

Validation Report
June 2022

The Republic of Tajikistan: Regional Power Transmission Project

Reference Number: PVR-867
Project Number: 43150-022
Grant Number: 0213



Raising development impact through evaluation

ABBREVIATIONS

ADB	–	Asian Development Bank
BUNCC	–	back-up network control center
CAREC	–	Central Asia Regional Economic Cooperation
CPS	–	country partnership strategy
DMF	–	design and monitoring framework
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
MEWR	–	Ministry of Energy and Water Resources
NCC	–	national control center
PCR	–	project completion report
PIC	–	project implementation consultant
PSDP	–	Power Sector Development Program
SCADA	–	supervisory control and data acquisition
SOP	–	sector operational performance improvement

NOTE

In this report, “\$” refers to United States dollars.

Director General	Emmanuel Jimenez, Independent Evaluation Department (IED)
Deputy Director General	Sona Shrestha, IED
Director	Nathan Subramaniam, Sector and Project Division (IESP), IED
Team leader	Arjun Guha, Evaluation Specialist, IESP, IED

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PROJECT BASIC DATA

Project number	43150-022	PCR circulation date	25 Nov 2021	
Grant number	0213	PCR validation date	Jun 2022	
Program name	Regional Power Transmission Project			
Sector and subsector	Energy	Electricity transmission and distribution		
Strategic agendas	Inclusive economic growth Regional integration			
Safeguard categories	Environment		B	
	Involuntary resettlement		B	
	Indigenous peoples		C	
Country	The Republic of Tajikistan		Approved (\$ million)	Actual (\$ million)
ADB financing (\$ million)	ADF: 122.00	Total project costs	141.00	121.95
	OCR: 0.00	Grant	122.00	121.95
		Borrower	19.00	0.00
Approval date	13 Aug 2010	Effectiveness date	16 Oct 2010	19 Oct 2010
Signing date	16 Sep 2010	Project completion date	31 Aug 2015	30 Jun 2020
		Financial closing date	—	21 Aug 2020
Project officers		Location	From	To
	L.V. Mtchedlishvili	ADB headquarters	Jan 2011	Oct 2014
	B. Chansavat	ADB headquarters	Nov 2014	Jan 2017
	L.V. Mtchedlishvili	ADB headquarters	Jan 2017	Jun 2017
	T. Luo	ADB headquarters	Jul 2017	Jul 2018
	S. Khojaev	Tajikistan Resident Mission	Jul 2018	Jul 2021
IED review				
Director	N. Subramaniam, IESP			
Team leader	A. Guha, Evaluation Specialist, IESP*			

— = no approved financial closing date, ADB = Asian Development Bank, ADF = Asian Development Fund, IED = Independent Evaluation Department, IESP = Sector and Project Division, OCR = ordinary capital resources, PCR = project completion report.

* Team members: H. Hettige (quality reviewer), F. De Guzman (Senior Evaluation Officer), G. Morgan and W. Zhou (consultants).

I. PROJECT DESCRIPTION

A. Rationale

1. Over 90% of electricity generated in Tajikistan come from hydropower plants. When demand is high and power generation depends on reservoir-stored water during winter, Tajikistan imports electricity from neighboring countries. Power was only supplied for a few hours a day during winter and power cuts became more frequent even in large cities, severely affecting urban and rural populations and businesses. Due to the lack of capital investment, the obsolete power infrastructure systems were not properly maintained or replaced. Progress in developing new capacity was slow due mainly to the significant resources needed to develop hydropower plants and associated transmission lines, and the lack of regional cooperation caused by issues relating to the sharing of river waters. Also, power system losses were high, due primarily to technical losses in the transmission and distribution network. Main contributing factors included limited maintenance of the network, changing consumption structure, and the use of electricity for space heating, which often overloaded the network. Also, the transmission network had limited

geographic coverage, affecting the evacuation of power from plants and restricting winter and summer power trade with Afghanistan, the Kyrgyz Republic, and Uzbekistan.

2. The operational performance of Tajikistan's energy sector was poor. Since 2006, the government approved increases in the below-cost tariff and the weighted average tariff. The tariff was \$0.019 per kilowatt-hour (kWh) in early 2010, substantially below the \$0.030/kWh required by Barki Tojik, the state-owned, vertically integrated power utility, for full cost recovery and financial viability of the sector. There were billing and collection issues as arrears of state-owned enterprises kept increasing. Barki Tojik also lacked essential systems to support management operations and decision making, such as a computerized customer billing system. While Barki Tojik's technical capacity was sufficient, its capacity for planning, power operations, financial management, and monitoring of social safeguards and environmental mitigation measures needed strengthening. Sector-wide weak governance resulted in inefficient utility operations, power theft, illegal power supply, reduced billing and tariff collections, and nonpayment of arrears.

3. When the Government of Tajikistan developed a strategy for power sector reform and investment, it requested assistance from the Asian Development Bank (ADB). The government and ADB agreed to prioritize the transmission network, which required physical investments and policy reforms. In 2010, ADB approved a grant of \$122.0 million from its Special Funds resources for the Regional Power Transmission Project in Tajikistan.¹ As the second regional transmission project in Tajikistan, the project aimed to expand and modernize the transmission network, which was a precondition to reduce system losses, improve energy efficiency, and facilitate power trade with neighboring countries covered by the Central Asia Regional Economic Cooperation (CAREC) program. The project also aimed to improve Barki Tojik's operational performance, paving the way for the much-needed sector reforms. The government was to relend \$112.5 million out of the grant proceeds to Barki Tojik through a subsidiary loan agreement.

B. Expected Impact, Outcome, and Outputs

4. Based on the project's design and monitoring framework (DMF), the expected impact was improved reliability of Tajikistan's power supply for domestic use and for regional power trade.² The intended outcome was upgraded high-voltage transmission network for regional trade. The project's planned outputs had four components. These were new transmission lines constructed, substations rehabilitated, supervisory control and data acquisition (SCADA) system installed, and Barki Tojik's operational performance improved.

C. Provision of Inputs

5. The project was approved in August 2010. The grant was scheduled to be closed in August 2015 but was closed in June 2020, involving three extensions totaling to 59 months to cover implementation delays. Physical works were delayed due to issues with the installation of the SCADA system, which was relatively new for Tajikistan and had delayed supply chain and site works, unexpected technical issues with adaptation at existing substations, and innovation challenges. The approved minor change in scope, was to add a third transmission line utilizing savings from turnkey contracts. This validation did not find a document on the minor change in scope, as indicated in the project completion report (PCR). All physical works were completed by

¹ ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to the Republic of Tajikistan for the Regional Power Transmission Project*. Manila.

² ADB. 2021. *Completion Report: Regional Power Transmission Project in Tajikistan*. Manila.

end of 2017, about 28 months later than scheduled. The nonphysical components of the project were completed in June 2020 due to completion of all activities under the sector operational performance improvement (SOPI) program and to support the preparation of the new Power Sector Development Program (PSDP). The latter was approved in December 2020.

6. The total project cost was at \$141 million at appraisal, with ADB covering 87% to finance turnkey contracts for transmission lines, substations, SCADA system, the SOPI, and related consulting services. The balance from the government was to cover financing costs during construction and taxes and duties. Of the \$122 million grant, \$9.5 million was to be allocated to the Ministry of Energy and Industry for sector reforms and Barki Tojik's capacity development. The balance was to be relented to Barki Tojik through a subsidiary loan agreement, for a term of 25 years, with a 5-year grace period, and 5% interest rate per annum, with the foreign exchange risks being borne by Barki Tojik. At grant closing in August 2020, the actual total project cost was \$140.9 million, of which \$121.9 million was from the ADB grant and the balance from the government. The difference in ADB grant between the appraised amount and the actual amount was the undisbursed grant balance of \$47,300, which was the result of exchange rate fluctuations and was canceled in August 2020. The subsidiary loan for relending the grant proceeds to Barki Tojik was converted into an equity contribution, as requested by the government.

7. As planned, the project engaged the consultants for all the components using quality- and cost-based selection procedure. The contract was awarded to the project implementation consultant (PIC) in September 2011, which was mobilized in November 2011. The PIC was responsible for assisting Barki Tojik in bidding documents preparation, bid evaluation, construction supervision, project accounting, safeguard monitoring, and reporting to the government and ADB. At completion, the PIC rendered 266 person-months of international consulting services and 246 person-months of national consulting services. The consultant for SOPI program was mobilized in April 2012 and was engaged until grant closing, with 388 person-months of international and 266 person-months of national consulting services. They completed all activities under the SOPI program and also conducted additional services relating to restructuring of Barki Tojik and the new PSDP. The three turnkey contracts under the project were procured through international competitive bidding and a single-stage, two-envelope procedure were awarded between February 2013 and September 2014. The contract for package 1 was amended to include the third transmission line to the project under the approved minor change in scope.

8. The project was categorized B for environment and involuntary resettlement, and C for indigenous peoples. It was categorized as some gender elements and did not have a gender action plan.

D. Implementation Arrangements

9. As planned, Barki Tojik was the executing agency for the project's physical components. The Ministry of Energy and Industry was the executing agency for the SOPI program. In 2013, its energy and water functions were transferred to the newly created Ministry of Energy and Water Resources (MEWR), which became the executing agency for the SOPI program. The project management unit for energy services was engaged by Barki Tojik to carry out day-to-day management, oversee the execution of the turnkey contracts, and prepare biannual safeguard reports with support from the PIC.³ The SOPI consultant and senior staff of Barki Tojik,

³ The project management unit for energy services is a state-owned independent body established by the President of Tajikistan in 2006 to support Barki Tojik in implementing investment projects financed by development agencies.

implemented the SOPI program with strategic advice from an interministerial committee chaired by the MEWR comprising deputy ministers from the MEWR, Ministry of Finance, Ministry of Justice, and the Committee for Investments and State Property Management, plus the chair of Barki Tojik.

10. The grant recipient and the executing agencies fully complied with 36 out of the 47 covenants in the grant agreement. Two covenants not complied with concerned the prompt payment for power from all budgetary institutions and state-owned enterprises, and settlement of liabilities of the largest state industrial enterprise. Partially complied with covenants were on insurance of project facilities, delays in submitting audited project financial statements and audited entity financial statements, tariff increase, collection of service fees, reconciliation of overdue liabilities of major debtors, and payments by agency for irrigation and institutions of the Ministry of Agriculture in 2020.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

11. The PCR rated the project relevant. Throughout the project cycle, the project and its intended outcome were fully aligned with the government's policies, strategies, and development priorities. The rehabilitation of energy infrastructure, particularly the transmission network, was identified in the government's 2002 Poverty Reduction Strategy Paper as one of the key issues to be addressed.⁴ In the government's national development strategy for 2006–2015, energy was one of the strategic focal areas.⁵ One of the two transactions emphasized by the government was the Central Asia–South Asia Regional Electricity Market Project, a high-voltage power transmission line from Tajikistan to Pakistan via Afghanistan. In the next national strategy (2016–2030), energy security and efficient use of energy were among the operational priorities.⁶

12. The project was congruent with the strategy for regional cooperation in the energy sector of CAREC countries, under which loss reduction and rehabilitation of existing assets were identified as part of the investment measures for regional cooperation.⁷ It also remained consistent with the strategy and work plan (2016–2020) for regional cooperation in the energy sector of CAREC countries and the CAREC Energy Strategy 2030.⁸

13. The program was fully aligned with ADB's strategies and policies at appraisal and remained so during implementation. ADB's country partnership strategy (CPS), 2010–2014 for Tajikistan set a road map for phased investments to improve connectivity, energy security, and private sector development.⁹ Energy was a top priority, under which rehabilitation of transmission lines and support for institutional and tariff reforms were among the key interventions. ADB's interim CPS 2015 extended the validity of the CPS, 2010–2014 and energy remained a focal area.¹⁰ The strategic objective of the CPS, 2016–2020 was to help the government achieve sustained and inclusive growth that is less susceptible to external shocks and create higher

⁴ Government of Tajikistan. 2002. *Poverty Reduction Strategy Paper*. Dushanbe.

⁵ Government of Tajikistan. 2006. *National Development Strategy, 2006–2015*. Dushanbe.

⁶ Government of Tajikistan. 2016. *National Development Strategy, 2016–2030*. Dushanbe.

⁷ CAREC. 2008. *Strategy for Regional Cooperation in the Energy Sector of CAREC Countries*. Baku.

⁸ CAREC. 2015. *Strategy and Work Plan (2016–2020) for Regional Cooperation in the Energy Sector of CAREC Countries*. Ulaanbaatar; and ADB. 2019. *CAREC Energy Strategy 2030*. Manila.

⁹ ADB. 2010. *Country Partnership Strategy: Tajikistan, 2010–2014*. Manila.

¹⁰ ADB. 2014. *Interim Country Partnership Strategy: Tajikistan, 2015*. Manila.

paying jobs.¹¹ One way to achieve this objective was continued infrastructure investments to remove key bottlenecks, where ADB would support modernizing generation and transmission assets, sector reform and restructuring, and better management of finances and system losses.

14. In general, this validation assesses that the project was properly designed and formulated. The use of a grant as the financing modality was appropriate since Tajikistan was classified by ADB's country policy as being eligible for 100% grant funding due to its high risk of debt distress. The project had one minor change in scope enabling savings from turnkey contracts to be utilized for a new 220 kilovolts (kV) single circuit transmission line (65.9 kilometers [km]) between Kairakum 220 kV and Sughd 500/220 kV substations. It included the extension of Sughd substation by one 220 kV transmission line feeder. This was a timely and appropriate response to the actual needs emerging from project implementation; thus, facilitating a fuller utilization of available resources to deliver more outputs toward achieving the outcome. It contributed to maintaining the project's relevance during its implementation. Similarly, the additional activities and components added by ADB to the SOPI program, such as the preparation of grid code and the PSDP, were relevant to the project's objective and design.

15. Following the approval of the minor change, the project's DMF was revised to reflect the additional physical component and remove the outcome indicator about achieving a 100% rate of collection of electricity bills from large industrial enterprise, Tajik Aluminum Company, and irrigation and pumping entities. Both the original and revised DMF had largely logical and sound links of outcome and outputs. However, output 4, which remained unchanged in the revised DMF, had only one vaguely defined performance indicator, which was inadequate to track the actual status of the SOPI program. There were various activities under the SOPI program leading to a set of recommended actions, some of which were not implemented as envisaged, due to resistance from Barki Tojik. However, these important updates of implementation status could not be captured by the single performance indicator for output 4. Therefore, the DMF could have more adequately and specifically defined the performance indicator for output 4, with possible links to Barki Tojik's financial performance indicators specified in the grant agreement covenants.

16. On the whole, the project was fully aligned with the government's and ADB's strategies and policies. Its minor change in scope met the actual emerging needs in a timely manner; hence, directly supporting the achievement of the project's intended outcome. The DMF could have been improved regarding the performance indicator for the nonphysical component. This validation assesses the project relevant.

B. Effectiveness in Achieving Project Outcomes and Outputs

17. The PCR rated the project effective in achieving its outcome and outputs. This validation notes that the project achieved its intended outcome of an upgraded high-voltage transmission network for regional trade. Annual electricity exports from Tajikistan have consistently exceeded the target of 700 gigawatt-hours since 2013, reaching 2,924 gigawatt-hours in 2019. The other outcome target that was included in the original DMF but was removed in the revised DMF, was partially achieved. The collections from Tajik Aluminum Company did not reach the target of 100% for 2012–2015 and collections from irrigation and water pumping entities remained well below the target of 100% throughout the project implementation period.

18. The project delivered the planned physical outputs, contributing directly to the upgrade of the transmission network, albeit with 3–4 years delay. At completion, three new 220 kV

¹¹ ADB. 2016. *Country Partnership Strategy: Tajikistan, 2016–2020*. Manila.

transmission lines, totaling 216 km, were operational.¹² The Regar 500/220 kV and Rumi 220/110 kV substations, and Baipaza 220 kV and Kairakum 220 kV switchyards were rehabilitated, and a new Geran-2 220/110 kV substation beside the old Geran-1 220/110 kV substation was constructed. Detailed design, manufacturing, transport, delivery, installation, site testing, and commissioning of various SCADA equipment components were completed.¹³ This output was expanded from the originally expected 32–44 substations using savings.

19. The nonphysical output, e.g., the SOPI program, was partially achieved. Although all major activities planned for it were conducted as envisaged, those requiring actions by Barki Tojik were not implemented due to its resistance to changes as well as the government's failure to implement adequate tariff increases to the extent that would have materially improved the financial situation of Barki Tojik.¹⁴ ADB supported completion of additional activities to the SOPI scope, including the preparation of a grid code and the PSDP, among other items.

20. The project was correctly categorized for safeguards. The scope and level of detail of the initial environmental examination prepared for the transmission lines was appropriate and consistent with ADB policy requirements and national requirements. Periodic environmental monitoring reports provided summaries of contractor monitoring reports, including observations from site visits with remedial actions to address identified issues. No complaints or disputes relating to environmental aspects were recorded through the grievance redress mechanism. A land acquisition and resettlement plan was prepared prior to appraisal and specific land acquisition and resettlement plans for the transmission lines were modified to take into account specific design changes and the finalization of the alignment of the transmission lines and towers. Periodic social monitoring reports documented the affected people, payments made, and confirm that all land acquisition was completed prior to the commencement of any civil works. There was generally a high level of satisfaction among affected people on the timeliness, amount, and form of compensation payments and no significant grievances or complaints were registered or noted. The project did not involve indigenous peoples as defined under ADB's Safeguard Policy.¹⁵ Despite delays, the delivery of all physical outputs contributed to the achievement of the project's intended outcome. On the whole, this validation assesses the project effective.

C. Efficiency of Resource Use

21. The PCR rated the project efficient, based on the recalculated economic internal rate of return (EIRR) that was higher than the benchmark. This validation notes that the PCR's

¹² First of the lines is a 220 kV single circuit transmission line (74.0 km) between Kairakum 220 kV and Asht 220 kV substation extensions, with a 220 kV transmission line feeder bay at each substation. Second, a new 220 kV single circuit transmission line (77.3 km) between the Geran-2 220 kV substation and the Rumi 220 kV substation. Third, a new 220 kV single circuit transmission line (65.9 km) between Kairakum 220 kV and Sughd 500/220 kV substations, including the extension of Sughd substation by one 220 kV transmission line feeder.

¹³ These included remote terminal units, telecommunication facilities, hardware at the national control center (NCC) and back-up network control center (BUNCC). Also, they had software, power supply equipment, emergency gensets (portable power generating sources) for the NCC and the BUNCC, adaptation works at the SCADA substations. Further, civil rehabilitation and refurbishment works on the NCC and BUNCC rooms, training of Barki Tojik personnel, factory acceptance tests for the key equipment, spare parts and tools, and support documentation were provided.

¹⁴ First two of these seven items were completed but not implemented. These were, development of program strategic and business plans and corporate governance changes and development of commercial, operating, and financial plans. The next three were completed. These were project management and training, preparation of accounting and management information systems and preparation of technical or operational performance audits. Sixth, reviews of sector-wide policy and institutional issues followed by sector reform program with specific action plans and their implementation was completed but not implemented. The last was development of a least-cost sector infrastructure development master plan, which was completed.

¹⁵ ADB. 2009. *Safeguard Policy Statement*. Manila.

recalculation was largely consistent with the approach taken at appraisal and generally aligned with ADB's guidelines for economic analysis.¹⁶ Capital investment costs were updated based on actual expenditures, reflecting the actual project activities and implementation delay. The estimate on the annual operation and maintenance costs was adjusted accordingly.

22. The PCR's recalculation considered various economic benefits of the four project components. For Kairakum–Asht, the benefits included increased throughput capacity on the transmission lines resulting in higher system capacity for increased local delivery of electricity and increased electricity supply due to reduced random localized system breakdowns. It also included increased electricity supply as a result of reduced line losses. For Geran–Rumi, the benefits included increased supply to Afghanistan and to the southern region of Tajikistan due to reduced transmission level breakdowns. For Regar–Baipaza, the benefits included increased supply to Uzbekistan and 20% of the local customers served by each of the substations under this component, because of reduced transmission level breakdowns. For the SCADA component, the benefit was increased power production from the optimization of the Vaksh hydro system using decision support software with real-time system-demand signals from the SCADA network and inputs from hydropower plant variables such as reservoir heights, river flow rates, turbines in operation, tail-race levels, and current and projected weather conditions.

23. The PCR's recalculated EIRR was 15.5%, exceeding the 12.0% benchmark, suggesting economic viability but significantly lower than at appraisal of 31.4%. The actual accrued duration of breakdown of transmission assets was 0.24 weeks per year whereas the original estimate at appraisal was 3 weeks per year. Sensitivity analysis under various adverse scenarios showed a mixed result. A 20% decrease in willingness-to-pay or a 20% decrease in resource cost savings would result in an EIRR of 15.1% or 14.7%, above the benchmark. However, the removal of benefits from SCADA would bring the EIRR down to 10.9%, below the benchmark. This suggested that the EIRR was highly sensitive to the SCADA benefits, which were difficult to quantify as indicated in the PCR.

24. The project incurred about 59 months of implementation delays, which were already accounted for in the recalculated EIRR. However, this validation notes substantial inconsistencies between the PCR's economic recalculation in Appendix 8 and its supporting Excel spreadsheet. The recalculated EIRR in the spreadsheet was 12.23%, which was lower than the PCR's result of 15.50%, and just marginally above the benchmark. Also, the economic investment cost and operation and maintenance cost in the spreadsheet were higher than those presented in Appendix 8 of the PCR, suggesting that the standard conversion factor and the shadow exchange rate factor used in the spreadsheet were different from those in the PCR. For Kairakum–Asht component, the PCR indicated that local benefits were considered as 50% incremental and 50% non-incremental, while the spreadsheet used 100% for incremental and 0% for non-incremental local benefits. The non-incremental benefit of displaced diesel genset generation was valued at \$0.30/kWh in the PCR, but more conservatively at \$0.23/kWh in the spreadsheet. Also, for Kairakum–Asht, Geran–Rumi, and Regar–Baipaza components, the assumption on the 6% annual growth rate of estimated power sales in the project areas was not supported by references or explanations either in the spreadsheet or the PCR. For Regar–Baipaza component, the increase in local power supply due to decreased transmission level breakdowns was estimated to be 0.15% in the PCR, but 1.96% in the spreadsheet. For SCADA component, its benefits were highly sensitive to the estimated increase in power production due to operational optimization, which was set as 0.80% in both the spreadsheet and the PCR without adequate substantiation. Given that the SCADA benefits accounted for a major share in the total benefits

¹⁶ ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila.

of the project, a marginal change of this parameter from 0.80% to 0.75% would reduce the project's EIRR from 12.23% (as recalculated in the spreadsheet) to 11.87%, below the benchmark. Still for the SCADA component, post-2022 power production from the Vaksh basin at the margin was valued based on the CASA-1000 power purchase rate of \$0.095/kWh. It is unclear to this validation whether this was an expected rate or a confirmed rate that was specified in an executed power purchase agreement. Applying a 10% reduction to this rate would bring the project's EIRR from 12.23% to 11.78%, below the benchmark. It is also not clear what numeraire was used to shadow price the costs and benefits. The economic reevaluation appeared to have used both the standard conversion factor (0.90) and shadow exchange rate factor (0.94) methodologies, especially for the conversion factors. In project economic analysis, the fundamental principle is to use only one approach and not to combine the two. Given the above methodological issues, this validation assesses the project less than efficient.

D. Preliminary Assessment of Sustainability

25. The PCR rated the project less than likely sustainable. Its financial internal rate of return (FIRR) recalculation largely followed the approach taken at appraisal and was in line with the general principles outlined in ADB's guidance note.¹⁷ It updated the financial analysis at appraisal to reflect the actual project costs and implementation delays. The financial benefits included increased revenues received by Barki Tojik from electricity sale in Tajikistan and regional trade as a result of increased throughput, decreased outages, and decreased losses. Regional financial benefits such as additional revenues generated in neighboring countries were not included in the financial evaluation. The recalculated FIRR was 9.23%, substantially exceeding the 3.11% weighted average cost of capital recalculated at grant closing, thereby suggesting that the project would be financially viable. Sensitivity analysis under the adverse scenario of a 20% decrease in revenues or a 100% increase in operation and maintenance costs showed that FIRR would slightly drop to 8.00% or 7.50%, remaining well above the weighted average cost of capital.

26. This validation notes that some of the aforementioned observations also apply here. Given that the increased revenue on account of the SCADA system dominated the total financial benefits, the recalculated FIRR is found to be highly sensitive to the variation in the efficiency improvement of 0.8% and the CASA-1000 power purchase rate of \$0.095/kWh. A 20% reduction of both parameters would decrease the FIRR to 6.76%. While the recalculated FIRR tends to suggest financial viability of the physical assets developed under the project, Barki Tojik's financial position remains weak due to chronic issues of deteriorating infrastructure, inadequate capacity, below-cost tariff, reduced billing and tariff collections, nonpayment of arrears, increasing debt levels, among other things. Latest audited report for the year ending December 2019 indicated that Barki Tojik was subject to a substantial uncertainty that may cast significant doubt on its ability to continue. Also, despite a series of recommended actions that were formulated under the SOPI program, Barki Tojik was reluctant to implement these actions to realize reforms. Although the PSDP had been approved, there exist large uncertainties as to the extent to which the envisaged sector reforms and policy actions would be implemented to effectively address the institutional, financial, and operational issues facing Barki Tojik. This validation assesses the project less than likely sustainable.

¹⁷ ADB. 2019. *Financial Analysis and Evaluation: Technical Guidance Note*. Manila.

III. OTHER PERFORMANCE ASSESSMENTS

A. Preliminary Assessment of Development Impact

27. The PCR rated the project's development impact satisfactory. At completion, the project constructed three new 220 kV transmission lines, rehabilitated five substations, and installed SCADA equipment components in 44 substations. These achieved outputs collectively contributed to improving reliability of Tajikistan power supply, for domestic use, and for regional power trade. The observed accrued duration of transmission losses had decreased from an average of 0.24 weeks (1.68 days) for years up to 2016 to 0.09 weeks (0.63 days) after 2016, exceeding the target of 1 day in 2020. The rehabilitation works at Regar substation and Baipaza switchyard significantly increased the reliability of power supply to the neighboring Uzbekistan. This contributed directly to reinforcing the Central Asian Power System and facilitating regional integration. This validation assesses the development impact of the project satisfactory.

B. Performance of the Recipient and Executing Agency

28. The PCR rated the performance of the recipient and the executing agencies satisfactory. The government as the grant recipient, performed its functions in a timely and responsible manner, including facilitating grant signing, releasing counterpart funds, and supporting efficient oversights and actions during implementation. Barki Tojik and the MEWR, as the executing agencies, demonstrated ownership and made appropriate institutional and implementation arrangements. With strong assistance from the PIC, Barki Tojik managed well the contractors' activities to expedite implementation progress so as to offset the initial delays. All outputs relating to the physical components were achieved. Safeguard requirements were complied with. Throughout implementation, progress reports for the physical components were submitted on a quarterly basis and reports for the SOPI program were submitted on monthly and quarterly basis. However, Barki Tojik was reluctant to implement the recommended reforms under the SOPI program. Its financial management capacity remained weak. Certain financial covenants were partial or not complied with. These issues are expected to be addressed in the ensuing PSDP implementation. This validation assesses the performance of the recipient and the executing agencies satisfactory.

C. Performance of the Asian Development Bank

29. The PCR rated ADB's performance satisfactory. ADB worked closely with the recipient, the executing agencies, and other stakeholders; thus, ensuring the project's timely preparation, approval, and implementation. ADB headquarters handled the processing and administration of the project before it was delegated to the Tajikistan Resident Mission in July 2018. ADB was responsive and flexible on the requests for extension of grant closing date for preparation of the new PSDP and the approval of change in scope to allow for utilization of savings for an additional transmission line. Project documents were reviewed and approved in a timely manner and all payment claims were processed promptly. ADB was closely involved in identifying and assessing implementation issues and provided substantial inputs to effectively resolve the identified issues and expedite implementation progress. ADB fielded 14 missions, providing necessary guidance to the executing agencies' timely remedial actions, resolving implementation issues, and taking the project forward. However, due diligence at appraisal could have been more in-depth on the issues associated with Barki Tojik's difficult financial position and resistance to change, so that interventions on financial management and sector reforms could have been more effective and efficient. Also, the output indicators for the SOPI program in the DMF could have been

strengthened to better serve as the metrics for measuring its progress and achievement. On the whole, this validation assesses ADB's performance satisfactory.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

30. The PCR rated the project successful. This validation assesses the project relevant, based on its alignment with the strategies of the government and ADB and the appropriateness of its design. It was effective in delivering the physical outputs and achieving the intended outcome. It was less than efficient due to methodological issues in recalculating the EIRR. It was less than likely sustainable due to Barki Tojik's weak financial position. Overall, this validation assesses the project less than successful.

Overall Ratings

Validation Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Relevance	Relevant	Relevant	
Effectiveness	Effective	Effective	
Efficiency	Efficient	Less than efficient	EIRR methodological issues.
Sustainability	Less than likely sustainable	Less than likely sustainable	
Overall Assessment	Successful	Less than successful	
Preliminary assessment of impact	Satisfactory	Satisfactory	
Borrower and executing agency	Satisfactory	Satisfactory	
Performance of ADB	Satisfactory	Satisfactory	
Quality of PCR		Satisfactory	Para. 37.

ADB = Asian Development Bank, EIRR = economic internal rate of return, IED = Independent Evaluation Department, PCR = project completion report.

Source: ADB (IED).

B. Lessons

31. The PCR identified the following lessons. First, early recognition of issues associated with Barki Tojik's difficult financial position and resistance to change would enable a more effective ADB interventions. Second, the DMF output for the SOPI program should be adequately and specifically defined, with possible links to the financial performance indicators specified in the grant agreement covenants to be easily assessed. Third, at appraisal, more attention could have been given to regulatory reforms and, more specifically, economic regulation and tariffs. A grant covenant to establish an independent regulatory authority, together with sector reform, would have put more onus on the government to do more.

32. This validation supports the above lessons and offers three additional project-level lessons. First, rehabilitating transmission and distribution assets and strengthening power grid and energy security require significant capital investment. In situations where sector reform is undertaken together with power infrastructure works, financing arrangements between the government and state-owned power utilities need to be sound. Instead of relending grant

proceeds to state-owned power utilities, the government may provide equity contributions to strengthen the financial position of the utilities, especially in situations where electricity tariffs are low. In this project, the subsidiary loan agreement between the government and Barki Tojik were amended in 2021 to convert the subsidiary loan into an equity contribution.

33. Second, good due diligence at appraisal is important to prepare a realistic project schedule considering the institutional setup, internal review and approval procedures, existing capacity, and prior experience of the government and executing agency in implementing ADB and other development partners' projects. Formulating appropriate project design, identifying major risks, implementing adequate mitigation measures, and providing early implementation support are crucial in minimizing startup delays and facilitating timely implementation progress of projects. This is important when substantial progress in policy actions and sector reforms is targeted.

34. Third, timely and appropriate changes in scope to respond to actual needs emerging from project implementation can strengthen a project's effectiveness by delivering additional outputs while increasing relevance. The minor change in scope facilitated a fuller utilization of available grant resources to deliver more physical outputs toward achieving the project outcome and additional activities and components were relevant to the project's objective and design.

C. Recommendations for Follow-Up

35. The PCR recommended that first, DMF outcomes leading to sector reform should be strengthened in future assistance and vague outcome indicators that are difficult to assess should be avoided. Second, the project design could have given more consideration to gender aspects. Third, projects with significant reform components should have more conservative schedules to account for multiple complex factors that can affect implementation. Fourth, ADB should monitor the performance of Barki Tojik under the approved PSDP to ensure adherence with the project's commitments. Fifth, future covenants should continue to address Barki Tojik's weak financial position. Sixth, ADB should follow up future training on SCADA. Seventh, ADB should continue to work through private and public sector operations to support modern forms of energy supply and to foster knowledge transfer in the region. This validation supports these recommendations.

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Monitoring and Reporting

36. PIC submitted quarterly reports to inform the status of physical components, disbursements, contractors' performance, and bottlenecks. MEWR submitted monthly and quarterly reports on the SOPI component. Barki Tojik submitted audited project financial statements which at times were delayed beyond the requisite 6 months. All had unqualified opinions. Audited entity financial statements were also submitted, but without audit opinion for fiscal years 2012 and 2013 due to insufficient appropriate audit evidence. Beyond that, qualified opinions were given for all audited reports.

B. Comments on Project Completion Report Quality

37. The PCR was consistent with the guidelines. It was comprehensive, objective, and clear in explaining major implementation issues. The economic and financial recalculations were generally well prepared but showed some methodological issues. The findings, lessons, and recommendations were evidence-based, relevant, and useful. This validation assesses the quality of the PCR satisfactory.

C. Data Sources for Validation

38. Data sources were the PCR, the report and recommendation of the President, grant and project agreements, mission reports, safeguard documents, and national and ADB strategies.

D. Recommendation for Independent Evaluation Department Follow-Up

39. Project performance evaluation report is not needed as an in-depth evaluation is not warranted.