

SECTOR ASSESSMENT (SUMMARY): ENERGY

A. Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. **Sector overview.** While the energy sector comprises many subsectors, the main focus of the ongoing sector reforms in Tajikistan as well as the support provided by development partners such as the Asian Development Bank (ADB) is on the electricity subsector. Tajikistan has made great strides in developing its power supply system since its independence in 1991. However, the current most significant challenge is the debt crisis of the subsector's vertically integrated state utility, Joint Stock Holding Company Barqi Tojik, which is reaching unsustainable levels. Tariffs below cost-recovery levels, nonpayment of bills, system losses caused by aged and obsolete infrastructure,¹ and inadequate capacity for financial and corporate management are the main contributors to the crisis. To improve the reliability of the subsector's performance, the government is leading comprehensive reforms with the aim to attract more private players in the future.

2. **Electricity generation.** Being a landlocked country, Tajikistan relies heavily on its abundant hydro resources for electricity generation. Its hydropower potential is estimated at 527 terawatt-hours (TWh) per year, which exceeds the current electricity consumption of Central Asia by almost 300%. Hydropower plants (HPPs) represent more than 90% of the country's installed generation capacity. Barqi Tojik operates Nurek (3,000 megawatts [MW]); Boygozi (600 MW); Sarband (240 MW, to be increased to 270 MW); Qairakkum (126 MW, to be increased to 170 MW), Pomir HPP-1 (28 MW), Sharshara HPP (29.95 MW), Varzob Cascade HPPs (27.4 MW), Markazi HPP (15 MW), and Khorog HPP (9 MW). Two HPPs are run by independent power producers: Sangtuda-1 (670 MW), which was developed in coordination with the Government of the Russian Federation, and Sangtuda-2 (220 MW), which was developed with the Government of the Islamic Republic of Iran. Barqi Tojik also has three combined heat and power plants: Dushanbe-1 (198 MW), Yovon (120 MW), and Dushanbe-2 thermal power plant (400 MW).² The first two can be run on gas or mazut but are no longer operational because of their age and low efficiency, while Dushanbe-2 operates on domestic coal.

3. Since the 1990s, Tajikistan has suffered from insufficient power supply to meet demand as it faced the enormous task of revamping its power systems. Large investments in generation capacity since 2013 have reduced the gap between supply and demand.³ An energy loss reduction program and a rural electrification program also made a significant contribution. However, more investments are needed, especially in the southern provinces of Khatlon and Gorno-Badakhshan, an autonomous region. While the country had a surplus power supply in 2019 (20.5 TWh of generation against 17.6 TWh of internal consumption),⁴ the dependence on hydropower keeps the subsector in a volatile supply condition that depends heavily on the water supply secured throughout the year.

4. **Transmission.** The transmission grid of Tajikistan operates on 500 kilovolts (kV), 220 kV, and 110 kV. It used to have two 500 kV and eight 220 kV interconnections with the Central Asian

¹ The half-yearly losses of Barqi Tojik totaled 15.2% in 2019 and 16.4% in 2020. Pamir Energy's half-yearly losses totaled 10.52% in 2019 and 10.03% in 2020.

² A Chinese company, TBEA, provided \$178.0 million to build the first 100 MW. In 2014, China Exim Bank allocated a concessional loan of \$348 million for another 300 MW and the rehabilitation of two substations (110 kilovolts [kV] and 220 kV).

³ The total installed generation capacity gradually increased from 5,313 MW in 2013 to 6,473 MW in 2019, including 740 MW of the Rogun hydropower project.

⁴ Data from the Ministry of Energy and Water Resources.

Power System (CAPS). However, in November 2009, after a major regional system failure, Tajikistan was disconnected from CAPS.⁵ It still has two interconnections with Afghanistan: (i) an old 110 kV line with transmission capacity of about 100 MW; and (ii) an ADB-financed 220 kV double-circuit transmission line with 600 MW of capacity.⁶ Tajikistan also participates in the interregional CASA-1000 project—a transmission line link from the Kyrgyz Republic and Tajikistan through Afghanistan to Pakistan—to export seasonal surplus electricity from hydropower plants.⁷ After extensive investments in its transmission infrastructure, Tajikistan has a unified grid (except for the small autonomous system in Gorno-Badakhshan) and the most modern supervisory control and data acquisition (SCADA) system among Central Asian countries.⁸

5. **Renewable resources.** Renewable energy (other than large hydro) resources have yet to be developed on a notable level. Tajikistan's estimated solar potential is about 25 TWh/year. It has about 2,100–3,100 hours of sunshine a year. While the country uses some solar resources for water heating purposes, it has not yet exploited this potential. The wind power potential remains largely unresearched. The potential to produce electricity from biomass sources is estimated at about 2 TWh per year.⁹ Only few off-grid solar systems have been installed because the government still gives priority to the development of hydropower resources.

6. **Fossil fuels.** Tajikistan has proven reserves of coal and some potential reserves of gas, of which only a small fraction has been exploited. The potential coal resources total almost 4,300 million tons, of which 320 million tons are of high calorific value in the range of 6,680–8,460 kilocalories per kilogram.¹⁰ There is enough coal for coal-fired power plants to complement hydropower generation and produce some hydrothermal synergy. The current average price of coal is estimated at TJS400–TJS420 per ton.

7. The country's accessible oil and gas resources are almost entirely exhausted. Its proven reserves of crude oil are estimated at 12 million barrels, and its proven reserves of gas at 5.6 billion cubic meters. Most of the country's potential gas reserves (85%) are in the south; the prospected gas reserves require complex boring to a depth of 5–7 kilometers. Therefore, Tajikistan depends on imports to meet the demand for these energy sources. In 2019, it imported 1,017,645 thousand tons of petroleum products, of which 457,737 thousand tons (or 43,5%) was from the Russian Federation.¹¹ Imports of natural gas from Uzbekistan were suspended in December 2012 but resumed in 2018. In 2019, imports from Uzbekistan were 45,929 thousand tons of liquid petroleum gas and 140,050 million cubic meters of natural gas. Prices for petroleum products and liquid petroleum gas are deregulated, with no state subsidy.

⁵ Since March 2018, the Tajikistan grid is connected to a section of the Uzbekistan grid in an islanded mode. ADB's ongoing grant project is supporting the full synchronization of the two systems: ADB. 2018. [Tajikistan: Reconnection to the Central Asian Power System Project](#). Manila.

⁶ ADB. 2006. [Afghanistan and Tajikistan: Regional Power Transmission Interconnection Project](#). Manila.

⁷ Tajikistan exported about 1.5 TWh of electricity to Afghanistan in 2019, and about 0.91 TWh to neighboring countries in the first half of 2020.

⁸ This SCADA was financed by ADB and completed in 2018. Source: ADB. 2010. [Tajikistan: Regional Power Transmission Project](#). Manila.

⁹ Renewable Energy and Energy Efficiency Partnership. 2012. *Tajikistan (2012)*: <https://www.reeep.org/tajikistan-2012> (last accessed 14 October 2020).

¹⁰ Little Earth. 2017. *Review of the Coal Sector in Republic of Tajikistan*. Dushanbe.

¹¹ Data of the Statistical Agency under the President of the Republic of Tajikistan.

8. **Weak regulations and uneconomic electricity pricing.** Although end-user electricity tariffs have been increased by 15% on average each year during 2014–2019, and is planned to continue to rise by an average 12% till 2025, the country’s electricity tariffs are still among the lowest in the world and below the cost recovery levels.¹² Low billing and collection rates, technical and commercial losses, inefficient subsidiaries, weak accounting and audit systems, and the absence of a sector regulator and tariff methodology have forced Tajikistan to endure a severe financial crisis especially since 2015 with chronic debts, and weak sector governance and financial management. The government adopted a new tariff strategy in 2017 and a new methodology in 2019, both developed with ADB support, to increase accountability, transparency, and governance in the power subsector, as well as public awareness of its role and needs.

9. The financial situation of Barqi Tojik was exacerbated by an increase in receivables for power supply. In January 2019, those receivables totaled TJS1,473.1 million. The main delinquent accounts were those of the state-owned Tajik Aluminium Company (TJS390.8 million) and the State Agency of Land Recourses and Irrigation (TSJ133.0 million). The percentage of money collected for energy sold by Barqi Tojik was 92.2% in 2016, and 86% in 2017 and 2018. Given the shortage of cash at various levels of the supply chain, Barqi Tojik had to strike agreements with entities such as Tajik Aluminium Company for barter arrangements, such as for coal deliveries, to settle some accounts, which further contributed to its cash shortage.

10. **Governance and institutional issues.** Financial management and governance are a major problem area of Tajikistan's electricity subsector. Despite the multimillion investments, support from development partners, numerous management changes, and the government’s close supervision of expenditures, Barqi Tojik continues to run into insolvency problems since 2015. Although it has staff members with well-developed technical skills, it still suffers from weak operational and economic management systems and a worsening financial position. The combination of these factors severely undermined its ability to undertake critical functions of planning, implementing, and supplying good quality, reliable power to the consumers of Tajikistan. A joint effort of the government and development partners is urgently needed to resolve the financial crisis in the subsector; a satisfactory solution will contribute to the country’s growth and poverty reduction, and the credibility of its utilities. Advanced metering and billing systems are crucial investments to strengthen the transparency, accountability, and governance of power distribution.

2. Government’s Sector Strategy

11. The policies of the government are based on the National Development Strategy (NDS) 2016–2030 and Midterm Development Program 2016–2020.¹³ The priorities of the NDS 2016–2030 are energy security and efficient use of energy; improved communications and repositioning as a transit country; food security, nutrition, and better public access to quality food; and creation of jobs through more private investment, economic diversification, and competitiveness. The proposed program’s impact is aligned with both the NDS 2016–2030 and ADB’s country partnership strategy, 2016–2020 for Tajikistan,¹⁴ its country operation business plan, 2020–2022,¹⁵ and the government’s strategic objectives.

¹² In 2006, the weighted average tariff was \$0.006 per kilowatt-hour (kWh). The weighted average end-user tariff in 2018 was estimated to be \$0.016 per kWh against the estimated cost-recovery level of \$0.041 per kWh.

¹³ Ministry of Economic Development and Trade. 2016. *National Development Strategy and Midterm Development Plan*. Dushanbe.

¹⁴ ADB. 2016. *Country Partnership Strategy: Tajikistan, 2016–2020*. Manila.

¹⁵ ADB. 2019. *Country Operations Business Plan: Tajikistan, 2020–2022*. Manila.

12. The goal of the long-term development of Tajikistan is to improve the standards of living of the population based on sustainable economic growth. To achieve it, the strategic development objectives for 2030 call for (i) energy security and efficient use of energy; (ii) diversification of energy generation through development of hydropower plants in small and large river basins; (iii) development of the existing capacities of the oil, gas, and coal industries; development of new deposits of fossil fuels; (iv) buildup of technical capabilities for the use of alternative (renewable) energy sources (solar, wind, biomass, geothermal); (v) modernization of existing and construction of new power and thermal power plants; (vi) efficient use of the existing energy capacity and realization of the electricity export potential; (vii) modernization and technical upgrades of the oil and gas industry, and development of new oil and gas fields; (viii) large-scale energy conservation and energy efficiency of the national economy; (ix) development of internal and external energy infrastructure (electrical networks and substations); (x) development of an effective system of risk management and monitoring of energy security, including unlimited and equal access to energy for all consumers; (xi) financially viable and sustainable operation of the energy sector; and (xii) integrated water resources management.

13. **Financing options for energy development.** The investment and business climate in Tajikistan is not yet developed to encourage private sector participation and is still largely controlled and influenced by government decisions. To meet the large investment needs, the government is implementing reforms to move to market-oriented sector operations and increase private investments. In the meantime, however, the government and the sector rely heavily on financing assistance from development partners for the immediate investment needs.

B. Major Development Partners: Strategic Foci and Key Activities

14. A summary of key activities of major development partners is in Table 1.

Table 1. Major Development Partners and Key Activities

Development Partner	Project Name	Duration	Amount (million)
Electricity Transmission and Distribution			
ADB, IsDB, SECO	Power Rehabilitation Project	2000–2010	\$63.3
ADB, IsDB, OFID	Regional Power Transmission Interconnection Project	2006–2013	\$40.8
ADB	Nurek 500 kV Switchyard Reconstruction Project	2008–2016	\$55.0
ADB	Regional Power Transmission Project	2010–2020	\$122.0
ADB	Wholesale Metering and Transmission Reinforcement	2014–2022	\$54.0
ADB	Reconnection to the Central Asian Power System	2019–2022	\$35.0
China Exim Bank	Construction of 220 kV transmission line Lolazor–Khatlon	2006–2009	\$55.2
China Exim Bank	Construction of 500 kV transmission line South–North	2006–2009	\$267.2
China Exim Bank	Construction of 220 kV transmission line Khujand–Ayni	2010–2011	\$35.1
China Exim Bank	Establishment of unified power system	2011–2011	\$26.5
China Exim Bank	Additional works for Lolazor-Khatlon and South-North transmission line	2008–2010	\$51.0
China Exim Bank	Rehabilitation of 500 kV Regar substation	2012–2014	\$35.0
EBRD, EU, IFCA	Sughd Energy Loss Reduction Project	2012–2013	€21.0
EBRD	CASA-1000	2015–2020	\$110.0
IsDB	Rehabilitation of 220 kV Ravshan Substation Project	2013–2019	\$13.1
IsDB	Construction of Small Hydropower Plants in Rural Areas	2007–2012	\$11.2
IsDB	CASA-1000	2015–2020	\$70.0
JICA	Improvement of Substations in Dushanbe Project	2017–2020	¥2.19
KFAED	Rehabilitation of Dushanbe City Electrical Networks	2005–2010	\$12.7
KfW	Nurek Switchyard 220 kV Rehabilitation Project	2008–2013	\$30.9

Development Partner	Project Name	Duration	Amount (million)
KOICA	Power Grid Construction and Improvement of Health	2018–2020	\$6.0
SECO	Power Rehabilitation Project	2000–2009	\$8.0
SECO	Energy Losses Reduction Project	2007–2011	\$8.0
SECO	Pamir Private Power Project	2003–2012	\$5.0
SECO	Pamir Private Power Project II	2013–2016	\$4.4
World Bank, IsDB, EBRD, EIB, USAID, DFID	CASA–1000	2014–2021	\$350.0
World Bank	Tajikistan Winter Energy Project	2015–2017	\$5.0
World Bank	Pamir Private Power Project	2002–2010	\$12.5
World Bank and SECO	Energy Loss Reduction Project	2005–2014	\$35.8
World Bank	Rural Electrification Project	2019–2023	\$31.7
World Bank	Community Support Program (Energy part)	2019–2022	\$10.0
KfW	Construction of Tajikistan SHPP	2014–2017	\$8.6
KfW, EU, World Bank, USAID, SECO	Construction of Sebzor SHPP	2019–2022	54.0
Large Hydropower Generation			
ADB	Emergency Baipaza Landslide Stabilization Project	2002–2005	\$4.4
ADB	Golovnaya 240 MW Hydropower Plant Rehabilitation	2013–2022	\$136.0
World Bank, AIIB, and Sangob (Iran)	Nurek HPP Rehabilitation Project, Phase I	2017–2021	\$24.0
Inter RAO UES	Construction of 220 MW Sangtuda-2 Hydropower Plant	2006–2014	\$278.8
	Construction of 670 MW Sangtuda-1 Hydropower Plant	2005–2010	\$524.1
EBRD, PPCR, Austria Fund, and UK	Qairokkum Hydro Power Rehabilitation Project (Phase I)	2014–2018	\$75.7
EBRD	Qairokkum Hydro Power Rehabilitation Project (Phase II)	2018–2023	\$38.0
Conventional Energy Generation			
China Exim Bank	Construction of Dushanbe CHP-2 (Phase II)	2014–2016	\$331.4
Sector Development			
DFID	Central Asia Investment Climate Programme	2015–2017	£2.0
USAID	Energy Links project/CASA-1000 Secretariat support	2014–2019	\$22.8
USAID	Power the Future Project	2017–2019	\$9.0
World Bank	Energy Emergency Project	2008–2010	\$15.0
World Bank	Power Utility Financial Recovery	2020–2026	\$134.0

ADB = Asian Development Bank, AIIB = Asian Infrastructure Investment Bank, CASA = Central Asia–South Asia power project, CHP = combined heat and power; DFID = Department for International Development of the United Kingdom, EBRD = European Bank for Reconstruction and Development, EDB = Eurasian Development Bank, EIB = European Investment Bank, EU = European Union, HPP = hydropower plant, JICA = Japan International Cooperation Agency, IFCA = Investment Facility for Central Asia, IsDB = Islamic Development Bank, KOICA = Korea International Cooperation Agency, kV = kilovolt, MW = megawatt, OFID = OPEC Fund for International Development, OPEC = Organization of the Petroleum Exporting Countries, PPCR = Pilot Program for Climate Resilience, SECO = Swiss State Secretariat for Economic Affairs, SHPP = small hydro power plant, UK = United Kingdom, USAID = United States Agency for International Development.

Source: Asian Development Bank.

C. Institutional Arrangements and Processes for Development Coordination

15. The overall goal of the government is to ensure effective coordination between the development partners and the government in support of the NDS 2016–2030 and the updated 10 Shared Principles for Cooperation.²¹ In 2007, the Development Coordination Council (DCC) was established, which provides a platform for interaction between 35 development partners and with the State Committee on Investments and State Property Management, the Ministry of

²¹ Development Coordination Council–Tajikistan, 2012, *Tajikistan: 2012 Development Forum*, Dushanbe

Economic Development and Trade, and other government ministries.

16. The 2012 Tajikistan Development Forum launched the government's new midterm strategy for improving living standards in Tajikistan.²² At the forum, DCC partners presented nine multi-partner coordinated initiatives, including an energy security initiative designed to achieve measurable results by 2015 in six priority areas, one of which is energy independence. The initiative was prepared by the Energy Sector Working Group in consultation with the government and focuses on reducing the winter deficit, rehabilitating existing hydropower assets, improving transmission and distribution systems, and strengthening governance in the energy sector.

D. ADB Experience and Assistance Program

17. Being one of Tajikistan's largest and most active development partners, ADB has been providing support for physical and nonphysical investments in power generation and transmission, institutional capacity building, sector reforms, governance, and efficiency improvements. ADB's energy sector portfolio consists of four successful projects amounting to \$347 million.²³

18. Through the sector operational performance improvement (SOPI) program, a component of the Regional Power Transmission Project (footnote 8), ADB has been contributing since 2011 to improving the reliability and sustainability of Tajikistan's power subsector through policy-based interventions (institutional and regulator reforms). MOEWR's reform plans supported by SOPI was introduced and endorsed at a high-level coordination meeting with 14 development partners in June 2018.²⁴ The proposed program includes the unbundling of Barqi Tojik; debt restructuring; introduction of a new tariff methodology that ensures cost recovery; investments in infrastructure modernization; redesign of the fund-flow mechanism with a settlement system; and the possibility of introducing multiyear management contracts in the transmission and distribution companies.

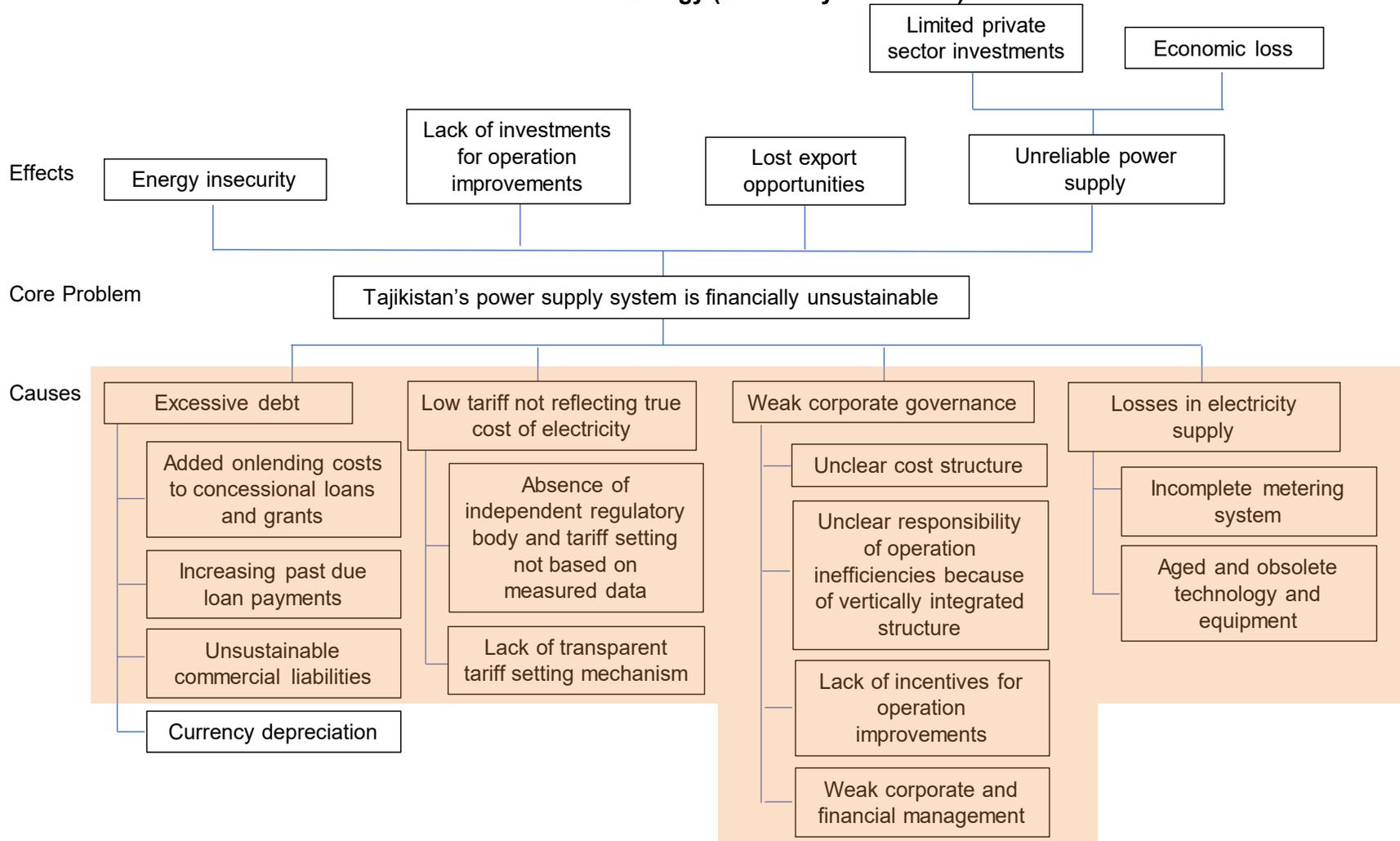
19. Through private and public sector operations, ADB will continue to work with the government and other development partners on leveraging its interventions to bring much-needed funds for modern energy (including improvements to governance, implementation of sector reforms, and restoration of the power subsector's financial sustainability) and for inclusive growth in a socially, economically, and environmentally sustainable way within a changing regional, global and technological context. ADB will also keep supporting efforts to (i) modernize upstream and downstream subsector components; (ii) reduce system losses and improve transparency and accountability through retail advanced metering and billing systems; and (iii) foster the transfer of knowledge on technologies, regulation, and best practices between Tajikistan and region.

²² Government of Tajikistan. 2013. *Living Standards Improvement Strategy of Tajikistan 2013–2015*. Dushanbe.

²³ Apart from the Regional Power Transmission Project (footnote 8) these are: ADB. 2013. [Tajikistan: Golovnaya 240-Megawatt Hydropower Plant Rehabilitation Project](#). Manila; ADB. 2014. [Tajikistan: Wholesale Metering and Transmission Reinforcement Project](#). Manila; and ADB. 2018. [Tajikistan: Reconnection to the Central Asian Power System Project](#). Manila.

²⁴ The 14 partners are: ADB, European Bank for Reconstruction and Development, Eurasian Development Bank, the European Union, Department for International Development (now Foreign, Commonwealth and Development Office), International Finance Corporation, International Monetary Fund, Islamic Development Bank, Japan International Cooperation Agency, Kuwait Fund for Arab Economic Development, KfW, Swiss State Secretariat for Economic Affairs, United States Aid for International Development and the World Bank.

Problem Tree for Energy (Electricity Subsector)



Supported by this sector development program