) struggled to service about US\$1.1 billion² of long-term debt from the Ministry of Finance (MOF) while MOF still had to repay the financiers. Those difficulties impaired BT's ability to provide reliable electric services; it increasingly relied on inefficient and polluting thermal power plants which operated on heavy fuel oil, and the customers began to rely on backup diesel generators to meet their power needs. The financial difficulties of BT were caused by: (i) below cost-recovery tariffs³ and the absence of a proper methodology for setting tariffs; (ii) excessive debt service costs; (iii) low collection rates for billed electricity; and (iv) operational inefficiencies. The situation was exacerbated by BT's inability to attract financing from development partners for large-scale rehabilitation projects of key power plants.

Affordability: Increasingly unaffordable electricity services and lack of efficient mitigation measures have adversely affected vulnerable consumers. The energy expenditure burden is high for the poorest parts of the population and is expected to be much higher when tariffs reach cost-recovery levels. Household survey data showed that due to higher electricity consumption per capita, the top 60 percent of households disproportionately benefited from below cost-recovery tariffs. The top quintile had been consuming nearly 3.5 times the amount of electricity per capita than the bottom quintile in Tajikistan. However, households in Dushanbe (the area with the lowest poverty rates in the country) consume

² As of December 31, 2018.

³ Estimated following the cash needs approach. Cost recovery tariff = cash that needs to be generated by BT to fully cover the energy purchase costs, O&M expenses, debt service costs, and taxes. This does not include return on existing investments or cash required for financing of future capital expenditures. The cost recovery tariff was estimated considering improvements in collection rates for billed electricity and reduction of energy losses.



more than 3.3 times the national average amount of electricity. Reduction of public subsidies to electricity consumption is therefore distributionally progressive in its direct effect; it is harder for poorer households to adjust to increasing energy costs.

Accessibility: In GBAO, 61 settlements with an estimated population of 11,700 people (5 percent of the regional total) have no electricity service. Located in remote mountainous areas of GBAO, these settlements are yet to be connected to the centralized electricity distribution network of PEC, which is responsible for generation and supply of electricity in GBAO. The settlements are scattered over a vast territory in the eastern part of GBAO, while a few are in the western part, close to the existing PEC grid. Connecting these settlements to the grid is a pressing issue. Due to the area's elevation (3,000m and higher above sea level), homes require heating for many months in the year. Currently there are no viable alternatives to electricity-based heating. Solid

fuels, which are unsafe and polluting, are transported from various parts of the country for heating purposes. But the prohibitively high capital costs of connecting these customers has been a barrier despite the fact that PEC has been operationally efficient and financially healthy.

THE RESPONSE

Since mid-2017, the multisectoral technical assistance provided by the World Bank, with support from the Energy Sector Management Assistance Program (ESMAP), has been helping BT, PEC, and other government counterparts to carry out detailed analytical work and design sound solutions to address the challenges faced by Tajikistan’s energy sector.

Developing a robust electricity tariff methodology. The World Bank with financial support from ESMAP and in collaboration with Asian Development Bank (ADB), helped the Ministry of Energy and Water Resources (MEWR) to prepare a robust electricity tariff methodology allowing for computation of tariffs for all segments

of the power supply value chain as well as end-user tariffs consistent with the principles of cost recovery. Approved by the government, the methodology is now under implementation—an essential step toward BT achieving financial viability. ESMAP also supported the development of a tariff increase trajectory for 2017-2025 to gradually reach cost recovery. Further, the Ministry of Health and Social Protection, MEWR, and other key government stakeholders benefited from technical support to estimate the poverty impacts of various scenarios of long-term tariff increases and identify the most viable approaches to mitigate the potential social impacts.

Providing recommendations on financial recovery of the power sector. Based on the recommendations from the World Bank, the government prepared a detailed financial recovery plan for the power sector. Specifically, the inputs from the World Bank helped to design the US\$1.5 billion Government Program for Financial Recovery of BT for 2019-2025. Currently, under implementation, the Government Program includes an exhaustive set of policy, regulatory, financial, operational, and governance improvements. With ESMAP input, BT and MOF developed a detailed plan for restructuring of debts provided by MOF to BT of approximately US\$1.1 billion.

Monitoring progress and impact. In the absence of a systematic approach to monitoring electricity reliability in Tajikistan, the ESMAP-funded team introduced an innovative automated network of devices to monitor frequency of electricity supply outages, which also helped to cross-check the reliability of other data collected on quality of electricity service and inform the design of a monitoring and evaluation indicator used in the Government Program.

Carrying out geospatial analysis. ESMAP support was also instrumental in helping the government carry out geospatial analysis to prepare a preliminary conceptual design for electrification of settlements in GBAO. In particular, the geospatial analysis helped to define a technically feasible and economically cost effective combination of renewable energy (RE) sources—micro hydro, solar PV, wind – combined with battery energy



storage systems (BESS) to meet the electricity demand in each settlement through microgrids to be operated by PEC. The solution would help ensure an average of 14 hours of electricity supply per day for residential, public, and commercial consumers without any access to electricity. Further, it would improve indoor comfort levels, reduce the stress on the local environment, and slash greenhouse gases (GHG). Without RE-based microgrids, consumers would have to continue to rely on household-level fossil fuel-based heating solutions, which are polluting and often unsafe.

OUTCOMES

Increased tariff. In 2017-2019, the government increased the weighted average electricity tariff by about 22 percent. This increase, coupled with the increases planned during the implementation of the Government Program, and other essential measures, should ensure that BT becomes a financially sustainable company capable of relying on self-financing of investments, raising commercial financing, and ensuring reliable electricity supply to consumers.

Restructured debt. In parallel to tariff increases, the government has initiated an ambitious undertaking to restructure the terms of debt owed by BT to MOF. As a first step, a total of US\$450 million in debt was restructured, which significantly improved the solvency of BT.

Funding leveraged. Strong commitment from the government coupled with sound measures to improve the financial viability of BT led the World Bank to provide a US\$134-million IDA grant to support certain measures under the Government Program as part of the Power Utility Financial Recovery Program-for-Results operation. This comprehensive and cross-sectoral engagement by the World Bank helped leverage committed financing of approximately US\$130 million from other development partners (ADB and EBRD). This will help address essential elements of the Government Program, including improvement of corporate governance of the power sector and scale-up of advanced metering and billing



infrastructure to improve billing and collection rates in large cities, which are essential for the long-term financial viability of BT and reliability of electricity supply.

Protection for the poor. The tariff necessitates increased attention to vulnerable consumers. To mitigate the potential social impacts, the World Bank provided support to estimate the poverty impacts of various scenarios of long-term tariff increases. This, in turn, helped to assess the fiscal cost of protection of the poor through the existing Targeted Social Assistance program which, since May 2020, has expanded to cover all regions of the country. The government, with support from the World Bank, is also working to design a lifeline tariff to protect the poor. This is necessary because, in the current economic environment, it may become challenging to adequately protect the poor using only state budget resources.

Clear communication. The issue of tariff increases and overall energy sector reforms is politically and socially sensitive. Therefore, the World Bank is supporting a public communication strategy for BT and MEWR to engage with the general public on important issues in the energy sector.

Construction of microgrids. PEC is the process of preparing the tender documents for construction of microgrids to supply electricity generated by micro hydro, solar PV, and wind plants to 11,700 people in the GBAO region of Tajikistan. The microgrids would include innovative battery energy storage systems to allow accumulation of energy during the off-peak day hours to be used during peak evening or morning hours. The construction will commence in 2021 and be completed in 2023. The construction of microgrids is supported under the World Bank's US\$31.7-million Rural Electrification Project. This project is part of the bigger US\$86-million program for development of the power sector in GBAO supported by the World Bank, KfW, EU, SECO, and USAID.

NEXT STEPS

Going forward, the government would need to focus on the following strategic priorities in order to strengthen the foundations and pillars of long-term financial viability of BT and generate larger economy-wide benefits from ongoing large investments in the power sector.

Further improvement of regional connectivity. Tajikistan made significant progress in expanding its electricity

exports at the regional level. Those efforts should continue to further improve electricity network connectivity and exports of clean hydropower to regional markets.

Mechanisms to leverage commercial financing for power sector. There is a need for sizeable additional investments until 2030—over US\$6 billion—to ensure adequate and reliable electricity supply including rehabilitation of existing power generation assets and construction of new facilities. Public financing of those investments may not be sustainable given broader macroeconomic and public debt considerations.

Further strengthening of mechanisms to mitigate higher costs for the vulnerable. The Bank is providing support to the government in strengthening TSA targeting mechanisms. Consultations are ongoing on better linking of the assistance to the energy price changes, including through a possible seasonal top-up.

Design of mechanisms to mitigate risks from climate change. Climate change is a specific and material risk in Tajikistan, which relies on hydropower for almost 95 percent of its total electricity supply. Climate change impacts hydrology with direct financial consequences on BT's revenues and their variability. Therefore, mechanisms need to be developed to mitigate those risks.

ABOUT ESMAP

The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Canada, Denmark, the European Commission, Finland, France, Germany, Iceland, Italy, Japan, Lithuania, Luxembourg, the Netherlands, Norway, the Rockefeller Foundation, Sweden, Switzerland, and the United Kingdom, as well as the World bank.

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